



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-3
Sample Delivery Group (SDG): 091106-66
Your Reference: 06/11/09
Location: Limerick Gasworks
Report No.: 66758

A total of 2 samples was received on Friday November 06, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091106-66
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66758

SOLID

Results Legend	Sample ID	E10		K11		Total
		1.10 - 1.50		0.20 - 0.70		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test						
N No Determination Possible						
Ammonium Soil by Titration	All		X		X	0 2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X	0 2
Easily Liberated Sulphide	All		X		X	0 2
EPH CWG (Aliphatic) GC (S)	All		X		X	0 2
EPH CWG (Aromatic) GC (S)	All		X		X	0 2
GRO BTEX MTBE GC (S)	All	X		X		0 2
Hexavalent Chromium (s)	All		X		X	0 2
Metals by iCap-OES (Soil)	Arsenic		X		X	0 2
	Cadmium		X		X	0 2
	Chromium		X		X	0 2
	Copper		X		X	0 2
	Lead		X		X	0 2
	Mercury		X		X	0 2
	Nickel		X		X	0 2
	Selenium		X		X	0 2
	Zinc		X		X	0 2
PAH micro by GCMS	All		X		X	0 2
PCBs by GCMS	All				X	0 1
pH	All		X		X	0 2
Phenols by HPLC (S)	All		X		X	0 2
Sample description	All		X		X	0 2
Total Sulphate	All		X		X	0 2
TPH CWG GC (S)	All		X		X	0 2
VOC MS (S)	All	X		X		0 2

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 No other copyright or patent required for any other use.

SDG:	091106-66	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-3	Attention:	Verity Sankey
Client Reference:	06/11/09	Order No.:	
Location:	Limerick Gasworks	Report No.:	66758

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E10	1.10 - 1.50	Brown	Sandy clay	0.1 - 2 mm	stones
K11	0.20 - 0.70	Brown	Sandy clay	0.1 - 2 mm	stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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Test Completion dates

SDG reference: 091106-66

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
E10	1.10 - 1.50	SOLID	18/11/2009	13/11/2009	10/11/2009	09/11/2009	10/11/2009	10/11/2009	10/11/2009	10/11/2009	10/11/2009	16/11/2009	13/11/2009	12/11/2009	12/11/2009	11/11/2009	10/11/2009	10/11/2009
K11	0.20 - 0.70	SOLID	18/11/2009	13/11/2009	10/11/2009	09/11/2009	10/11/2009	10/11/2009	07/12/2009	10/11/2009	10/11/2009	16/11/2009	13/11/2009	11/11/2009	11/11/2009	11/11/2009	10/11/2009	10/11/2009

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 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
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Results Legend			Sample Identity	E10	K11				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.10 - 1.50	0.20 - 0.70				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	04/11/2009	04/11/2009				
			Date Received	06/11/2009	06/11/2009				
			SDG Ref	091106-66	091106-66				
			Lab Sample No.(s)	593173	593070				
Component	LOD/Units	Method							
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	30.5		<15.0				
				M		M			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	43.5		<15.0				
				M		M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	33.8		<15.0				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	0.821		<0.0100				
				M		M			
Cresols	<0.01 mg/kg	TM062 (S)	1.39		<0.0100				
				M		M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	0.932		<0.0150				
				M		M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100				
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100				
				M		M			
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150		<0.0150				
				M		M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	3.14		0.00				
pH value of soil	1 pH Units	TM133	8.48		7.30				
				M		M			
Hexavalent Chromium	<0.6 mg/kg	TM151	1.3		<0.60				
				#		#			
Hexavalent Chromium	<0.6 mg/kg	TM151	1.43		<0.600				
				#		#			
Total Cyanide	<1 mg/kg	TM153	173		<1.00				
				M		M			
PCB congener 28	<3 µg/kg	TM168			<3.00				
PCB congener 52	<3 µg/kg	TM168			<3.00				
PCB congener 101	<3 µg/kg	TM168			<3.00				
PCB congener 118	<3 µg/kg	TM168			<3.00				
PCB congener 138	<3 µg/kg	TM168			<3.00				
PCB congener 153	<3 µg/kg	TM168			<3.00				
PCB congener 180	<3 µg/kg	TM168			<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168			<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	177.81		<15.00				
				#		#			
Easily Liberated Sulphide	<15 mg/kg	TM180	197		<15.0				
				#		#			
Arsenic	<0.6 mg/kg	TM181	9.31		14.1				
				M		M			
Cadmium	<0.02 mg/kg	TM181	0.473		2.19				
				M		M			
Chromium	<0.9 mg/kg	TM181	8.65		103				
				M		M			
Copper	<1.4 mg/kg	TM181	12.8		62.9				
				M		M			
Lead	<0.7 mg/kg	TM181	13.1		10.5				
				M		M			
Mercury	<0.14 mg/kg	TM181	0.216		<0.140				
				M		M			
Nickel	<0.2 mg/kg	TM181	5.72		79.3				
				M		M			
Selenium	<1 mg/kg	TM181	1.08		1.18				
				#		#			
Zinc	<1.9 mg/kg	TM181	23.1		79.6				
				M		M			
Total Sulphate	<48 mg/kg	TM221	774		6950				
				M		M			

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EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E10	K11				
Depth (m)	1.10 - 1.50	0.20 - 0.70				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	04/11/2009	04/11/2009				
Date Received	06/11/2009	06/11/2009				
SDG Ref	091106-66	091106-66				
Lab Sample No.(s)	593173	593070				

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	717000	4660		
Aliphatics >C16-C21	<100 µg/kg	TM173	1030000	4940		
Aliphatics >C21-C35	<100 µg/kg	TM173	591000	11600		
Aliphatics >C35-C44	<100 µg/kg	TM173	65800	2180		
Total Aliphatics >C12-C44	<100 µg/kg	TM173	2410000	23400		
Aliphatics >C16-C35	<100 µg/kg	TM173	1620000	16500		

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EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E10	K11				
Depth (m)	1.10 - 1.50	0.20 - 0.70				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	04/11/2009	04/11/2009				
Date Received	06/11/2009	06/11/2009				
SDG Ref	091106-66	091106-66				
Lab Sample No.(s)	593173	593070				

Component	LOD/Units	Method	E10	K11			
Aromatics >EC12-EC16	<100 µg/kg	TM173	1460000	8340			
Aromatics >EC16-EC21	<100 µg/kg	TM173	2300000	12700			
Aromatics >EC21-EC35	<100 µg/kg	TM173	3830000	42800			
Aromatics >EC35-EC44	<100 µg/kg	TM173	588000	9310			
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	8180000	73100			
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	8180000	73100			

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GRO BTEX MTBE GC (S)

Results Legend
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 M mCERTS accredited.
 * subcontracted test.
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 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E10	K11				
Depth (m)	1.10 - 1.50	0.20 - 0.70				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	04/11/2009	04/11/2009				
Date Received	06/11/2009	06/11/2009				
SDG Ref	091106-66	091106-66				
Lab Sample No.(s)	593173	593070				

Component	LOD/Units	Method	E10	K11			
GRO C5-C12	<44 µg/kg	TM089	109000	704			
			#	#			
MTBE	<5 µg/kg	TM089	<5.00	<5.00			
			#	#			
Benzene	<10 µg/kg	TM089	1010	21.3			
			M	M			
Toluene	<2 µg/kg	TM089	5370	63.8			
			M	M			
Ethyl Benzene	<3 µg/kg	TM089	2430	14.6			
			M	M			
m & p Xylene	<6 µg/kg	TM089	12400	63.8			
			M	M			
o Xylene	<3 µg/kg	TM089	5950	26.9			
			M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	18400	90.7			
			M	M			
Sum of BTEX	<10 µg/kg	TM089	27200	190			
			M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	83.9	66.5			
Aliphatics >C6-C8	<10 µg/kg	TM089	3100	99.8			
Aliphatics >C8-C10	<10 µg/kg	TM089	11400	50.3			
Aliphatics >C10-C12	<10 µg/kg	TM089	20200	88.9			
Total Aliphatics C5-C12	<10 µg/kg	TM089	34800	305			
Aromatics C6-C7	<10 µg/kg	TM089	1010	21.3			
Aromatics >C7-C8	<10 µg/kg	TM089	5370	63.8			
Aromatics >EC8-EC10	<10 µg/kg	TM089	37900	76.9			
Aromatics >EC10-EC12	<10 µg/kg	TM089	30300	133			
Total Aromatics C6-C12	<10 µg/kg	TM089	74600	399			

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PAH micro by GCMS

Results Legend		Sample Identity	E10	K11				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.10 - 1.50 Soil/Solid 04/11/2009 06/11/2009 091106-66 593173	0.20 - 0.70 Soil/Solid 04/11/2009 06/11/2009 091106-66 593070				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	1150000 M	103 M				
Acenaphthylene (S)	<12 µg/kg	TM218	158000 M	72.6 M				
Acenaphthene (S)	<8 µg/kg	TM218	128000 M	16.8 M				
Flourene (S)	<10 µg/kg	TM218	188000 M	49.8 M				
Phenanthrene (S)	<15 µg/kg	TM218	360000 M	297 M				
Anthracene (S)	<16 µg/kg	TM218	134000 M	96.5 M				
Fluoranthene (S)	<17 µg/kg	TM218	214000 M	269 M				
Pyrene (S)	<15 µg/kg	TM218	136000 M	184 M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	62500 M	119 M				
Chrysene (S)	<10 µg/kg	TM218	41700 M	73.7 M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	54000 M	119 M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	21800 M	49.2 M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	45000 M	92.7 M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	21000 M	47.4 M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	5930 M	<23.0 M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	22000 M	54.5 M				
PAH 16 EPA Total	<118 µg/kg	TM218	2740000 M	640 M				

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TPH CWG GC (S)

Results Legend
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M mCERTS accredited.
subcontracted test.
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Sample Identity	E10	K11				
Depth (m)	1.10 - 1.50	0.20 - 0.70				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	04/11/2009	04/11/2009				
Date Received	06/11/2009	06/11/2009				
SDG Ref	091106-66	091106-66				
Lab Sample No.(s)	593173	593070				

Component	LOD/Units	Method	E10	K11			
Total Aliphatics >C5-C44	<100 µg/kg	TM173	2440000	23700			
Total Aromatics >C6-C44	<100 µg/kg	TM173	8260000	73500			
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	10700000	97200			

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VOC MS (S)

Results Legend			Sample Identity	E10	K11				
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			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	04/11/2009	04/11/2009				
			Date Received	06/11/2009	06/11/2009				
			SDG Ref	091106-66	091106-66				
			Lab Sample No.(s)	593173	593070				
			Method						
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	156	83.4					
Toluene-d8**	%	TM116	42.9	63.1					
4-Bromofluorobenzene**	%	TM116	132	42.5					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	#	#			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
Carbon Disulphide	<9 µg/kg	TM116	242	<9.00	M	M			
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Benzene	<9 µg/kg	TM116	3270	33.4	M	M			
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	M	M			
Toluene	<6 µg/kg	TM116	11900	105	M	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	M	M			
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	M	M			
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
Ethylbenzene	<9 µg/kg	TM116	11900	36.3	M	M			

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VOC MS (S)

Results Legend			Sample Identity	E10	K11				
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Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116		106000	189	#	#		
o-Xylene	<11 µg/kg	TM116		47100	72.3	M	M		
Styrene	<11 µg/kg	TM116		<11.0	<11.0	M	M		
Bromoform	<12 µg/kg	TM116		<12.0	<12.0	M	M		
Isopropylbenzene	<9 µg/kg	TM116		1850	<9.00	M	M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116		<15.0	<15.0	#	#		
1,2,3-Trichloropropane	<13 µg/kg	TM116		<13.0	<13.0	M	M		
Bromobenzene	<14 µg/kg	TM116		<14.0	<14.0	M	M		
Propylbenzene	<6 µg/kg	TM116		2930	7.59	M	M		
2-Chlorotoluene	<14 µg/kg	TM116		<14.0	<14.0	#	#		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		25700	22.0	M	M		
4-Chlorotoluene	<9 µg/kg	TM116		<9.00	<9.00	#	#		
tert-Butylbenzene	<12 µg/kg	TM116		<12.0	<12.0	#	#		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116		58200	54.6	#	#		
sec-Butylbenzene	<8 µg/kg	TM116		364	<8.00	#	#		
4-Isopropyltoluene	<8 µg/kg	TM116		1520	<8.00	#	#		
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8.00	<8.00	#	#		
1,4-Dichlorobenzene	<11 µg/kg	TM116		<11.0	<11.0	M	M		
n-Butylbenzene	<7 µg/kg	TM116		<7.00	<7.00	#	#		
1,2-Dichlorobenzene	<8 µg/kg	TM116		<8.00	<8.00	M	M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116		<11.0	<11.0	M	M		
Tert-amyl methyl ether	<7 µg/kg	TM116		<7.00	<7.00	#	#		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116		<9.00	<9.00	#	#		
Hexachlorobutadiene	<15 µg/kg	TM116		<15.0	<15.0	#	#		
Naphthalene	<7 µg/kg	TM116		2750000	1820	#	#		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116		<12.0	<12.0	#	#		

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-3
Sample Delivery Group (SDG): 091109-12
Your Reference: 06/11/09
Location: Limerick Gasworks
Report No.: 66900

A total of 7 samples was received on Friday November 06, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66900

SOLID

Results Legend	Sample ID	H10		H8		H9		J10		J11		Total
		Depth (m)		Depth (m)		Depth (m)		Depth (m)		Depth (m)		
		Container		Container		Container		Container		Container		
X Test												
N No Determination Possible												
Ammonium Soil by Titration	All	X	X	X	X	X	X	X	X	X		0
Asbestos Presence Screen	All			X								7
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X	X	X	X	X	X	X	X	X		0
Easily Liberated Sulphide	All	X	X	X	X	X	X	X	X	X		7
EPH CWG (Aliphatic) GC (S)	All	X	X	X	X	X	X	X	X	X		0
EPH CWG (Aromatic) GC (S)	All	X	X	X	X	X	X	X	X	X		7
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	X	X	X	X		0
Hexavalent Chromium (s)	All	X	X	X	X	X	X	X	X	X		7
Metals by iCap-OES (Soil)	Arsenic	X	X	X	X	X	X	X	X	X		0
	Cadmium	X	X	X	X	X	X	X	X	X		7
	Chromium	X	X	X	X	X	X	X	X	X		0
	Copper	X	X	X	X	X	X	X	X	X		7
	Lead	X	X	X	X	X	X	X	X	X		0
	Mercury	X	X	X	X	X	X	X	X	X		7
	Nickel	X	X	X	X	X	X	X	X	X		0
	Selenium	X	X	X	X	X	X	X	X	X		7
	Zinc	X	X	X	X	X	X	X	X	X		0
PAH by GCMS	All			X								1
PAH micro by GCMS	All	X	X			X	X	X	X	X		0
PCBs by GCMS	All					X						6
pH	All	X	X	X	X	X	X	X	X	X		0
Phenols by HPLC (S)	All	X	X	X	X	X	X	X	X	X		7
Sample description	All	X	X	X	X	X	X	X	X	X		0
Total Sulphate	All	X	X	X	X	X	X	X	X	X		7
TPH CWG GC (S)	All	X	X	X	X	X	X	X	X	X		0
VOC MS (S)	All				X		X			X		3

SDG:	091109-12	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-3	Attention:	Verity Sankey
Client Reference:	06/11/09	Order No.:	
Location:	Limerick Gasworks	Report No.:	66900

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
H10	0.00 - 0.50	Brown	Sandy clay	0.1 - 2 mm	stones
H8	0.00 - 0.30	Brown	Sand	0.1 - 2 mm	stones
H9	0.00 - 0.40	Brown	Sand	0.1 - 2 mm	stones
	3.00 - 3.50	Brown	Sand	0.1 - 2 mm	stones
	4.00 - 4.20	Brown	Sandy clay	0.1 - 2 mm	stones
J10	0.00 - 0.30	Brown	Sandy clay	0.1 - 2 mm	stones
J11	0.85 - 0.95	Brown	Sandy clay	0.1 - 2 mm	stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091109-12
 Job: D_MOUCHEL_ELE-3
 Client Reference: 06/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66900

Test Completion dates

SDG reference: 091109-12

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
H10	0.00 - 0.50	SOLID	13/11/2009	12/11/2009	13/11/2009	16/11/2009	16/11/2009	13/11/2009	12/11/2009	12/11/2009	13/11/2009	13/11/2009	10/11/2009	10/11/2009	12/11/2009	10/11/2009	12/11/2009	12/11/2009	16/11/2009
H8	0.00 - 0.30	SOLID	13/11/2009	12/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	12/11/2009	13/11/2009	13/11/2009	10/11/2009	10/11/2009	12/11/2009	10/11/2009	12/11/2009	12/11/2009	14/11/2009
H9	0.00 - 0.40	SOLID	11/11/2009	10/11/2009	11/11/2009	12/11/2009	12/11/2009	13/11/2009	13/11/2009	11/11/2009	11/11/2009	18/11/2009	11/11/2009	10/11/2009	11/11/2009	10/11/2009	11/11/2009	13/11/2009	13/11/2009
	3.00 - 3.50	SOLID	13/11/2009	11/11/2009	11/11/2009	11/11/2009	17/11/2009	13/11/2009	12/11/2009	12/11/2009	11/11/2009	08/12/2009	13/11/2009	10/11/2009	12/11/2009	10/11/2009	11/11/2009	17/11/2009	18/11/2009
	4.00 - 4.20	SOLID	13/11/2009	12/11/2009	13/11/2009	13/11/2009	17/11/2009	13/11/2009	13/11/2009	12/11/2009	13/11/2009	13/11/2009	13/11/2009	10/11/2009	12/11/2009	10/11/2009	12/11/2009	17/11/2009	18/11/2009
J10	0.00 - 0.30	SOLID	13/11/2009	11/11/2009	11/11/2009	12/11/2009	12/11/2009	13/11/2009	12/11/2009	12/11/2009	13/11/2009	13/11/2009	10/11/2009	10/11/2009	12/11/2009	10/11/2009	11/11/2009	13/11/2009	13/11/2009
J11	0.85 - 0.95	SOLID	11/11/2009	11/11/2009	11/11/2009	12/11/2009	12/11/2009	13/11/2009	13/11/2009	12/11/2009	13/11/2009	13/11/2009	08/12/2009	10/11/2009	11/11/2009	10/11/2009	11/11/2009	17/11/2009	20/11/2009

SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

Results Legend			Sample Identity	H10	H8	H9	H9	H9	J10
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	0.00 - 0.30	0.00 - 0.40	3.00 - 3.50	4.00 - 4.20	0.00 - 0.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	06/11/2009	05/11/2009	10/11/2009	05/11/2009	06/11/2009	06/11/2009
			Date Received	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009
			SDG Ref	091109-12	091109-12	091109-12	091109-12	091109-12	091109-12
			Lab Sample No.(s)	595634	595611	595723	595803	595816	595684
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001				No ACM Detected			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024				<15.0 M	49.8 M	55.7 M	<15.0 M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0		38.7	43.3	<15.0
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100		<0.200	<0.500	<0.0100
Phenol	<0.01 mg/kg	TM062 (S)	<0.0300	<0.0300	<0.0100		12.2	199	<0.0100
Cresols	<0.01 mg/kg	TM062 (S)	0.0655	<0.0400	<0.0100		51.0	243	<0.0100
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500		<1.00	<2.50	<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150		113	195	<0.0150
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100		<0.200	<0.500	<0.0100
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100		<0.200	<0.500	<0.0100
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150		<0.300	<0.750	<0.0150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.100	<0.0800	0.00		177	637	0.00
pH value of soil	1 pH Units	TM133	11.59	8.09	8.4		9.32	11.57	8.54
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600		<0.600	<0.600	<0.600
Total Cyanide	<1 mg/kg	TM153	4.25	1.75	1.20		5.31	1.95	<1.00
PCB congener 28	<3 µg/kg	TM168					<3.00		
PCB congener 52	<3 µg/kg	TM168					<3.00		
PCB congener 101	<3 µg/kg	TM168					<3.00		
PCB congener 118	<3 µg/kg	TM168					<3.00		
PCB congener 138	<3 µg/kg	TM168					<3.00		
PCB congener 153	<3 µg/kg	TM168					<3.00		
PCB congener 180	<3 µg/kg	TM168					<3.00		
Total of 7 Congener PCBs	<3 µg/kg	TM168					<3.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	27.1	33.6		250	48.9	<15.0
Arsenic	<0.6 mg/kg	TM181	5.98	3.03	3.76		5.39	9.56	4.35
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200		<0.0200	<0.0200	<0.0200
Chromium	<0.9 mg/kg	TM181	8.62	10.2	11.9		12.1	15.5	11.1
Copper	<1.4 mg/kg	TM181	6.44	7.87	7.24		7.61	7.17	12.2
Lead	<0.7 mg/kg	TM181	12.5	9.64	8.33		20.1	55.1	18.8
Mercury	<0.14 mg/kg	TM181	0.156	0.197	0.233		0.331	<0.140	0.274
Nickel	<0.2 mg/kg	TM181	6.60	15.7	17.6		9.45	10.4	15.2
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00		<1.00	<1.00	<1.00
Zinc	<1.9 mg/kg	TM181	22.6	32.5	33.2		22.7	19.0	55.3
Total Sulphate	<48 mg/kg	TM221	1070	4470	1650		1920	6440	1100

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H10	H8	H9	H9	H9	J10
Depth (m)	0.00 - 0.50	0.00 - 0.30	0.00 - 0.40	3.00 - 3.50	4.00 - 4.20	0.00 - 0.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	05/11/2009	05/11/2009	10/11/2009	05/11/2009	05/11/2009	05/11/2009
Date Received	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009
SDG Ref	091109-12	091109-12	091109-12	091109-12	091109-12	091109-12
Lab Sample No.(s)	595634	595611	595723	595803	595816	595684

Component	LOD/Units	Method	H10	H8	H9	H9	H9	J10
Aliphatics >C12-C16	<100 µg/kg	TM173	12800	1160	1180	110000	63700	8500
Aliphatics >C16-C21	<100 µg/kg	TM173	28200	1580	1620	163000	80000	17200
Aliphatics >C21-C35	<100 µg/kg	TM173	75600	15200	18400	301000	93200	106000
Aliphatics >C35-C44	<100 µg/kg	TM173	55200	<100	17800	73000	7270	89800
Total Aliphatics >C12-C44	<100 µg/kg	TM173	172000	18000	39000	647000	244000	221000
Aliphatics >C16-C35	<100 µg/kg	TM173	104000	16800	20000	465000	173000	123000

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

EPH CWG (Aromatic) GC (S)

Sample Identity	H10	H8	H9	H9	H9	J10
Depth (m)	0.00 - 0.50	0.00 - 0.30	0.00 - 0.40	3.00 - 3.50	4.00 - 4.20	0.00 - 0.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	05/11/2009	05/11/2009	10/11/2009	05/11/2009	05/11/2009	05/11/2009
Date Received	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009
SDG Ref	091109-12	091109-12	091109-12	091109-12	091109-12	091109-12
Lab Sample No.(s)	595634	595611	595723	595803	595816	595684

Component	LOD/Units	Method	H10	H8	H9	H9	H9	J10
Aromatics >EC12-EC16	<100 µg/kg	TM173	15600	3690	1620	435000	190000	13600
Aromatics >EC16-EC21	<100 µg/kg	TM173	38400	1290	2020	765000	386000	27700
Aromatics >EC21-EC35	<100 µg/kg	TM173	301000	13000	44000	1840000	934000	380000
Aromatics >EC35-EC44	<100 µg/kg	TM173	171000	18400	48100	400000	179000	353000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	526000	36500	95700	3440000	1690000	774000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	526000	36500	95700	3440000	1690000	774000

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

GRO BTEX MTBE GC (S)

Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Sample Identity	H10	H8	H9	H9	H9	J10
	Depth (m)	0.00 - 0.50	0.00 - 0.30	0.00 - 0.40	3.00 - 3.50	4.00 - 4.20	0.00 - 0.30
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	05/11/2009	05/11/2009	10/11/2009	05/11/2009	05/11/2009	05/11/2009
	Date Received	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009
	SDG Ref	091109-12	091109-12	091109-12	091109-12	091109-12	091109-12
Lab Sample No.(s)	595634	595611	595723	595803	595816	595684	

Component	LOD/Units	Method	H10	H8	H9	H9	H9	J10
GRO C5-C12	<44 µg/kg	TM089	819 #	84.1 #	441 #	226000 #	93700 #	<44.0 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #	<25.0 #	<10.0 #	<5.00 #
Benzene	<10 µg/kg	TM089	93.9 M	31.1 M	129 M	5810 M	468 M	<10.0 M
Toluene	<2 µg/kg	TM089	90.6 M	30.1 M	88.5 M	19300 M	4810 M	<6.00 M
Ethyl Benzene	<3 µg/kg	TM089	10.9 M	<3.00 M	<6.00 M	4630 M	1850 M	<3.00 M
m & p Xylene	<6 µg/kg	TM089	62.2 M	11.4 M	30.2 M	28800 M	13900 M	<6.00 M
o Xylene	<3 µg/kg	TM089	26.2 M	<4.00 M	14.6 M	11800 M	5940 M	<3.00 M
Sum m&p and o Xylene	<10 µg/kg	TM089	88.5 M	11.4 M	44.8 M	40500 M	19800 M	<10.0 M
Sum of BTEX	<10 µg/kg	TM089	284 M	72.7 M	262 M	70200 M	26900 M	<10.0 M
Aliphatics C5-C6	<10 µg/kg	TM089	36.0	<10.0	<10.0	239	75.6	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	40.9	<10.0	<10.0	3340	864	<10.0
Aliphatics >C8-C10	<10 µg/kg	TM089	70.3	<10.0	37.9	21000	8460	<10.0
Aliphatics >C10-C12	<10 µg/kg	TM089	110	<10.0	66.3	40100	17900	<10.0
Total Aliphatics C5-C12	<10 µg/kg	TM089	257	<10.0	74.2	64600	27300	<10.0
Aromatics C6-C7	<10 µg/kg	TM089	93.9	31.1	129	5810	468	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	90.6	30.1	88.5	19300	4810	<10.0
Aromatics >EC8-EC10	<10 µg/kg	TM089	205	20.6	102	76600	34300	<10.0
Aromatics >EC10-EC12	<10 µg/kg	TM089	164	<10.0	54.4	60100	26800	<10.0
Total Aromatics C6-C12	<10 µg/kg	TM089	554	81.8	374	162000	66400	<10.0

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

PAH by GCMS

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H9
Depth (m)	0.00 - 0.40
Sample Type	Soil/Solid
Date Sampled	10/11/2009
Date Received	06/11/2009
SDG Ref	091109-12
Lab Sample No.(s)	595723

Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	155	M			
Acenaphthylene (S)	<12 µg/kg	TM218	79.6	M			
Acenaphthene (S)	<8 µg/kg	TM218	16.7	M			
Fluorene (S)	<10 µg/kg	TM218	29.4	M			
Phenanthrene (S)	<15 µg/kg	TM218	112	M			
Anthracene (S)	<16 µg/kg	TM218	45.1	M			
Fluoranthene (S)	<17 µg/kg	TM218	200	M			
Pyrene (S)	<15 µg/kg	TM218	185	M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	112	M			
Chrysene (S)	<10 µg/kg	TM218	68.3	M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	184	M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	69.1	M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	116	M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	72.7	M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	23.4	M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	91.7	M			
PAH 16 EPA Total	<118 µg/kg	TM218	1560	M			

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

PAH micro by GCMS

Results Legend			Sample Identity	H10	H8	H9	H9	J10
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 06/11/2009 091109-12 595634	0.00 - 0.30 Soil/Solid 05/11/2009 06/11/2009 091109-12 595611	3.00 - 3.50 Soil/Solid 05/11/2009 06/11/2009 091109-12 595803	4.00 - 4.20 Soil/Solid 05/11/2009 06/11/2009 091109-12 595816	0.00 - 0.30 Soil/Solid 05/11/2009 06/11/2009 091109-12 595684
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	901	178	609000	214000	707	
			M	M	M	M	M	M
Acenaphthylene (S)	<12 µg/kg	TM218	2080	183	136000	57800	855	
			M	M	M	M	M	M
Acenaphthene (S)	<8 µg/kg	TM218	141	14.3	24700	6080	59.7	
			M	M	M	M	M	M
Flourene (S)	<10 µg/kg	TM218	491	47.2	99900	39300	96.2	
			M	M	M	M	M	M
Phenanthrene (S)	<15 µg/kg	TM218	2570	228	254000	101000	511	
			M	M	M	M	M	M
Anthracene (S)	<16 µg/kg	TM218	1180	118	92000	31200	564	
			M	M	M	M	M	M
Fluoranthene (S)	<17 µg/kg	TM218	8160	379	164000	68900	1830	
			M	M	M	M	M	M
Pyrene (S)	<15 µg/kg	TM218	6310	330	117000	43300	1670	
			M	M	M	M	M	M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	3890	266	54000	23400	1520	
			M	M	M	M	M	M
Chrysene (S)	<10 µg/kg	TM218	2550	227	43700	16800	1210	
			M	M	M	M	M	M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	5700	400	44600	18400	2370	
			M	M	M	M	M	M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	2020	160	20000	7980	899	
			M	M	M	M	M	M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	5200	362	44900	17400	2450	
			M	M	M	M	M	M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	3010	249	19600	8410	1400	
			M	M	M	M	M	M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	680	74.4	6160	2550	416	
			M	M	M	M	M	M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	3020	205	20300	8220	1610	
			M	M	M	M	M	M
PAH 16 EPA Total	<118 µg/kg	TM218	47900	3510	1750000	665000	18200	
			M	M	M	M	M	M

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H10	H8	H9	H9	H9	J10
Depth (m)	0.00 - 0.50	0.00 - 0.30	0.00 - 0.40	3.00 - 3.50	4.00 - 4.20	0.00 - 0.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	05/11/2009	05/11/2009	10/11/2009	05/11/2009	05/11/2009	05/11/2009
Date Received	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009	06/11/2009
SDG Ref	091109-12	091109-12	091109-12	091109-12	091109-12	091109-12
Lab Sample No.(s)	595634	595611	595723	595803	595816	595684

Component	LOD/Units	Method	H10	H8	H9	H9	H9	J10
Total Aliphatics >C5-C44	<100 µg/kg	TM173	172000	18000	39100	712000	272000	221000
Total Aromatics >C6-C44	<100 µg/kg	TM173	527000	36500	96100	3610000	1760000	774000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	699000	54500	135000	4320000	2030000	995000

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SDG: 091109-12
 Job: D_MOUCHEL_ELE-3
 Client Reference: 06/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66470

VOC MS (S)

Results Legend			Sample Identity	H9	H9				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.00 - 4.20				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	05/11/2009	05/11/2009				
			Date Received	06/11/2009	06/11/2009				
			SDG Ref	091109-12	091109-12				
			Lab Sample No.(s)	595803	595816				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		115	0.820				
Toluene-d8**	%	TM116		48.7	56.4				
4-Bromofluorobenzene**	%	TM116		60.4	49.2				
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0				
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0				
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0				
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00				
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
Carbon Disulphide	<9 µg/kg	TM116		44.8	<9.00				
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0				
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0				
Chloroform	<10 µg/kg	TM116		<10.0	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0				
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0				
Benzene	<9 µg/kg	TM116		1710	1980				
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0				
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0				
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0				
Toluene	<6 µg/kg	TM116		999	20600				
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00				
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00				
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0				
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0				
Ethylbenzene	<9 µg/kg	TM116		1050	6550				

SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66470

VOC MS (S)

Results Legend			Sample Identity		H9	H9				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.00 - 4.20					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	05/11/2009	05/11/2009					
			Date Received	06/11/2009	06/11/2009					
			SDG Ref	091109-12	091109-12					
			Lab Sample No.(s)	595803	595816					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	9120	#	36100	#				
o-Xylene	<11 µg/kg	TM116	4730	M	18200	M				
Styrene	<11 µg/kg	TM116	3440	M	<11.0	M				
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0	M				
Isopropylbenzene	<9 µg/kg	TM116	760	M	505	M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0	#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0	M				
Propylbenzene	<6 µg/kg	TM116	1590	M	580	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0	#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	3090	M	6730	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	6110	#	25000	#				
sec-Butylbenzene	<8 µg/kg	TM116	157	#	<8.00	#				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#	320	#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<8.00	#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00	#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00	M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<7.00	#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0	#				
Naphthalene	<7 µg/kg	TM116	393000	#	1010000	#				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#				

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SDG: 091109-12
 Job: D_MOUCHEL_ELE-3
 Client Reference: 06/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66470

Results Legend		Sample Identity	J11				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.85 - 0.95				
		Sample Type	Soil/Solid				
		Date Sampled	05/11/2009				
		Date Received	06/11/2009				
		SDG Ref	091109-12				
		Lab Sample No.(s)	595713				
Component	LOD/Units	Method					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0				M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100				M
Cresols	<0.01 mg/kg	TM062 (S)	0.230				M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150				M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100				
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100				M
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150				M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.190				
pH value of soil	1 pH Units	TM133	8.89				M
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600				#
Total Cyanide	<1 mg/kg	TM153	2.12				M
PCB congener 28	<3 µg/kg	TM168	<3.00				
PCB congener 52	<3 µg/kg	TM168	<3.00				
PCB congener 101	<3 µg/kg	TM168	<3.00				
PCB congener 118	<3 µg/kg	TM168	<3.00				
PCB congener 138	<3 µg/kg	TM168	<3.00				
PCB congener 153	<3 µg/kg	TM168	<3.00				
PCB congener 180	<3 µg/kg	TM168	<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	74.7				#
Arsenic	<0.6 mg/kg	TM181	6.16				M
Cadmium	<0.02 mg/kg	TM181	0.0596				M
Chromium	<0.9 mg/kg	TM181	38.2				M
Copper	<1.4 mg/kg	TM181	71.6				M
Lead	<0.7 mg/kg	TM181	18.0				M
Mercury	<0.14 mg/kg	TM181	<0.140				M
Nickel	<0.2 mg/kg	TM181	52.4				M
Selenium	<1 mg/kg	TM181	1.32				#
Zinc	<1.9 mg/kg	TM181	46.9				M
Total Sulphate	<48 mg/kg	TM221	772				M

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J11					
Depth (m)	0.85 - 0.95					
Sample Type	Soil/Solid					
Date Sampled	05/11/2009					
Date Received	06/11/2009					
SDG Ref	091109-12					
Lab Sample No.(s)	595713					

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	53200			
Aliphatics >C16-C21	<100 µg/kg	TM173	155000			
Aliphatics >C21-C35	<100 µg/kg	TM173	703000			
Aliphatics >C35-C44	<100 µg/kg	TM173	220000			
Total Aliphatics >C12-C44	<100 µg/kg	TM173	1130000			
Aliphatics >C16-C35	<100 µg/kg	TM173	857000			

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J11
Depth (m)	0.85 - 0.95
Sample Type	Soil/Solid
Date Sampled	05/11/2009
Date Received	06/11/2009
SDG Ref	091109-12
Lab Sample No.(s)	595713

Component	LOD/Units	Method					
Aromatics >EC12-EC16	<100 µg/kg	TM173	236000				
Aromatics >EC16-EC21	<100 µg/kg	TM173	640000				
Aromatics >EC21-EC35	<100 µg/kg	TM173	1790000				
Aromatics >EC35-EC44	<100 µg/kg	TM173	316000				
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	2980000				
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	2980000				

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	J11				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.85 - 0.95				
			Sample Type	Soil/Solid				
			Date Sampled	05/11/2009				
			Date Received	06/11/2009				
			SDG Ref	091109-12				
			Lab Sample No.(s)	595713				
			Method					
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	12000	#				
MTBE	<5 µg/kg	TM089	<5.00	#				
Benzene	<10 µg/kg	TM089	318	M				
Toluene	<2 µg/kg	TM089	235	M				
Ethyl Benzene	<3 µg/kg	TM089	140	M				
m & p Xylene	<6 µg/kg	TM089	511	M				
o Xylene	<3 µg/kg	TM089	414	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	924	M				
Sum of BTEX	<10 µg/kg	TM089	1620	M				
Aliphatics C5-C6	<10 µg/kg	TM089	165					
Aliphatics >C6-C8	<10 µg/kg	TM089	575					
Aliphatics >C8-C10	<10 µg/kg	TM089	1370					
Aliphatics >C10-C12	<10 µg/kg	TM089	2490					
Total Aliphatics C5-C12	<10 µg/kg	TM089	4600					
Aromatics C6-C7	<10 µg/kg	TM089	318					
Aromatics >C7-C8	<10 µg/kg	TM089	235					
Aromatics >EC8-EC10	<10 µg/kg	TM089	3120					
Aromatics >EC10-EC12	<10 µg/kg	TM089	3740					
Total Aromatics C6-C12	<10 µg/kg	TM089	7410					

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SDG: 091109-12
Job: D_MOUCHEL_ELE-3
Client Reference: 06/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66470

PAH micro by GCMS

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J11				
Depth (m)	0.85 - 0.95				
Sample Type	Soil/Solid				
Date Sampled	05/11/2009				
Date Received	06/11/2009				
SDG Ref	091109-12				
Lab Sample No.(s)	595713				

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	81700	M		
Acenaphthylene (S)	<12 µg/kg	TM218	45400	M		
Acenaphthene (S)	<8 µg/kg	TM218	8760	M		
Flourene (S)	<10 µg/kg	TM218	42600	M		
Phenanthrene (S)	<15 µg/kg	TM218	125000	M		
Anthracene (S)	<16 µg/kg	TM218	48500	M		
Fluoranthene (S)	<17 µg/kg	TM218	104000	M		
Pyrene (S)	<15 µg/kg	TM218	68200	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	39600	M		
Chrysene (S)	<10 µg/kg	TM218	26400	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	29800	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	11900	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	28400	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	12900	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	3800	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	13600	M		
PAH 16 EPA Total	<118 µg/kg	TM218	690000	M		

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SDG: 091109-12
 Job: D_MOUCHEL_ELE-3
 Client Reference: 06/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66470

VOC MS (S)

Results Legend			Sample Identity	J11				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.85 - 0.95				
			Sample Type	Soil/Solid				
			Date Sampled	05/11/2009				
			Date Received	06/11/2009				
			SDG Ref	091109-12				
			Lab Sample No.(s)	595713				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	35.9					
Toluene-d8**	%	TM116	29.8					
4-Bromofluorobenzene**	%	TM116	25.8					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0					
Chloromethane	<12 µg/kg	TM116	<12.0					
Vinyl Chloride	<10 µg/kg	TM116	<10.0					
Bromoethane	<9 µg/kg	TM116	<9.00					
Chloroethane	<12 µg/kg	TM116	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00					
Carbon Disulphide	<9 µg/kg	TM116	<9.00					
Dichloromethane	<10 µg/kg	TM116	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Bromochloromethane	<10 µg/kg	TM116	<10.0					
Chloroform	<10 µg/kg	TM116	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0					
Carbontetrachloride	<11 µg/kg	TM116	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0					
Benzene	<9 µg/kg	TM116	134					
Trichloroethene	<9 µg/kg	TM116	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Dibromomethane	<12 µg/kg	TM116	<12.0					
Bromodichloromethane	<11 µg/kg	TM116	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0					
Toluene	<6 µg/kg	TM116	104					
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00					
Tetrachloroethene	<9 µg/kg	TM116	<9.00					
Dibromochloromethane	<9 µg/kg	TM116	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0					
Chorobenzene	<7 µg/kg	TM116	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0					
Ethylbenzene	<9 µg/kg	TM116	135					

SDG: 091109-12
 Job: D_MOUCHEL_ELE-3
 Client Reference: 06/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66470

VOC MS (S)

Results Legend		Sample Identity	J11				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.85 - 0.95				
		Sample Type	Soil/Solid				
		Date Sampled	05/11/2009				
		Date Received	06/11/2009				
		SDG Ref	091109-12				
		Lab Sample No.(s)	595713				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	507	#			
o-Xylene	<11 µg/kg	TM116	407	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	35.3	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	55.8	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	320	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	656	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	39.4	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	26400	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 09 December 2009
Job: D_MOUCHEL_ELE-4
Sample Delivery Group (SDG): 091109-34
Your Reference: 09/11/09
Location: Limerick Gasworks
Report No.: 67031

A total of 6 samples was received on Monday November 09, 2009 and completed on Wednesday December 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091109-34
 Job: D_MOUCHEL_ELE-4
 Client Reference: 09/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 67031

SOLID

Results Legend	Sample ID	D7						H7			Total	
		1.70 - 2.00		2.30 - 2.70		3.50 - 4.00		1.50 - 2.00		3.50 - 4.00		5.00 - 5.50
		60g VOC Dublin JAR (D) TUB (D)		60g VOC Dublin JAR (D) TUB (D)		60g VOC Dublin JAR (D) TUB (D)		60g VOC Dublin JAR (D) TUB (D)		60g VOC Dublin JAR (D) TUB (D)		TUB (D)
Ammonium Soil by Titration	All											0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X		X		X		X		X		6
Easily Liberated Sulphide	All	X		X		X		X		X		6
EPH CWG (Aliphatic) GC (S)	All	X		X		X		X		X		6
EPH CWG (Aromatic) GC (S)	All			X				X				2
GRO BTEX MTBE GC (S)	All	X		X		X		X		X		6
Hexavalent Chromium (s)	All		X			X		X		X		6
Metals by iCap-OES (Soil)	Arsenic	X		X		X		X		X		6
	Cadmium	X		X		X		X		X		6
	Chromium	X		X		X		X		X		6
	Copper	X		X		X		X		X		6
	Lead	X		X		X		X		X		6
	Mercury	X		X		X		X		X		6
	Nickel	X		X		X		X		X		6
	Selenium	X		X		X		X		X		6
	Zinc	X		X		X		X		X		6
PAH micro by GCMS	All	X		X		X		X		X		6
PCBs by GCMS	All			X								1
pH	All		N			X			N		X	2
Phenols by HPLC (S)	All		X		X		X		X		X	4
Sample description	All	X		X		X		X		X		6
Total Sulphate	All	X		X		X		X		X		6
TPH CWG GC (S)	All	X		X		X		X		X		6
VOC MS (S)	All	X					X			X		3

SDG:	091109-34	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-4	Attention:	Verity Sankey
Client Reference:	09/11/09	Order No.:	
Location:	Limerick Gasworks	Report No.:	67031

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D7	1.70 - 2.00	Black	Gravel	0.063 - 0.1 mm	oil/petroleum
	2.30 - 2.70	Brown	Sand	0.063 - 0.1 mm	stones
	3.50 - 4.00	Black	Silty sand	0.063 - 0.1 mm	tar
H7	1.50 - 2.00	Black	Silty sand	0.063 - 0.1 mm	tar
	3.50 - 4.00	Brown	Sandy clay	0.1 - 2 mm	stones
	5.00 - 5.50	Brown	Sandy clay	0.1 - 2 mm	stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67031

Test Completion dates

SDG reference: 091109-34

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
D7	1.70 - 2.00	SOLID	19/11/2009	19/11/2009	12/11/2009	11/11/2009	12/11/2009	13/11/2009	09/12/2009	12/11/2009	12/11/2009	12/11/2009	16/11/2009	19/11/2009	19/11/2009	12/11/2009	12/11/2009	12/11/2009
	2.30 - 2.70	SOLID	17/11/2009	12/11/2009	12/11/2009	11/11/2009	12/11/2009	14/11/2009	13/11/2009	12/11/2009	12/11/2009	12/11/2009	16/11/2009	17/11/2009	17/11/2009	12/11/2009	12/11/2009	12/11/2009
	3.50 - 4.00	SOLID	20/11/2009	12/11/2009	12/11/2009	11/11/2009	12/11/2009	14/11/2009	13/11/2009	12/11/2009	12/11/2009	12/11/2009	16/11/2009	19/11/2009	19/11/2009	12/11/2009	12/11/2009	12/11/2009
H7	1.50 - 2.00	SOLID	19/11/2009	17/11/2009	12/11/2009	11/11/2009	12/11/2009	14/11/2009	12/11/2009	13/11/2009	12/11/2009	12/11/2009	16/11/2009	19/11/2009	19/11/2009	13/11/2009	12/11/2009	12/11/2009
	3.50 - 4.00	SOLID	19/11/2009	12/11/2009	12/11/2009	11/11/2009	12/11/2009	14/11/2009	12/11/2009	13/11/2009	12/11/2009	12/11/2009	16/11/2009	19/11/2009	19/11/2009	13/11/2009	12/11/2009	12/11/2009
	5.00 - 5.50	SOLID	18/11/2009	19/11/2009	12/11/2009	11/11/2009	12/11/2009	14/11/2009	12/11/2009	13/11/2009	12/11/2009	12/11/2009	16/11/2009	19/11/2009	19/11/2009	13/11/2009	12/11/2009	12/11/2009

SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66472

Results Legend			Sample Identity			D7	D7	D7	H7	H7	H7	
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	Date Sampled	Date Received	SDG Ref	Lab Sample No.(s)				
Component	LOD/Units	Method										
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	120						139	719	395	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	93.4						108	559	307	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0500						<0.0500	<0.0500	<0.0500	
Phenol	<0.01 mg/kg	TM062 (S)	1.81						1.11	12.6	1.68	
Cresols	<0.01 mg/kg	TM062 (S)	4.14						7.28	38.5	13.0	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.250						<0.250	<0.250	<0.250	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0750						2.57	78.2	32.7	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0500						<0.0500	<0.0500	<0.0500	
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0500						<0.0500	<0.0500	<0.0500	
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0750						<0.0750	<0.0750	<0.0750	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	5.95						11.0	129	47.4	
pH value of soil	1 pH Units	TM133				10.75				8.54	8.52	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600			<0.600			<6.00	<0.600	<0.600	
Total Cyanide	<1 mg/kg	TM153	355			1.67			<1.00	213	48.8	
PCB congener 28	<3 µg/kg	TM168				<3.00						
PCB congener 52	<3 µg/kg	TM168				<3.00						
PCB congener 101	<3 µg/kg	TM168				<3.00						
PCB congener 118	<3 µg/kg	TM168				<3.00						
PCB congener 138	<3 µg/kg	TM168				<3.00						
PCB congener 153	<3 µg/kg	TM168				<3.00						
PCB congener 180	<3 µg/kg	TM168				<3.00						
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00						
Easily Liberated Sulphide	<15 mg/kg	TM180	655			152			59.4	1520	132	
Arsenic	<0.6 mg/kg	TM181	6.45			9.63			9.07	10.1	7.20	
Cadmium	<0.02 mg/kg	TM181	<0.0200			<0.0200			<0.0200	<0.0200	0.0467	
Chromium	<0.9 mg/kg	TM181	13.7			4.87			4.22	6.47	10.8	
Copper	<1.4 mg/kg	TM181	59.0			2.17			5.51	12.9	8.99	
Lead	<0.7 mg/kg	TM181	71.3			4.36			4.97	39.5	25.3	
Mercury	<0.14 mg/kg	TM181	0.795			0.161			<0.140	0.999	0.186	
Nickel	<0.2 mg/kg	TM181	19.3			3.16			3.35	6.04	10.7	
Selenium	<1 mg/kg	TM181	<1.00			<1.00			<1.00	1.44	<1.00	
Zinc	<1.9 mg/kg	TM181	52.2			8.64			7.10	33.1	22.9	
Total Sulphate	<48 mg/kg	TM221	5890			4880			31500	18200	1250	

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SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66472

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D7	D7	D7	H7	H7	H7
Depth (m)	1.70 - 2.00	2.30 - 2.70	3.50 - 4.00	1.50 - 2.00	3.50 - 4.00	5.00 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	06/11/2009	06/11/2009	06/11/2009	09/11/2009	06/11/2009
Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009
SDG Ref	091109-34	091109-34	091109-34	091109-34	091109-34	091109-34
Lab Sample No.(s)	597031	598263	598272	596908	596937	596976

Component	LOD/Units	Method	D7	D7	D7	H7	H7	H7
Aliphatics >C12-C16	<100 µg/kg	TM173	506000	23200	925000	741000	129000	29600
Aliphatics >C16-C21	<100 µg/kg	TM173	214000	23800	1230000	837000	142000	56300
Aliphatics >C21-C35	<100 µg/kg	TM173	154000	31200	1440000	757000	150000	68700
Aliphatics >C35-C44	<100 µg/kg	TM173	9630	2850	118000	83300	9320	5450
Total Aliphatics >C12-C44	<100 µg/kg	TM173	884000	81100	3710000	3160000	430000	160000
Aliphatics >C16-C35	<100 µg/kg	TM173	368000	55000	2670000	1970000	292000	125000

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SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66472

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D7	D7	D7	H7	H7	H7
Depth (m)	1.70 - 2.00	2.30 - 2.70	3.50 - 4.00	1.50 - 2.00	3.50 - 4.00	5.00 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	06/11/2009	06/11/2009	06/11/2009	09/11/2009	06/11/2009
Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009
SDG Ref	091109-34	091109-34	091109-34	091109-34	091109-34	091109-34
Lab Sample No.(s)	597031	598263	598272	596908	596937	596976

Component	LOD/Units	Method	D7	D7	D7	H7	H7	H7
Aromatics >EC12-EC16	<100 µg/kg	TM173	3360000	137000	5700000	2300000	413000	110000
Aromatics >EC16-EC21	<100 µg/kg	TM173	4590000	257000	10300000	3290000	731000	314000
Aromatics >EC21-EC35	<100 µg/kg	TM173	8910000	595000	20200000	6740000	1650000	786000
Aromatics >EC35-EC44	<100 µg/kg	TM173	1460000	120000	2870000	219000	334000	158000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	18300000	1110000	39100000	4500000	3130000	1370000
Aromatics >EC35-EC40	<100 µg/kg	TM173	980000		1960000	156000	218000	103000
Aromatics >EC40-EC44	<100 µg/kg	TM173	482000		907000	63100	115000	54200
Total Aromatics >EC12-EC35	<100 µg/kg	TM173	16900000		36300000	4280000	2790000	1210000
Total Aromatics >EC12-EC40	<100 µg/kg	TM173	17800000		38200000	4440000	3010000	1310000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	18300000	1110000	39100000	4500000	3130000	1370000

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SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66472

GRO BTEX MTBE GC (S)

Results Legend	Sample Identity	D7	D7	D7	H7	H7	H7
	Depth (m)	1.70 - 2.00	2.30 - 2.70	3.50 - 4.00	1.50 - 2.00	3.50 - 4.00	5.00 - 5.50
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	11/11/2009	06/11/2009	06/11/2009	06/11/2009	09/11/2009	06/11/2009
	Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009
	SDG Ref	091109-34	091109-34	091109-34	091109-34	091109-34	091109-34
	Lab Sample No.(s)	597031	598263	598272	596908	596937	596976

Component	LOD/Units	Method	D7	D7	D7	H7	H7	H7
GRO C5-C12	<44 µg/kg	TM089	4240000	26200 #	668000 #	1690000 #	298000 #	51200 #
MTBE	<5 µg/kg	TM089	586	<5.00 #	<5.00 #	<5.00 #	354 #	<5.00 #
Benzene	<10 µg/kg	TM089	40400 M	64.7 M	187000 M	25400 M	3430 M	1630 M
Toluene	<2 µg/kg	TM089	651000 M	552 M	136000 M	149000 M	10900 M	3710 M
Ethyl Benzene	<3 µg/kg	TM089	101000 M	315 M	9570 M	47100 M	5480 M	1270 M
m & p Xylene	<6 µg/kg	TM089	968000 M	2930 M	77700 M	292000 M	31500 M	7430 M
o Xylene	<3 µg/kg	TM089	377000 M	1330 M	29100 M	122000 M	15500 M	3690 M
Sum m&p and o Xylene	<10 µg/kg	TM089	1350000 M	4260 M	107000 M	413000 M	47000 M	11100 M
Sum of BTEX	<10 µg/kg	TM089	2140000 M	5190 M	440000 M	635000 M	66800 M	17700 M
Aliphatics C5-C6	<10 µg/kg	TM089	389	<10.0	934	421	118	117
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	87.5	<10.0	17500	12000	2370
Aliphatics >C8-C10	<10 µg/kg	TM089	353000	2200	25500	132000	28900	4940
Aliphatics >C10-C12	<10 µg/kg	TM089	505000	6160	74900	283000	58600	7440
Total Aliphatics C5-C12	<10 µg/kg	TM089	859000	8450	101000	433000	99600	14900
Aromatics C6-C7	<10 µg/kg	TM089	40400	64.7	187000	25400	3430	1630
Aromatics >C7-C8	<10 µg/kg	TM089	651000	552	136000	149000	10900	3710
Aromatics >EC8-EC10	<10 µg/kg	TM089	1980000	7870	155000	659000	95900	19800
Aromatics >EC10-EC12	<10 µg/kg	TM089	758000	9250	112000	424000	87800	11200
Total Aromatics C6-C12	<10 µg/kg	TM089	3430000	17700	590000	1260000	198000	36300

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SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66472

PAH micro by GCMS

Results Legend	Sample Identity		D7	D7	D7	H7	H7	H7
	Depth (m)	Sample Type	1.70 - 2.00 Soil/Solid 11/11/2009 09/11/2009 091109-34 597031	2.30 - 2.70 Soil/Solid 06/11/2009 09/11/2009 091109-34 598263	3.50 - 4.00 Soil/Solid 06/11/2009 09/11/2009 091109-34 598272	1.50 - 2.00 Soil/Solid 06/11/2009 09/11/2009 091109-34 596908	3.50 - 4.00 Soil/Solid 09/11/2009 091109-34 596937	5.00 - 5.50 Soil/Solid 06/11/2009 09/11/2009 091109-34 596976

Component	LOD/Units	Method	D7	D7	D7	H7	H7	H7
Naphthalene (S)	<9 µg/kg	TM218	3100000 M	139000 M	13800000 M	5600000 M	274000 M	310000 M
Acenaphthylene (S)	<12 µg/kg	TM218	145000 M	19600 M	2560000 M	638000 M	47800 M	48200 M
Acenaphthene (S)	<8 µg/kg	TM218	33400 M	3440 M	379000 M	219000 M	8660 M	8430 M
Flourene (S)	<10 µg/kg	TM218	110000 M	22100 M	1720000 M	645000 M	34700 M	32900 M
Phenanthrene (S)	<15 µg/kg	TM218	209000 M	63100 M	5240000 M	1630000 M	91000 M	85100 M
Anthracene (S)	<16 µg/kg	TM218	66000 M	14700 M	1490000 M	552000 M	30300 M	27500 M
Fluoranthene (S)	<17 µg/kg	TM218	123000 M	38300 M	3570000 M	1070000 M	63800 M	56900 M
Pyrene (S)	<15 µg/kg	TM218	82600 M	26300 M	2590000 M	694000 M	41200 M	36400 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	34400 M	13800 M	1030000 M	329000 M	19300 M	16600 M
Chrysene (S)	<10 µg/kg	TM218	29100 M	9610 M	784000 M	240000 M	14000 M	11800 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	30800 M	12900 M	1050000 M	311000 M	17600 M	14700 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	16100 M	4890 M	433000 M	125000 M	8360 M	6760 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	28100 M	10500 M	963000 M	248000 M	14600 M	11900 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	13600 M	4750 M	407000 M	107000 M	6940 M	5470 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<4600 M	1620 M	107000 M	30800 M	1830 M	1300 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	14900 M	4670 M	485000 M	123000 M	7380 M	5750 M
PAH 16 EPA Total	<118 µg/kg	TM218	4040000 M	389000 M	36500000 M	12600000 M	681000 M	680000 M

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SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66472

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D7	D7	D7	H7	H7	H7
Depth (m)	1.70 - 2.00	2.30 - 2.70	3.50 - 4.00	1.50 - 2.00	3.50 - 4.00	5.00 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	06/11/2009	06/11/2009	06/11/2009	09/11/2009	06/11/2009
Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009
SDG Ref	091109-34	091109-34	091109-34	091109-34	091109-34	091109-34
Lab Sample No.(s)	597031	598263	598272	596908	596937	596976

Component	LOD/Units	Method	D7	D7	D7	H7	H7	H7
Total Aliphatics >C5-C44	<100 µg/kg	TM173	1740000	89500	3810000	2590000	530000	175000
Total Aromatics >C6-C44	<100 µg/kg	TM173	21800000	1130000	39700000	14600000	3320000	1400000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	23500000	1220000	43500000	17200000	3850000	1580000

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SDG: 091109-34
 Job: D_MOUCHEL_ELE-4
 Client Reference: 09/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66472

VOC MS (S)

Results Legend			Sample Identity	D7	H7	H7			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.70 - 2.00	1.50 - 2.00	5.00 - 5.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	11/11/2009	06/11/2009	06/11/2009			
			Date Received	09/11/2009	09/11/2009	09/11/2009			
			SDG Ref	091109-34	091109-34	091109-34			
			Lab Sample No.(s)	597031	596908	596976			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		106	139	115			
Toluene-d8**	%	TM116		65.4	50.5	75.7			
4-Bromofluorobenzene**	%	TM116		116	93.7	64.2			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Carbon Disulphide	<9 µg/kg	TM116		276	695	11.6			
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Benzene	<9 µg/kg	TM116		16500	73600	2860			
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0			
Toluene	<6 µg/kg	TM116		181000	260000	9110			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0			
Chlorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
Ethylbenzene	<9 µg/kg	TM116		42400	71600	2270			

SDG: 091109-34
Job: D_MOUCHEL_ELE-4
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66472

VOC MS (S)

Results Legend			Sample Identity	D7	H7	H7			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.70 - 2.00	1.50 - 2.00	5.00 - 5.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	11/11/2009	06/11/2009	06/11/2009			
			Date Received	09/11/2009	09/11/2009	09/11/2009			
			SDG Ref	091109-34	091109-34	091109-34			
			Lab Sample No.(s)	597031	596908	596976			
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	348000	428000	20700	#	#	#	
o-Xylene	<11 µg/kg	TM116	154000	177000	8720	M	M	M	
Styrene	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Isopropylbenzene	<9 µg/kg	TM116	8060	5220	248	M	M	M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	<15.0	#	#	#	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	M	M	M	
Propylbenzene	<6 µg/kg	TM116	10600	8600	482	M	M	M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	#	#	#	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	61300	69400	1770	M	M	M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#	#	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	141000	145000	3750	#	#	#	
sec-Butylbenzene	<8 µg/kg	TM116	862	667	58.3	#	#	#	
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	2270	<8.00	#	#	#	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	#	#	#	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	#	#	#	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	M	M	M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	<7.00	#	#	#	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	<15.0	#	#	#	
Naphthalene	<7 µg/kg	TM116	1730000	1030000	256000	#	#	#	
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#	#	

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Notification of NDPs (No determination possible)

SDG Number	091109-34	Location	Limerick Gas Works
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	09/11/09	Report No.	29396-0
Attention	Dave Watts	Date Received	09/11/2009 16:19:02

Sample No	Sample Identity	Depth (m)	Test	Comment
601846	H7	1.50 - 2.00	pH	Sample contains oil / product
601846	H7	1.50 - 2.00	pH	Sample contains oil / product
601846	H7	1.50 - 2.00	pH	Sample contains oil / product
601899	D7	1.70 - 2.00	pH	Sample contains oil / product
601899	D7	1.70 - 2.00	pH	Sample contains oil / product
601899	D7	1.70 - 2.00	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 03 December 2009
Job: D_MOUCHEL_ELE-5
Sample Delivery Group (SDG): 091110-55
Your Reference: 09/11/09
Location: Limerick Gas Works
Report No.: 66474

A total of 5 samples was received on Monday November 09, 2009 and completed on Thursday December 03, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091110-55
 Job: D_MOUCHEL_ELE-5
 Client Reference: 09/11/09
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66474

SOLID

Results Legend	Sample ID	H6										Total
		1.30 - 1.50		3.50 - 4.00		5.50 - 6.00		8.50 - 9.00		0.00 - 0.50		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test												
N No Determination Possible												
Ammonium Soil by Titration	All		X		X		X		X		X	0
Asbestos Presence Screen	All		X		X		X		X		X	5
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X		X	0
Easily Liberated Sulphide	All		X		X		X		X		X	5
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X		X	0
GRO BTEX MTBE GC (S)	All		X		X		X		X		X	3
Hexavalent Chromium (s)	All	X		X		X		X		X		0
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X		X	0
	Cadmium		X		X		X		X		X	5
	Chromium		X		X		X		X		X	0
	Copper		X		X		X		X		X	5
	Lead		X		X		X		X		X	0
	Mercury		X		X		X		X		X	5
	Nickel		X		X		X		X		X	0
	Selenium		X		X		X		X		X	0
	Zinc		X		X		X		X		X	5
PAH micro by GCMS	All		X		X		X		X		X	0
PCBs by GCMS	All		X		X		X		X		X	5
pH	All		X		X		X		X		X	1
Phenols by HPLC (S)	All		X		X		X		X		X	4
Sample description	All		X		X		X		X		X	0
Total Sulphate	All		X		X		X		X		X	5
TPH CWG GC (S)	All		X		X		X		X		X	0
VOC MS (S)	All		X		X		X		X		X	5
				X		X				X		0
												3

SDG:	091110-55	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-5	Attention:	Verity Sankey
Client Reference:	09/11/09	Order No.:	
Location:	Limerick Gas Works	Report No.:	66474

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
H6	1.30 - 1.50	Brown	Gravel	0.1 - 2 mm	stones
	3.50 - 4.00	Brown	Sandy clay	0.1 - 2 mm	stones
	5.50 - 6.00	Brown	Sandy clay	0.1 - 2 mm	stones
	8.50 - 9.00	Brown	Sandy clay	0.1 - 2 mm	stones
I 11	0.00 - 0.50	Grey	Silty sand	0.063 - 0.1 mm	vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091110-55
Job: D_MOUCHEL_ELE-5
Client Reference: 09/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66474

Test Completion dates

SDG reference: 091110-55

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
H6	1.30 - 1.50	SOLID	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
	3.50 - 4.00	SOLID	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009
	5.50 - 6.00	SOLID	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
	8.50 - 9.00	SOLID	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
I 11	0.00 - 0.50	SOLID	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009

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SDG: 091110-55
Job: D_MOUCHEL_ELE-5
Client Reference: 09/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66474

Results Legend			Sample Identity		H6	H6	H6	H6	I 11	
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	H6	H6	H6	H6	I 11		
			Sample Type	1.30 - 1.50	3.50 - 4.00	5.50 - 6.00	8.50 - 9.00	0.00 - 0.50		
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Received	07/11/2009	07/11/2009	07/11/2009	07/11/2009	11/11/2009		
			SDG Ref	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009		
Lab Sample No.(s)	091110-55	091110-55	091110-55	091110-55	091110-55					
Component	LOD/Units	Method								
Asbestos Presence Screen	-	TM001	No ACM Detected						No ACM Detected	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	106	121	<15.0	<15.0			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	82.3	93.8	<15.0	<15.0			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	0.146	<0.0300	<0.0100	<0.0300	0.127			
Cresols	<0.01 mg/kg	TM062 (S)	0.224	<0.0100	<0.0100	0.0990	0.673			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	0.488	<0.0150	0.220	<0.0150			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	0.0762			
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.370	0.525	0.900	0.352	0.876			
pH value of soil	1 pH Units	TM133	11.16		8.4	8.19	7.82			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	<0.600	<0.600			
Total Cyanide	<1 mg/kg	TM153	3.18	79.5	23.5	8.98	<1.00			
PCB congener 28	<3 µg/kg	TM168		<3.00						
PCB congener 52	<3 µg/kg	TM168		<3.00						
PCB congener 101	<3 µg/kg	TM168		<3.00						
PCB congener 118	<3 µg/kg	TM168		<3.00						
PCB congener 138	<3 µg/kg	TM168		<3.00						
PCB congener 153	<3 µg/kg	TM168		<3.00						
PCB congener 180	<3 µg/kg	TM168		<3.00						
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00						
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	1320	733	25.1	28.3			
Arsenic	<0.6 mg/kg	TM181	4.10	3.76	22.6	2.10	3.82			
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	0.0509	<0.0200	<0.0200			
Chromium	<0.9 mg/kg	TM181	62.1	37.9	21.5	4.14	16.0			
Copper	<1.4 mg/kg	TM181	30.9	20.5	35.5	1.46	24.5			
Lead	<0.7 mg/kg	TM181	28.7	89.4	189	5.06	29.9			
Mercury	<0.14 mg/kg	TM181	<0.140	0.830	0.318	0.165	0.221			
Nickel	<0.2 mg/kg	TM181	45.4	38.0	31.0	1.82	21.4			
Selenium	<1 mg/kg	TM181	<1.00	<1.00	1.12	<1.00	<1.00			
Zinc	<1.9 mg/kg	TM181	71.7	45.9	51.9	7.22	65.8			
Total Sulphate	<48 mg/kg	TM221	1310	4840	2300	920	1720			

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SDG: 091110-55
Job: D_MOUCHEL_ELE-5
Client Reference: 09/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66474

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
* This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H6	H6	H6	H6	I 11	
Depth (m)	1.30 - 1.50	3.50 - 4.00	5.50 - 6.00	8.50 - 9.00	0.00 - 0.50	
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
Date Sampled	07/11/2009	07/11/2009	07/11/2009	07/11/2009	11/11/2009	
Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009	
SDG Ref	091110-55	091110-55	091110-55	091110-55	091110-55	
Lab Sample No.(s)	598771	598798	598861	598907	598989	

Component	LOD/Units	Method	H6	H6	H6	H6	I 11	
Aliphatics >C12-C16	<100 µg/kg	TM173	15200	31100	8910	2230	14600	
Aliphatics >C16-C21	<100 µg/kg	TM173	21600	43300	4570	<100	11700	
Aliphatics >C21-C35	<100 µg/kg	TM173	20000	61200	6860	<100	88100	
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	5710	<100	<100	131000	
Total Aliphatics >C12-C44	<100 µg/kg	TM173	56700	141000	20300	2230	245000	
Aliphatics >C16-C35	<100 µg/kg	TM173	41600	105000	11400	<100	99800	

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SDG: 091110-55
 Job: D_MOUCHEL_ELE-5
 Client Reference: 09/11/09
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66474

EPH CWG (Aromatic) GC (S)

Results Legend		Sample Identity		H6	H6	H6	H6	I 11	
<small> # ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery. </small>		Depth (m)	1.30 - 1.50	3.50 - 4.00	5.50 - 6.00	8.50 - 9.00	0.00 - 0.50		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	07/11/2009	07/11/2009	07/11/2009	07/11/2009	11/11/2009		
		Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009		
		SDG Ref	091110-55	091110-55	091110-55	091110-55	091110-55		
		Lab Sample No.(s)	598771	598798	598861	598907	598989		
Component	LOD/Units	Method							
Aromatics >EC12-EC16	<100 µg/kg	TM173	24400	138000	13700	10100	21400		
Aromatics >EC16-EC21	<100 µg/kg	TM173	34000	338000	26500	9750	34400		
Aromatics >EC21-EC35	<100 µg/kg	TM173	215000	906000	277000	27100	276000		
Aromatics >EC35-EC44	<100 µg/kg	TM173	77200	162000	91800	17400	276000		
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	351000	1540000	409000	64400	608000		
Aromatics >EC35-EC40	<100 µg/kg	TM173		111000			148000		
Aromatics >EC40-EC44	<100 µg/kg	TM173		51400			128000		
Total Aromatics >EC12-EC35	<100 µg/kg	TM173		1380000			332000		
Total Aromatics >EC12-EC40	<100 µg/kg	TM173		1490000			480000		
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	351000	1540000	409000	64400	608000		

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SDG: 091110-55
Job: D_MOUCHEL_ELE-5
Client Reference: 09/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66474

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	H6	H6	H6	H6	I 11	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.30 - 1.50	3.50 - 4.00	5.50 - 6.00	8.50 - 9.00	0.00 - 0.50	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	07/11/2009	07/11/2009	07/11/2009	07/11/2009	07/11/2009	11/11/2009
			Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009
			SDG Ref	091110-55	091110-55	091110-55	091110-55	091110-55	091110-55
Lab Sample No.(s)	598771	598798	598861	598907	598989				
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	983	95200	3560	825	2810		
			#	#	#	#	#		#
MTBE	<5 µg/kg	TM089	23.5	153	22.1	<5.00	<5.00		#
			#	#	#	#	#		#
Benzene	<10 µg/kg	TM089	61.6	344	2940	134	45.7		M
			M	M	M	M	M		M
Toluene	<2 µg/kg	TM089	88.5	<2.00	74.1	109	260		M
			M	M	M	M	M		M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	29.9	29.7	39.4		M
			M	M	M	M	M		M
m & p Xylene	<6 µg/kg	TM089	60.5	<6.00	63.7	111	180		M
			M	M	M	M	M		M
o Xylene	<3 µg/kg	TM089	21.3	<3.00	114	46.2	80.0		M
			M	M	M	M	M		M
Sum m&p and o Xylene	<10 µg/kg	TM089	81.8	<10.0	178	157	260		M
			M	M	M	M	M		M
Sum of BTEX	<10 µg/kg	TM089	232	344	3220	430	606		M
			M	M	M	M	M		M
Aliphatics C5-C6	<10 µg/kg	TM089	33.4	<10.0	<10.0	<10.0	406		
Aliphatics >C6-C8	<10 µg/kg	TM089	91.5	13700	<10.0	<10.0	224		
Aliphatics >C8-C10	<10 µg/kg	TM089	54.0	20500	74.9	44.4	247		
Aliphatics >C10-C12	<10 µg/kg	TM089	187	11900	195	112	384		
Total Aliphatics C5-C12	<10 µg/kg	TM089	366	46100	193	156	1260		
Aromatics C6-C7	<10 µg/kg	TM089	61.6	344	2940	134	45.7		
Aromatics >C7-C8	<10 µg/kg	TM089	88.5	<10.0	74.1	109	260		
Aromatics >EC8-EC10	<10 µg/kg	TM089	163	30700	325	254	670		
Aromatics >EC10-EC12	<10 µg/kg	TM089	281	17900	173	167	577		
Total Aromatics C6-C12	<10 µg/kg	TM089	594	49000	3510	664	1550		

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SDG: 091110-55
Job: D_MOUCHEL_ELE-5
Client Reference: 09/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66474

PAH micro by GCMS

Results Legend			Sample Identity	H6	H6	H6	H6	I 11
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.30 - 1.50 Soil/Solid 07/11/2009 09/11/2009 091110-55 598771	3.50 - 4.00 Soil/Solid 07/11/2009 09/11/2009 091110-55 598798	5.50 - 6.00 Soil/Solid 07/11/2009 09/11/2009 091110-55 598861	8.50 - 9.00 Soil/Solid 07/11/2009 09/11/2009 091110-55 598907	0.00 - 0.50 Soil/Solid 11/11/2009 09/11/2009 091110-55 598989
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	2650	14800	2530	814	2040	
			M	M	M	M	M	M
Acenaphthylene (S)	<12 µg/kg	TM218	1460	24700	509	30.7	1090	
			M	M	M	M	M	M
Acenaphthene (S)	<8 µg/kg	TM218	204	9600	1380	28.8	118	
			M	M	M	M	M	M
Flourene (S)	<10 µg/kg	TM218	223	28600	918	56.1	227	
			M	M	M	M	M	M
Phenanthrene (S)	<15 µg/kg	TM218	2390	76600	2510	91.3	944	
			M	M	M	M	M	M
Anthracene (S)	<16 µg/kg	TM218	1080	27200	1790	32.6	433	
			M	M	M	M	M	M
Fluoranthene (S)	<17 µg/kg	TM218	6750	58900	7560	56.0	3910	
			M	M	M	M	M	M
Pyrene (S)	<15 µg/kg	TM218	6260	38000	6310	42.0	3340	
			M	M	M	M	M	M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	3320	20600	5960	32.8	2120	
			M	M	M	M	M	M
Chrysene (S)	<10 µg/kg	TM218	2460	14600	4750	22.7	1670	
			M	M	M	M	M	M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	5870	20000	8630	35.9	3540	
			M	M	M	M	M	M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	2750	8370	3830	<14.0	1380	
			M	M	M	M	M	M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6220	16900	7600	27.2	3010	
			M	M	M	M	M	M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4480	8040	3970	<18.0	1480	
			M	M	M	M	M	M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1110	2090	1540	<23.0	415	
			M	M	M	M	M	M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	5440	8170	3800	<24.0	1680	
			M	M	M	M	M	M
PAH 16 EPA Total	<118 µg/kg	TM218	52700	372000	63600	1270	27400	
			M	M	M	M	M	M

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SDG: 091110-55
Job: D_MOUCHEL_ELE-5
Client Reference: 09/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66474

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H6	H6	H6	H6	I 11
Depth (m)	1.30 - 1.50	3.50 - 4.00	5.50 - 6.00	8.50 - 9.00	0.00 - 0.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	07/11/2009	07/11/2009	07/11/2009	07/11/2009	11/11/2009
Date Received	09/11/2009	09/11/2009	09/11/2009	09/11/2009	09/11/2009
SDG Ref	091110-55	091110-55	091110-55	091110-55	091110-55
Lab Sample No.(s)	598771	598798	598861	598907	598989

Component	LOD/Units	Method	H6	H6	H6	H6	I 11
Total Aliphatics >C5-C44	<100 µg/kg	TM173	57100	187000	20500	2380	247000
Total Aromatics >C6-C44	<100 µg/kg	TM173	351000	1590000	413000	65000	610000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	408000	1780000	433000	67400	856000

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SDG: 091110-55
 Job: D_MOUCHEL_ELE-5
 Client Reference: 09/11/09
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66474

VOC MS (S)

Results Legend			Sample Identity	H6	H6	I 11			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.50 - 4.00	5.50 - 6.00	0.00 - 0.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	07/11/2009	07/11/2009	11/11/2009			
			Date Received	09/11/2009	09/11/2009	09/11/2009			
			SDG Ref	091110-55	091110-55	091110-55			
			Lab Sample No.(s)	598798	598861	598989			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	80.5	79.1	73.4				
Toluene-d8**	%	TM116	66.0	78.1	63.0				
4-Bromofluorobenzene**	%	TM116	75.9	58.2	47.3				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	41.6	55.6	<9.00				
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Benzene	<9 µg/kg	TM116	247	2180	26.9				
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0				
Toluene	<6 µg/kg	TM116	68.3	56.9	199				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0				
Chlorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0				
Ethylbenzene	<9 µg/kg	TM116	386	21.8	34.3				

SDG: 091110-55
Job: D_MOUCHEL_ELE-5
Client Reference: 09/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66474

VOC MS (S)

Results Legend			Sample Identity			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	H6	H6	I 11
			Sample Type	3.50 - 4.00	5.50 - 6.00	0.00 - 0.50
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid
			Date Received	07/11/2009	07/11/2009	11/11/2009
			SDG Ref	09/11/2009	09/11/2009	09/11/2009
			Lab Sample No.(s)	091110-55	091110-55	091110-55
Lab Sample No.(s)	598798	598861	598989			
Component	LOD/Units	Method				
p/m-Xylene	<13 µg/kg	TM116	402 #	55.6 #	148 #	
o-Xylene	<11 µg/kg	TM116	434 M	69.5 M	58.0 M	
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	
Isopropylbenzene	<9 µg/kg	TM116	200 M	<9.00 M	<9.00 M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	
Propylbenzene	<6 µg/kg	TM116	348 M	<6.00 M	<6.00 M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	74.8 M	<8.00 M	30.8 M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	434 #	16.9 #	69.1 #	
sec-Butylbenzene	<8 µg/kg	TM116	97.1 #	<8.00 #	<8.00 #	
4-Isopropyltoluene	<8 µg/kg	TM116	46.7 #	<8.00 #	155 #	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	
Naphthalene	<7 µg/kg	TM116	3550 #	156 #	962 #	
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	

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Notification of NDPs (No determination possible)

SDG Number	091110-55	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	09/11/09	Report No.	28799-0
Attention	Dave Watts	Date Received	10/11/2009 11:56:03

Sample No	Sample Identity	Depth (m)	Test	Comment
601719	H6	3.50 - 4.00	pH	Sample contains oil / product
601719	H6	3.50 - 4.00	pH	Sample contains oil / product
601719	H6	3.50 - 4.00	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 19 November 2009
Job: D_MOUCHEL_ELE-6
Sample Delivery Group (SDG): 091110-83
Your Reference: 09/11/09
Location: Limerick Gasworks
Report No.: 65461

A total of 2 samples was received on Monday November 09, 2009 and completed on Thursday November 19, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091110-83
Job: D_MOUCHEL_ELE-6
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 65461

SOLID

Results Legend	Sample ID	HS				Total
		2.50 - 3.00		5.50 - 6.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
Container						
Ammonium Soil by Titration	All					0
			X		X	2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide					0
			X		X	2
Easily Liberated Sulphide	All					0
			X		X	2
EPH CWG (Aliphatic) GC (S)	All					0
		X			X	2
EPH CWG (Aromatic) GC (S)	All					0
					X	2
GRO BTEX MTBE GC (S)	All					0
		X		X		2
Hexavalent Chromium (s)	All					0
			X		X	2
Metals by iCap-OES (Soil)	Arsenic					0
		X			X	2
	Cadmium					0
		X			X	2
	Chromium					0
		X			X	2
	Copper					0
		X			X	2
	Lead					0
		X			X	2
	Mercury					0
		X			X	2
	Nickel					0
		X			X	2
	Selenium					0
		X			X	2
	Zinc					0
		X			X	2
PAH micro by GCMS	All					0
		X			X	2
pH	All					0
			X		X	2
Phenols by HPLC (S)	All					0
			X		X	2
Sample description	All					0
		X			X	2
Total Sulphate	All					0
		X			X	2
TPH CWG GC (S)	All					0
		X			X	2

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SDG:	091110-83	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-6	Attention:	Verity Sankey
Client Reference:	09/11/09	Order No.:	
Location:	Limerick Gasworks	Report No.:	65461

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
H5	2.50 - 3.00	Grey	Silty sand	0.063 - 0.1 mm	stones
	5.50 - 6.00	Brown	Sandy clay	0.1 - 2 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091110-83
Job: D_MOUCHEL_ELE-6
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 65461

Test Completion dates

SDG reference: 091110-83

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
H5	2.50 - 3.00	SOLID	19/11/2009	12/11/2009	11/11/2009	12/11/2009	14/11/2009	12/11/2009	12/11/2009	12/11/2009	16/11/2009	19/11/2009	19/11/2009	12/11/2009	12/11/2009	12/11/2009
	5.50 - 6.00	SOLID	16/11/2009	12/11/2009	11/11/2009	12/11/2009	14/11/2009	12/11/2009	12/11/2009	12/11/2009	16/11/2009	16/11/2009	16/11/2009	13/11/2009	12/11/2009	12/11/2009

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SDG: 091110-83
Job: D_MOUCHEL_ELE-6
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 65461

Results Legend			Sample Identity		H5	H5				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	5.50 - 6.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	07/11/2009	07/11/2009					
			Date Received	09/11/2009	09/11/2009					
			SDG Ref	091110-83	091110-83					
			Lab Sample No.(s)	599527	599623					
Component	LOD/Units	Method								
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	16.0	56.8	M	M				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	25.3	84.8	M	M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	19.7	65.9						
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100						
Phenol	<0.01 mg/kg	TM062 (S)	0.0615	<0.0100	M	M				
Cresols	<0.01 mg/kg	TM062 (S)	0.0615	<0.0100	M	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	M	M				
1 Napthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100						
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	M	M				
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	M	M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.100	<0.0200						
pH value of soil	1 pH Units	TM133	7.42	8.40	M	M				
Hexavalent Chromium	<0.6 mg/kg	TM151	0.071	0.070	#	#				
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0877	0.0807	#	#				
Total Cyanide	<1 mg/kg	TM153	1340	209	M	M				
Easily Liberated Sulphide	<15 mg/kg	TM180	209.89	38.87	#	#				
Easily Liberated Sulphide	<15 mg/kg	TM180	258	45.1	#	#				
Arsenic	<0.6 mg/kg	TM181	9.53	4.01	M	M				
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	M	M				
Chromium	<0.9 mg/kg	TM181	36.0	4.94	M	M				
Copper	<1.4 mg/kg	TM181	210	4.80	M	M				
Lead	<0.7 mg/kg	TM181	351	43.5	M	M				
Mercury	<0.14 mg/kg	TM181	1.55	0.389	M	M				
Nickel	<0.2 mg/kg	TM181	47.2	3.63	M	M				
Selenium	<1 mg/kg	TM181	1.77	<1.00	#	#				
Zinc	<1.9 mg/kg	TM181	55.6	16.2	M	M				
Total Sulphate	<48 mg/kg	TM221	3690	1370	M	M				

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SDG: 091110-83
Job: D_MOUCHEL_ELE-6
Client Reference: 09/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65461

PAH micro by GCMS

Results Legend		Sample Identity	H5	H5				
# ISO17025 accredited. m CERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 07/11/2009 09/11/2009 091110-83 599527	5.50 - 6.00 Soil/Solid 07/11/2009 09/11/2009 091110-83 599623				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	17400 M	6520 M				
Acenaphthylene (S)	<12 µg/kg	TM218	1540 M	66.8 M				
Acenaphthene (S)	<8 µg/kg	TM218	1360 M	208 M				
Flourene (S)	<10 µg/kg	TM218	1780 M	198 M				
Phenanthrene (S)	<15 µg/kg	TM218	4870 M	574 M				
Anthracene (S)	<16 µg/kg	TM218	1830 M	162 M				
Fluoranthene (S)	<17 µg/kg	TM218	7510 M	574 M				
Pyrene (S)	<15 µg/kg	TM218	5860 M	436 M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	5370 M	307 M				
Chrysene (S)	<10 µg/kg	TM218	3900 M	231 M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	10200 M	345 M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3500 M	146 M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	9010 M	256 M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	6500 M	123 M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1830 M	45.4 M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	7890 M	124 M				
PAH 16 EPA Total	<118 µg/kg	TM218	90300 M	10300 M				

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SDG: 091110-83
 Job: D_MOUCHEL_ELE-6
 Client Reference: 09/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65461

TPH CWG (S)

Results Legend		Sample Identity	H5	H5				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	2.50 - 3.00	5.50 - 6.00				
		Sample Type	Soil/Solid	Soil/Solid				
		Date Sampled	07/11/2009	07/11/2009				
		Date Received	09/11/2009	09/11/2009				
		SDG Ref	091110-83	091110-83				
		Lab Sample No.(s)	599527	599623				
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	4690	4870	#	#		
MTBE	<5 µg/kg	TM089	<5.00	<5.00	#	#		
Benzene	<10 µg/kg	TM089	258	3540	M	M		
Toluene	<2 µg/kg	TM089	99.6	111	M	M		
Ethyl Benzene	<3 µg/kg	TM089	65.2	92.8	M	M		
m & p Xylene	<6 µg/kg	TM089	336	289	M	M		
o Xylene	<3 µg/kg	TM089	145	378	M	M		
Sum m&p and o Xylene	<10 µg/kg	TM089	481	667	M	M		
Sum of BTEX	<10 µg/kg	TM089	904	4410	M	M		
Aliphatics C5-C6	<10 µg/kg	TM089	29.9	50.1				
Aliphatics >C6-C8	<10 µg/kg	TM089	167	<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	664	90.4				
Aliphatics >C10-C12	<10 µg/kg	TM089	772	134				
Aliphatics >C12-C16	<100 µg/kg	TM173	46700	5350				
Aliphatics >C16-C21	<100 µg/kg	TM173	18600	2980				
Aliphatics >C21-C35	<100 µg/kg	TM173	20800	6410				
Aliphatics >C35-C44	<100 µg/kg	TM173	604	700				
Total Aliphatics C5-C12	<10 µg/kg	TM089	1630	275				
Total Aliphatics >C12-C44	<100 µg/kg	TM173	86700	14700				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	88400	15000				
Aromatics C6-C7	<10 µg/kg	TM089	258	3540				
Aromatics >C7-C8	<10 µg/kg	TM089	99.6	111				
Aromatics >EC8-EC10	<10 µg/kg	TM089	1540	895				
Aromatics >EC10-EC12	<10 µg/kg	TM089	1160	201				
Aromatics >EC12-EC16	<100 µg/kg	TM173	91100	18200				
Aromatics >EC16-EC21	<100 µg/kg	TM173	78400	14500				
Aromatics >EC21-EC35	<100 µg/kg	TM173	258000	69000				
Aromatics >EC35-EC44	<100 µg/kg	TM173	55100	36200				
Total Aromatics C6-C12	<10 µg/kg	TM089	3060	4750				
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	483000	138000				
Total Aromatics >C6-C44	<100 µg/kg	TM173	486000	143000				
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	574000	158000				
Aliphatics >C16-C35	<100 µg/kg	TM173	39400	9390				
Aromatics >EC35-EC40	<100 µg/kg	TM173	40100					
Aromatics >EC40-EC44	<100 µg/kg	TM173	15100					
Total Aromatics >EC12-EC35	<100 µg/kg	TM173	428000					
Total Aromatics >EC12-EC40	<100 µg/kg	TM173	468000					
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	483000	138000				

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 03 December 2009
Job: D_MOUCHEL_ELE-7
Sample Delivery Group (SDG): 091111-56
Your Reference: 10/11/09
Location: Limerick Gasworks
Report No.: 66477

A total of 4 samples was received on Tuesday November 10, 2009 and completed on Thursday December 03, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091111-56
 Job: D_MOUCHEL_ELE-7
 Client Reference: 10/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66477

SOLID

Results Legend	Sample ID	H4				Soakaway	Total				
		2.50 - 3.00		3.00 - 6.00				7.00 - 7.50		2.00 - 2.20	
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)			60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)		
X Test											
N No Determination Possible											
Ammonium Soil by Titration	All		X	X	X	X	0	4			
Asbestos Presence Screen	All		X				0	0			
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X	X	X	X	0	4			
Easily Liberated Sulphide	All		X	X	X	X	0	4			
EPH CWG (Aliphatic) GC (S)	All		X	X	X	X	0	4			
EPH CWG (Aromatic) GC (S)	All		X	X	X	X	0	4			
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	0	4			
Hexavalent Chromium (s)	All		X	X	X	X	0	4			
Metals by iCap-OES (Soil)	Arsenic		X	X	X	X	0	4			
	Cadmium		X	X	X	X	0	4			
	Chromium		X	X	X	X	0	4			
	Copper		X	X	X	X	0	4			
	Lead		X	X	X	X	0	4			
	Mercury		X	X	X	X	0	4			
	Nickel		X	X	X	X	0	4			
	Selenium		X	X	X	X	0	4			
	Zinc		X	X	X	X	0	4			
PAH micro by GCMS	All		X	X	X	X	0	4			
PCBs by GCMS	All			X		X	0	2			
pH	All		X	X	X	X	0	4			
Phenols by HPLC (S)	All		X	X	X	X	0	4			
Sample description	All		X	X	X	X	0	4			
Total Sulphate	All		X	X	X	X	0	4			
TPH CWG GC (S)	All		X	X	X	X	0	4			
VOC MS (S)	All			X		X	0	2			

SDG:	091111-56	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-7	Attention:	Verity Sankey
Client Reference:	10/11/09	Order No.:	
Location:	Limerick Gasworks	Report No.:	66477

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
H4	2.50 - 3.00	Brown	Dust	0.063 - 0.1 mm	stones
	3.00 - 6.00	Black	Silty sand	<0.063 mm	N/A
	7.00 - 7.50	Grey	Silty Clay	0.1 - 2 mm	N/A
Soakaway	2.00 - 2.20	Blue	Sludge / sediment	<0.063 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091111-56
 Job: D_MOUCHEL_ELE-7
 Client Reference: 10/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66477

Test Completion dates

SDG reference: 091111-56

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
H4	2.50 - 3.00	SOLID	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
	3.00 - 6.00	SOLID	19/11/2009	18/11/2009	19/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
	7.00 - 7.50	SOLID	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
Soakaway	2.00 - 2.20	SOLID	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009

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SDG: 091111-56
 Job: D_MOUCHEL_ELE-7
 Client Reference: 10/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66477

Results Legend		Sample Identity	H4	H4	H4	Soakaway		
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 09/11/2009 10/11/2009 091111-56 601882	3.00 - 6.00 Soil/Solid 09/11/2009 10/11/2009 091111-56 601915	7.00 - 7.50 Soil/Solid 09/11/2009 10/11/2009 091111-56 601973	2.00 - 2.20 Soil/Solid 09/11/2009 10/11/2009 091111-56 602103		
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001	No ACM Detected					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	113 M	92.6 M	448 M		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	87.6	72.0	349		
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100		
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M		
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	0.127 M	0.195 M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0500 M	<0.0150 M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100		
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M		
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.160	<0.100		
pH value of soil	1 pH Units	TM133	12.22 M	9.19 M	8.44 M	2.38 M		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	0.0792 #	<6.00 #	<60.0 #		
Total Cyanide	<1 mg/kg	TM153	<1.00 M	92.3 M	1.64 M	14100 M		
PCB congener 28	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
PCB congener 52	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
PCB congener 101	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
PCB congener 118	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
PCB congener 138	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
PCB congener 153	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
PCB congener 180	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00	<3.00	<3.00	<3.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	22.0 #	321 #	<15.0 #	<15.0 #		
Arsenic	<0.6 mg/kg	TM181	4.01 M	2.92 M	5.37 M	17.7 M		
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M	0.0487 M	<0.0200 M		
Chromium	<0.9 mg/kg	TM181	11.2 M	6.17 M	6.47 M	3.66 M		
Copper	<1.4 mg/kg	TM181	16.8 M	6.37 M	5.73 M	<1.40 M		
Lead	<0.7 mg/kg	TM181	12.7 M	11.5 M	27.6 M	159 M		
Mercury	<0.14 mg/kg	TM181	<0.140 M	0.189 M	0.340 M	<0.140 M		
Nickel	<0.2 mg/kg	TM181	12.8 M	7.58 M	4.98 M	2.50 M		
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	2.27 #		
Zinc	<1.9 mg/kg	TM181	18.5 M	17.2 M	18.6 M	149 M		
Total Sulphate	<48 mg/kg	TM221	8720 M	2010 M	597 M	20700 M		

SDG: 091111-56
Job: D_MOUCHEL_ELE-7
Client Reference: 10/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66477

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H4	H4	H4	Soakaway
Depth (m)	2.50 - 3.00	3.00 - 6.00	7.00 - 7.50	2.00 - 2.20
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	09/11/2009	09/11/2009	09/11/2009	09/11/2009
Date Received	10/11/2009	10/11/2009	10/11/2009	10/11/2009
SDG Ref	091111-56	091111-56	091111-56	091111-56
Lab Sample No.(s)	601882	601915	601973	602103

Component	LOD/Units	Method	H4	H4	H4	Soakaway
Aliphatics >C12-C16	<100 µg/kg	TM173	<100	<100	184	17200
Aliphatics >C16-C21	<100 µg/kg	TM173	<100	<100	3620	41700
Aliphatics >C21-C35	<100 µg/kg	TM173	<100	214	6930	352000
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	<100	272	49100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	<100	214	11000	460000
Aliphatics >C16-C35	<100 µg/kg	TM173	<100	214	10600	394000

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SDG: 091111-56
Job: D_MOUCHEL_ELE-7
Client Reference: 10/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66477

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H4	H4	H4	Soakaway
Depth (m)	2.50 - 3.00	3.00 - 6.00	7.00 - 7.50	2.00 - 2.20
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	09/11/2009	09/11/2009	09/11/2009	09/11/2009
Date Received	10/11/2009	10/11/2009	10/11/2009	10/11/2009
SDG Ref	091111-56	091111-56	091111-56	091111-56
Lab Sample No.(s)	601882	601915	601973	602103

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	16400	2770	3080	328000
Aromatics >EC16-EC21	<100 µg/kg	TM173	44500	5070	6520	297000
Aromatics >EC21-EC35	<100 µg/kg	TM173	125000	23300	44400	1360000
Aromatics >EC35-EC44	<100 µg/kg	TM173	34100	12700	4970	157000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	220000	43800	59000	2140000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	220000	43800	59000	2140000

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SDG: 091111-56
Job: D_MOUCHEL_ELE-7
Client Reference: 10/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66477

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	H4	H4	H4	Soakaway		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	3.00 - 6.00	7.00 - 7.50	2.00 - 2.20		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	09/11/2009	09/11/2009	09/11/2009	09/11/2009		
			Date Received	10/11/2009	10/11/2009	10/11/2009	10/11/2009		
			SDG Ref	091111-56	091111-56	091111-56	091111-56		
			Lab Sample No.(s)	601882	601915	601973	602103		
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	149	737	153	1410	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00	#	#	#
Benzene	<10 µg/kg	TM089	50.9	30.2	11.5	42.9	M	M	M
Toluene	<2 µg/kg	TM089	35.3	<2.00	18.4	33.2	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	<3.00	<3.00	M	M	M
m & p Xylene	<6 µg/kg	TM089	11.4	<6.00	<6.00	31.2	M	M	M
o Xylene	<3 µg/kg	TM089	<3.00	<3.00	<3.00	80.0	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	11.4	<10.0	<10.0	111	M	M	M
Sum of BTEX	<10 µg/kg	TM089	97.6	30.2	29.9	187	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	<10.0	198			
Aliphatics >C6-C8	<10 µg/kg	TM089	44.4	<10.0	80.8	36.4			
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	50.3	10.9	78.4			
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	232	<10.0	318			
Total Aliphatics C5-C12	<10 µg/kg	TM089	44.4	283	97.7	631			
Aromatics C6-C7	<10 µg/kg	TM089	50.9	30.2	11.5	42.9			
Aromatics >C7-C8	<10 µg/kg	TM089	35.3	<10.0	18.4	33.2			
Aromatics >EC8-EC10	<10 µg/kg	TM089	14.2	78.5	25.4	229			
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	348	<10.0	478			
Total Aromatics C6-C12	<10 µg/kg	TM089	100	454	55.3	782			

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SDG: 091111-56
Job: D_MOUCHEL_ELE-7
Client Reference: 10/11/09
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66477

PAH micro by GCMS

Results Legend		Sample Identity	H4	H4	H4	Soakaway		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 09/11/2009 10/11/2009 091111-56 601882	3.00 - 6.00 Soil/Solid 09/11/2009 10/11/2009 091111-56 601915	7.00 - 7.50 Soil/Solid 09/11/2009 10/11/2009 091111-56 601973	2.00 - 2.20 Soil/Solid 09/11/2009 10/11/2009 091111-56 602103		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	2640 M	770 M	1330 M	38200 M		
Acenaphthylene (S)	<12 µg/kg	TM218	460 M	259 M	205 M	5890 M		
Acenaphthene (S)	<8 µg/kg	TM218	124 M	110 M	361 M	1160 M		
Fluorene (S)	<10 µg/kg	TM218	621 M	324 M	728 M	2630 M		
Phenanthrene (S)	<15 µg/kg	TM218	2110 M	1380 M	2340 M	51500 M		
Anthracene (S)	<16 µg/kg	TM218	639 M	435 M	754 M	8900 M		
Fluoranthene (S)	<17 µg/kg	TM218	1550 M	1140 M	1860 M	70900 M		
Pyrene (S)	<15 µg/kg	TM218	1220 M	850 M	1250 M	56200 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	736 M	479 M	910 M	40300 M		
Chrysene (S)	<10 µg/kg	TM218	612 M	401 M	582 M	33800 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	813 M	443 M	1000 M	71100 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	333 M	66.4 M	371 M	25000 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	784 M	423 M	649 M	13000 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	467 M	217 M	387 M	30500 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	126 M	67.9 M	146 M	7340 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	516 M	278 M	432 M	29800 M		
PAH 16 EPA Total	<118 µg/kg	TM218	13700 M	7600 M	13500 M	486000 M		

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SDG: 091111-56
 Job: D_MOUCHEL_ELE-7
 Client Reference: 10/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66477

VOC MS (S)

Results Legend			Sample Identity	H4	Soakaway				
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 6.00	2.00 - 2.20				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	09/11/2009	09/11/2009				
			Date Received	10/11/2009	10/11/2009				
			SDG Ref	091111-56	091111-56				
			Lab Sample No.(s)	601915	602103				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		86.0	88.8				
Toluene-d8**	%	TM116		78.0	60.8				
4-Bromofluorobenzene**	%	TM116		70.3	53.3				
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0				
Chloromethane	<12 µg/kg	TM116		<12.0	209				
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0				
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00				
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
Carbon Disulphide	<9 µg/kg	TM116		21.3	259				
Dichloromethane	<10 µg/kg	TM116		<10.0	21.7				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0				
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0				
Chloroform	<10 µg/kg	TM116		<10.0	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0				
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0				
Benzene	<9 µg/kg	TM116		19.0	<9.00				
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0				
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0				
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0				
Toluene	<6 µg/kg	TM116		<6.00	19.8				
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00				
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00				
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0				
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0				
Ethylbenzene	<9 µg/kg	TM116		<9.00	<9.00				

SDG: 091111-56
 Job: D_MOUCHEL_ELE-7
 Client Reference: 10/11/09
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66477

VOC MS (S)

Results Legend		Sample Identity	H4	Soakaway				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 6.00 Soil/Solid 09/11/2009 10/11/2009 091111-56 601915	2.00 - 2.20 Soil/Solid 09/11/2009 10/11/2009 091111-56 602103				
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	<13.0	39.2	#	#		
o-Xylene	<11 µg/kg	TM116	<11.0	<11.0	M	M		
Styrene	<11 µg/kg	TM116	<11.0	79.9	M	M		
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	M	M		
Isopropylbenzene	<9 µg/kg	TM116	<9.00	<9.00	M	M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	#	#		
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	M	M		
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	M	M		
Propylbenzene	<6 µg/kg	TM116	<6.00	<6.00	M	M		
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	#	#		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8.00	47.4	M	M		
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	#	#		
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	<10.0	50.2	#	#		
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	<8.00	#	#		
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	<8.00	#	#		
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	#	#		
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	M	M		
n-Butylbenzene	<7 µg/kg	TM116	<7.00	30.0	#	#		
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	M	M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	M	M		
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	#	#		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	#	#		
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	#	#		
Naphthalene	<7 µg/kg	TM116	1110	2260	#	#		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#		

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 03 December 2009
Job: D_MOUCHEL_ELE-8
Sample Delivery Group (SDG): 091111-74
Your Reference: 11/11/09
Location: Limerick Gas Works
Report No.: 66479

A total of 3 samples was received on Wednesday November 11, 2009 and completed on Thursday December 03, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091111-74
Job: D_MOUCHEL_ELE-8
Client Reference: 11/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66479

SOLID

Results Legend	Sample ID	J1						Total
		0.50 - 1.00		1.00 - 1.50		4.00 - 4.50		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All		X		X		X	3
Hexavalent Chromium (s)	All	X		X		X		3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
	Cadmium		X		X		X	3
	Chromium		X		X		X	0
	Copper		X		X		X	3
	Lead		X		X		X	0
	Mercury		X		X		X	3
	Nickel		X		X		X	0
	Selenium		X		X		X	3
	Zinc		X		X		X	0
PAH micro by GCMS	All		X		X		X	3
PCBs by GCMS	All				X			0
pH	All		X		X		X	3
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	3
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	3
VOC MS (S)	All			X				0
								1

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SDG:	091111-74	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-8	Attention:	Verity Sankey
Client Reference:	11/11/09	Order No.:	
Location:	Limerick Gas Works	Report No.:	66479

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
J1	0.50 - 1.00	Grey	Silty Clay	0.063 - 0.1 mm	stones
	1.00 - 1.50	Grey	Sandy clay	0.1 - 2 mm	stones
	4.00 - 4.50	Grey	Clay	<0.063 mm	stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091111-74
Job: D_MOUCHEL_ELE-8
Client Reference: 11/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66479

Test Completion dates

SDG reference: 091111-74

Sample ID	Depth	Type	SDG reference: 091111-74														
			VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana
J1	0.50 - 1.00	SOLID	19/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	13/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	17/11/2009	17/11/2009	13/11/2009	18/11/2009
	1.00 - 1.50	SOLID	19/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	13/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	17/11/2009	17/11/2009	13/11/2009	18/11/2009
	4.00 - 4.50	SOLID	19/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	13/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	17/11/2009	17/11/2009	13/11/2009	18/11/2009

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SDG: 091111-74
 Job: D_MOUCHEL_ELE-8
 Client Reference: 11/11/09
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66479

Results Legend			Sample Identity			J1			J1			J1			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	1.00 - 1.50	4.00 - 4.50	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Date Sampled	11/11/2009	11/11/2009	11/11/2009	
			Date Received	11/11/2009	11/11/2009	11/11/2009	SDG Ref	091111-74	091111-74	091111-74	Lab Sample No.(s)	602958	602968	603017	
			Component	LOD/Units	Method										
			Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0	40.9	M	M	M				
			Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	31.8							
			Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100							
Phenol	<0.01 mg/kg	TM062 (S)	0.545	0.151	<0.0100	M	M	M							
Cresols	<0.01 mg/kg	TM062 (S)	0.487	0.383	<0.0100	M	M	M							
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500										
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	M	M	M							
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100										
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	M	M	M							
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	M	M	M							
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	1.03	0.534	0.00										
pH value of soil	1 pH Units	TM133	7.92	12.02	8.78	M	M	M							
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0861	<0.600	<0.600	#	#	#							
Total Cyanide	<1 mg/kg	TM153	4.40	22.0	<1.00	M	M	M							
PCB congener 28	<3 µg/kg	TM168		<3.00											
PCB congener 52	<3 µg/kg	TM168		<3.00											
PCB congener 101	<3 µg/kg	TM168		<3.00											
PCB congener 118	<3 µg/kg	TM168		<3.00											
PCB congener 138	<3 µg/kg	TM168		<3.00											
PCB congener 153	<3 µg/kg	TM168		<3.00											
PCB congener 180	<3 µg/kg	TM168		<3.00											
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00											
Easily Liberated Sulphide	<15 mg/kg	TM180	218	235	<15.0	#	#	#							
Arsenic	<0.6 mg/kg	TM181	9.20	6.69	4.73	M	M	M							
Cadmium	<0.02 mg/kg	TM181	0.751	0.315	<0.0200	M	M	M							
Chromium	<0.9 mg/kg	TM181	26.0	16.6	7.71	M	M	M							
Copper	<1.4 mg/kg	TM181	102	25.5	5.75	M	M	M							
Lead	<0.7 mg/kg	TM181	214	78.3	15.5	M	M	M							
Mercury	<0.14 mg/kg	TM181	0.346	<0.140	0.196	M	M	M							
Nickel	<0.2 mg/kg	TM181	26.7	19.4	8.96	M	M	M							
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	#	#	#							
Zinc	<1.9 mg/kg	TM181	492	390	24.1	M	M	M							
Total Sulphate	<48 mg/kg	TM221	12100	669	540	M	M	M							

SDG: 091111-74
Job: D_MOUCHEL_ELE-8
Client Reference: 11/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66479

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J1	J1	J1
Depth (m)	0.50 - 1.00	1.00 - 1.50	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091111-74	091111-74	091111-74
Lab Sample No.(s)	602958	602968	603017

Component	LOD/Units	Method	J1	J1	J1
Aromatics >EC12-EC16	<100 µg/kg	TM173	598	948	<100
Aromatics >EC16-EC21	<100 µg/kg	TM173	3960	1420	<100
Aromatics >EC21-EC35	<100 µg/kg	TM173	86600	18400	8200
Aromatics >EC35-EC44	<100 µg/kg	TM173	33000	1020	13800
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	124000	21800	22000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	124000	21800	22000

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SDG: 091111-74
Job: D_MOUCHEL_ELE-8
Client Reference: 11/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66479

GRO BTEX MTBE GC (S)

Results Legend
ISO17025 accredited.
mCERTS accredited.
subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J1	J1	J1
Depth (m)	0.50 - 1.00	1.00 - 1.50	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091111-74	091111-74	091111-74
Lab Sample No.(s)	602958	602968	603017

Component	LOD/Units	Method	J1	J1	J1
GRO C5-C12	<44 µg/kg	TM089	1060 #	2880 #	<44.0 #
MTBE	<5 µg/kg	TM089	<5.00 #	13.9 #	<8.00 #
Benzene	<10 µg/kg	TM089	15.1 M	<10.0 M	<10.0 M
Toluene	<2 µg/kg	TM089	46.4 M	15.1 M	<4.00 M
Ethyl Benzene	<3 µg/kg	TM089	41.8 M	15.1 M	<3.00 M
m & p Xylene	<6 µg/kg	TM089	42.9 M	54.5 M	<7.00 M
o Xylene	<3 µg/kg	TM089	19.7 M	27.8 M	<3.00 M
Sum m&p and o Xylene	<10 µg/kg	TM089	62.6 M	82.4 M	<10.0 M
Sum of BTEX	<10 µg/kg	TM089	166 M	113 M	<10.0 M
Aliphatics C5-C6	<10 µg/kg	TM089	119	36.2	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	252	79.7	<10.0
Aliphatics >C8-C10	<10 µg/kg	TM089	102	156	<10.0
Aliphatics >C10-C12	<10 µg/kg	TM089	107	899	<10.0
Total Aliphatics C5-C12	<10 µg/kg	TM089	579	1170	<10.0
Aromatics C6-C7	<10 µg/kg	TM089	15.1	<10.0	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	46.4	16.1	<10.0
Aromatics >EC8-EC10	<10 µg/kg	TM089	257	33.9	<10.0
Aromatics >EC10-EC12	<10 µg/kg	TM089	160	1350	<10.0
Total Aromatics C6-C12	<10 µg/kg	TM089	479	1700	<10.0

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SDG: 091111-74
Job: D_MOUCHEL_ELE-8
Client Reference: 11/11/09
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66479

PAH micro by GCMS

Results Legend		Sample Identity	J1	J1	J1			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 11/11/2009 11/11/2009 091111-74 602958	1.00 - 1.50 Soil/Solid 11/11/2009 091111-74 602968	4.00 - 4.50 Soil/Solid 11/11/2009 11/11/2009 091111-74 603017			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	1040 M	4280 M	29.8 M			
Acenaphthylene (S)	<12 µg/kg	TM218	63.8 M	54.1 M	<12.0 M			
Acenaphthene (S)	<8 µg/kg	TM218	114 M	352 M	128 M			
Fluorene (S)	<10 µg/kg	TM218	225 M	348 M	29.1 M			
Phenanthrene (S)	<15 µg/kg	TM218	668 M	790 M	64.6 M			
Anthracene (S)	<16 µg/kg	TM218	205 M	234 M	48.0 M			
Fluoranthene (S)	<17 µg/kg	TM218	1400 M	790 M	165 M			
Pyrene (S)	<15 µg/kg	TM218	1060 M	718 M	121 M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	414 M	431 M	72.7 M			
Chrysene (S)	<10 µg/kg	TM218	406 M	340 M	45.8 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	724 M	726 M	62.6 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	239 M	263 M	26.4 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	323 M	546 M	15.3 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	236 M	350 M	23.5 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	71.9 M	96.0 M	<23.0 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	298 M	134 M	28.7 M			
PAH 16 EPA Total	<118 µg/kg	TM218	7480 M	10700 M	891 M			

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SDG: 091111-74
 Job: D_MOUCHEL_ELE-8
 Client Reference: 11/11/09
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66479

VOC MS (S)

Results Legend			Sample Identity	J1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50				
			Sample Type	Soil/Solid				
			Date Sampled					
			Date Received	11/11/2009				
			SDG Ref	091111-74				
			Lab Sample No.(s)	602968				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	0.840					
Toluene-d8**	%	TM116	71.7					
4-Bromofluorobenzene**	%	TM116	58.7					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0					
Chloromethane	<12 µg/kg	TM116	<12.0					
Vinyl Chloride	<10 µg/kg	TM116	<10.0					
Bromoethane	<9 µg/kg	TM116	<9.00					
Chloroethane	<12 µg/kg	TM116	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00					
Carbon Disulphide	<9 µg/kg	TM116	73.2					
Dichloromethane	<10 µg/kg	TM116	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Bromochloromethane	<10 µg/kg	TM116	<10.0					
Chloroform	<10 µg/kg	TM116	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0					
Carbontetrachloride	<11 µg/kg	TM116	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0					
Benzene	<9 µg/kg	TM116	<9.00					
Trichloroethene	<9 µg/kg	TM116	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Dibromomethane	<12 µg/kg	TM116	<12.0					
Bromodichloromethane	<11 µg/kg	TM116	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0					
Toluene	<6 µg/kg	TM116	<6.00					
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00					
Tetrachloroethene	<9 µg/kg	TM116	<9.00					
Dibromochloromethane	<9 µg/kg	TM116	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0					
Chorobenzene	<7 µg/kg	TM116	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0					
Ethylbenzene	<9 µg/kg	TM116	<9.00					

SDG: 091111-74
 Job: D_MOUCHEL_ELE-8
 Client Reference: 11/11/09
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66479

VOC MS (S)

Results Legend		Sample Identity	J1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.00 - 1.50				
		Sample Type	Soil/Solid				
		Date Sampled					
		Date Received	11/11/2009				
		SDG Ref	091111-74				
		Lab Sample No.(s)	602968				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	<13.0	#			
o-Xylene	<11 µg/kg	TM116	<11.0	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	<9.00	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	<6.00	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	13.1	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	27.3	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	1540	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-9
Sample Delivery Group (SDG): 091111-80
Your Reference: 11/11/09 (J2)
Location: Limerick Gasworks
Report No.: 66530

A total of 2 samples was received on Wednesday November 11, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091111-80
Job: D_MOUCHEL_ELE-9
Client Reference: 11/11/09 (J2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66530

SOLID

Results Legend	Sample ID	J2				Total
		0.20 - 0.70		5.50 - 6.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test						
N No Determination Possible						
Ammonium Soil by Titration	All		X		X	0 2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X	0 2
Easily Liberated Sulphide	All		X		X	0 2
EPH CWG (Aliphatic) GC (S)	All		X		X	0 2
EPH CWG (Aromatic) GC (S)	All		X		X	0 2
GRO BTEX MTBE GC (S)	All	X		X		0 2
Hexavalent Chromium (s)	All		X		X	0 2
Metals by iCap-OES (Soil)	Arsenic		X		X	0 2
	Cadmium		X		X	0 2
	Chromium		X		X	0 2
	Copper		X		X	0 2
	Lead		X		X	0 2
	Mercury		X		X	0 2
	Nickel		X		X	0 2
	Selenium		X		X	0 2
	Zinc		X		X	0 2
PAH micro by GCMS	All		X		X	0 2
PCBs by GCMS	All		X			0 1
pH	All		X		X	0 2
Phenols by HPLC (S)	All		X		X	0 2
Sample description	All		X		X	0 2
Total Sulphate	All		X		X	0 2
TPH CWG GC (S)	All		X		X	0 2

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SDG:	091111-80	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-9	Attention:	Verity Sankey
Client Reference:	11/11/09 (J2)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66530

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
J2	0.20 - 0.70	Black	Sandy clay	0.1 - 2 mm	stones
	5.50 - 6.00	Grey	Silty Clay	0.063 - 0.1 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091111-80
Job: D_MOUCHEL_ELE-9
Client Reference: 11/11/09 (J2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66530

Test Completion dates

SDG reference: 091111-80

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
J2	0.20 - 0.70	SOLID	19/11/2009	13/11/2009	12/11/2009	18/11/2009	17/11/2009	16/11/2009	13/11/2009	16/11/2009	16/11/2009	19/11/2009	16/11/2009	16/11/2009	17/11/2009	13/11/2009	18/11/2009
	5.50 - 6.00	SOLID	19/11/2009	13/11/2009	12/11/2009	18/11/2009	17/11/2009	16/11/2009	13/11/2009	16/11/2009	16/11/2009	19/11/2009	16/11/2009	16/11/2009	17/11/2009	13/11/2009	18/11/2009

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SDG: 091111-80
 Job: D_MOUCHEL_ELE-9
 Client Reference: 11/11/09 (J2)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66530

Results Legend			Sample Identity					
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	J2	J2			
			Sample Type	0.20 - 0.70	5.50 - 6.00			
			Date Sampled	Soil/Solid	Soil/Solid			
			Date Received	11/11/2009	11/11/2009			
			SDG Ref	091111-80	091111-80			
			Lab Sample No.(s)	603295	603387			
Component	LOD/Units	Method						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	M	52.1	M		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		40.5			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M		
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M	0.0565	M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		0.0904			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100			
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M		
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00		<0.130			
pH value of soil	1 pH Units	TM133	10.75	M	8.46	M		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#	<3.00	#		
Total Cyanide	<1 mg/kg	TM153	59.2	M	18.2			
PCB congener 28	<3 µg/kg	TM168	4.75					
PCB congener 52	<3 µg/kg	TM168	<3.00					
PCB congener 101	<3 µg/kg	TM168	<3.00					
PCB congener 118	<3 µg/kg	TM168	<3.00					
PCB congener 138	<3 µg/kg	TM168	<3.00					
PCB congener 153	<3 µg/kg	TM168	<3.00					
PCB congener 180	<3 µg/kg	TM168	<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168	4.75					
Easily Liberated Sulphide	<15 mg/kg	TM180	17.4	#	72.9	#		
Arsenic	<0.6 mg/kg	TM181	13.7	M	3.27	M		
Cadmium	<0.02 mg/kg	TM181	0.0281	M	<0.0200	M		
Chromium	<0.9 mg/kg	TM181	17.3	M	4.69	M		
Copper	<1.4 mg/kg	TM181	97.7	M	6.04	M		
Lead	<0.7 mg/kg	TM181	720	M	34.8	M		
Mercury	<0.14 mg/kg	TM181	1.54	M	0.340	M		
Nickel	<0.2 mg/kg	TM181	25.4	M	4.01	M		
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#		
Zinc	<1.9 mg/kg	TM181	420	M	15.6	M		
Total Sulphate	<48 mg/kg	TM221	3360	M	1250	M		

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SDG: 091111-80
Job: D_MOUCHEL_ELE-9
Client Reference: 11/11/09 (J2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66530

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J2	J2				
Depth (m)	0.20 - 0.70	5.50 - 6.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled						
Date Received	11/11/2009	11/11/2009				
SDG Ref	091111-80	091111-80				
Lab Sample No.(s)	603295	603387				

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	3510	3000		
Aliphatics >C16-C21	<100 µg/kg	TM173	7800	3600		
Aliphatics >C21-C35	<100 µg/kg	TM173	67600	6610		
Aliphatics >C35-C44	<100 µg/kg	TM173	13900	4500		
Total Aliphatics >C12-C44	<100 µg/kg	TM173	92800	17700		
Aliphatics >C16-C35	<100 µg/kg	TM173	75400	10200		

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SDG: 091111-80
Job: D_MOUCHEL_ELE-9
Client Reference: 11/11/09 (J2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66530

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J2	J2				
Depth (m)	0.20 - 0.70	5.50 - 6.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled						
Date Received	11/11/2009	11/11/2009				
SDG Ref	091111-80	091111-80				
Lab Sample No.(s)	603295	603387				

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	3150	8160		
Aromatics >EC16-EC21	<100 µg/kg	TM173	7900	13300		
Aromatics >EC21-EC35	<100 µg/kg	TM173	101000	71500		
Aromatics >EC35-EC44	<100 µg/kg	TM173	39500	34100		
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	152000	127000		
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	152000	127000		

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SDG: 091111-80
Job: D_MOUCHEL_ELE-9
Client Reference: 11/11/09 (J2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66530

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	J2	J2				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.20 - 0.70	5.50 - 6.00				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled						
			Date Received	11/11/2009	11/11/2009				
			SDG Ref	091111-80	091111-80				
			Lab Sample No.(s)	603295	603387				
			Method						
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	93.5	140	#	#			
MTBE	<5 µg/kg	TM089	<5.00	<5.00	#	#			
Benzene	<10 µg/kg	TM089	<10.0	<10.0	M	M			
Toluene	<2 µg/kg	TM089	11.4	<2.00	M	M			
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	M	M			
m & p Xylene	<6 µg/kg	TM089	<6.00	<6.00	M	M			
o Xylene	<3 µg/kg	TM089	<3.00	<3.00	M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	<10.0	M	M			
Sum of BTEX	<10 µg/kg	TM089	11.4	<10.0	M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	35.1	21.7					
Aliphatics >C6-C8	<10 µg/kg	TM089	47.0	49.8					
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	18.3					
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	<10.0					
Total Aliphatics C5-C12	<10 µg/kg	TM089	82.1	89.8					
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0					
Aromatics >C7-C8	<10 µg/kg	TM089	11.4	<10.0					
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	27.4					
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	13.7					
Total Aromatics C6-C12	<10 µg/kg	TM089	11.4	41.1					

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SDG: 091111-80
Job: D_MOUCHEL_ELE-9
Client Reference: 11/11/09 (J2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66530

PAH micro by GCMS

Results Legend			Sample Identity		J2		J2	
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.20 - 0.70	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid			
			Date Sampled	11/11/2009	11/11/2009			
			Date Received	11/11/2009	11/11/2009			
			SDG Ref	091111-80	091111-80			
			Lab Sample No.(s)	603295	603387			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	330	215				
			M	M				
Acenaphthylene (S)	<12 µg/kg	TM218	180	32.3				
			M	M				
Acenaphthene (S)	<8 µg/kg	TM218	86.7	43.9				
			M	M				
Fluorene (S)	<10 µg/kg	TM218	84.0	159				
			M	M				
Phenanthrene (S)	<15 µg/kg	TM218	1850	615				
			M	M				
Anthracene (S)	<16 µg/kg	TM218	446	173				
			M	M				
Fluoranthene (S)	<17 µg/kg	TM218	3460	514				
			M	M				
Pyrene (S)	<15 µg/kg	TM218	3170	348				
			M	M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	2540	220				
			M	M				
Chrysene (S)	<10 µg/kg	TM218	2690	188				
			M	M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	5560	260				
			M	M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	1520	92.6				
			M	M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	3250	195				
			M	M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	2350	99.9				
			M	M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	749	41.3				
			M	M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	2770	128				
			M	M				
PAH 16 EPA Total	<118 µg/kg	TM218	31000	3320				
			M	M				

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SDG: 091111-80
Job: D_MOUCHEL_ELE-9
Client Reference: 11/11/09 (J2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66530

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J2	J2				
Depth (m)	0.20 - 0.70	5.50 - 6.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled						
Date Received	11/11/2009	11/11/2009				
SDG Ref	091111-80	091111-80				
Lab Sample No.(s)	603295	603387				

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	92900	17800		
Total Aromatics >C6-C44	<100 µg/kg	TM173	152000	127000		
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	245000	145000		

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-10
Sample Delivery Group (SDG): 091112-41
Your Reference: 11/11/09 (H3)
Location: Limerick Gasworks
Report No.: 66531

A total of 3 samples was received on Wednesday November 11, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66531

SOLID

Results Legend	Sample ID	H3						Total
		3.00 - 3.50		6.50 - 7.00		8.50 - 9.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All						0	
			X		X		3	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide						0	
			X		X		3	
Easily Liberated Sulphide	All						0	
			X		X		3	
EPH CWG (Aliphatic) GC (S)	All						0	
			X		X		3	
EPH CWG (Aromatic) GC (S)	All						0	
			X		X		3	
GRO BTEX MTBE GC (S)	All						0	
		X		X			3	
Hexavalent Chromium (s)	All						0	
			X		X		3	
Metals by iCap-OES (Soil)	Arsenic						0	
			X		X		3	
	Cadmium						0	
			X		X		3	
	Chromium						0	
			X		X		3	
	Copper						0	
			X		X		3	
	Lead						0	
			X		X		3	
	Mercury						0	
			X		X		3	
	Nickel						0	
			X		X		3	
	Selenium						0	
			X		X		3	
	Zinc						0	
			X		X		3	
PAH micro by GCMS	All						0	
			X		X		3	
PCBs by GCMS	All						0	
			X				1	
pH	All						0	
			X		X		3	
Phenols by HPLC (S)	All						0	
			X		X		3	
Sample description	All						0	
			X		X		3	
Total Sulphate	All						0	
			X		X		3	
TPH CWG GC (S)	All						0	
			X		X		3	

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SDG:	091112-41	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-10	Attention:	Verity Sankey
Client Reference:	11/11/09 (H3)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66531

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
H3	3.00 - 3.50	Brown	Sandy clay	0.1 - 2 mm	stones
	6.50 - 7.00	Brown	Silty Clay	0.063 - 0.1 mm	stones
	8.50 - 9.00	Brown	Silty Clay	0.063 - 0.1 mm	stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66531

Test Completion dates

SDG reference: 091112-41

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
H3	3.00 - 3.50	SOLID	19/11/2009	17/11/2009	13/11/2009	18/11/2009	17/11/2009	18/11/2009	17/11/2009	16/11/2009	16/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	16/11/2009	18/11/2009
	6.50 - 7.00	SOLID	19/11/2009	16/11/2009	13/11/2009	18/11/2009	17/11/2009	17/11/2009	17/11/2009	16/11/2009	16/11/2009	19/11/2009	17/11/2009	17/11/2009	18/11/2009	16/11/2009	16/11/2009
	8.50 - 9.00	SOLID	19/11/2009	16/11/2009	13/11/2009	18/11/2009	17/11/2009	17/11/2009	17/11/2009	16/11/2009	16/11/2009	19/11/2009	17/11/2009	17/11/2009	18/11/2009	16/11/2009	16/11/2009

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SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66531

Results Legend			Sample Identity			H3			H3			H3			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	6.50 - 7.00	8.50 - 9.00	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Date Sampled	10/11/2009	10/11/2009	10/11/2009	
			Date Received	11/11/2009	11/11/2009	11/11/2009	SDG Ref	091112-41	091112-41	091112-41	Lab Sample No.(s)	604906	604954	605017	
			Component	LOD/Units	Method										
			Exchangeable Ammonium as NH4	<15 mg/kg	TM024	43.1	142	162	M	M	M				
			Ammoniacal Nitrogen as N	<15 mg/kg	TM024	33.5	110	126							
			Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100							
			Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	M	M	M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.0750	M	M	M							
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500										
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	M	M	M							
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100										
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	M	M	M							
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	M	M	M							
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.0700										
pH value of soil	1 pH Units	TM133	8.07	8.16	8.74	M	M	M							
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	<3.00	<3.00	#	#	#							
Total Cyanide	<1 mg/kg	TM153	600	5.24	12.6	M	M	M							
PCB congener 28	<3 µg/kg	TM168	<3.00												
PCB congener 52	<3 µg/kg	TM168	<3.00												
PCB congener 101	<3 µg/kg	TM168	<3.00												
PCB congener 118	<3 µg/kg	TM168	<3.00												
PCB congener 138	<3 µg/kg	TM168	<3.00												
PCB congener 153	<3 µg/kg	TM168	<3.00												
PCB congener 180	<3 µg/kg	TM168	<3.00												
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00												
Easily Liberated Sulphide	<15 mg/kg	TM180	179	19.1	265	#	#	#							
Arsenic	<0.6 mg/kg	TM181	6.02	14.0	7.09	M	M	M							
Cadmium	<0.02 mg/kg	TM181	0.340	0.695	0.538	M	M	M							
Chromium	<0.9 mg/kg	TM181	12.2	20.5	15.4	M	M	M							
Copper	<1.4 mg/kg	TM181	25.6	14.8	9.75	M	M	M							
Lead	<0.7 mg/kg	TM181	63.7	29.9	24.1	M	M	M							
Mercury	<0.14 mg/kg	TM181	1.11	<0.140	<0.140	M	M	M							
Nickel	<0.2 mg/kg	TM181	17.0	28.9	15.5	M	M	M							
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	#	#	#							
Zinc	<1.9 mg/kg	TM181	54.4	48.3	50.4	M	M	M							
Total Sulphate	<48 mg/kg	TM221	5170	631	1350	M	M	M							

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SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66531

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H3	H3	H3
Depth (m)	3.00 - 3.50	6.50 - 7.00	8.50 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	10/11/2009	10/11/2009	10/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091112-41	091112-41	091112-41
Lab Sample No.(s)	604906	604954	605017

Component	LOD/Units	Method	H3	H3	H3
Aliphatics >C12-C16	<100 µg/kg	TM173	4370	<100	3580
Aliphatics >C16-C21	<100 µg/kg	TM173	6900	<100	4260
Aliphatics >C21-C35	<100 µg/kg	TM173	7000	971	6730
Aliphatics >C35-C44	<100 µg/kg	TM173	174	<100	314
Total Aliphatics >C12-C44	<100 µg/kg	TM173	18400	971	14900
Aliphatics >C16-C35	<100 µg/kg	TM173	13900	971	11000

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SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66531

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H3	H3	H3
Depth (m)	3.00 - 3.50	6.50 - 7.00	8.50 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	10/11/2009	10/11/2009	10/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091112-41	091112-41	091112-41
Lab Sample No.(s)	604906	604954	605017

Component	LOD/Units	Method	H3	H3	H3
Aromatics >EC12-EC16	<100 µg/kg	TM173	8910	3030	7030
Aromatics >EC16-EC21	<100 µg/kg	TM173	25400	15400	14400
Aromatics >EC21-EC35	<100 µg/kg	TM173	111000	65700	42600
Aromatics >EC35-EC44	<100 µg/kg	TM173	26900	13400	9200
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	172000	97500	73200
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	172000	97500	73200

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SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66531

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	H3	H3	H3			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	6.50 - 7.00	8.50 - 9.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	10/11/2009	10/11/2009	10/11/2009			
			Date Received	11/11/2009	11/11/2009	11/11/2009			
			SDG Ref	091112-41	091112-41	091112-41			
			Lab Sample No.(s)	604906	604954	605017			
			Method						
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	275	1100	1820				
			#	#	#				
MTBE	<5 µg/kg	TM089	21.1	<7.00	22.5				
			#	#	#				
Benzene	<10 µg/kg	TM089	<10.0	<10.0	1290				
			M	M	M				
Toluene	<2 µg/kg	TM089	<6.00	<5.00	17.5				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	<6.00				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	<6.00	<6.00	22.5				
			M	M	M				
o Xylene	<3 µg/kg	TM089	<3.00	<6.00	50.0				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	<10.0	72.5				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	<10.0	<10.0	1380				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	10.1	11.3	27.5				
Aliphatics >C6-C8	<10 µg/kg	TM089	90.1	32.7	169				
Aliphatics >C8-C10	<10 µg/kg	TM089	28.4	161	411				
Aliphatics >C10-C12	<10 µg/kg	TM089	29.5	260	190				
Total Aliphatics C5-C12	<10 µg/kg	TM089	158	465	285				
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	1290				
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	17.5				
Aromatics >EC8-EC10	<10 µg/kg	TM089	42.7	134	134				
Aromatics >EC10-EC12	<10 µg/kg	TM089	44.3	389	72.0				
Total Aromatics C6-C12	<10 µg/kg	TM089	86.9	631	1510				

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SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66531

PAH micro by GCMS

Results Legend		Sample Identity	H3	H3	H3			
# ISO17025 accredited. m mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 3.50 Soil/Solid 10/11/2009 11/11/2009 091112-41 604906	6.50 - 7.00 Soil/Solid 10/11/2009 11/11/2009 091112-41 604954	8.50 - 9.00 Soil/Solid 10/11/2009 11/11/2009 091112-41 605017			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	1350 M	1470 M	752 M			
Acenaphthylene (S)	<12 µg/kg	TM218	578 M	824 M	69.2 M			
Acenaphthene (S)	<8 µg/kg	TM218	421 M	571 M	877 M			
Fluorene (S)	<10 µg/kg	TM218	535 M	2670 M	932 M			
Phenanthrene (S)	<15 µg/kg	TM218	15100 M	7580 M	2530 M			
Anthracene (S)	<16 µg/kg	TM218	3280 M	3140 M	730 M			
Fluoranthene (S)	<17 µg/kg	TM218	14700 M	5730 M	1450 M			
Pyrene (S)	<15 µg/kg	TM218	11300 M	3980 M	1100 M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	5320 M	2650 M	589 M			
Chrysene (S)	<10 µg/kg	TM218	4310 M	1820 M	498 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	5060 M	2000 M	660 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	2490 M	1090 M	276 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	4700 M	1700 M	521 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	2890 M	659 M	259 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	798 M	274 M	105 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	3300 M	595 M	276 M			
PAH 16 EPA Total	<118 µg/kg	TM218	76100 M	36800 M	11600 M			

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SDG: 091112-41
Job: D_MOUCHEL_ELE-10
Client Reference: 11/11/09 (H3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66531

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H3	H3	H3
Depth (m)	3.00 - 3.50	6.50 - 7.00	8.50 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	10/11/2009	10/11/2009	10/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091112-41	091112-41	091112-41
Lab Sample No.(s)	604906	604954	605017

Component	LOD/Units	Method	H3	H3	H3
Total Aliphatics >C5-C44	<100 µg/kg	TM173	18600	1440	15200
Total Aromatics >C6-C44	<100 µg/kg	TM173	172000	98200	74700
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	191000	99600	89800

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 23 November 2009
Job: D_MOUCHEL_ELE-12
Sample Delivery Group (SDG): 091112-57
Your Reference: 11/11/09 (H1)
Location: Limerick Gasworks
Report No.: 65621

A total of 2 samples was received on Wednesday November 11, 2009 and completed on Monday November 23, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091112-57
Job: D_MOUCHEL_ELE-12
Client Reference: 11/11/09 (H1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 65621

SOLID

Results Legend	Sample ID	H1				Total
		0.80 - 1.00		2.50 - 3.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test						
N No Determination Possible						
Ammonium Soil by Titration	All		X		X	0 2
Asbestos Presence Screen	All		X			0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X	0 2
Easily Liberated Sulphide	All		X		X	0 2
EPH CWG (Aliphatic) GC (S)	All		X		X	0 2
EPH CWG (Aromatic) GC (S)	All		X		X	0 2
GRO BTEX MTBE GC (S)	All	X		X		0 2
Hexavalent Chromium (s)	All				X	0 2
Metals by iCap-OES (Soil)	Arsenic		X		X	0 2
	Cadmium		X		X	0 2
	Chromium		X		X	0 2
	Copper		X		X	0 2
	Lead		X		X	0 2
	Mercury		X		X	0 2
	Nickel		X		X	0 2
	Selenium		X		X	0 2
	Zinc		X		X	0 2
	PAH micro by GCMS	All		X		X
PCBs by GCMS	All		X		X	0 2
pH	All		X		X	0 2
Phenols by HPLC (S)	All		X		X	0 2
Sample description	All		X		X	0 2
Total Sulphate	All		X		X	0 2
TPH CWG GC (S)	All		X		X	0 2
VOC MS (S)	All	X				0 1

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SDG:	091112-57	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-12	Attention:	Verity Sankey
Client Reference:	11/11/09 (H1)	Order No.:	
Location:	Limerick Gasworks	Report No.:	65621

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
H1	0.80 - 1.00	Brown	Sandy clay	0.1 - 2 mm	stones
	2.50 - 3.00	Brown	Sandy clay	0.1 - 2 mm	stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091112-57
Job: D_MOUCHEL_ELE-12
Client Reference: 11/11/09 (H1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 65621

Test Completion dates

SDG reference: 091112-57

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
H1	0.80 - 1.00	SOLID	18/11/2009	13/11/2009	16/11/2009	18/11/2009	19/11/2009	19/11/2009	19/11/2009	16/11/2009	16/11/2009	17/11/2009	18/11/2009	17/11/2009	18/11/2009	13/11/2009	17/11/2009	19/11/2009	20/11/2009
	2.50 - 3.00	SOLID	18/11/2009	16/11/2009	18/11/2009	17/11/2009	17/11/2009	19/11/2009	19/11/2009	16/11/2009	16/11/2009	17/11/2009	18/11/2009	17/11/2009	18/11/2009	13/11/2009	16/11/2009	19/11/2009	19/11/2009

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SDG: 091112-57
Job: D_MOUCHEL_ELE-12
Client Reference: 11/11/09 (H1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 65621

Results Legend		Sample Identity	H1	H1			
# ISO17025 accredited. # mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.80 - 1.00 Soil/Solid 10/11/2009 11/11/2009 091112-57 605990	2.50 - 3.00 Soil/Solid 10/11/2009 11/11/2009 091112-57 606032			
Component	LOD/Units	Method					
Asbestos Presence Screen	-	TM001	No ACM Detected				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	19.9	17.0			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	30.1	25.4			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	23.4	19.8			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	0.437	<0.0100			
Cresols	<0.01 mg/kg	TM062 (S)	0.885	<0.0100			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150			
1 Napthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100			
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100			
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	1.32	0.00			
pH value of soil	1 pH Units	TM133	11.97	8.09			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600			
Total Cyanide	<1 mg/kg	TM153	9.52	7.90			
PCB congener 28	<3 µg/kg	TM168	<3.00	<3.00			
PCB congener 52	<3 µg/kg	TM168	<3.00	<3.00			
PCB congener 101	<3 µg/kg	TM168	<3.00	<3.00			
PCB congener 118	<3 µg/kg	TM168	<3.00	<3.00			
PCB congener 138	<3 µg/kg	TM168	<3.00	<3.00			
PCB congener 153	<3 µg/kg	TM168	<3.00	<3.00			
PCB congener 180	<3 µg/kg	TM168	<3.00	<3.00			
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00	<3.00			
Easily Liberated Sulphide	<15 mg/kg	TM180	30.58	56.89			
Easily Liberated Sulphide	<15 mg/kg	TM180	36.1	66.0			
Arsenic	<0.6 mg/kg	TM181	27.8	4.22			
Cadmium	<0.02 mg/kg	TM181	0.889	0.322			
Chromium	<0.9 mg/kg	TM181	18.6	7.85			
Copper	<1.4 mg/kg	TM181	54.0	5.72			
Lead	<0.7 mg/kg	TM181	1700	25.4			
Mercury	<0.14 mg/kg	TM181	0.159	<0.140			
Nickel	<0.2 mg/kg	TM181	29.0	9.35			
Selenium	<1 mg/kg	TM181	<1.00	<1.00			
Zinc	<1.9 mg/kg	TM181	244	23.6			
Total Sulphate	<48 mg/kg	TM221	1910	5380			

SDG: 091112-57
 Job: D_MOUCHEL_ELE-12
 Client Reference: 11/11/09 (H1)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65621

PAH micro by GCMS

Results Legend			Sample Identity		H1	H1				
# ISO17025 accredited. m mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.80 - 1.00	2.50 - 3.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	10/11/2009	10/11/2009					
			Date Received	11/11/2009	11/11/2009					
			SDG Ref	091112-57	091112-57					
			Lab Sample No.(s)	605990	606032					
Component	LOD/Units	Method								
Naphthalene (S)	<9 µg/kg	TM218	411000	114	M	M				
Acenaphthylene (S)	<12 µg/kg	TM218	136000	31.1	M	M				
Acenaphthene (S)	<8 µg/kg	TM218	68700	862	M	M				
Fluorene (S)	<10 µg/kg	TM218	248000	793	M	M				
Phenanthrene (S)	<15 µg/kg	TM218	2230000	2140	M	M				
Anthracene (S)	<16 µg/kg	TM218	551000	1010	M	M				
Fluoranthene (S)	<17 µg/kg	TM218	1800000	965	M	M				
Pyrene (S)	<15 µg/kg	TM218	1560000	854	M	M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	594000	166	M	M				
Chrysene (S)	<10 µg/kg	TM218	471000	136	M	M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	530000	98.6	M	M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	199000	44.0	M	M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	529000	84.6	M	M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	265000	43.5	M	M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	72900	<23.0	M	M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	314000	54.7	M	M				
PAH 16 EPA Total	<118 µg/kg	TM218	9980000	7400	M	M				

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SDG: 091112-57
Job: D_MOUCHEL_ELE-12
Client Reference: 11/11/09 (H1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65621

TPH CWG (S)

Results Legend		Sample Identity	H1	H1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.80 - 1.00 Soil/Solid 10/11/2009 11/11/2009 091112-57 605990	2.50 - 3.00 Soil/Solid 10/11/2009 11/11/2009 091112-57 606032				
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	3420	<44.0	#	#		
MTBE	<5 µg/kg	TM089	<5.00	<5.00	#	#		
Benzene	<10 µg/kg	TM089	116	<10.0	M	M		
Toluene	<2 µg/kg	TM089	55.5	<2.00	M	M		
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	M	M		
m & p Xylene	<6 µg/kg	TM089	79.1	<6.00	M	M		
o Xylene	<3 µg/kg	TM089	38.9	<3.00	M	M		
Sum m&p and o Xylene	<10 µg/kg	TM089	118	<10.0	M	M		
Sum of BTEX	<10 µg/kg	TM089	289	<10.0	M	M		
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	52.5	<10.0				
Aliphatics >C10-C12	<10 µg/kg	TM089	1200	<10.0				
Aliphatics >C12-C16	<100 µg/kg	TM173	9850	5190				
Aliphatics >C16-C21	<100 µg/kg	TM173	24800	10600				
Aliphatics >C21-C35	<100 µg/kg	TM173	53000	9650				
Aliphatics >C35-C44	<100 µg/kg	TM173	4190	420				
Total Aliphatics C5-C12	<10 µg/kg	TM089	1250	<10.0				
Total Aliphatics >C12-C44	<100 µg/kg	TM173	91800	25800				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	93100	25800				
Aromatics C6-C7	<10 µg/kg	TM089	116	<10.0				
Aromatics >C7-C8	<10 µg/kg	TM089	55.5	<10.0				
Aromatics >EC8-EC10	<10 µg/kg	TM089	197	<10.0				
Aromatics >EC10-EC12	<10 µg/kg	TM089	1790	<10.0				
Aromatics >EC12-EC16	<100 µg/kg	TM173	464000	35000				
Aromatics >EC16-EC21	<100 µg/kg	TM173	2880000	94700				
Aromatics >EC21-EC35	<100 µg/kg	TM173	8590000	60700				
Aromatics >EC35-EC44	<100 µg/kg	TM173	1180000	5670				
Total Aromatics C6-C12	<10 µg/kg	TM089	2160	<10.0				
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	13100000	196000				
Total Aromatics >C6-C44	<100 µg/kg	TM173	13100000	196000				
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	13200000	222000				
Aliphatics >C16-C35	<100 µg/kg	TM173	77800	20200				
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	13100000	196000				

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SDG: 091112-57
 Job: D_MOUCHEL_ELE-12
 Client Reference: 11/11/09 (H1)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65621

VOC MS (S)

Results Legend		Sample Identity	H1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.80 - 1.00 Soil/Solid 10/11/2009 11/11/2009 091112-57 605990				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	0.980				
Toluene-d8**	%	TM116	95.6				
4-Bromofluorobenzene**	%	TM116	71.3				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1.1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	15.0				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1-2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1.1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1-2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2.2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1.1.1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1.1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1.2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	39.7				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1.2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1-3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	18.9				
trans-1-3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1.1.2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1.3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1.2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1.1.1.2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	<9.00				

SDG: 091112-57
Job: D_MOUCHEL_ELE-12
Client Reference: 11/11/09 (H1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65621

VOC MS (S)

Results Legend		Sample Identity		H1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.80 - 1.00					
		Sample Type	Soil/Solid					
		Date Sampled	10/11/2009					
		Date Received	11/11/2009					
		SDG Ref	091112-57					
		Lab Sample No.(s)	605990					
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	27.5	#				
o-Xylene	<11 µg/kg	TM116	13.7	M				
Styrene	<11 µg/kg	TM116	<11.0	M				
Bromoform	<12 µg/kg	TM116	<12.0	M				
Isopropylbenzene	<9 µg/kg	TM116	<9.00	M				
1.1.2.2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#				
1.2.3-Trichloropropane	<13 µg/kg	TM116	<13.0	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	M				
Propylbenzene	<6 µg/kg	TM116	<6.00	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#				
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8.00	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#				
1.2.4-Trimethylbenzene	<10 µg/kg	TM116	<10.0	#				
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#				
1.3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#				
1.4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#				
1.2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M				
1.2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#				
1.2.4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#				
Naphthalene	<7 µg/kg	TM116	15000	#				
1.2.3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#				

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-13
Sample Delivery Group (SDG): 091112-79
Your Reference: 11/11/09 (H2)
Location: Limerick Gas Works
Report No.: 66532

A total of 6 samples was received on Wednesday November 11, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091112-79
Job: D_MOUCHEL_ELE-13
Client Reference: 11/11/09 (H2)
Location: Limerick Gas Works

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66532

SOLID

Results Legend	Sample ID	H2						Total		
		0.10 - 0.50		0.50 - 1.00		2.00 - 2.10				
		60g VOC Dublin		60g VOC Dublin		60g VOC Dublin				
	Depth (m)	Container								
		JAR (D)	TUB (D)	JAR (D)	TUB (D)	JAR (D)	TUB (D)	JAR (D)	TUB (D)	
Ammonium Soil by Titration	All									0
Asbestos Presence Screen	All			X	X	X	X	X	X	5
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X								1
Easily Liberated Sulphide	All		X	X	X	X	X	X	X	5
EPH CWG (Aliphatic) GC (S)	All		X	X	X	X	X	X	X	5
EPH CWG (Aromatic) GC (S)	All		X	X	X	X	X	X	X	5
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	X	X	X	5
Hexavalent Chromium (s)	All		X	X	X	X	X	X	X	5
Metals by iCap-OES (Soil)	Arsenic		X	X	X	X	X	X	X	5
	Cadmium		X	X	X	X	X	X	X	5
	Chromium		X	X	X	X	X	X	X	5
	Copper		X	X	X	X	X	X	X	5
	Lead		X	X	X	X	X	X	X	5
	Mercury		X	X	X	X	X	X	X	5
	Nickel		X	X	X	X	X	X	X	5
	Selenium		X	X	X	X	X	X	X	5
	Zinc		X	X	X	X	X	X	X	5
PAH by GCMS	All		X							1
PAH micro by GCMS	All			X	X	X	X	X	X	4
PCBs by GCMS	All		X							1
pH	All			X	X	X	X	X	X	5
Phenols by HPLC (S)	All			X	X	X	X	X	X	5
Sample description	All	X	X	X	X	X	X	X	X	6
Total Sulphate	All		X	X	X	X	X	X	X	5
TPH CWG GC (S)	All		X	X	X	X	X	X	X	5
VOC MS (S)	All		X		X					2

SDG:	091112-79	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-13	Attention:	Verity Sankey
Client Reference:	11/11/09 (H2)	Order No.:	
Location:	Limerick Gas Works	Report No.:	66532

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
H2	0.10 - 0.50	Brown	Sand	0.1 - 2 mm	stones
	0.50 - 1.00	Black	Sand	0.1 - 2 mm	Coal fragments
	2.00 - 2.10	Brown	Sandy clay	0.1 - 2 mm	stones
	3.00 - 3.50	Brown	Sandy clay	0.1 - 2 mm	stones
	5.00 - 5.50	Brown	Silty Clay	0.063 - 0.1 mm	stones
	8.00 - 8.50	Brown	Sandy clay	0.1 - 2 mm	stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091112-79
 Job: D_MOUCHEL_ELE-13
 Client Reference: 11/11/09 (H2)
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66532

Test Completion dates

SDG reference: 091112-79

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration	
H2	0.10 - 0.50	SOLID	13/11/2009																13/11/2009	
	0.50 - 1.00	SOLID	18/11/2009	19/11/2009	17/11/2009	13/11/2009	18/11/2009	17/11/2009	18/11/2009	22/11/2009	17/11/2009	16/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	16/11/2009	16/11/2009	18/11/2009	
	2.00 - 2.10	SOLID	18/11/2009	19/11/2009	17/11/2009	13/11/2009	18/11/2009	17/11/2009	17/11/2009	17/11/2009	16/11/2009	16/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	16/11/2009	16/11/2009	18/11/2009	
	3.00 - 3.50	SOLID	18/11/2009	19/11/2009	17/11/2009	13/11/2009	18/11/2009	17/11/2009	17/11/2009	17/11/2009	16/11/2009	16/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	16/11/2009	16/11/2009	18/11/2009
	5.00 - 5.50	SOLID	18/11/2009	19/11/2009	17/11/2009	13/11/2009	18/11/2009	17/11/2009	17/11/2009	17/11/2009	16/11/2009	16/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	16/11/2009	16/11/2009	18/11/2009
	8.00 - 8.50	SOLID	18/11/2009	19/11/2009	17/11/2009	13/11/2009	18/11/2009	17/11/2009	17/11/2009	17/11/2009	16/11/2009	16/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	18/11/2009	16/11/2009	16/11/2009	18/11/2009

SDG: 091112-79
Job: D_MOUCHEL_ELE-13
Client Reference: 11/11/09 (H2)
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66532

Results Legend			Sample Identity	H2	H2	H2	H2	H2	H2
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.50	0.50 - 1.00	2.00 - 2.10	3.00 - 3.50	5.00 - 5.50	8.00 - 8.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	10/11/2009	10/11/2009	10/11/2009	10/11/2009	10/11/2009	10/11/2009
			Date Received	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009
			SDG Ref	091112-79	091112-79	091112-79	091112-79	091112-79	091112-79
Lab Sample No.(s)	606296	606330	606385	606403	606433	606483			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024		<15.0	<15.0	46.2	153	111	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024		<15.0	<15.0	35.9	119	86.4	
Catechol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
Cresols	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0400	<0.0100	<0.0100	<0.0100	
Resorcinol	<0.05 mg/kg	TM062 (S)		<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)		<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	
1-Naphthol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)		<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)		0.00	<0.0400	0.00	0.00	0.00	
pH value of soil	1 pH Units	TM133		7.87	8.91	8.25	8.19	8.75	
Hexavalent Chromium	<0.6 mg/kg	TM151		<0.600	<3.00	<0.600	<3.00	<3.00	
Total Cyanide	<1 mg/kg	TM153		116	211	3.08	<1.00	<1.00	
PCB congener 28	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
PCB congener 52	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
PCB congener 101	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
PCB congener 118	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
PCB congener 138	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
PCB congener 153	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
PCB congener 180	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00	<3.00	<3.00	<3.00	<3.00	
Easily Liberated Sulphide	<15 mg/kg	TM180		21.8	356	155	32.1	19.3	
Arsenic	<0.6 mg/kg	TM181		20.7	3.17	3.92	10.9	3.83	
Cadmium	<0.02 mg/kg	TM181		0.817	0.439	0.322	0.472	0.319	
Chromium	<0.9 mg/kg	TM181		14.8	5.56	6.87	17.7	5.00	
Copper	<1.4 mg/kg	TM181		199	4.19	4.58	9.79	4.23	
Lead	<0.7 mg/kg	TM181		16200	28.5	14.2	39.0	22.3	
Mercury	<0.14 mg/kg	TM181		3.57	0.463	<0.140	<0.140	<0.140	
Nickel	<0.2 mg/kg	TM181		55.0	4.34	8.08	18.4	3.74	
Selenium	<1 mg/kg	TM181		<1.00	<1.00	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181		415	114	29.5	55.8	16.6	
Total Sulphate	<48 mg/kg	TM221		1090	2230	1390	958	416	

SDG: 091112-79
Job: D_MOUCHEL_ELE-13
Client Reference: 11/11/09 (H2)
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66532

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H2	H2	H2	H2	H2
Depth (m)	0.50 - 1.00	2.00 - 2.10	3.00 - 3.50	5.00 - 5.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	10/11/2009		10/11/2009	10/11/2009	10/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091112-79	091112-79	091112-79	091112-79	091112-79
Lab Sample No.(s)	606330	606385	606403	606433	606483

Component	LOD/Units	Method	H2	H2	H2	H2	H2
Aliphatics >C12-C16	<100 µg/kg	TM173	17400	7220	3260	3160	2990
Aliphatics >C16-C21	<100 µg/kg	TM173	26600	18100	8220	3940	3230
Aliphatics >C21-C35	<100 µg/kg	TM173	128000	22900	4070	5240	8600
Aliphatics >C35-C44	<100 µg/kg	TM173	23900	366	100	178	328
Total Aliphatics >C12-C44	<100 µg/kg	TM173	196000	48600	15600	12500	15100
Aliphatics >C16-C35	<100 µg/kg	TM173	154000	41000	12300	9180	11800

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SDG: 091112-79
Job: D_MOUCHEL_ELE-13
Client Reference: 11/11/09 (H2)
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66532

GRO BTEX MTBE GC (S)

Results Legend # ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Sample Identity	H2	H2	H2	H2	H2
	Depth (m)	0.50 - 1.00	2.00 - 2.10	3.00 - 3.50	5.00 - 5.50	8.00 - 8.50
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	10/11/2009	10/11/2009	10/11/2009	10/11/2009	10/11/2009
	Date Received	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009
	SDG Ref	091112-79	091112-79	091112-79	091112-79	091112-79
Lab Sample No.(s)	606330	606385	606403	606433	606483	

Component	LOD/Units	Method	H2	H2	H2	H2	H2
GRO C5-C12	<44 µg/kg	TM089	111 #	1790 #	2260 #	<44.0 #	606 #
MTBE	<5 µg/kg	TM089	25.7 #	<5.00 #	<5.00 #	<5.00 #	38.8 #
Benzene	<10 µg/kg	TM089	<10.0 M	183 M	<10.0 M	<10.0 M	<10.0 M
Toluene	<2 µg/kg	TM089	<2.00 M	16.5 M	<2.00 M	<4.00 M	14.8 M
Ethyl Benzene	<3 µg/kg	TM089	<3.00 M	231 M	<3.00 M	<3.00 M	<3.00 M
m & p Xylene	<6 µg/kg	TM089	<6.00 M	95.6 M	<6.00 M	<6.00 M	28.5 M
o Xylene	<3 µg/kg	TM089	<3.00 M	22.4 M	15.5 M	<3.00 M	16.0 M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0 M	118 M	15.5 M	<10.0 M	44.5 M
Sum of BTEX	<10 µg/kg	TM089	<10.0 M	549 M	15.5 M	<10.0 M	59.3 M
Aliphatics C5-C6	<10 µg/kg	TM089	24.8	78.9	<10.0	<10.0	70.9
Aliphatics >C6-C8	<10 µg/kg	TM089	60.6	285	<10.0	<10.0	229
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	116	80.4	<10.0	69.5
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	233	536	<10.0	13.8
Total Aliphatics C5-C12	<10 µg/kg	TM089	85.4	713	896	<10.0	383
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	183	<10.0	<10.0	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	165	<10.0	<10.0	14.8
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	523	136	<10.0	149
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	350	1220	<10.0	20.7
Total Aromatics C6-C12	<10 µg/kg	TM089	<10.0	1070	1360	<10.0	184

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SDG: 091112-79
 Job: D_MOUCHEL_ELE-13
 Client Reference: 11/11/09 (H2)
 Location: Limerick Gas Works

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66532

PAH micro by GCMS

Results Legend			Sample Identity	H2	H2	H2	H2		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.00 - 2.10	3.00 - 3.50	5.00 - 5.50	8.00 - 8.50		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	10/11/2009	10/11/2009	10/11/2009	10/11/2009		
			Date Received	11/11/2009	11/11/2009	11/11/2009	11/11/2009		
			SDG Ref	091112-79	091112-79	091112-79	091112-79		
	Lab Sample No.(s)	606385	606403	606433	606483				
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	20400	5510	323	560			
Acenaphthylene (S)	<12 µg/kg	TM218	2170	111	405	76.0			
Acenaphthene (S)	<8 µg/kg	TM218	1040	25200	285	160			
Fluorene (S)	<10 µg/kg	TM218	2990	17000	648	408			
Phenanthrene (S)	<15 µg/kg	TM218	7240	40100	2490	1460			
Anthracene (S)	<16 µg/kg	TM218	2500	5960	1540	465			
Fluoranthene (S)	<17 µg/kg	TM218	6540	6220	6900	1210			
Pyrene (S)	<15 µg/kg	TM218	4760	4490	5240	907			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	2080	616	4000	513			
Chrysene (S)	<10 µg/kg	TM218	1700	487	2810	443			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	2020	258	3130	546			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	831	127	1410	234			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1910	221	2700	443			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	944	71.4	1110	227			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	283	31.3	486	86.8			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1040	81.8	1070	270			
PAH 16 EPA Total	<118 µg/kg	TM218	58500	106000	34500	8020			

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SDG: 091112-79
Job: D_MOUCHEL_ELE-13
Client Reference: 11/11/09 (H2)
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66532

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	H2	H2	H2	H2	H2
Depth (m)	0.50 - 1.00	2.00 - 2.10	3.00 - 3.50	5.00 - 5.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	10/11/2009		10/11/2009	10/11/2009	10/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091112-79	091112-79	091112-79	091112-79	091112-79
Lab Sample No.(s)	606330	606385	606403	606433	606483

Component	LOD/Units	Method	H2	H2	H2	H2	H2
Total Aliphatics >C5-C44	<100 µg/kg	TM173	196000	49300	16500	12500	15500
Total Aromatics >C6-C44	<100 µg/kg	TM173	135000	154000	111000	301000	94400
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	331000	203000	128000	313000	110000

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SDG: 091112-79
Job: D_MOUCHEL_ELE-13
Client Reference: 11/11/09 (H2)
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66532

VOC MS (S)

Results Legend			Sample Identity		H2	H2					
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	3.00 - 3.50						
			Sample Type	Soil/Solid	Soil/Solid						
			Date Sampled	10/11/2009	10/11/2009						
			Date Received	11/11/2009	11/11/2009						
			SDG Ref	091112-79	091112-79						
			Lab Sample No.(s)	606330	606403						
			Method								
Component	LOD/Units	Method									
Dibromofluoromethane**	%	TM116		129	97.1						
Toluene-d8**	%	TM116		70.2	83.5						
4-Bromofluorobenzene**	%	TM116		45.4	72.6						
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0						
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0						
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0						
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00						
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0						
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00						
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
Carbon Disulphide	<9 µg/kg	TM116		<9.00	<9.00						
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0						
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00						
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0						
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00						
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0						
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0						
Chloroform	<10 µg/kg	TM116		<10.0	<10.0						
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0						
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0						
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0						
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0						
Benzene	<9 µg/kg	TM116		<9.00	<9.00						
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0						
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0						
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0						
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0						
Toluene	<6 µg/kg	TM116		23.9	<6.00						
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0						
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00						
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00						
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00						
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00						
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0						
Chlorobenzene	<7 µg/kg	TM116		<7.00	<7.00						
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0						
Ethylbenzene	<9 µg/kg	TM116		<9.00	<9.00						

SDG: 091112-79
Job: D_MOUCHEL_ELE-13
Client Reference: 11/11/09 (H2)
Location: Limerick Gas Works

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66532

VOC MS (S)

Component	LOD/Units	Method	Sample Identity		H2	H2												
			Depth (m)	Sample Type	Date Sampled	Date Received	SDG Ref	Lab Sample No.(s)										
p/m-Xylene	<13 µg/kg	TM116	0.50 - 1.00	Soil/Solid	10/11/2009	11/11/2009	091112-79	606330	<13.0	<13.0	#	#						
o-Xylene	<11 µg/kg	TM116							<11.0	<11.0	M	M						
Styrene	<11 µg/kg	TM116							<11.0	<11.0	M	M						
Bromoform	<12 µg/kg	TM116							<12.0	<12.0	M	M						
Isopropylbenzene	<9 µg/kg	TM116							<9.00	<9.00	M	M						
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116							<15.0	<15.0	#	#						
1,2,3-Trichloropropane	<13 µg/kg	TM116							<13.0	<13.0	M	M						
Bromobenzene	<14 µg/kg	TM116							<14.0	<14.0	M	M						
Propylbenzene	<6 µg/kg	TM116							<6.00	<6.00	M	M						
2-Chlorotoluene	<14 µg/kg	TM116							<14.0	<14.0	#	#						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116							<8.00	<8.00	M	M						
4-Chlorotoluene	<9 µg/kg	TM116							<9.00	<9.00	#	#						
tert-Butylbenzene	<12 µg/kg	TM116							<12.0	<12.0	#	#						
1,2,4-Trimethylbenzene	<10 µg/kg	TM116							<10.0	<10.0	#	#						
sec-Butylbenzene	<8 µg/kg	TM116							<8.00	<8.00	#	#						
4-Isopropyltoluene	<8 µg/kg	TM116							<8.00	<8.00	#	#						
1,3-Dichlorobenzene	<8 µg/kg	TM116							<8.00	<8.00	#	#						
1,4-Dichlorobenzene	<11 µg/kg	TM116							<11.0	<11.0	M	M						
n-Butylbenzene	<7 µg/kg	TM116							<7.00	<7.00	#	#						
1,2-Dichlorobenzene	<8 µg/kg	TM116							<8.00	<8.00	M	M						
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116							<11.0	<11.0	M	M						
Tert-amyl methyl ether	<7 µg/kg	TM116							<7.00	<7.00	#	#						
1,2,4-Trichlorobenzene	<9 µg/kg	TM116							<9.00	<9.00	#	#						
Hexachlorobutadiene	<15 µg/kg	TM116							<15.0	<15.0	#	#						
Naphthalene	<7 µg/kg	TM116							<7.00	415	#	#						
1,2,3-Trichlorobenzene	<12 µg/kg	TM116							<12.0	<12.0	#	#						

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-14
Sample Delivery Group (SDG): 091113-23
Your Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks
Report No.: 66917

A total of 4 samples was received on Thursday November 12, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66917

SOLID

Results Legend	Sample ID	C5		D5		E5		Total
		Depth (m)		Depth (m)		Depth (m)		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	4
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All		X		X		X	0
Hexavalent Chromium (s)	All	X		X		X		4
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
	Cadmium		X		X		X	0
	Chromium		X		X		X	0
	Copper		X		X		X	0
	Lead		X		X		X	0
	Mercury		X		X		X	0
	Nickel		X		X		X	0
	Selenium		X		X		X	0
	Zinc		X		X		X	0
PAH micro by GCMS	All		X		X		X	0
PCBs by GCMS	All		X		X		X	0
pH	All		X		X		X	0
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	0
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	0
VOC MS (S)	All	X		X			X	0
								3

SDG:	091113-23	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-14	Attention:	Verity Sankey
Client Reference:	11/11/09(C5 & E5)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66917

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C5	1.00 - 1.50	Black	Sand	0.1 - 2 mm	tar
D5	0.15 - 3.00	Brown	Ballast	2 - 10 mm	stones
E5	1.10 - 1.50	Beige	Sand	0.1 - 2 mm	Stones
	2.00 - 2.50	Brown	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66917

Test Completion dates

SDG reference: 091113-23

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
C5	1.00 - 1.50	SOLID	23/11/2009	25/11/2009	18/11/2009	16/11/2009	19/11/2009	18/11/2009	08/12/2009	18/11/2009	17/11/2009	17/11/2009	24/11/2009	19/11/2009	19/11/2009	20/11/2009	17/11/2009	19/11/2009
D5	0.15 - 3.00	SOLID	23/11/2009	20/11/2009	18/11/2009	16/11/2009	18/11/2009	18/11/2009	08/12/2009	17/11/2009	17/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	23/11/2009
E5	1.10 - 1.50	SOLID	20/11/2009	20/11/2009	18/11/2009	16/11/2009	18/11/2009	18/11/2009	08/12/2009	19/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	23/11/2009
	2.00 - 2.50	SOLID	23/11/2009	25/11/2009	20/11/2009	16/11/2009	18/11/2009	18/11/2009	08/12/2009	19/11/2009	18/11/2009	18/11/2009	24/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	23/11/2009

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SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66534

Results Legend			Sample Identity		C5	D5	E5	E5	
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.00 - 1.50	0.15 - 3.00	1.10 - 1.50	2.00 - 2.50	
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled		11/11/2009	11/11/2009	11/11/2009	11/11/2009	
			Date Received		12/11/2009	12/11/2009	12/11/2009	12/11/2009	
			SDG Ref		091113-23	091113-23	091113-23	091113-23	
			Lab Sample No.(s)		608552	608615	608677	608706	
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	38.8	M	72.5	M	<15.0	M	<15.0
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	30.2		56.4		<15.0		<15.0
Catechol	<0.01 mg/kg	TM062 (S)	<0.0200		<0.0100		<0.0100		<0.200
Phenol	<0.01 mg/kg	TM062 (S)	<0.0200	M	<0.0100	M	<0.0100	M	<0.200
Cresols	<0.01 mg/kg	TM062 (S)	2.43	M	<0.0100	M	<0.0100	M	<0.200
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.100		<0.0500		<0.0500		<1.00
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0300	M	<0.0150	M	<0.0200	M	<0.300
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0200		<0.0100		<0.0100		<0.200
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0200	M	<0.0100	M	<0.0100	M	<0.200
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0300	M	<0.0150	M	<0.0150	M	<0.300
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	2.43		0.00		<0.0400		0.00
pH value of soil	1 pH Units	TM133	8.62	M	9.86	M	8.81	M	8.63
Hexavalent Chromium	<0.6 mg/kg	TM151	<6.00	#	<3.00	#	<3.00	#	<3.00
Total Cyanide	<1 mg/kg	TM153	213	M	66.1	M	43.7	M	173
PCB congener 28	<3 µg/kg	TM168			<3.00				
PCB congener 52	<3 µg/kg	TM168			<3.00				
PCB congener 101	<3 µg/kg	TM168			<3.00				
PCB congener 118	<3 µg/kg	TM168			<3.00				
PCB congener 138	<3 µg/kg	TM168			<3.00				
PCB congener 153	<3 µg/kg	TM168			<3.00				
PCB congener 180	<3 µg/kg	TM168			<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168			<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	1080	#	236	#	73.8	#	247
Arsenic	<0.6 mg/kg	TM181	22.4	M	6.06	M	3.69	M	9.74
Cadmium	<0.02 mg/kg	TM181	0.196	M	<0.0200	M	<0.0200	M	6.00
Chromium	<0.9 mg/kg	TM181	20.2	M	4.14	M	1.22	M	56.7
Copper	<1.4 mg/kg	TM181	52.5	M	12.2	M	3.10	M	59.5
Lead	<0.7 mg/kg	TM181	413	M	9.46	M	6.11	M	66.5
Mercury	<0.14 mg/kg	TM181	0.211	M	<0.140	M	<0.140	M	0.328
Nickel	<0.2 mg/kg	TM181	28.2	M	5.91	M	7.23	M	32.8
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	<1.00	#	<1.00
Zinc	<1.9 mg/kg	TM181	55.8	M	14.7	M	12.8	M	160
Total Sulphate	<48 mg/kg	TM221	7770	M	2560	M	113	M	693

SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66534

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C5	D5	E5	E5
Depth (m)	1.00 - 1.50	0.15 - 3.00	1.10 - 1.50	2.00 - 2.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009	11/11/2009
Date Received	12/11/2009	12/11/2009	12/11/2009	12/11/2009
SDG Ref	091113-23	091113-23	091113-23	091113-23
Lab Sample No.(s)	608552	608615	608677	608706

Component	LOD/Units	Method	C5	D5	E5	E5
Aliphatics >C12-C16	<100 µg/kg	TM173	488000	17600	753	49200
Aliphatics >C16-C21	<100 µg/kg	TM173	490000	57700	12000	97600
Aliphatics >C21-C35	<100 µg/kg	TM173	1510000	356000	11800	162000
Aliphatics >C35-C44	<100 µg/kg	TM173	442000	105000	<100	28800
Total Aliphatics >C12-C44	<100 µg/kg	TM173	2930000	536000	24500	338000
Aliphatics >C16-C35	<100 µg/kg	TM173	2000000	413000	23800	260000

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SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66534

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C5	D5	E5	E5
Depth (m)	1.00 - 1.50	0.15 - 3.00	1.10 - 1.50	2.00 - 2.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009	11/11/2009
Date Received	12/11/2009	12/11/2009	12/11/2009	12/11/2009
SDG Ref	091113-23	091113-23	091113-23	091113-23
Lab Sample No.(s)	608552	608615	608677	608706

Component	LOD/Units	Method	C5	D5	E5	E5
Aromatics >EC12-EC16	<100 µg/kg	TM173	1780000	56100	2540	55200
Aromatics >EC16-EC21	<100 µg/kg	TM173	2610000	124000	7480	203000
Aromatics >EC21-EC35	<100 µg/kg	TM173	6410000	451000	29200	1000000
Aromatics >EC35-EC44	<100 µg/kg	TM173	1300000	119000	5290	235000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	12100000	750000	44500	1500000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	12100000	750000	44500	1500000

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SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66534

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C5	D5	E5	E5
Depth (m)	1.00 - 1.50	0.15 - 3.00	1.10 - 1.50	2.00 - 2.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009	11/11/2009
Date Received	12/11/2009	12/11/2009	12/11/2009	12/11/2009
SDG Ref	091113-23	091113-23	091113-23	091113-23
Lab Sample No.(s)	608552	608615	608677	608706

Component	LOD/Units	Method	C5	D5	E5	E5
GRO C5-C12	<44 µg/kg	TM089	277000 #	11300 #	5050 #	60000 #
MTBE	<5 µg/kg	TM089	726 #	<5.00 #	<5.00 #	108 #
Benzene	<10 µg/kg	TM089	1690 M	55.0 M	92.1 M	363 M
Toluene	<2 µg/kg	TM089	5980 M	57.1 M	47.1 M	1100 M
Ethyl Benzene	<3 µg/kg	TM089	6460 M	29.1 M	35.6 M	1040 M
m & p Xylene	<6 µg/kg	TM089	28600 M	148 M	78.5 M	5730 M
o Xylene	<3 µg/kg	TM089	13500 M	120 M	76.4 M	3680 M
Sum m&p and o Xylene	<10 µg/kg	TM089	42100 M	269 M	155 M	9410 M
Sum of BTEX	<10 µg/kg	TM089	56200 M	410 M	330 M	11900 M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	19400	184	103	5500
Aliphatics >C8-C10	<10 µg/kg	TM089	38500	1140	541	8680
Aliphatics >C10-C12	<10 µg/kg	TM089	41700	3130	1910	8310
Total Aliphatics C5-C12	<10 µg/kg	TM089	99600	4450	1950	22500
Aromatics C6-C7	<10 µg/kg	TM089	1690	55.0	92.1	363
Aromatics >C7-C8	<10 µg/kg	TM089	5980	57.1	47.1	1100
Aromatics >EC8-EC10	<10 µg/kg	TM089	106000	2010	1000	23500
Aromatics >EC10-EC12	<10 µg/kg	TM089	62500	4690	1960	12500
Total Aromatics C6-C12	<10 µg/kg	TM089	176000	6810	3100	37400

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SDG: 091113-23
 Job: D_MOUCHEL_ELE-14
 Client Reference: 11/11/09(C5 & E5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66534

PAH micro by GCMS

Results Legend	Sample Identity		C5	D5	E5	E5
	Depth (m)	Sample Type	1.00 - 1.50 Soil/Solid	0.15 - 3.00 Soil/Solid	1.10 - 1.50 Soil/Solid	2.00 - 2.50 Soil/Solid
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Date Sampled	Date Received	11/11/2009	11/11/2009	11/11/2009	11/11/2009
	SDG Ref		091113-23	091113-23	091113-23	091113-23
	Lab Sample No.(s)		608552	608615	608677	608706

Component	LOD/Units	Method	C5	D5	E5	E5
Naphthalene (S)	<9 µg/kg	TM218	2200000 M	404000 M	142 M	18700 M
Acenaphthylene (S)	<12 µg/kg	TM218	409000 M	107000 M	303 M	14200 M
Acenaphthene (S)	<8 µg/kg	TM218	108000 M	30100 M	9.19 M	4060 M
Fluorene (S)	<10 µg/kg	TM218	337000 M	100000 M	22.4 M	12600 M
Phenanthrene (S)	<15 µg/kg	TM218	863000 M	295000 M	135 M	45300 M
Anthracene (S)	<16 µg/kg	TM218	318000 M	103000 M	237 M	23100 M
Fluoranthene (S)	<17 µg/kg	TM218	615000 M	217000 M	308 M	115000 M
Pyrene (S)	<15 µg/kg	TM218	411000 M	144000 M	256 M	90400 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	196000 M	75700 M	175 M	48800 M
Chrysene (S)	<10 µg/kg	TM218	143000 M	52200 M	162 M	35800 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	173000 M	70300 M	324 M	52300 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	74900 M	28100 M	149 M	20400 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	160000 M	59500 M	305 M	49300 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	72300 M	26800 M	356 M	24100 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	18900 M	7520 M	74.5 M	6870 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	81200 M	28700 M	520 M	27000 M
PAH 16 EPA Total	<118 µg/kg	TM218	<5900 M	175000 M	3460 M	588000 M

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SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66534

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C5	D5	E5	E5		
Depth (m)	1.00 - 1.50	0.15 - 3.00	1.10 - 1.50	2.00 - 2.50		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	11/11/2009	11/11/2009	11/11/2009	11/11/2009		
Date Received	12/11/2009	12/11/2009	12/11/2009	12/11/2009		
SDG Ref	091113-23	091113-23	091113-23	091113-23		
Lab Sample No.(s)	608552	608615	608677	608706		

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	3030000	540000	26500	360000
Total Aromatics >C6-C44	<100 µg/kg	TM173	12300000	757000	47600	1530000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	15300000	1300000	74100	1890000

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SDG: 091113-23
Job: D_MOUCHEL_ELE-14
Client Reference: 11/11/09(C5 & E5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66534

VOC MS (S)

Results Legend			Sample Identity	C5	D5	E5			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	0.15 - 3.00	2.00 - 2.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	11/11/2009	11/11/2009	11/11/2009			
			Date Received	12/11/2009	12/11/2009	12/11/2009			
			SDG Ref	091113-23	091113-23	091113-23			
			Lab Sample No.(s)	608552	608615	608706			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		140	85.7	140			
Toluene-d8**	%	TM116		50.3	81.9	76.7			
4-Bromofluorobenzene**	%	TM116		94.2	68.4	70.8			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Carbon Disulphide	<9 µg/kg	TM116		75.8	<9.00	<9.00			
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Benzene	<9 µg/kg	TM116		2270	30.0	389			
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0			
Toluene	<6 µg/kg	TM116		4980	23.1	1230			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0			
Chlorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
Ethylbenzene	<9 µg/kg	TM116		14700	22.8	1770			

SDG: 091113-23
 Job: D_MOUCHEL_ELE-14
 Client Reference: 11/11/09(C5 & E5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66534

VOC MS (S)

Results Legend		Sample Identity	C5	D5	E5			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.00 - 1.50	0.15 - 3.00	2.00 - 2.50			
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
		Date Sampled	11/11/2009	11/11/2009	11/11/2009			
		Date Received	12/11/2009	12/11/2009	12/11/2009			
		SDG Ref	091113-23	091113-23	091113-23			
		Lab Sample No.(s)	608552	608615	608706			
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	77600 #	87.6 #	4440 #			
o-Xylene	<11 µg/kg	TM116	37100 M	71.0 M	3120 M			
Styrene	<11 µg/kg	TM116	<11.0 M	13.9 M	653 M			
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M			
Isopropylbenzene	<9 µg/kg	TM116	2590 M	<9.00 M	244 M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M			
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M			
Propylbenzene	<6 µg/kg	TM116	4740 M	22.9 M	421 M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	24800 M	111 M	1250 M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	61800 #	316 #	3900 #			
sec-Butylbenzene	<8 µg/kg	TM116	560 #	<8.00 #	68.0 #			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	20.9 #	175 #			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #			
Naphthalene	<7 µg/kg	TM116	1350000 #	17800 #	64700 #			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #			

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 30 November 2009
Job: D_MOUCHEL_ELE-15
Sample Delivery Group (SDG): 091113-43
Your Reference: 11/11/09 (J3)
Location: Limerick Gasworks
Report No.: 66041

A total of 3 samples was received on Thursday November 12, 2009 and completed on Monday November 30, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091113-43
 Job: D_MOUCHEL_ELE-15
 Client Reference: 11/11/09 (J3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66041

SOLID

Results Legend	Sample ID	J3						Total
		0.50 - 1.00		1.00 - 1.20		4.00 - 4.50		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
Ammonium Soil by Titration	All						0	
			X		X	X	3	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide						0	
			X		X	X	3	
Easily Liberated Sulphide	All						0	
			X		X	X	3	
EPH CWG (Aliphatic) GC (S)	All						0	
		X		X		X	3	
EPH CWG (Aromatic) GC (S)	All						0	
		X		X		X	3	
GRO BTEX MTBE GC (S)	All						0	
		X		X		X	3	
Hexavalent Chromium (s)	All						0	
			X		X	X	3	
Metals by iCap-OES (Soil)	Arsenic						0	
		X		X		X	3	
	Cadmium						0	
		X		X		X	3	
	Chromium						0	
		X		X		X	3	
	Copper						0	
		X		X		X	3	
	Lead						0	
		X		X		X	3	
	Mercury						0	
		X		X		X	3	
	Nickel						0	
		X		X		X	3	
	Selenium						0	
		X		X		X	3	
	Zinc						0	
		X		X		X	3	
PAH micro by GCMS	All						0	
		X		X		X	3	
pH	All						0	
			X		X	X	3	
Phenols by HPLC (S)	All						0	
			X		X	X	3	
Sample description	All						0	
		X		X		X	3	
Total Sulphate	All						0	
		X		X		X	3	
TPH CWG GC (S)	All						0	
		X		X		X	3	
VOC MS (S)	All						0	
			X				1	

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SDG:	091113-43	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-15	Attention:	Verity Sankey
Client Reference:	11/11/09 (J3)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66041

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
J3	0.50 - 1.00	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	1.00 - 1.20	Black	Silty Sand	0.063 - 0.1 mm	Stones
	4.00 - 4.50	Grey	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091113-43
Job: D_MOUCHEL_ELE-15
Client Reference: 11/11/09 (J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66041

Test Completion dates

SDG reference: 091113-43

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
J3	0.50 - 1.00	SOLID	20/11/2009	18/11/2009	18/11/2009	16/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	17/11/2009	19/11/2009	19/11/2009
	1.00 - 1.20	SOLID	23/11/2009	20/11/2009	18/11/2009	16/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	17/11/2009	19/11/2009	19/11/2009
	4.00 - 4.50	SOLID	20/11/2009	18/11/2009	18/11/2009	16/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	17/11/2009	19/11/2009	19/11/2009

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SDG: 091113-43
Job: D_MOUCHEL_ELE-15
Client Reference: 11/11/09 (J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66041

Results Legend		Sample Identity	J3	J3	J3			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.50 - 1.00	1.00 - 1.20	4.00 - 4.50			
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
		Date Sampled	11/11/2009	11/11/2009	11/11/2009			
		Date Received	12/11/2009	12/11/2009	12/11/2009			
		SDG Ref	091113-43	091113-43	091113-43			
		Lab Sample No.(s)	608840	608851	608910			
Component	LOD/Units	Method						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024		<15.0	189			
				M	M			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	77.3	<15.0	297			
			M	M	M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	60.1	<15.0	231			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	0.0516	<0.0100			
			M	M	M			
Cresols	<0.01 mg/kg	TM062 (S)	0.252	0.0774	<0.0100			
			M	M	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150			
			M	M	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100			
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100			
			M	M	M			
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150			
			M	M	M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.170	<0.100	0.00			
					0.45			
pH value of soil	1 pH Units	TM133	6.94	7.94				
			M	M	M			
Hexavalent Chromium	<0.6 mg/kg	TM151	<12	0.082	<3.0			
			#	#	#			
Hexavalent Chromium	<0.6 mg/kg	TM151	<12.0	<0.600	<3.00			
			#	#	#			
Total Cyanide	<1 mg/kg	TM153	1080	17.2	17.0			
			M	M	M			
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	37.43	84.64			
			#	#	#			
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	47.9	103			
			#	#	#			
Arsenic	<0.6 mg/kg	TM181	26.8	55.6	11.4			
			M	M	M			
Cadmium	<0.02 mg/kg	TM181	0.200	1.51	0.0370			
			M	M	M			
Chromium	<0.9 mg/kg	TM181	23.9	66.2	15.4			
			M	M	M			
Copper	<1.4 mg/kg	TM181	495	142	28.4			
			M	M	M			
Lead	<0.7 mg/kg	TM181	370	276	32.7			
			M	M	M			
Mercury	<0.14 mg/kg	TM181	0.764	0.171	<0.140			
			M	M	M			
Nickel	<0.2 mg/kg	TM181	57.8	137	21.1			
			M	M	M			
Selenium	<1 mg/kg	TM181	2.40	<1.00	<1.00			
			#	#	#			
Zinc	<1.9 mg/kg	TM181	65.4	214	34.7			
			M	M	M			
Total Sulphate	<48 mg/kg	TM221	120000	106000	4310			
			M	M	M			

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SDG: 091113-43
Job: D_MOUCHEL_ELE-15
Client Reference: 11/11/09 (J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66041

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J3	J3	J3
Depth (m)	0.50 - 1.00	1.00 - 1.20	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009
Date Received	12/11/2009	12/11/2009	12/11/2009
SDG Ref	091113-43	091113-43	091113-43
Lab Sample No.(s)	608840	608851	608910

Component	LOD/Units	Method	J3	J3	J3
Aromatics >EC12-EC16	<100 µg/kg	TM173	451000	106000	20800
Aromatics >EC16-EC21	<100 µg/kg	TM173	1180000	325000	50900
Aromatics >EC21-EC35	<100 µg/kg	TM173	3560000	1050000	178000
Aromatics >EC35-EC44	<100 µg/kg	TM173	580000	202000	34300
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	5770000	1680000	284000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	5770000	1680000	284000

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SDG: 091113-43
Job: D_MOUCHEL_ELE-15
Client Reference: 11/11/09 (J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66041

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	J3	J3	J3			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	1.00 - 1.20	4.00 - 4.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	11/11/2009	11/11/2009	11/11/2009			
			Date Received	12/11/2009	12/11/2009	12/11/2009			
			SDG Ref	091113-43	091113-43	091113-43			
			Lab Sample No.(s)	608840	608851	608910			
			Method	TM089	TM089	TM089			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	2870	6710	<44.0				
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00				
			#	#	#				
Benzene	<10 µg/kg	TM089	72.5	267	26.8				
			M	M	M				
Toluene	<2 µg/kg	TM089	17.8	51.6	<2.00				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	<3.00	36.1	<3.00				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	14.8	54.2	<6.00				
			M	M	M				
o Xylene	<3 µg/kg	TM089	14.8	46.4	<3.00				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	29.6	101	<10.0				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	120	455	26.8				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	65.9	122	<10.0				
Aliphatics >C6-C8	<10 µg/kg	TM089	90.9	263	<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	238	558	<10.0				
Aliphatics >C10-C12	<10 µg/kg	TM089	801	1790	<10.0				
Total Aliphatics C5-C12	<10 µg/kg	TM089	1200	2730	<10.0				
Aromatics C6-C7	<10 µg/kg	TM089	72.5	267	26.8				
Aromatics >C7-C8	<10 µg/kg	TM089	17.8	51.6	<10.0				
Aromatics >EC8-EC10	<10 µg/kg	TM089	386	973	<10.0				
Aromatics >EC10-EC12	<10 µg/kg	TM089	1200	2690	<10.0				
Total Aromatics C6-C12	<10 µg/kg	TM089	1680	3980	26.8				

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SDG: 091113-43
Job: D_MOUCHEL_ELE-15
Client Reference: 11/11/09 (J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66041

PAH micro by GCMS

Results Legend		Sample Identity	J3	J3	J3			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 11/11/2009 12/11/2009 091113-43 608840	1.00 - 1.20 Soil/Solid 11/11/2009 12/11/2009 091113-43 608851	4.00 - 4.50 Soil/Solid 11/11/2009 12/11/2009 091113-43 608910			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	33500 M	48600 M	51.3 M			
Acenaphthylene (S)	<12 µg/kg	TM218	23400 M	13000 M	29.1 M			
Acenaphthene (S)	<8 µg/kg	TM218	19700 M	7050 M	29.2 M			
Fluorene (S)	<10 µg/kg	TM218	63600 M	21100 M	72.2 M			
Phenanthrene (S)	<15 µg/kg	TM218	322000 M	70700 M	189 M			
Anthracene (S)	<16 µg/kg	TM218	86800 M	28400 M	91.8 M			
Fluoranthene (S)	<17 µg/kg	TM218	358000 M	93400 M	300 M			
Pyrene (S)	<15 µg/kg	TM218	266000 M	73400 M	243 M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	141000 M	39800 M	161 M			
Chrysene (S)	<10 µg/kg	TM218	92600 M	24600 M	102 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	152000 M	45800 M	178 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	55300 M	16900 M	65.8 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	100000 M	30000 M	127 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	54800 M	17600 M	70.9 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	16000 M	5190 M	25.2 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	55100 M	18900 M	78.8 M			
PAH 16 EPA Total	<118 µg/kg	TM218	1840000 M	554000 M	1810 M			

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SDG: 091113-43
 Job: D_MOUCHEL_ELE-15
 Client Reference: 11/11/09 (J3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66041

VOC MS (S)

Results Legend		Sample Identity	J3				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.00 - 1.20				
		Sample Type	Soil/Solid				
		Date Sampled	11/11/2009				
		Date Received	12/11/2009				
		SDG Ref	091113-43				
		Lab Sample No.(s)	608851				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	107				
Toluene-d8**	%	TM116	80.0				
4-Bromofluorobenzene**	%	TM116	64.1				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1.1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	399				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1-2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1.1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1-2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2.2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1.1.1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1.1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1.2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	121				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1.2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1-3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	22.2				
trans-1-3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1.1.2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1.3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1.2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1.1.1.2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	20.1				

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SDG: 091113-43
 Job: D_MOUCHEL_ELE-15
 Client Reference: 11/11/09 (J3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66041

VOC MS (S)

Results Legend		Sample Identity	J3				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.00 - 1.20				
		Sample Type	Soil/Solid				
		Date Sampled	11/11/2009				
		Date Received	12/11/2009				
		SDG Ref	091113-43				
		Lab Sample No.(s)	608851				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	26.7	#			
o-Xylene	<11 µg/kg	TM116	14.8	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	<9.00	M			
1.1.2.2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1.2.3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	15.7	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	29.0	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1.2.4-Trimethylbenzene	<10 µg/kg	TM116	78.2	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	16.0	#			
1.3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1.4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1.2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1.2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1.2.4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	2360	#			
1.2.3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-16
Sample Delivery Group (SDG): 091113-49 **Report No.:** 66536
Your Reference: 11/11/09 (K4 & J3)
Location: Limerick Gasworks

A total of 5 samples was received on Thursday November 12, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091113-49
 Job: D_MOUCHEL_ELE-16
 Client Reference: 11/11/09 (K4 & J3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66536

SOLID

Results Legend	Sample ID	J3				K4				Total		
		7.10 - 7.50		8.80 - 9.00		0.00 - 0.50		1.00 - 1.50			6.25 - 6.75	
		JAR (D)	TUB (D) 60g VOC Dublin	JAR (D)	TUB (D) 60g VOC Dublin	JAR (D)	TUB (D) 60g VOC Dublin	JAR (D)	TUB (D) 60g VOC Dublin		JAR (D)	TUB (D)
X Test												
N No Determination Possible												
Ammonium Soil by Titration	All			X		X		X		X		0
Asbestos Presence Screen	All											4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X										0
Easily Liberated Sulphide	All			X		X		X		X		4
EPH CWG (Aliphatic) GC (S)	All			X		X		X		X		0
EPH CWG (Aromatic) GC (S)	All			X		X		X		X		4
GRO BTEX MTBE GC (S)	All			X		X		X		X		0
Hexavalent Chromium (s)	All		X			X		X		X		4
Metals by iCap-OES (Soil)	Arsenic		X			X		X		X		0
	Cadmium		X			X		X		X		4
	Chromium		X			X		X		X		0
	Copper		X			X		X		X		4
	Lead		X			X		X		X		0
	Mercury		X			X		X		X		4
	Nickel		X			X		X		X		0
	Selenium		X			X		X		X		4
	Zinc		X			X		X		X		0
PAH by GCMS	All		X									1
PAH micro by GCMS	All					X		X		X		0
pH	All			X		X		X		X		3
Phenols by HPLC (S)	All			X		X		X		X		0
Sample description	All	X	X		X	X		X		X		5
Total Sulphate	All		X		X	X		X		X		0
TPH CWG GC (S)	All		X		X	X		X		X		4
VOC MS (S)	All						X		X			2

SDG:	091113-49	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-16	Attention:	Verity Sankey
Client Reference:	11/11/09 (K4 & J3)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66536

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
J3	7.10 - 7.50	Cream	Dry Sample	0.063 - 0.1 mm	N/A
	8.80 - 9.00	Grey	Received Silt	<0.063 mm	Stones
K4	0.00 - 0.50	Brown	Gravel	0.1 - 2 mm	Stones
	1.00 - 1.50	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	6.25 - 6.75	Black	Sand	0.1 - 2 mm	tar

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091113-49
Job: D_MOUCHEL_ELE-16
Client Reference: 11/11/09 (K4 & J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66536

Test Completion dates

SDG reference: 091113-49

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
J3	7.10 - 7.50	SOLID	16/11/2009															16/11/2009
	8.80 - 9.00	SOLID	19/11/2009	20/11/2009	18/11/2009	16/11/2009	18/11/2009	18/11/2009	22/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	19/11/2009	17/11/2009		19/11/2009
K4	0.00 - 0.50	SOLID	19/11/2009	20/11/2009	18/11/2009	16/11/2009	19/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009		19/11/2009
	1.00 - 1.50	SOLID	19/11/2009	20/11/2009	18/11/2009	16/11/2009	19/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009		19/11/2009
	6.25 - 6.75	SOLID	19/11/2009	20/11/2009	18/11/2009	16/11/2009	19/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009		19/11/2009

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SDG: 091113-49
Job: D_MOUCHEL_ELE-16
Client Reference: 11/11/09 (K4 & J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66536

Results Legend			Sample Identity	J3	J3	K4	K4	K4
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	7.10 - 7.50 Soil/Solid 11/11/2009 12/11/2009 091113-49 609320	8.80 - 9.00 Soil/Solid 11/11/2009 12/11/2009 091113-49 609337	0.00 - 0.50 Soil/Solid 11/11/2009 12/11/2009 091113-49 609188	1.00 - 1.50 Soil/Solid 11/11/2009 12/11/2009 091113-49 609202	6.25 - 6.75 Soil/Solid 11/11/2009 12/11/2009 091113-49 609259
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001	No ACM Detected					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024		<15.0	M	<15.0	M	103
Ammoniacal Nitrogen as N	<15 mg/kg	TM024		<15.0	M	<15.0	M	79.8
Catechol	<0.01 mg/kg	TM062 (S)		<0.0100		<0.0100		<0.200
Phenol	<0.01 mg/kg	TM062 (S)		0.0460	M	<0.0100	M	71.5
Cresols	<0.01 mg/kg	TM062 (S)		<0.0200	M	<0.0100	M	179
Resorcinol	<0.05 mg/kg	TM062 (S)		<0.0500		<0.0500		<1.00
Xylenols	<0.015 mg/kg	TM062 (S)		<0.0150	M	<0.0150	M	347
1-Naphthol	<0.01 mg/kg	TM062 (S)		<0.0100		<0.0100		<0.200
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)		<0.0100	M	<0.0100	M	<0.200
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)		<0.0150	M	<0.0150	M	<0.300
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)		<0.0600		9.00	2.78	597
pH value of soil	1 pH Units	TM133		8.90	M	8.74	8.17	8.75
Hexavalent Chromium	<0.6 mg/kg	TM151		0.0864	#	<0.600	<0.600	<3.00
Total Cyanide	<1 mg/kg	TM153		<1.00	M	1.37	16.1	14.8
Easily Liberated Sulphide	<15 mg/kg	TM180		<15.0	M	<15.0	365	214
Arsenic	<0.6 mg/kg	TM181		0.94	#	5.39	4.70	9.41
Cadmium	<0.02 mg/kg	TM181		<0.0200	M	<0.0200	<0.0200	0.150
Chromium	<0.9 mg/kg	TM181		3.56	M	14.2	7.69	22.1
Copper	<1.4 mg/kg	TM181		5.48	M	170	8.23	18.6
Lead	<0.7 mg/kg	TM181		3.05	M	24.1	32.1	71.4
Mercury	<0.14 mg/kg	TM181		0.153	M	<0.140	1.77	<0.140
Nickel	<0.2 mg/kg	TM181		5.43	M	25.1	8.34	26.7
Selenium	<1 mg/kg	TM181		<1.00	#	<1.00	<1.00	<1.00
Zinc	<1.9 mg/kg	TM181		14.2	M	76.1	24.1	51.9
Total Sulphate	<48 mg/kg	TM221		10000	M	848	397	1100

SDG: 091113-49
Job: D_MOUCHEL_ELE-16
Client Reference: 11/11/09 (K4 & J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66536

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J3	K4	K4	K4
Depth (m)	8.80 - 9.00	0.00 - 0.50	1.00 - 1.50	6.25 - 6.75
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009	11/11/2009
Date Received	12/11/2009	12/11/2009	12/11/2009	12/11/2009
SDG Ref	091113-49	091113-49	091113-49	091113-49
Lab Sample No.(s)	609337	609188	609202	609259

Component	LOD/Units	Method	J3	K4	K4	K4
GRO C5-C12	<44 µg/kg	TM089	2070 #	58.2 #	20100 #	1140000 M
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	194 #	<5.00 M
Benzene	<10 µg/kg	TM089	1620 M	18.3 M	662 M	79100 M
Toluene	<2 µg/kg	TM089	220 M	15.1 M	1000 M	141000 M
Ethyl Benzene	<3 µg/kg	TM089	<3.00 M	<3.00 M	877 M	33800 M
m & p Xylene	<6 µg/kg	TM089	18.4 M	<6.00 M	2140 M	151000 M
o Xylene	<3 µg/kg	TM089	<3.00 M	<3.00 M	1190 M	61500 M
Sum m&p and o Xylene	<10 µg/kg	TM089	18.4 M	<10.0 M	3330 M	213000 M
Sum of BTEX	<10 µg/kg	TM089	1850 M	33.4 M	5870 M	467000 M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	135	4280 M
Aliphatics >C6-C8	<10 µg/kg	TM089	198	24.8	1590	28500 M
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	<10.0	2050	90700 M
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	<10.0	2870	165000 M
Total Aliphatics C5-C12	<10 µg/kg	TM089	198	24.8	6650	288000 M
Aromatics C6-C7	<10 µg/kg	TM089	1620	18.3	662	79100 M
Aromatics >C7-C8	<10 µg/kg	TM089	220	15.1	1000	141000 M
Aromatics >EC8-EC10	<10 µg/kg	TM089	31.3	10.0	7300	383000 M
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	<10.0	4310	247000 M
Total Aromatics C6-C12	<10 µg/kg	TM089	1870	33.4	13300	850000 M

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SDG: 091113-49
 Job: D_MOUCHEL_ELE-16
 Client Reference: 11/11/09 (K4 & J3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66536

PAH by GCMS

Results Legend		Sample Identity	J3				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	8.80 - 9.00				
		Sample Type	Soil/Solid				
		Date Sampled	11/11/2009				
		Date Received	12/11/2009				
		SDG Ref	091113-49				
		Lab Sample No.(s)	609337				
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	557				
				M			
Acenaphthylene (S)	<12 µg/kg	TM218	<12.0				
				M			
Acenaphthene (S)	<8 µg/kg	TM218	<8.00				
				M			
Fluorene (S)	<10 µg/kg	TM218	<10.0				
				M			
Phenanthrene (S)	<15 µg/kg	TM218	<15.0				
				M			
Anthracene (S)	<16 µg/kg	TM218	<16.0				
				M			
Fluoranthene (S)	<17 µg/kg	TM218	24.1				
				M			
Pyrene (S)	<15 µg/kg	TM218	23.0				
				M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	<14.0				
				M			
Chrysene (S)	<10 µg/kg	TM218	12.1				
				M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	<15.0				
				M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	<14.0				
				M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	<15.0				
				M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	<18.0				
				M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0				
				M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	<24.0				
				M			
PAH 16 EPA Total	<118 µg/kg	TM218	616				
				M			

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SDG: 091113-49
Job: D_MOUCHEL_ELE-16
Client Reference: 11/11/09 (K4 & J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66536

PAH micro by GCMS

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K4	K4	K4
Depth (m)	0.00 - 0.50	1.00 - 1.50	6.25 - 6.75
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009
Date Received	12/11/2009	12/11/2009	12/11/2009
SDG Ref	091113-49	091113-49	091113-49
Lab Sample No.(s)	609188	609202	609259

Component	LOD/Units	Method			
Naphthalene (S)	<9 µg/kg	TM218	292	9070	1140000
Acenaphthylene (S)	<12 µg/kg	TM218	498	3820	189000
Acenaphthene (S)	<8 µg/kg	TM218	150	5360	34300
Fluorene (S)	<10 µg/kg	TM218	129	7000	129000
Phenanthrene (S)	<15 µg/kg	TM218	619	15000	309000
Anthracene (S)	<16 µg/kg	TM218	291	5790	114000
Fluoranthene (S)	<17 µg/kg	TM218	1730	16700	200000
Pyrene (S)	<15 µg/kg	TM218	1730	13700	141000
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1000	6860	61900
Chrysene (S)	<10 µg/kg	TM218	707	4150	44100
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1920	8350	48800
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	679	3040	22400
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1440	6860	46000
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	899	3670	20000
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	260	943	5410
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1130	4670	21700
PAH 16 EPA Total	<118 µg/kg	TM218	13500	115000	2530000

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SDG: 091113-49
Job: D_MOUCHEL_ELE-16
Client Reference: 11/11/09 (K4 & J3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66536

VOC MS (S)

Results Legend			Sample Identity	K4	K4				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	6.25 - 6.75				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	11/11/2009	11/11/2009				
			Date Received	12/11/2009	12/11/2009				
			SDG Ref	091113-49	091113-49				
			Lab Sample No.(s)	609202	609259				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	94.7	145					
Toluene-d8**	%	TM116	67.4	41.2					
4-Bromofluorobenzene**	%	TM116	56.0	66.3					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	#	#			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
Carbon Disulphide	<9 µg/kg	TM116	<9.00	119	M	M			
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Benzene	<9 µg/kg	TM116	414	38600	M	M			
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	M	M			
Toluene	<6 µg/kg	TM116	657	74500	M	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	M	M			
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	210	M	M			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	M	M			
Chlorobenzene	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
Ethylbenzene	<9 µg/kg	TM116	586	21500	M	M			

SDG: 091113-49
 Job: D_MOUCHEL_ELE-16
 Client Reference: 11/11/09 (K4 & J3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66536

VOC MS (S)

Results Legend			Sample Identity		K4	K4				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	6.25 - 6.75					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	11/11/2009	11/11/2009					
			Date Received	12/11/2009	12/11/2009					
			SDG Ref	091113-49	091113-49					
			Lab Sample No.(s)	609202	609259					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	1740	#	111000	#				
o-Xylene	<11 µg/kg	TM116	710	M	46500	M				
Styrene	<11 µg/kg	TM116	<11.0	M	<11.0	M				
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0	M				
Isopropylbenzene	<9 µg/kg	TM116	26.4	M	1430	M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0	#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0	M				
Propylbenzene	<6 µg/kg	TM116	34.8	M	<6.00	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0	#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	207	M	16700	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	371	#	41900	#				
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#	<8.00	#				
4-Isopropyltoluene	<8 µg/kg	TM116	20.4	#	<8.00	#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<8.00	#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00	#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00	M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	18.8	#	<7.00	#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0	#				
Naphthalene	<7 µg/kg	TM116	3510	#	1570000	#				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#				

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-17
Sample Delivery Group (SDG): 091113-66
Your Reference: 11/11/09 (E6)
Location: Limerick Gasworks
Report No.: 66618

A total of 3 samples was received on Wednesday November 11, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091113-66
Job: D_MOUCHEL_ELE-17
Client Reference: 11/11/09 (E6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66618

SOLID

Results Legend	Sample ID	E6						Total
		0.00 - 0.50		1.50 - 2.00		3.00 - 3.50		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All	X		X		X		3
Hexavalent Chromium (s)	All		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X	3
	Cadmium		X		X		X	0
	Chromium		X		X		X	3
	Copper		X		X		X	0
	Lead		X		X		X	3
	Mercury		X		X		X	0
	Nickel		X		X		X	3
	Selenium		X		X		X	0
	Zinc		X		X		X	3
PAH micro by GCMS	All		X		X		X	0
pH	All		X		X		X	3
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	3
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	3
VOC MS (S)	All			X		X		0
				X		X		2

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SDG:	091113-66	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-17	Attention:	Verity Sankey
Client Reference:	11/11/09 (E6)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66618

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E6	0.00 - 0.50	Brown	Sand	0.1 - 2 mm	Stones
	1.50 - 2.00	Brown	Sand	0.1 - 2 mm	Stones
	3.00 - 3.50	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091113-66
Job: D_MOUCHEL_ELE-17
Client Reference: 11/11/09 (E6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66618

Test Completion dates

SDG reference: 091113-66

Sample ID	Depth	Type	SDG reference: 091113-66														
			Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
E6	0.00 - 0.50	SOLID	23/11/2009	17/11/2009	18/11/2009	19/11/2009	20/11/2009	18/11/2009	18/11/2009	19/11/2009	18/11/2009	18/11/2009	16/11/2009	18/11/2009	20/11/2009	20/11/2009	23/11/2009
	1.50 - 2.00	SOLID	23/11/2009	17/11/2009	18/11/2009	19/11/2009	20/11/2009	18/11/2009	18/11/2009	19/11/2009	18/11/2009	18/11/2009	16/11/2009	18/11/2009	20/11/2009	20/11/2009	23/11/2009
	3.00 - 3.50	SOLID	23/11/2009	17/11/2009	18/11/2009	19/11/2009	20/11/2009	18/11/2009	18/11/2009	19/11/2009	18/11/2009	18/11/2009	16/11/2009	18/11/2009	20/11/2009	20/11/2009	23/11/2009

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SDG: 091113-66
Job: D_MOUCHEL_ELE-17
Client Reference: 11/11/09 (E6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65739

Results Legend			Sample Identity			E6			E6			E6		
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	1.50 - 2.00	3.00 - 3.50								
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid								
			Date Sampled	11/11/2009	11/11/2009	11/11/2009								
			Date Received	11/11/2009	11/11/2009	11/11/2009								
			SDG Ref	091113-66	091113-66	091113-66								
			Lab Sample No.(s)	609547	609577	609609								
Component	LOD/Units	Method												
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	M	93.8	M	73.6	M						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		73.0		57.2							
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100							
Phenol	<0.01 mg/kg	TM062 (S)	<0.0200	M	0.107	M	1.65	M						
Cresols	<0.01 mg/kg	TM062 (S)	0.0798	M	0.442	M	4.60	M						
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.0500		<0.0500							
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	9.85	M	7.94	M						
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100							
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M						
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M						
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0900		10.4		14.2							
pH value of soil	1 pH Units	TM133	11.44	M	8.01	M	8.88	M						
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	#	<3.00	#	<3.00	#						
Total Cyanide	<1 mg/kg	TM153	10.3	M	347	M	72.7	M						
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	#	731	#	109	#						
Arsenic	<0.6 mg/kg	TM181	22.5	M	13.2	M	12.2	M						
Cadmium	<0.02 mg/kg	TM181	0.265	M	0.225	M	<0.0200	M						
Chromium	<0.9 mg/kg	TM181	22.6	M	14.7	M	14.0	M						
Copper	<1.4 mg/kg	TM181	50.3	M	44.9	M	13.0	M						
Lead	<0.7 mg/kg	TM181	1970	M	855	M	89.5	M						
Mercury	<0.14 mg/kg	TM181	<0.140	M	<0.140	M	<0.140	M						
Nickel	<0.2 mg/kg	TM181	36.9	M	20.3	M	16.9	M						
Selenium	<1 mg/kg	TM181	<1.00	#	2.22	#	<1.00	#						
Zinc	<1.9 mg/kg	TM181	70.3	M	92.5	M	45.5	M						
Total Sulphate	<48 mg/kg	TM221	1670	M	9690	M	1470	M						

SDG: 091113-66
Job: D_MOUCHEL_ELE-17
Client Reference: 11/11/09 (E6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65739

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E6	E6	E6
Depth (m)	0.00 - 0.50	1.50 - 2.00	3.00 - 3.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091113-66	091113-66	091113-66
Lab Sample No.(s)	609547	609577	609609

Component	LOD/Units	Method	E6	E6	E6
Aliphatics >C12-C16	<100 µg/kg	TM173	93500	561000	22800
Aliphatics >C16-C21	<100 µg/kg	TM173	<100	281000	42500
Aliphatics >C21-C35	<100 µg/kg	TM173	91400	155000	69000
Aliphatics >C35-C44	<100 µg/kg	TM173	29000	36000	26800
Total Aliphatics >C12-C44	<100 µg/kg	TM173	214000	1030000	161000
Aliphatics >C16-C35	<100 µg/kg	TM173	91400	436000	112000

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SDG: 091113-66
Job: D_MOUCHEL_ELE-17
Client Reference: 11/11/09 (E6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65739

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E6	E6	E6
Depth (m)	0.00 - 0.50	1.50 - 2.00	3.00 - 3.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	11/11/2009	11/11/2009	11/11/2009
Date Received	11/11/2009	11/11/2009	11/11/2009
SDG Ref	091113-66	091113-66	091113-66
Lab Sample No.(s)	609547	609577	609609

Component	LOD/Units	Method	E6	E6	E6
Aromatics >EC12-EC16	<100 µg/kg	TM173	73400	1030000	109000
Aromatics >EC16-EC21	<100 µg/kg	TM173	243000	1730000	291000
Aromatics >EC21-EC35	<100 µg/kg	TM173	1160000	3780000	752000
Aromatics >EC35-EC44	<100 µg/kg	TM173	318000	811000	208000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	1800000	7350000	1360000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	1800000	7350000	1360000

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SDG: 091113-66
 Job: D_MOUCHEL_ELE-17
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Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65739

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	E6	E6	E6			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	1.50 - 2.00	3.00 - 3.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	11/11/2009	11/11/2009	11/11/2009			
			Date Received	11/11/2009	11/11/2009	11/11/2009			
			SDG Ref	091113-66	091113-66	091113-66			
			Lab Sample No.(s)	609547	609577	609609			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	2230	440000	44900				
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00				
			#	#	#				
Benzene	<10 µg/kg	TM089	75.2	2880	52.4				
			M	M	M				
Toluene	<2 µg/kg	TM089	91.2	10700	241				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	30.8	6230	412				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	168	47200	2870				
			M	M	M				
o Xylene	<3 µg/kg	TM089	74.1	22500	1750				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	242	69800	4620				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	439	89600	5330				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	250	<10.0				
Aliphatics >C6-C8	<10 µg/kg	TM089	18.4	4290	517				
Aliphatics >C8-C10	<10 µg/kg	TM089	236	46700	5710				
Aliphatics >C10-C12	<10 µg/kg	TM089	471	91500	8930				
Total Aliphatics C5-C12	<10 µg/kg	TM089	726	143000	16200				
Aromatics C6-C7	<10 µg/kg	TM089	75.2	2880	52.4				
Aromatics >C7-C8	<10 µg/kg	TM089	91.2	10700	241				
Aromatics >EC8-EC10	<10 µg/kg	TM089	627	146000	13600				
Aromatics >EC10-EC12	<10 µg/kg	TM089	707	137000	14900				
Total Aromatics C6-C12	<10 µg/kg	TM089	1500	297000	28800				

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 Job: D_MOUCHEL_ELE-17
 Client Reference: 11/11/09 (E6)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65739

PAH micro by GCMS

Results Legend		Sample Identity	E6	E6	E6			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.00 - 0.50	1.50 - 2.00	3.00 - 3.50			
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
		Date Sampled	11/11/2009	11/11/2009	11/11/2009			
		Date Received	11/11/2009	11/11/2009	11/11/2009			
		SDG Ref	091113-66	091113-66	091113-66			
		Lab Sample No.(s)	609547	609577	609609			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	22300 M	1690000 M	304000 M			
Acenaphthylene (S)	<12 µg/kg	TM218	6630 M	199000 M	51100 M			
Acenaphthene (S)	<8 µg/kg	TM218	1600 M	37100 M	14200 M			
Fluorene (S)	<10 µg/kg	TM218	3980 M	202000 M	61800 M			
Phenanthrene (S)	<15 µg/kg	TM218	39100 M	665000 M	259000 M			
Anthracene (S)	<16 µg/kg	TM218	13300 M	151000 M	71900 M			
Fluoranthene (S)	<17 µg/kg	TM218	50900 M	446000 M	185000 M			
Pyrene (S)	<15 µg/kg	TM218	38200 M	331000 M	131000 M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	23100 M	138000 M	67100 M			
Chrysene (S)	<10 µg/kg	TM218	17600 M	89200 M	45900 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	30600 M	134000 M	50200 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	11600 M	55400 M	23600 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	28600 M	138000 M	50900 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	17100 M	66800 M	23100 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	4830 M	18700 M	7320 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	19200 M	77600 M	24700 M			
PAH 16 EPA Total	<118 µg/kg	TM218	329000 M	4440000 M	1370000 M			

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SDG: 091113-66
Job: D_MOUCHEL_ELE-17
Client Reference: 11/11/09 (E6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 65739

VOC MS (S)

Results Legend			Sample Identity		E6	E6					
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	3.00 - 3.50						
			Sample Type	Soil/Solid	Soil/Solid						
			Date Sampled	11/11/2009	11/11/2009						
			Date Received	11/11/2009	11/11/2009						
			SDG Ref	091113-66	091113-66						
			Lab Sample No.(s)	609577	609609						
			Method								
Component	LOD/Units	Method									
Dibromofluoromethane**	%	TM116		139	114						
Toluene-d8**	%	TM116		60.1	72.8						
4-Bromofluorobenzene**	%	TM116		116	59.6						
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0						
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0						
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0						
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00						
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0						
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00						
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
Carbon Disulphide	<9 µg/kg	TM116		42.5	14.4						
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0						
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00						
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0						
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00						
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0						
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0						
Chloroform	<10 µg/kg	TM116		<10.0	<10.0						
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0						
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0						
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0						
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0						
Benzene	<9 µg/kg	TM116		5750	36.2						
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0						
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0						
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0						
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0						
Toluene	<6 µg/kg	TM116		26200	186						
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0						
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00						
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00						
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00						
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00						
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0						
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00						
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0						
Ethylbenzene	<9 µg/kg	TM116		11600	475						

SDG: 091113-66
 Job: D_MOUCHEL_ELE-17
 Client Reference: 11/11/09 (E6)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65739

VOC MS (S)

Component	LOD/Units	Method	Sample Identity		E6		E6	
			Depth (m)	Sample Type	1.50 - 2.00	3.00 - 3.50	Soil/Solid	Soil/Solid
			Date Sampled	11/11/2009	11/11/2009	11/11/2009	11/11/2009	
			Date Received	11/11/2009	11/11/2009	11/11/2009	11/11/2009	
			SDG Ref	091113-66	091113-66	091113-66	091113-66	
			Lab Sample No.(s)	609577	609577	609609	609609	
p/m-Xylene	<13 µg/kg	TM116		121000	#	3500	#	
o-Xylene	<11 µg/kg	TM116		53000	M	1740	M	
Styrene	<11 µg/kg	TM116		<11.0	M	<11.0	M	
Bromoform	<12 µg/kg	TM116		<12.0	M	<12.0	M	
Isopropylbenzene	<9 µg/kg	TM116		1750	M	103	M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116		<15.0	#	<15.0	#	
1,2,3-Trichloropropane	<13 µg/kg	TM116		<13.0	M	<13.0	M	
Bromobenzene	<14 µg/kg	TM116		<14.0	M	<14.0	M	
Propylbenzene	<6 µg/kg	TM116		<6.00	M	230	M	
2-Chlorotoluene	<14 µg/kg	TM116		<14.0	#	<14.0	#	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		35200	M	1360	M	
4-Chlorotoluene	<9 µg/kg	TM116		<9.00	#	<9.00	#	
tert-Butylbenzene	<12 µg/kg	TM116		<12.0	#	<12.0	#	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116		82800	#	5470	#	
sec-Butylbenzene	<8 µg/kg	TM116		275	#	30.7	#	
4-Isopropyltoluene	<8 µg/kg	TM116		1260	#	162	#	
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8.00	#	<8.00	#	
1,4-Dichlorobenzene	<11 µg/kg	TM116		<11.0	M	<11.0	M	
n-Butylbenzene	<7 µg/kg	TM116		<7.00	#	<7.00	#	
1,2-Dichlorobenzene	<8 µg/kg	TM116		<8.00	M	<8.00	M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116		<11.0	M	<11.0	M	
Tert-amyl methyl ether	<7 µg/kg	TM116		<7.00	#	<7.00	#	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116		<9.00	#	<9.00	#	
Hexachlorobutadiene	<15 µg/kg	TM116		<15.0	#	<15.0	#	
Naphthalene	<7 µg/kg	TM116		2370000		223000		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116		87.9	#	<12.0	#	

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-18
Sample Delivery Group (SDG): 091113-77
Your Reference: 11/11/09 (E7)
Location: Limerick Gasworks
Report No.: 66903

A total of 4 samples was received on Thursday November 12, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66903

SOLID

Results Legend	Sample ID	E7					Total
		Depth (m)					
		0.50 - 1.00	1.50 - 2.00	4.80 - 5.00	5.50 - 6.00		
	Container	JAR (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	JAR (D)
Ammonium Soil by Titration	All						0
			X			X	2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide						0
			X			X	2
Easily Liberated Sulphide	All						0
			X			X	2
EPH CWG (Aliphatic) GC (S)	All		X			X	2
EPH CWG (Aromatic) GC (S)	All		X			X	2
GRO BTEX MTBE GC (S)	All						0
		X		X			2
Hexavalent Chromium (s)	All						0
			X			X	2
Metals by iCap-OES (Soil)	Arsenic						0
			X			X	2
	Cadmium						0
						X	2
	Chromium						0
			X			X	2
	Copper						0
			X			X	2
	Lead						0
			X			X	2
	Mercury						0
			X			X	2
	Nickel						0
			X			X	2
	Selenium						0
			X			X	2
	Zinc						0
			X			X	2
PAH micro by GCMS	All						0
			X			X	2
PCBs by GCMS	All						0
		X				X	2
pH	All						0
			X			X	2
Phenols by HPLC (S)	All						0
			X			X	2
Sample description	All						0
		X	X		X	X	4
Total Sulphate	All						0
			X			X	2
TPH CWG GC (S)	All						0
			X			X	2
VOC MS (S)	All						0
				X			1

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SDG:	091113-77	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-18	Attention:	Verity Sankey
Client Reference:	11/11/09 (E7)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66903

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E7	0.50 - 1.00	Brown	Sand	0.1 - 2 mm	Stones
	1.50 - 2.00	Beige	Sand	0.1 - 2 mm	Stones
	4.80 - 5.00	Brown	Sandy clay	0.1 - 2 mm	oil/petroleum
	5.50 - 6.00	Brown	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66903

Test Completion dates

SDG reference: 091113-77

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
E7	0.50 - 1.00	SOLID				04/12/2009		08/12/2009										
	1.50 - 2.00	SOLID		21/11/2009	18/11/2009	16/11/2009	18/11/2009	18/11/2009	19/11/2009	18/11/2009	19/11/2009	18/11/2009	20/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	19/11/2009
	4.80 - 5.00	SOLID	23/10/2009	25/11/2009	18/11/2009	16/11/2009	19/11/2009	18/11/2009	18/11/2009	18/11/2009	17/11/2009	17/11/2009	20/11/2009	19/11/2009	19/11/2009	18/11/2009	17/11/2009	19/11/2009
	5.50 - 6.00	SOLID				04/12/2009		07/12/2009										

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SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65729

Results Legend		Sample Identity	E7	E7	E7	E7
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 11/11/2009 12/11/2009 091113-77 609890	1.50 - 2.00 Soil/Solid 11/11/2009 12/11/2009 091113-77 609923	4.80 - 5.00 Soil/Solid 11/11/2009 12/11/2009 091113-77 610023	5.50 - 6.00 Soil/Solid 11/11/2009 12/11/2009 091113-77 610045
Component	LOD/Units	Method				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024		<15.0 M	<15.0 M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024		<15.0	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.200	
Phenol	<0.01 mg/kg	TM062 (S)		<0.0100 M	124 M	
Cresols	<0.01 mg/kg	TM062 (S)		<0.0100 M	100 M	
Resorcinol	<0.05 mg/kg	TM062 (S)		<0.0500	<1.00	
Xylenols	<0.015 mg/kg	TM062 (S)		<0.0150 M	28.6 M	
1-Naphthol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.200	
2,3,5 Trimethyl-Phenol	<0.01 mg/kg	TM062 (S)		<0.0100 M	<0.200 M	
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)		<0.0150 M	<0.300 M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)		0.00	252	
pH value of soil	1 pH Units	TM133		9.16 M	12.80 M	
Hexavalent Chromium	<0.6 mg/kg	TM151		<0.600 #	<0.600 #	
Total Cyanide	<1 mg/kg	TM153		<1.00 M	<1.00 M	
PCB congener 28	<3 µg/kg	TM168	<3.00			<3.00
PCB congener 52	<3 µg/kg	TM168	<3.00			<3.00
PCB congener 101	<3 µg/kg	TM168	<3.00			<3.00
PCB congener 118	<3 µg/kg	TM168	<3.00			<3.00
PCB congener 138	<3 µg/kg	TM168	<3.00			<3.00
PCB congener 153	<3 µg/kg	TM168	<3.00			<3.00
PCB congener 180	<3 µg/kg	TM168	<3.00			<3.00
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00			<3.00
Easily Liberated Sulphide	<15 mg/kg	TM180		<15.0 #	37.1 #	
Arsenic	<0.6 mg/kg	TM181		1.43 M	4.04 M	
Cadmium	<0.02 mg/kg	TM181		<0.0200 M	<0.0200 M	
Chromium	<0.9 mg/kg	TM181		1.16 M	5.77 M	
Copper	<1.4 mg/kg	TM181		2.18 M	2.76 M	
Lead	<0.7 mg/kg	TM181		2.59 M	10.0 M	
Mercury	<0.14 mg/kg	TM181		<0.140 M	<0.140 M	
Nickel	<0.2 mg/kg	TM181		3.39 M	3.19 M	
Selenium	<1 mg/kg	TM181		<1.00 #	<1.00 #	
Zinc	<1.9 mg/kg	TM181		13.9 M	12.3 M	
Total Sulphate	<48 mg/kg	TM221		251 M	3280 M	

SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65729

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E7	E7				
Depth (m)	1.50 - 2.00	4.80 - 5.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	11/11/2009	11/11/2009				
Date Received	12/11/2009	12/11/2009				
SDG Ref	091113-77	091113-77				
Lab Sample No.(s)	609923	610023				

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	<100	46400		
Aliphatics >C16-C21	<100 µg/kg	TM173	<100	59400		
Aliphatics >C21-C35	<100 µg/kg	TM173	<100	73600		
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	5090		
Total Aliphatics >C12-C44	<100 µg/kg	TM173	<100	184000		
Aliphatics >C16-C35	<100 µg/kg	TM173	<100	133000		

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SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65729

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E7	E7				
Depth (m)	1.50 - 2.00	4.80 - 5.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	11/11/2009	11/11/2009				
Date Received	12/11/2009	12/11/2009				
SDG Ref	091113-77	091113-77				
Lab Sample No.(s)	609923	610023				

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	265	809000		
Aromatics >EC16-EC21	<100 µg/kg	TM173	442	1540000		
Aromatics >EC21-EC35	<100 µg/kg	TM173	3460	3290000		
Aromatics >EC35-EC44	<100 µg/kg	TM173	<100	634000		
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	4240	6270000		
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	4240	6270000		

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SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65729

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	E7	E7				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	4.80 - 5.00				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	11/11/2009	11/11/2009				
			Date Received	12/11/2009	12/11/2009				
			SDG Ref	091113-77	091113-77				
			Lab Sample No.(s)	609923	610023				
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	<44.0		305000				
			#		#				
MTBE	<5 µg/kg	TM089	<5.00		<5.00				
			#		#				
Benzene	<10 µg/kg	TM089	<10.0	M	8910	M			
Toluene	<2 µg/kg	TM089	<2.00	M	33500	M			
Ethyl Benzene	<3 µg/kg	TM089	<3.00	M	3240	M			
m & p Xylene	<6 µg/kg	TM089	<6.00	M	42800	M			
o Xylene	<3 µg/kg	TM089	<3.00	M	15600	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	M	58300	M			
Sum of BTEX	<10 µg/kg	TM089	<10.0	M	104000	M			
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0		151				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0		<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0		17800				
Aliphatics >C10-C12	<10 µg/kg	TM089	10.9		64100				
Total Aliphatics C5-C12	<10 µg/kg	TM089	10.9		82100				
Aromatics C6-C7	<10 µg/kg	TM089	<10.0		8910				
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0		33500				
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0		86300				
Aromatics >EC10-EC12	<10 µg/kg	TM089	16.4		96200				
Total Aromatics C6-C12	<10 µg/kg	TM089	16.4		227000				

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SDG: 091113-77
 Job: D_MOUCHEL_ELE-18
 Client Reference: 11/11/09 (E7)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65729

PAH micro by GCMS

Results Legend		Sample Identity	E7	E7				
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.50 - 2.00	4.80 - 5.00				
		Sample Type	Soil/Solid	Soil/Solid				
		Date Sampled	11/11/2009	11/11/2009				
		Date Received	12/11/2009	12/11/2009				
		SDG Ref	091113-77	091113-77				
		Lab Sample No.(s)	609923	610023				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	29.8	1080000	M	M		
Acenaphthylene (S)	<12 µg/kg	TM218	77.1	148000	M	M		
Acenaphthene (S)	<8 µg/kg	TM218	<8.00	23400	M	M		
Fluorene (S)	<10 µg/kg	TM218	<10.0	116000	M	M		
Phenanthrene (S)	<15 µg/kg	TM218	38.8	393000	M	M		
Anthracene (S)	<16 µg/kg	TM218	25.0	83500	M	M		
Fluoranthene (S)	<17 µg/kg	TM218	258	248000	M	M		
Pyrene (S)	<15 µg/kg	TM218	216	186000	M	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	145	69100	M	M		
Chrysene (S)	<10 µg/kg	TM218	124	47900	M	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	179	48900	M	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	67.3	25100	M	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	164	57200	M	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	98.0	25200	M	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	26.6	6470	M	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	120	31800	M	M		
PAH 16 EPA Total	<118 µg/kg	TM218	1570	2580000	M	M		

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SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65729

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E7	E7				
Depth (m)	1.50 - 2.00	4.80 - 5.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	11/11/2009	11/11/2009				
Date Received	12/11/2009	12/11/2009				
SDG Ref	091113-77	091113-77				
Lab Sample No.(s)	609923	610023				

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	<100	267000		
Total Aromatics >C6-C44	<100 µg/kg	TM173	4260	6500000		
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	4270	6760000		

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SDG: 091113-77
Job: D_MOUCHEL_ELE-18
Client Reference: 11/11/09 (E7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 65729

VOC MS (S)

Results Legend			Sample Identity	E7				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	4.80 - 5.00				
			Sample Type	Soil/Solid				
			Date Sampled	11/11/2009				
			Date Received	12/11/2009				
			SDG Ref	091113-77				
			Lab Sample No.(s)	610023				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	0.850					
Toluene-d8**	%	TM116	63.0					
4-Bromofluorobenzene**	%	TM116	48.1					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0					
Chloromethane	<12 µg/kg	TM116	<12.0					
Vinyl Chloride	<10 µg/kg	TM116	<10.0					
Bromoethane	<9 µg/kg	TM116	<9.00					
Chloroethane	<12 µg/kg	TM116	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00					
Carbon Disulphide	<9 µg/kg	TM116	36.9					
Dichloromethane	<10 µg/kg	TM116	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Bromochloromethane	<10 µg/kg	TM116	<10.0					
Chloroform	<10 µg/kg	TM116	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0					
Carbontetrachloride	<11 µg/kg	TM116	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116	150					
Benzene	<9 µg/kg	TM116	2990					
Trichloroethene	<9 µg/kg	TM116	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Dibromomethane	<12 µg/kg	TM116	<12.0					
Bromodichloromethane	<11 µg/kg	TM116	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0					
Toluene	<6 µg/kg	TM116	5120					
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00					
Tetrachloroethene	<9 µg/kg	TM116	<9.00					
Dibromochloromethane	<9 µg/kg	TM116	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0					
Chorobenzene	<7 µg/kg	TM116	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0					
Ethylbenzene	<9 µg/kg	TM116	855					

SDG: 091113-77
 Job: D_MOUCHEL_ELE-18
 Client Reference: 11/11/09 (E7)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65729

VOC MS (S)

Results Legend		Sample Identity	E7				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	4.80 - 5.00				
		Sample Type	Soil/Solid				
		Date Sampled	11/11/2009				
		Date Received	12/11/2009				
		SDG Ref	091113-77				
		Lab Sample No.(s)	610023				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	11700				
o-Xylene	<11 µg/kg	TM116	3920				
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	50.5	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	91.2	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	1940	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	3190				
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	326000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 09 December 2009
Job: D_MOUCHEL_ELE-19
Sample Delivery Group (SDG): 091113-84 **Report No.:** 67032
Your Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

A total of 5 samples was received on Friday November 13, 2009 and completed on Wednesday December 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091113-84
 Job: D_MOUCHEL_ELE-19
 Client Reference: 12/11/09 (A7, J6 & J8)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 67032

SOLID

Results Legend	Sample ID	A7		J6		J8		Total
		Depth (m)		Depth (m)		Depth (m)		
		1.50 - 2.00	3.50 - 4.00	1.10 - 1.30	5.00 - 5.50	0.00 - 0.40		
	Container	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	
Ammonium Soil by Titration	All							0
Asbestos Presence Screen	All	X	X	X	X	X	X	5
Cyanides Complex/Free/Total/Thiocya	Total Cyanide							0
Easily Liberated Sulphide	All	X	X	X	X	X	X	5
EPH CWG (Aliphatic) GC (S)	All	X	X	X	X	X	X	5
EPH CWG (Aromatic) GC (S)	All	X	X	X	X	X	X	5
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	X	5
Hexavalent Chromium (s)	All	X	X	X	X	X	X	5
Metals by iCap-OES (Soil)	Arsenic	X	X	X	X	X	X	5
	Cadmium	X	X	X	X	X	X	5
	Chromium	X	X	X	X	X	X	5
	Copper	X	X	X	X	X	X	5
	Lead	X	X	X	X	X	X	5
	Mercury	X	X	X	X	X	X	5
	Nickel	X	X	X	X	X	X	5
	Selenium	X	X	X	X	X	X	5
	Zinc	X	X	X	X	X	X	5
PAH micro by GCMS	All	X	X	X	X	X	X	5
PCBs by GCMS	All			X			X	2
pH	All	X	X	X	X	X	X	5
Phenols by HPLC (S)	All	X	X	X	X	X	X	5
Sample description	All	X	X	X	X	X	X	5
Total Sulphate	All	X	X	X	X	X	X	5
TPH CWG GC (S)	All	X	X	X	X	X	X	5
VOC MS (S)	All	X	X		X			3

SDG:	091113-84	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-19	Attention:	Verity Sankey
Client Reference:	12/11/09 (A7, J6 & J8)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67032

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
A7	1.50 - 2.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	3.50 - 4.00	Grey	Silty Sand	0.1 - 2 mm	Oil/Petroleum
J6	1.10 - 1.30	Black	Silty Clay	0.063 - 0.1 mm	Stones
	5.00 - 5.50	Grey	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
J8	0.00 - 0.40	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67032

Test Completion dates

SDG reference: 091113-84

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
A7	1.50 - 2.00	SOLID	19/11/2009	19/11/2009	19/11/2009	18/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	18/11/2009	18/11/2009	19/11/2009	17/11/2009	19/11/2009	19/11/2009	21/11/2009
	3.50 - 4.00	SOLID	19/11/2009	19/11/2009	19/11/2009	18/11/2009	20/11/2009	20/11/2009	25/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	18/11/2009	19/11/2009	17/11/2009	19/11/2009	25/11/2009	02/12/2009
J6	1.10 - 1.30	SOLID	19/11/2009	19/11/2009	19/11/2009	18/11/2009	19/11/2009	19/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	08/12/2009	18/11/2009	19/11/2009	17/11/2009	19/11/2009	20/11/2009	20/11/2009
	5.00 - 5.50	SOLID	19/11/2009	19/11/2009	19/11/2009	18/11/2009	19/11/2009	19/11/2009	25/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	18/11/2009	19/11/2009	19/11/2009	19/11/2009	25/11/2009	02/12/2009
J8	0.00 - 0.40	SOLID	19/11/2009	17/11/2009	19/11/2009	18/11/2009	19/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	18/11/2009	19/11/2009	17/11/2009	19/11/2009	20/11/2009	20/11/2009

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SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66245

Results Legend			Sample Identity		A7	A7	J6	J6	J8			
# ISO17025 accredited. # mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.50 - 2.00	3.50 - 4.00	1.10 - 1.30	5.00 - 5.50	0.00 - 0.40			
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled		12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009			
			Date Received		13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009			
			SDG Ref		091113-84	091113-84	091113-84	091113-84	091113-84			
			Lab Sample No.(s)		610458	614362	614426	614451	614462			
Component	LOD/Units	Method										
Asbestos Presence Screen	-	TM001							No ACM Detected			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	18.4	M	916	M	57.0	M	73.9	M	23.7	M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		713		44.4		57.5		18.4	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.100		<0.0100		<0.100		<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	1.47	M	13.6	M	<0.0100	M	0.638	M	<0.0100	M
Cresols	<0.01 mg/kg	TM062 (S)	4.20	M	20.3	M	<0.0100	M	1.61	M	<0.0100	M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.500		<0.0500		<0.500		<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	6.46	M	16.6	M	<0.0150	M	12.1	M	<0.0150	M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.100		<0.0100		2.90		<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.100	M	<0.0100	M	<0.100	M	<0.0100	M
2-Isopropyl Phenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.150	M	<0.0150	M	<0.150	M	<0.0150	M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	12.1		50.4		9.00		17.2		0.00	
pH value of soil	1 pH Units	TM133	10.57	M	11.38	M	8.94	M	8.58	M	9.17	M
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	#	<0.600	#	<3.00	#	<6.00	#	<3.00	#
Total Cyanide	<1 mg/kg	TM153	4.55	M	1.10	M	1010	M	157	M	3.81	M
PCB congener 28	<3 µg/kg	TM168					<3.00				<3.00	
PCB congener 52	<3 µg/kg	TM168					<3.00				<3.00	
PCB congener 101	<3 µg/kg	TM168					<3.00				<3.00	
PCB congener 118	<3 µg/kg	TM168					<3.00				<3.00	
PCB congener 138	<3 µg/kg	TM168					<3.00				<3.00	
PCB congener 153	<3 µg/kg	TM168					<3.00				<3.00	
PCB congener 180	<3 µg/kg	TM168					<3.00				<3.00	
Total of 7 Congener PCBs	<3 µg/kg	TM168					<3.00				<3.00	
Easily Liberated Sulphide	<15 mg/kg	TM180	43.1	#	66.1	#	119	#	409	#	21.2	#
Arsenic	<0.6 mg/kg	TM181	2.95	M	7.02	M	23.0	M	4.58	M	5.05	M
Cadmium	<0.02 mg/kg	TM181	<0.0200	M	0.0622	M	0.269	M	0.127	M	0.0320	M
Chromium	<0.9 mg/kg	TM181	21.9	M	12.3	M	20.9	M	4.98	M	11.9	M
Copper	<1.4 mg/kg	TM181	4.00	M	30.0	M	53.7	M	7.31	M	11.8	M
Lead	<0.7 mg/kg	TM181	4.87	M	10.4	M	308	M	26.2	M	24.2	M
Mercury	<0.14 mg/kg	TM181	<0.140	M	<0.140	M	0.577	M	0.729	M	<0.140	M
Nickel	<0.2 mg/kg	TM181	8.02	M	21.9	M	15.4	M	3.07	M	15.1	M
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	<1.00	#	<1.00	#	<1.00	#
Zinc	<1.9 mg/kg	TM181	18.9	M	32.7	M	62.4	M	31.6	M	98.7	M
Total Sulphate	<48 mg/kg	TM221	541	M	3290	M	64700	M	4150	M	1580	M

SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66245

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A7	A7	J6	J6	J8
Depth (m)	1.50 - 2.00	3.50 - 4.00	1.10 - 1.30	5.00 - 5.50	0.00 - 0.40
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091113-84	091113-84	091113-84	091113-84	091113-84
Lab Sample No.(s)	610458	614362	614426	614451	614462

Component	LOD/Units	Method	A7	A7	J6	J6	J8
Aromatics >EC12-EC16	<100 µg/kg	TM173	4790	214000	155000	747000	19900
Aromatics >EC16-EC21	<100 µg/kg	TM173	14900	438000	429000	1220000	30600
Aromatics >EC21-EC35	<100 µg/kg	TM173	41300	1030000	2220000	2810000	228000
Aromatics >EC35-EC44	<100 µg/kg	TM173	506	286000	553000	759000	185000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	61500	1970000	3350000	5540000	464000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	61500	1970000	3350000	5540000	464000

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SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66245

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	A7	A7	J6	J6	J8	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	3.50 - 4.00	1.10 - 1.30	5.00 - 5.50	0.00 - 0.40	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009	
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	
			SDG Ref	091113-84	091113-84	091113-84	091113-84	091113-84	
			Lab Sample No.(s)	610458	614362	614426	614451	614462	
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	2560	106000	3530	129000	<44.0		
			#	M	#	M		#	
MTBE	<5 µg/kg	TM089	<5.00	168	<5.00	1290	<5.00		
			#	M	#	M		#	
Benzene	<10 µg/kg	TM089	22.0	7670	32.9	6570	10.8		
			M	M	M	M		M	
Toluene	<2 µg/kg	TM089	25.3	24100	19.5	10100	11.9		
			M	M	M	M		M	
Ethyl Benzene	<3 µg/kg	TM089	12.1	2340	<4.00	2690	<3.00		
			M	M	M	M		M	
m & p Xylene	<6 µg/kg	TM089	85.8	16400	23.2	16300	<8.00		
			M	M	M	M		M	
o Xylene	<3 µg/kg	TM089	53.9	6250	15.9	6590	<3.00		
			M	M	M	M		M	
Sum m&p and o Xylene	<10 µg/kg	TM089	140	22600	39.0	22900	<10.0		
			M	M	M	M		M	
Sum of BTEX	<10 µg/kg	TM089	199	56800	91.5	42300	22.7		
			M	M	M	M		M	
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	30.9	53.3	209	<10.0		
				M		M			
Aliphatics >C6-C8	<10 µg/kg	TM089	60.1	<10.0	93.1	20600	<10.0		
				M		M			
Aliphatics >C8-C10	<10 µg/kg	TM089	245	9340	304	15600	<10.0		
				M		M			
Aliphatics >C10-C12	<10 µg/kg	TM089	675	11000	623	10100	<10.0		
				M		M			
Total Aliphatics C5-C12	<10 µg/kg	TM089	981	20400	1460	46500	<10.0		
				M		M			
Aromatics C6-C7	<10 µg/kg	TM089	22.0	7670	32.9	6570	10.8		
				M		M			
Aromatics >C7-C8	<10 µg/kg	TM089	25.3	24100	19.5	10100	11.9		
				M		M			
Aromatics >EC8-EC10	<10 µg/kg	TM089	520	39000	630	49000	<10.0		
				M		M			
Aromatics >EC10-EC12	<10 µg/kg	TM089	1010	16500	1380	15200	<10.0		
				M		M			
Total Aromatics C6-C12	<10 µg/kg	TM089	1580	87300	2070	80900	22.7		
				M		M			

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SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66245

PAH micro by GCMS

Results Legend			Sample Identity	A7	A7	J6	J6	J8
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 12/11/2009 13/11/2009 091113-84 610458	3.50 - 4.00 Soil/Solid 12/11/2009 13/11/2009 091113-84 614362	1.10 - 1.30 Soil/Solid 12/11/2009 13/11/2009 091113-84 614426	5.00 - 5.50 Soil/Solid 12/11/2009 13/11/2009 091113-84 614451	0.00 - 0.40 Soil/Solid 12/11/2009 13/11/2009 091113-84 614462
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	3610	451000	2210	1560000	248	
			M	M	M	M	M	M
Acenaphthylene (S)	<12 µg/kg	TM218	2380	58700	9230	333000	526	
			M	M	M	M	M	M
Acenaphthene (S)	<8 µg/kg	TM218	513	14200	2150	75400	44.4	
			M	M	M	M	M	M
Fluorene (S)	<10 µg/kg	TM218	1920	62500	5410	282000	76.5	
			M	M	M	M	M	M
Phenanthrene (S)	<15 µg/kg	TM218	5930	171000	21700	671000	443	
			M	M	M	M	M	M
Anthracene (S)	<16 µg/kg	TM218	2000	51900	8630	250000	313	
			M	M	M	M	M	M
Fluoranthene (S)	<17 µg/kg	TM218	3880	111000	6190	472000	2730	
			M	M	M	M	M	M
Pyrene (S)	<15 µg/kg	TM218	2960	76400	28600	295000	2310	
			M	M	M	M	M	M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1310	38200	23300	152000	1490	
			M	M	M	M	M	M
Chrysene (S)	<10 µg/kg	TM218	1020	28400	17600	107000	1260	
			M	M	M	M	M	M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1310	31500	39700	129000	2030	
			M	M	M	M	M	M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	459	12200	15400	54100	816	
			M	M	M	M	M	M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1180	31700	26700	113000	1830	
			M	M	M	M	M	M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	555	13400	17500	51600	1100	
			M	M	M	M	M	M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	146	4100	5070	14700	313	
			M	M	M	M	M	M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	610	14900	18700	56600	1270	
			M	M	M	M	M	M
PAH 16 EPA Total	<118 µg/kg	TM218	29800	1170000	248000	4610000	16800	
			M	M	M	M	M	M

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SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66245

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A7	A7	J6	J6	J8
Depth (m)	1.50 - 2.00	3.50 - 4.00	1.10 - 1.30	5.00 - 5.50	0.00 - 0.40
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091113-84	091113-84	091113-84	091113-84	091113-84
Lab Sample No.(s)	610458	614362	614426	614451	614462

Component	LOD/Units	Method	A7	A7	J6	J6	J8
Total Aliphatics >C5-C44	<100 µg/kg	TM173	17800	248000	1040000	1080000	137000
Total Aromatics >C6-C44	<100 µg/kg	TM173	63100	2060000	3360000	5630000	464000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	80800	2310000	4400000	6700000	601000

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SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66245

VOC MS (S)

Results Legend			Sample Identity			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	A7	A7	J6
			Sample Type	1.50 - 2.00	3.50 - 4.00	5.00 - 5.50
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid
			Date Received	12/11/2009	12/11/2009	12/11/2009
			SDG Ref	13/11/2009	13/11/2009	13/11/2009
			Lab Sample No.(s)	091113-84	091113-84	091113-84
Component	LOD/Units	Method	610458	614362	614451	
Dibromofluoromethane**	%	TM116	210	120	58.6	
Toluene-d8**	%	TM116	196	97.9	72.5	
4-Bromofluorobenzene**	%	TM116	200	99.8	67.8	
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Carbon Disulphide	<9 µg/kg	TM116	<9.00	<9.00	64.5	
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Benzene	<9 µg/kg	TM116	16.3	12.5	1860	
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	
Toluene	<6 µg/kg	TM116	14.9	9.99	23100	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
Ethylbenzene	<9 µg/kg	TM116	<9.00	<9.00	18300	

SDG: 091113-84
Job: D_MOUCHEL_ELE-19
Client Reference: 12/11/09 (A7, J6 & J8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66245

VOC MS (S)

Results Legend		Sample Identity	A7	A7	J6			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 12/11/2009 13/11/2009 091113-84 610458	3.50 - 4.00 Soil/Solid 12/11/2009 13/11/2009 091113-84 614362	5.00 - 5.50 Soil/Solid 12/11/2009 13/11/2009 091113-84 614451			
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	22.0 #	<13.0 #	142000 #			
o-Xylene	<11 µg/kg	TM116	<11.0 M	<11.0 M	60600 M			
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M			
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M			
Isopropylbenzene	<9 µg/kg	TM116	<9.00 M	<9.00 M	300 M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M			
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M			
Propylbenzene	<6 µg/kg	TM116	<6.00 M	<6.00 M	532 M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	16.0 M	<8.00 M	52000 M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	14.8 #	<10.0 #	109000 #			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	63.4 #			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #			
Naphthalene	<7 µg/kg	TM116	388 #	249 #	1230000 #			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #			

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-20
Sample Delivery Group (SDG): 091116-18
Report No.: 66619
Your Reference: 13/11/09 (17)
Location: Limerick Gasworks

A total of 4 samples was received on Friday November 13, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66619

SOLID

Results Legend	Sample ID									Total	
		Depth (m)									
		0.00 - 1.00		2.00 - 3.00		3.00 - 4.00		4.00 - 5.00			
		Container		Container		Container		Container			
X Test											
N No Determination Possible											
Ammonium Soil by Titration	All		X		X		X		X	0	4
Asbestos Presence Screen	All		X							0	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	0	4
Easily Liberated Sulphide	All		X		X		X		X	0	4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0	4
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	0	4
GRO BTEX MTBE GC (S)	All	X		X		X		X		0	4
Hexavalent Chromium (s)	All		X		X		X		X	0	4
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0	4
	Cadmium		X		X		X		X	0	4
	Chromium		X		X		X		X	0	4
	Copper		X		X		X		X	0	4
	Lead		X		X		X		X	0	4
	Mercury		X		X		X		X	0	4
	Nickel		X		X		X		X	0	4
	Selenium		X		X		X		X	0	4
	Zinc		X		X		X		X	0	4
PAH micro by GCMS	All		X		X		X		X	0	4
pH	All			X		X			N	1	3
Phenols by HPLC (S)	All		X		X		X		X	0	4
Sample description	All		X		X		X		X	0	4
Total Sulphate	All		X		X		X		X	0	4
TPH CWG GC (S)	All		X		X		X		X	0	4
VOC MS (S)	All			X		X		X		0	3

SDG:	091116-18	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-20	Attention:	Verity Sankey
Client Reference:	13/11/09 (17)	Order No.:	
Location:	Limerick Gasworks	Report No:	66619

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
17	0.00 - 1.00	Brown	Sand	0.063 - 0.1 mm	Stones
	2.00 - 3.00	Grey	Sludge / Sediment	0.063 - 0.1 mm	Stones
	3.00 - 4.00	Grey	Sand	0.063 - 0.1 mm	Oil/Petroleum
	4.00 - 5.00	Black	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66619

Test Completion dates

SDG reference: 091116-18

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
I7	0.00 - 1.00	SOLID	28/11/2009	28/11/2009	20/11/2009	17/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	23/11/2009	28/11/2009	28/11/2009	20/11/2009	19/11/2009	17/11/2009	23/11/2009
	2.00 - 3.00	SOLID	30/11/2009	25/11/2009	20/11/2009	17/11/2009	25/11/2009	23/11/2009	20/11/2009	20/11/2009	20/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	25/11/2009
	3.00 - 4.00	SOLID	30/11/2009	30/11/2009	20/11/2009	17/11/2009	23/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	26/11/2009	24/11/2009	24/11/2009	24/11/2009	20/11/2009	19/11/2009	25/11/2009
	4.00 - 5.00	SOLID	30/11/2009	25/11/2009	20/11/2009	17/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	24/11/2009	23/11/2009	23/11/2009	23/11/2009	20/11/2009	19/11/2009	23/11/2009

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SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66619

Results Legend			Sample Identity	I7	I7	I7	I7
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 1.00	2.00 - 3.00	3.00 - 4.00	4.00 - 5.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref	091116-18	091116-18	091116-18	091116-18
			Lab Sample No.(s)	614699	614776	614801	614828
Component	LOD/Units	Method					
Asbestos Presence Screen	-	TM001	No ACM Detected				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	73.2	126	205	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	56.9	97.9	160	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.200	<0.100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	0.144	1.85	<0.100	0.124	
Cresols	<0.01 mg/kg	TM062 (S)	0.377	10.3	<0.230	0.0565	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<1.00	<0.500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	0.322	118	<0.150	0.328	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.200	<0.100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.200	<0.100	<0.0100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.300	<0.150	<0.0150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.844	130	0.413	0.509	
pH value of soil	1 pH Units	TM133	10.37	10.82		8.82	
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0806	<6.00	<3.00	0.0762	
Total Cyanide	<1 mg/kg	TM153	174	105	117	166	
Easily Liberated Sulphide	<15 mg/kg	TM180	54.3	1290	408	521	
Arsenic	<0.6 mg/kg	TM181	7.04	14.2	12.2	2.51	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	<0.0200	
Chromium	<0.9 mg/kg	TM181	10.9	15.3	15.3	7.77	
Copper	<1.4 mg/kg	TM181	9.23	32.8	33.0	4.96	
Lead	<0.7 mg/kg	TM181	140	31.7	165	13.0	
Mercury	<0.14 mg/kg	TM181	<0.140	0.352	0.326	<0.140	
Nickel	<0.2 mg/kg	TM181	12.1	17.6	23.0	6.85	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	32.6	23.1	20.7	18.3	
Total Sulphate	<48 mg/kg	TM221	4510	322000	42200	1220	

SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66619

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I7	I7	I7	I7
Depth (m)	0.00 - 1.00	2.00 - 3.00	3.00 - 4.00	4.00 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-18	091116-18	091116-18	091116-18
Lab Sample No.(s)	614699	614776	614801	614828

Component	LOD/Units	Method	I7	I7	I7	I7
Aromatics >EC12-EC16	<100 µg/kg	TM173	149000	3230000	1510000	54500
Aromatics >EC16-EC21	<100 µg/kg	TM173	261000	4410000	2650000	128000
Aromatics >EC21-EC35	<100 µg/kg	TM173	787000	9150000	6150000	319000
Aromatics >EC35-EC44	<100 µg/kg	TM173	126000	1190000	878000	62600
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	1320000	18000000	11200000	564000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	1320000	18000000	11200000	564000

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SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66619

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I7	I7	I7	I7
Depth (m)	0.00 - 1.00	2.00 - 3.00	3.00 - 4.00	4.00 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-18	091116-18	091116-18	091116-18
Lab Sample No.(s)	614699	614776	614801	614828

Component	LOD/Units	Method	I7	I7	I7	I7
GRO C5-C12	<44 µg/kg	TM089	7190	2180000	1320000	88500
MTBE	<5 µg/kg	TM089	<5.00	<5.00	3680	<5.00
Benzene	<10 µg/kg	TM089	1290	303000	22600	276
Toluene	<2 µg/kg	TM089	1190	436000	127000	2710
Ethyl Benzene	<3 µg/kg	TM089	211	55000	45400	2130
m & p Xylene	<6 µg/kg	TM089	1130	365000	256000	14300
o Xylene	<3 µg/kg	TM089	408	136000	103000	5900
Sum m&p and o Xylene	<10 µg/kg	TM089	1530	501000	359000	20200
Sum of BTEX	<10 µg/kg	TM089	4230	1300000	554000	25300
Aliphatics C5-C6	<10 µg/kg	TM089	286	9450	684	135
Aliphatics >C6-C8	<10 µg/kg	TM089	858	<10.0	52500	3330
Aliphatics >C8-C10	<10 µg/kg	TM089	440	131000	101000	9080
Aliphatics >C10-C12	<10 µg/kg	TM089	288	220000	182000	14800
Total Aliphatics C5-C12	<10 µg/kg	TM089	1870	361000	336000	27400
Aromatics C6-C7	<10 µg/kg	TM089	1290	303000	22600	276
Aromatics >C7-C8	<10 µg/kg	TM089	1190	436000	127000	2710
Aromatics >EC8-EC10	<10 µg/kg	TM089	2400	753000	556000	36000
Aromatics >EC10-EC12	<10 µg/kg	TM089	431	330000	272000	22200
Total Aromatics C6-C12	<10 µg/kg	TM089	5320	1820000	978000	61200

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SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66619

PAH micro by GCMS

Results Legend			Sample Identity	I7	I7	I7	I7
# ISO17025 accredited. mCERES accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 1.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614699	2.00 - 3.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614776	3.00 - 4.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614801	4.00 - 5.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614828
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	5840	2060000	2050000	191000	
Acenaphthylene (S)	<12 µg/kg	TM218	1770	375000	246000	25300	
Acenaphthene (S)	<8 µg/kg	TM218	168	64000	66100	6350	
Fluorene (S)	<10 µg/kg	TM218	593	252000	217000	20600	
Phenanthrene (S)	<15 µg/kg	TM218	2980	650000	574000	57900	
Anthracene (S)	<16 µg/kg	TM218	898	228000	193000	20200	
Fluoranthene (S)	<17 µg/kg	TM218	5150	468000	411000	42200	
Pyrene (S)	<15 µg/kg	TM218	4250	302000	267000	27500	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	2960	141000	123000	12300	
Chrysene (S)	<10 µg/kg	TM218	2400	105000	93600	9400	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	4090	131000	117000	11700	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	1670	53900	48000	4660	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	3500	106000	94200	9240	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	2710	52800	46800	4410	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	702	14700	13600	1240	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	3130	58300	51600	4860	
PAH 16 EPA Total	<118 µg/kg	TM218	42800	506000	461000	449000	

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SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66619

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I7	I7	I7	I7
Depth (m)	0.00 - 1.00	2.00 - 3.00	3.00 - 4.00	4.00 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-18	091116-18	091116-18	091116-18
Lab Sample No.(s)	614699	614776	614801	614828

Component	LOD/Units	Method	I7	I7	I7	I7
Total Aliphatics >C5-C44	<100 µg/kg	TM173	227000	3220000	2450000	160000
Total Aromatics >C6-C44	<100 µg/kg	TM173	1330000	19800000	12200000	625000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	1560000	23000000	14600000	786000

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SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66619

VOC MS (S)

Results Legend			Sample Identity	I7	I7	I7
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.00 - 3.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614776	3.00 - 4.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614801	4.00 - 5.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614828
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM116		126	128	96.3
Toluene-d8**	%	TM116		58.1	65.0	71.3
4-Bromofluorobenzene**	%	TM116		82.8	79.0	56.4
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00
Carbon Disulphide	<9 µg/kg	TM116		799	1810	78.2
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0
Benzene	<9 µg/kg	TM116		338000	20700	195
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0
Toluene	<6 µg/kg	TM116		491000	32600	1160
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0
Ethylbenzene	<9 µg/kg	TM116		98100	16600	1220

SDG: 091116-18
Job: D_MOUCHEL_ELE-20
Client Reference: 13/11/09 (I7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66619

VOC MS (S)

Results Legend		Sample Identity	I7	I7	I7
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.00 - 3.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614776	3.00 - 4.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614801	4.00 - 5.00 Soil/Solid 13/11/2009 13/11/2009 091116-18 614828
Component	LOD/Units	Method			
p/m-Xylene	<13 µg/kg	TM116	598000	112000	3560
				#	#
o-Xylene	<11 µg/kg	TM116	239000	46800	1710
				M	M
Styrene	<11 µg/kg	TM116	<11.0	<11.0	<11.0
			M	M	M
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	<12.0
			M	M	M
Isopropylbenzene	<9 µg/kg	TM116	10800	7440	244
			M	M	M
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	<15.0
			#	#	#
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	<13.0
			M	M	M
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	<14.0
			M	M	M
Propylbenzene	<6 µg/kg	TM116	16100	10500	367
			M	M	M
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	<14.0
			#	#	#
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	82900	27400	1590
			M	M	M
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	<9.00
			#	#	#
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0
			#	#	#
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	179000	62600	4550
			#	#	#
sec-Butylbenzene	<8 µg/kg	TM116	960	1190	38.5
			#	#	#
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	3520	146
			#	#	#
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00
			#	#	#
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	<11.0
			M	M	M
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00
			#	#	#
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00
			M	M	M
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	<11.0
			M	M	M
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	<7.00
			#	#	#
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	<9.00
			#	#	#
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	<15.0
			#	#	#
Naphthalene	<7 µg/kg	TM116	4480000	1340000	135000
			#	#	#
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0
			#	#	#

Notification of NDPs (No determination possible)

SDG Number	091116-18	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	13/11/09 (I7)	Report No.	28940-0
Attention	Dave Watts	Date Received	16/11/2009 10:39:58

Sample No	Sample Identity	Depth (m)	Test	Comment
622073	I7	3.00 - 4.00	pH	Sample contains oil / product
622073	I7	3.00 - 4.00	pH	Sample contains oil / product
622073	I7	3.00 - 4.00	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-23
Sample Delivery Group (SDG): 091116-23
Your Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks
Report No.: 66893

A total of 5 samples was received on Friday November 13, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091116-23
 Job: D_MOUCHEL_ELE-23
 Client Reference: 12/11/09 (A8 & A6)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66893

SOLID

Results Legend	Sample ID	A6						A8		Total		
		0.00 - 0.50		3.50 - 4.00		5.80 - 6.00		1.50 - 2.00			3.50 - 4.00	
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)			
Ammonium Soil by Titration	All									0		
Asbestos Presence Screen	All	X	X	X	X	X	X	X	X	5		
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X	X	X	X	X	X	X	X	0		
Easily Liberated Sulphide	All	X	X	X	X	X	X	X	X	5		
EPH CWG (Aliphatic) GC (S)	All	X	X	X	X	X	X	X	X	0		
EPH CWG (Aromatic) GC (S)	All	X	X	X	X	X	X	X	X	5		
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	X	X	X	0		
Hexavalent Chromium (s)	All	X	X	X	X	X	X	X	X	5		
Metals by iCap-OES (Soil)	Arsenic	X	X	X	X	X	X	X	X	0		
	Cadmium	X	X	X	X	X	X	X	X	5		
	Chromium	X	X	X	X	X	X	X	X	0		
	Copper	X	X	X	X	X	X	X	X	5		
	Lead	X	X	X	X	X	X	X	X	0		
	Mercury	X	X	X	X	X	X	X	X	5		
	Nickel	X	X	X	X	X	X	X	X	0		
	Selenium	X	X	X	X	X	X	X	X	5		
	Zinc	X	X	X	X	X	X	X	X	0		
PAH by GCMS	All							X		0		
PAH micro by GCMS	All	X	X	X	X	X	X			1		
PCBs by GCMS	All						X			0		
pH	All	X	X	X	X	X	X	X	X	0		
Phenols by HPLC (S)	All	X	X	X	X	X	X	X	X	5		
Sample description	All	X	X	X	X	X	X	X	X	0		
Total Sulphate	All	X	X	X	X	X	X	X	X	5		
TPH CWG GC (S)	All	X	X	X	X	X	X	X	X	0		
VOC MS (S)	All		X	X				X		0		
										3		

SDG:	091116-23	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-23	Attention:	Verity Sankey
Client Reference:	12/11/09 (A8 & A6)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66893

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
A6	0.00 - 0.50	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	3.50 - 4.00	Grey	Silty Sand	0.063 - 0.1 mm	Oil/Petroleum
	5.80 - 6.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
A8	1.50 - 2.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	3.50 - 4.00	Grey	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66893

Test Completion dates

SDG reference: 091116-23

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
A6	0.00 - 0.50	SOLID	23/11/2009	17/11/2009	19/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	18/11/2009	20/11/2009	25/11/2009	
	3.50 - 4.00	SOLID	26/11/2009	19/11/2009	20/11/2009	20/11/2009	23/11/2009	23/11/2009	26/11/2009	20/11/2009	21/11/2009	20/11/2009	20/11/2009	20/11/2009	23/11/2009	18/11/2009	20/11/2009	26/11/2009	24/11/2009
	5.80 - 6.00	SOLID	25/11/2009	19/11/2009	20/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	23/11/2009	17/11/2009	20/11/2009	25/11/2009	24/11/2009
A8	1.50 - 2.00	SOLID	23/11/2009	19/11/2009	20/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	18/11/2009	20/11/2009	25/11/2009	
	3.50 - 4.00	SOLID	23/11/2009	19/11/2009	20/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	18/11/2009	20/11/2009	23/11/2009	30/11/2009

SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

Results Legend			Sample Identity		A6	A6	A6	A8	A8	
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	0.00 - 0.50	3.50 - 4.00	5.80 - 6.00	1.50 - 2.00	3.50 - 4.00	
			Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref	091116-23	091116-23	091116-23	091116-23	091116-23	091116-23	091116-23
			Lab Sample No.(s)	615275	615332	615354	615068	615222		
Component	LOD/Units	Method								
Asbestos Presence Screen	-	TM001	No ACM Detected							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	1100	333	<15.0	145			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	852	259	<15.0	112			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0500	<0.0200	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	7.08	13.2	<0.0100	0.317			
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	21.1	16.3	<0.0100	0.0766			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.250	<0.100	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	48.7	11.9	<0.0150	0.372			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0500	<0.0200	<0.0100	<0.0100			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0500	<0.0200	<0.0100	<0.0100			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0750	<0.0300	<0.0150	<0.0150			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	76.9	41.4	0.00	0.766			
pH value of soil	1 pH Units	TM133	8.78	9.52	9.01	9.03	8.09			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	<0.600	0.0718			
Total Cyanide	<1 mg/kg	TM153	17.0	12.7	<1.00	<1.00	56.8			
PCB congener 28	<3 µg/kg	TM168				<3.00				
PCB congener 52	<3 µg/kg	TM168				<3.00				
PCB congener 101	<3 µg/kg	TM168				<3.00				
PCB congener 118	<3 µg/kg	TM168				<3.00				
PCB congener 138	<3 µg/kg	TM168				<3.00				
PCB congener 153	<3 µg/kg	TM168				<3.00				
PCB congener 180	<3 µg/kg	TM168				<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	18.7	35.2	24.3	<15.0	334			
Arsenic	<0.6 mg/kg	TM181	4.22	6.40	15.4	4.26	11.8			
Cadmium	<0.02 mg/kg	TM181	0.0366	<0.0200	0.861	<0.0200	0.0298			
Chromium	<0.9 mg/kg	TM181	4.20	14.1	6.24	2.87	7.02			
Copper	<1.4 mg/kg	TM181	6.09	22.6	5.54	4.34	4.29			
Lead	<0.7 mg/kg	TM181	13.3	18.2	12.3	8.86	10.7			
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	0.173	<0.140	<0.140			
Nickel	<0.2 mg/kg	TM181	8.86	22.7	12.4	7.36	8.76			
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	9.04			
Zinc	<1.9 mg/kg	TM181	34.2	25.4	25.9	24.7	17.3			
Total Sulphate	<48 mg/kg	TM221	419	2620	385	63.2	10900			

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SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A6	A6	A6	A8	A8
Depth (m)	0.00 - 0.50	3.50 - 4.00	5.80 - 6.00	1.50 - 2.00	3.50 - 4.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-23	091116-23	091116-23	091116-23	091116-23
Lab Sample No.(s)	615275	615332	615354	615068	615222

Component	LOD/Units	Method	A6	A6	A6	A8	A8
Aliphatics >C12-C16	<100 µg/kg	TM173	11000	95800	40600	<100	6780
Aliphatics >C16-C21	<100 µg/kg	TM173	11300	118000	41700	<100	2770
Aliphatics >C21-C35	<100 µg/kg	TM173	27700	165000	49600	<100	620
Aliphatics >C35-C44	<100 µg/kg	TM173	13000	20700	3360	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	63100	400000	135000	<100	10200
Aliphatics >C16-C35	<100 µg/kg	TM173	39100	283000	91400	<100	3390

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SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

GRO BTEX MTBE GC (S)

Results Legend	Sample Identity	A6	A6	A6	A8	A8
	Depth (m)	0.00 - 0.50	3.50 - 4.00	5.80 - 6.00	1.50 - 2.00	3.50 - 4.00
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
	Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
	SDG Ref	091116-23	091116-23	091116-23	091116-23	091116-23
	Lab Sample No.(s)	615275	615332	615354	615068	615222

Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	68.6	527000	48200	<44.0	8270	
			#	#	#	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	467	<5.00	<5.00	<5.00	
			#	#	#	#	#	#
Benzene	<10 µg/kg	TM089	<10.0	7060	2270	<10.0	632	
			M	M	M	M	M	M
Toluene	<2 µg/kg	TM089	<7.00	29800	4930	<2.00	271	
			M	M	M	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	8580	916	<3.00	161	
			M	M	M	M	M	M
m & p Xylene	<6 µg/kg	TM089	<6.00	61900	7380	<6.00	959	
			M	M	M	M	M	M
o Xylene	<3 µg/kg	TM089	<3.00	27300	2760	<3.00	388	
			M	M	M	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	89200	10100	<10.0	1350	
			M	M	M	M	M	M
Sum of BTEX	<10 µg/kg	TM089	<10.0	135000	18300	<10.0	2410	
			M	M	M	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	189	96.0	<10.0	<10.0	
Aliphatics >C6-C8	<10 µg/kg	TM089	10.2	11500	1050	<10.0	88.0	
Aliphatics >C8-C10	<10 µg/kg	TM089	13.4	37500	3700	<10.0	551	
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	115000	7820	<10.0	1750	
Total Aliphatics C5-C12	<10 µg/kg	TM089	23.6	164000	12700	<10.0	2390	
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	7060	2270	<10.0	632	
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	29800	4930	<10.0	271	
Aromatics >EC8-EC10	<10 µg/kg	TM089	20.1	154000	16600	<10.0	2340	
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	172000	11700	<10.0	2630	
Total Aromatics C6-C12	<10 µg/kg	TM089	20.1	363000	35600	<10.0	5870	

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SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

PAH by GCMS

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A8
Depth (m)	3.50 - 4.00
Sample Type	Soil/Solid
Date Sampled	12/11/2009
Date Received	13/11/2009
SDG Ref	091116-23
Lab Sample No.(s)	615222

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	2490	M		
Acenaphthylene (S)	<12 µg/kg	TM218	182	M		
Acenaphthene (S)	<8 µg/kg	TM218	83.2	M		
Fluorene (S)	<10 µg/kg	TM218	297	M		
Phenanthrene (S)	<15 µg/kg	TM218	914	M		
Anthracene (S)	<16 µg/kg	TM218	365	M		
Fluoranthene (S)	<17 µg/kg	TM218	1260	M		
Pyrene (S)	<15 µg/kg	TM218	953	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	464	M		
Chrysene (S)	<10 µg/kg	TM218	369	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	439	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	159	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	332	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	209	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	64.0	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	246	M		
PAH 16 EPA Total	<118 µg/kg	TM218	8820	M		

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SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

PAH micro by GCMS

Results Legend			Sample Identity	A6	A6	A6	A8		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	3.50 - 4.00	5.80 - 6.00	1.50 - 2.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009		
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
			SDG Ref	091116-23	091116-23	091116-23	091116-23		
	Lab Sample No.(s)	615275	615332	615354	615068				
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	233	1170000	55100	32.1			
Acenaphthylene (S)	<12 µg/kg	TM218	648	91900	8300	82.4			
Acenaphthene (S)	<8 µg/kg	TM218	43.6	33100	1920	<8.00			
Fluorene (S)	<10 µg/kg	TM218	105	133000	9060	14.8			
Phenanthrene (S)	<15 µg/kg	TM218	727	356000	24400	106			
Anthracene (S)	<16 µg/kg	TM218	470	91200	7820	48.9			
Fluoranthene (S)	<17 µg/kg	TM218	2240	236000	15900	265			
Pyrene (S)	<15 µg/kg	TM218	1990	170000	10900	201			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1190	78600	5660	167			
Chrysene (S)	<10 µg/kg	TM218	924	54000	4040	120			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1790	57600	4420	229			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	585	26200	1980	90.3			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1580	58000	4400	214			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	1030	30600	724	139			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	259	8580	543	37.5			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1120	31300	2050	168			
PAH 16 EPA Total	<118 µg/kg	TM218	14900	2620000	157000	1910			

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SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A6	A6	A6	A8	A8
Depth (m)	0.00 - 0.50	3.50 - 4.00	5.80 - 6.00	1.50 - 2.00	3.50 - 4.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-23	091116-23	091116-23	091116-23	091116-23
Lab Sample No.(s)	615275	615332	615354	615068	615222

Component	LOD/Units	Method	A6	A6	A6	A8	A8
Total Aliphatics >C5-C44	<100 µg/kg	TM173	63100	563000	148000	<100	12600
Total Aromatics >C6-C44	<100 µg/kg	TM173	64000	4230000	995000	1510	26300
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	127000	4790000	1140000	1510	38800

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SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

VOC MS (S)

Results Legend			Sample Identity			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	A6	A6	A8
			Sample Type	3.50 - 4.00	3.50 - 4.00	3.50 - 4.00
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid
			Date Received	12/11/2009	12/11/2009	12/11/2009
			SDG Ref	13/11/2009	13/11/2009	13/11/2009
			Lab Sample No.(s)	091116-23	091116-23	091116-23
Component	LOD/Units	Method	A6	A6	A8	
Dibromofluoromethane**	%	TM116	95.0	108	99.9	
Toluene-d8**	%	TM116	57.0	89.5	87.1	
4-Bromofluorobenzene**	%	TM116	68.0	72.4	78.5	
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Carbon Disulphide	<9 µg/kg	TM116	68.7	<9.00	39.8	
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Benzene	<9 µg/kg	TM116	10300	7370	367	
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	
Toluene	<6 µg/kg	TM116	24900	7220	153	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
Ethylbenzene	<9 µg/kg	TM116	4860	1320	92.7	

SDG: 091116-23
Job: D_MOUCHEL_ELE-23
Client Reference: 12/11/09 (A8 & A6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66090

VOC MS (S)

Results Legend		Sample Identity	A6	A6	A8
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.50 - 4.00 Soil/Solid 12/11/2009 13/11/2009 091116-23 615332	5.80 - 6.00 Soil/Solid 12/11/2009 13/11/2009 091116-23 615354	3.50 - 4.00 Soil/Solid 12/11/2009 13/11/2009 091116-23 615222
Component	LOD/Units	Method			
p/m-Xylene	<13 µg/kg	TM116	50100 #	9390	575 #
o-Xylene	<11 µg/kg	TM116	18400 M	3390	232 M
Styrene	<11 µg/kg	TM116	3690 M	<11.0 M	<11.0 M
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M
Isopropylbenzene	<9 µg/kg	TM116	765 M	108 M	12.4 M
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M
Propylbenzene	<6 µg/kg	TM116	1360 M	233 M	26.6 M
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	5690 M	1350 M	135 M
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	11500 #	2490 #	319 #
sec-Butylbenzene	<8 µg/kg	TM116	110 #	26.0 #	<8.00 #
4-Isopropyltoluene	<8 µg/kg	TM116	577 #	<8.00 #	13.4 #
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
Naphthalene	<7 µg/kg	TM116	1130000	86400	419000
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 09 December 2009
Job: D_MOUCHEL_ELE-22
Sample Delivery Group (SDG): 091116-31
Your Reference: 13/11/09 (J7 & I8)
Location: Limerick Gasworks
Report No.: 66093

A total of 9 samples was received on Friday November 13, 2009 and completed on Wednesday December 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091116-31
 Job: D_MOUCHEL_ELE-22
 Client Reference: 13/11/09 (J7 & I8)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66093

SOLID

Results Legend	Sample ID											Total		
		18											J7	
		1.00 - 1.50		3.00 - 3.50		3.50 - 3.90		3.90 - 4.30		4.40 - 4.50				4.00 - 4.50
60g VOC Dublin JAR (D)		60g VOC Dublin JAR (D)		60g VOC Dublin TUB (D)		60g VOC Dublin JAR (D)		60g VOC Dublin TUB (D)		60g VOC Dublin JAR (D)		TUB (D)		
Ammonium Soil by Titration	All													0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X		X	X	X	X	X	X	X	X	X	X	8
Easily Liberated Sulphide	All	X		X	X	X	X	X	X	X	X	X	X	8
EPH CWG (Aliphatic) GC (S)	All	X		X	X	X	X	X	X	X	X	X	X	8
EPH CWG (Aromatic) GC (S)	All	X		X	X	X	X	X	X	X	X	X	X	8
GRO BTEX MTBE GC (S)	All	X		X	X	X	X	X	X	X	X	X	X	8
Hexavalent Chromium (s)	All	X		X	X	X	X	X	X	X	X	X	X	8
Metals by iCap-OES (Soil)	Arsenic	X		X	X	X	X	X	X	X	X	X	X	8
	Cadmium	X		X	X	X	X	X	X	X	X	X	X	8
	Chromium	X		X	X	X	X	X	X	X	X	X	X	8
	Copper	X		X	X	X	X	X	X	X	X	X	X	8
	Lead	X		X	X	X	X	X	X	X	X	X	X	8
	Mercury	X		X	X	X	X	X	X	X	X	X	X	8
	Nickel	X		X	X	X	X	X	X	X	X	X	X	8
	Selenium	X		X	X	X	X	X	X	X	X	X	X	8
	Zinc	X		X	X	X	X	X	X	X	X	X	X	8
PAH micro by GCMS	All	X		X	X	X	X	X	X	X	X	X	X	8
PCBs by GCMS	All		X											1
pH	All		X		N	X	X	X	X	X	X	X	X	7
Phenols by HPLC (S)	All	X		X	X	X	X	X	X	X	X	X	X	8
Sample description	All	X	X	X	X	X	X	X	X	X	X	X	X	9
Total Sulphate	All	X		X	X	X	X	X	X	X	X	X	X	8
TPH CWG GC (S)	All	X		X	X	X	X	X	X	X	X	X	X	8
VOC MS (S)	All	X		X	X	X	X		X		X		X	6

SDG:	091116-31	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-22	Attention:	Verity Sankey
Client Reference:	13/11/09 (J7 & I8)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66093

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
I8	1.00 - 1.50	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	3.00 - 3.50	Black	Sandy Clay	0.1 - 2 mm	Tar
	3.50 - 3.90	Black	N/A	N/A	Tar
	3.90 - 4.30	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	4.40 - 4.50	Black	Sand	0.1 - 2 mm	Oil/Petroleum
J7	1.50 - 1.70	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	2.50 - 3.00	Grey	Sandy Clay	0.1 - 2 mm	Stones
	3.50 - 4.00	Brown	Sand	0.1 - 2 mm	Stones
	4.00 - 4.50	Grey	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091116-31
 Job: D_MOUCHEL_ELE-22
 Client Reference: 13/11/09 (J7 & 18)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66093

Test Completion dates

SDG reference: 091116-31

Sample ID	Depth	Type	Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)	
18	1.00 - 1.50	SOLID	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	24/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	17/11/2009	20/11/2009	20/11/2009	25/11/2009	24/11/2009
	3.00 - 3.50	SOLID									09/12/2009				04/12/2009				
	3.50 - 3.90	SOLID	23/11/2009	19/11/2009	20/11/2009	24/11/2009	20/11/2009	24/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	20/11/2009	20/11/2009	25/11/2009	24/11/2009
	3.90 - 4.30	SOLID	25/11/2009	19/11/2009	20/11/2009	20/11/2009	24/11/2009	24/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	17/11/2009	20/11/2009	25/11/2009	30/11/2009
	4.40 - 4.50	SOLID	25/11/2009	18/11/2009	20/11/2009	20/11/2009	20/11/2009	24/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	17/11/2009	20/11/2009	25/11/2009	30/11/2009
J7	1.50 - 1.70	SOLID	23/11/2009	19/11/2009	20/11/2009	19/11/2009	19/11/2009	23/11/2009	20/11/2009	19/11/2009	21/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	17/11/2009	19/11/2009	23/11/2009	23/11/2009
	2.50 - 3.00	SOLID	23/11/2009	19/11/2009	20/11/2009	19/11/2009	19/11/2009	23/11/2009	20/11/2009	19/11/2009	23/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	17/11/2009	19/11/2009	24/11/2009	24/11/2009
	3.50 - 4.00	SOLID	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	21/11/2009	20/11/2009	19/11/2009	21/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	17/11/2009	20/11/2009	21/11/2009	21/11/2009
	4.00 - 4.50	SOLID	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	21/11/2009	20/11/2009	20/11/2009	22/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	17/11/2009	20/11/2009	21/11/2009	24/11/2009

SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66093

Results Legend			Sample Identity	I8	I8	I8	I8	I8	J7
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.00 - 1.50 Soil/Solid 13/11/2009 13/11/2009 091116-31 615832	3.00 - 3.50 Soil/Solid 13/11/2009 13/11/2009 091116-31 615869	3.50 - 3.90 Soil/Solid 13/11/2009 13/11/2009 091116-31 615927	3.90 - 4.30 Soil/Solid 13/11/2009 13/11/2009 091116-31 616022	4.40 - 4.50 Soil/Solid 13/11/2009 13/11/2009 091116-31 677396	1.50 - 1.70 Soil/Solid 13/11/2009 13/11/2009 091116-31 615494
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	818		914	282	66.8	<15.0	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	636		711	220	52.0	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.500		<1.00	<0.0100	<0.500	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	92.2		631	218	126	<0.0100	
Cresols	<0.01 mg/kg	TM062 (S)	106		1510	292	401	<0.0100	
Resorcinol	<0.05 mg/kg	TM062 (S)	<2.50		<5.00	<2.50	<2.50	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	130		958	203	494	<0.0150	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.500		<1.00	<0.500	55.0	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.500		<1.00	<0.500	<0.500	<0.0100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.750		<1.50	<0.750	<0.750	<0.0150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	328		3100	714	1070	0.00	
pH value of soil	1 pH Units	TM133	8.52			10.50	11.62	7.99	
Hexavalent Chromium	<0.6 mg/kg	TM151	<12.0		<6.00	<6.00	<3.00	<6.00	
Total Cyanide	<1 mg/kg	TM153	28.3		449	3.51	1.35	58.9	
PCB congener 28	<3 µg/kg	TM168		<3.00					
PCB congener 52	<3 µg/kg	TM168		<3.00					
PCB congener 101	<3 µg/kg	TM168		<3.00					
PCB congener 118	<3 µg/kg	TM168		<3.00					
PCB congener 138	<3 µg/kg	TM168		<3.00					
PCB congener 153	<3 µg/kg	TM168		<3.00					
PCB congener 180	<3 µg/kg	TM168		<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	23.3		3180	118	56.6	31.1	
Arsenic	<0.6 mg/kg	TM181	16.8		46.8	15.0	11.0	9.23	
Cadmium	<0.02 mg/kg	TM181	0.453		1.42	0.418	<0.0200	0.0738	
Chromium	<0.9 mg/kg	TM181	11.6		7.51	33.9	5.66	17.5	
Copper	<1.4 mg/kg	TM181	23.8		34.8	31.3	3.67	18.9	
Lead	<0.7 mg/kg	TM181	278		2710	73.9	10.4	191	
Mercury	<0.14 mg/kg	TM181	2.00		2.85	<0.140	<0.140	0.322	
Nickel	<0.2 mg/kg	TM181	15.3		18.4	50.4	4.36	28.3	
Selenium	<1 mg/kg	TM181	<1.00		1.83	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	73.0		128	80.3	12.7	50.1	
Total Sulphate	<48 mg/kg	TM221	1390		21100	971	5210	2220	

SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & I8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66093

GRO BTEX MTBE GC (S)

Results Legend	Sample Identity	I8	I8	I8	I8	J7
	Depth (m)	1.00 - 1.50	3.50 - 3.90	3.90 - 4.30	4.40 - 4.50	1.50 - 1.70
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
	Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
	SDG Ref	091116-31	091116-31	091116-31	091116-31	091116-31
	Lab Sample No.(s)	615832	615927	616022	677396	615494

Component	LOD/Units	Method	I8	I8	I8	I8	J7
GRO C5-C12	<44 µg/kg	TM089	793000	2720000	293000	2080000	149
			#		#		#
MTBE	<5 µg/kg	TM089	989	<5.00	<5.00	<5.00	<5.00
			#		#		#
Benzene	<10 µg/kg	TM089	21400	854000	35700	738000	14.2
			M		M	M	M
Toluene	<2 µg/kg	TM089	62300	808000	45000	480000	<9.00
			M		M	M	M
Ethyl Benzene	<3 µg/kg	TM089	16200	46500	7500	43900	<3.00
			M		M	M	M
m & p Xylene	<6 µg/kg	TM089	92600	285000	43400	252000	<6.00
			M		M	M	M
o Xylene	<3 µg/kg	TM089	45600	115000	16800	84000	<6.00
			M		M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	138000	400000	60200	336000	<10.0
			M		M	M	M
Sum of BTEX	<10 µg/kg	TM089	238000	2110000	148000	1600000	14.2
			M		M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	277	787000	1350	10100	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	17700	<10.0	3210	<10.0	34.7
Aliphatics >C8-C10	<10 µg/kg	TM089	77100	166000	17600	79100	23.4
Aliphatics >C10-C12	<10 µg/kg	TM089	137000	161000	36300	145000	10.7
Total Aliphatics C5-C12	<10 µg/kg	TM089	232000	1110000	60700	234000	68.8
Aromatics C6-C7	<10 µg/kg	TM089	21400	854000	35700	738000	14.2
Aromatics >C7-C8	<10 µg/kg	TM089	62300	808000	45000	480000	<10.0
Aromatics >EC8-EC10	<10 µg/kg	TM089	270000	696000	94400	499000	35.2
Aromatics >EC10-EC12	<10 µg/kg	TM089	206000	241000	57400	217000	16.0
Total Aromatics C6-C12	<10 µg/kg	TM089	560000	2600000	233000	1930000	65.4

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & I8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66093

PAH micro by GCMS

Results Legend			Sample Identity	I8	I8	I8	I8	J7
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.00 - 1.50 Soil/Solid 13/11/2009 13/11/2009 091116-31 615832	3.50 - 3.90 Soil/Solid 13/11/2009 13/11/2009 091116-31 615927	3.90 - 4.30 Soil/Solid 13/11/2009 13/11/2009 091116-31 616022	4.40 - 4.50 Soil/Solid 13/11/2009 13/11/2009 091116-31 677396	1.50 - 1.70 Soil/Solid 13/11/2009 13/11/2009 091116-31 615494
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	2710000	14500000	250000	9420000	2420	
Acenaphthylene (S)	<12 µg/kg	TM218	449000	2990000	50600	1310000	8400	
Acenaphthene (S)	<8 µg/kg	TM218	259000	457000	7680	260000	2520	
Fluorene (S)	<10 µg/kg	TM218	485000	2350000	40100	1520000	8320	
Phenanthrene (S)	<15 µg/kg	TM218	1230000	5710000	97800	3570000	27100	
Anthracene (S)	<16 µg/kg	TM218	447000	2060000	30700	1110000	11000	
Fluoranthene (S)	<17 µg/kg	TM218	904000	3620000	60900	2330000	32000	
Pyrene (S)	<15 µg/kg	TM218	581000	2370000	39500	1480000	23400	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	296000	1120000	20400	220000	12700	
Chrysene (S)	<10 µg/kg	TM218	211000	851000	14100	557000	9020	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	236000	833000	15800	633000	13000	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	96300	395000	5950	268000	5540	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	226000	748000	14600	552000	11800	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	103000	347000	6340	261000	5680	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	27700	97400	1880	71500	1500	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	110000	350000	6630	275000	5600	
PAH 16 EPA Total	<118 µg/kg	TM218	8370000	38800000	663000	23900000	180000	

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & I8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66093

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I8	I8	I8	I8	J7
Depth (m)	1.00 - 1.50	3.50 - 3.90	3.90 - 4.30	4.40 - 4.50	1.50 - 1.70
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-31	091116-31	091116-31	091116-31	091116-31
Lab Sample No.(s)	615832	615927	616022	677396	615494

Component	LOD/Units	Method	I8	I8	I8	I8	J7
Total Aliphatics >C5-C44	<100 µg/kg	TM173	1650000	15100000	74200	4060000	1510000
Total Aromatics >C6-C44	<100 µg/kg	TM173	11300000	81000000	284000	40700000	3580000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	13000000	96100000	358000	44700000	5090000

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66093

VOC MS (S)

Results Legend			Sample Identity				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	I8	I8	I8	I8
			Sample Type	1.00 - 1.50	3.50 - 3.90	3.90 - 4.30	4.40 - 4.50
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Lab Sample No.(s)	091116-31	091116-31	091116-31	091116-31			
Component	LOD/Units	Method	I8	I8	I8	I8	
Dibromofluoromethane**	%	TM116	137	91.7	117	108	
Toluene-d8**	%	TM116	58.5	64.7	76.6	60.7	
4-Bromofluorobenzene**	%	TM116	85.3	57.6	59.1	66.3	
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	<13.0	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
Carbon Disulphide	<9 µg/kg	TM116	48.8	237	53.8	230	
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	<8.00	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	<13.0	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	
Benzene	<9 µg/kg	TM116	12400	1200000	6540	718000	
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	<25.0	
Toluene	<6 µg/kg	TM116	39700	843000	6900	473000	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0	<27.0	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00	
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	<14.0	
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0	
Ethylbenzene	<9 µg/kg	TM116	5400	158000	7450	98700	

SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66093

VOC MS (S)

Component	LOD/Units	Method	Sample Identity				
			18	18	18	18	
Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.00 - 1.50 Soil/Solid 13/11/2009 13/11/2009 091116-31 615832	3.50 - 3.90 Soil/Solid 13/11/2009 13/11/2009 091116-31 615927	3.90 - 4.30 Soil/Solid 13/11/2009 13/11/2009 091116-31 616022	4.40 - 4.50 Soil/Solid 13/11/2009 13/11/2009 091116-31 677396
p/m-Xylene	<13 µg/kg	TM116	79100 #	1010000	44500 #	532000	
o-Xylene	<11 µg/kg	TM116	32500 M	354000	16000 M	187000	
Styrene	<11 µg/kg	TM116	5860 M	194000	<11.0 M	<11.0 M	
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	<12.0 M	
Isopropylbenzene	<9 µg/kg	TM116	1070 M	10000 M	214 M	3480 M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	<13.0 M	
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	<14.0 M	
Propylbenzene	<6 µg/kg	TM116	2070 M	23400 M	409 M	6590 M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #	<14.0 #	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	6720 M	103000 M	1950 M	63800 M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	<12.0 #	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	42900 #	199000 #	10800 #	116000 #	
sec-Butylbenzene	<8 µg/kg	TM116	228 #	2040 #	41.0 #	<8.00 #	
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	<8.00 #	179 #	<8.00 #	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	<8.00 #	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	<8.00 M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #	
Naphthalene	<7 µg/kg	TM116	1320000	14300000	195000	6640000	
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	<12.0 #	

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66093

Results Legend			Sample Identity	J7	J7	J7
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	3.50 - 4.00	4.00 - 4.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	13/11/2009	13/11/2009	17/11/2009
			Date Received	13/11/2009	13/11/2009	13/11/2009
			SDG Ref	091116-31	091116-31	091116-31
			Lab Sample No.(s)	615504	615513	615767
Component	LOD/Units	Method				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	114 M	22.8 M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	88.8	17.7	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0300 M	0.280 M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	0.0770 M	0.796 M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	0.192 M	0.231 M	1.04 M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.170	<0.230	2.12	
pH value of soil	1 pH Units	TM133	7.48 M	8.57 M	8.81 M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00 #	<0.600 #	<0.600 #	
Total Cyanide	<1 mg/kg	TM153	22.6 M	200 M	9.90 M	
Easily Liberated Sulphide	<15 mg/kg	TM180	465 #	2720 #	835 #	
Arsenic	<0.6 mg/kg	TM181	7.22 M	9.00 M	2.39 M	
Cadmium	<0.02 mg/kg	TM181	0.531 M	0.236 M	<0.0200 M	
Chromium	<0.9 mg/kg	TM181	8.46 M	12.3 M	4.14 M	
Copper	<1.4 mg/kg	TM181	15.3 M	30.8 M	1.57 M	
Lead	<0.7 mg/kg	TM181	112 M	29.0 M	1.04 M	
Mercury	<0.14 mg/kg	TM181	0.884 M	0.506 M	<0.140 M	
Nickel	<0.2 mg/kg	TM181	9.56 M	20.8 M	1.65 M	
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	
Zinc	<1.9 mg/kg	TM181	214 M	34.6 M	8.79 M	
Total Sulphate	<48 mg/kg	TM221	25100 M	13900 M	1390 M	

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66093

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J7	J7	J7
Depth (m)	2.50 - 3.00	3.50 - 4.00	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	17/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-31	091116-31	091116-31
Lab Sample No.(s)	615504	615513	615767

Component	LOD/Units	Method	J7	J7	J7
Aliphatics >C12-C16	<100 µg/kg	TM173	135000	903	13500
Aliphatics >C16-C21	<100 µg/kg	TM173	99900	806	1850
Aliphatics >C21-C35	<100 µg/kg	TM173	99000	<100	877
Aliphatics >C35-C44	<100 µg/kg	TM173	22700	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	357000	1710	16200
Aliphatics >C16-C35	<100 µg/kg	TM173	199000	806	2730

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66093

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J7	J7	J7
Depth (m)	2.50 - 3.00	3.50 - 4.00	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	17/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-31	091116-31	091116-31
Lab Sample No.(s)	615504	615513	615767

Component	LOD/Units	Method	J7	J7	J7
GRO C5-C12	<44 µg/kg	TM089	37900 #	36800 #	5580 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	61.2 M	246 M	170 M
Toluene	<2 µg/kg	TM089	122 M	399 M	158 M
Ethyl Benzene	<3 µg/kg	TM089	450 M	328 M	38.7 M
m & p Xylene	<6 µg/kg	TM089	2330 M	1890 M	260 M
o Xylene	<3 µg/kg	TM089	1360 M	1010 M	79.6 M
Sum m&p and o Xylene	<10 µg/kg	TM089	3690 M	2900 M	340 M
Sum of BTEX	<10 µg/kg	TM089	4330 M	3880 M	706 M
Aliphatics C5-C6	<10 µg/kg	TM089	11.5	21.1	11.2
Aliphatics >C6-C8	<10 µg/kg	TM089	218	1170	37.1
Aliphatics >C8-C10	<10 µg/kg	TM089	3990	4570	803
Aliphatics >C10-C12	<10 µg/kg	TM089	9330	8130	1630
Total Aliphatics C5-C12	<10 µg/kg	TM089	13500	13900	1980
Aromatics C6-C7	<10 µg/kg	TM089	61.2	246	170
Aromatics >C7-C8	<10 µg/kg	TM089	122	399	158
Aromatics >EC8-EC10	<10 µg/kg	TM089	10100	10400	834
Aromatics >EC10-EC12	<10 µg/kg	TM089	14000	12200	2440
Total Aromatics C6-C12	<10 µg/kg	TM089	24300	22900	3600

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66093

PAH micro by GCMS

Results Legend		Sample Identity	J7	J7	J7			
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 13/11/2009 13/11/2009 091116-31 615504	3.50 - 4.00 Soil/Solid 13/11/2009 13/11/2009 091116-31 615513	4.00 - 4.50 Soil/Solid 17/11/2009 13/11/2009 091116-31 615767			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	554000 M	40200 M	6000 M			
Acenaphthylene (S)	<12 µg/kg	TM218	30800 M	18800 M	1110 M			
Acenaphthene (S)	<8 µg/kg	TM218	20400 M	5720 M	442 M			
Fluorene (S)	<10 µg/kg	TM218	39300 M	20900 M	1400 M			
Phenanthrene (S)	<15 µg/kg	TM218	94900 M	38800 M	3600 M			
Anthracene (S)	<16 µg/kg	TM218	29700 M	14200 M	1280 M			
Fluoranthene (S)	<17 µg/kg	TM218	65300 M	37700 M	2700 M			
Pyrene (S)	<15 µg/kg	TM218	41500 M	26900 M	1750 M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	20100 M	12300 M	825 M			
Chrysene (S)	<10 µg/kg	TM218	15200 M	8400 M	580 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	16300 M	13300 M	725 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	7130 M	4800 M	300 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	14600 M	11400 M	685 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	6850 M	6180 M	242 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1570 M	1530 M	65.1 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	7170 M	6300 M	233 M			
PAH 16 EPA Total	<118 µg/kg	TM218	965000 M	267000 M	<118 M			

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SDG: 091116-31
Job: D_MOUCHEL_ELE-22
Client Reference: 13/11/09 (J7 & 18)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66093

VOC MS (S)

Results Legend			Sample Identity					
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	J7	J7			
			Sample Type	2.50 - 3.00	4.00 - 4.50			
			Date Sampled	Soil/Solid	Soil/Solid			
			Date Received	13/11/2009	17/11/2009			
			SDG Ref	13/11/2009	13/11/2009			
			Lab Sample No.(s)	091116-31	091116-31			
				615504	615767			
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116		123	119			
Toluene-d8**	%	TM116		81.2	98.2			
4-Bromofluorobenzene**	%	TM116		67.9	89.6			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00			
Carbon Disulphide	<9 µg/kg	TM116		<9.00	35.4			
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0			
Benzene	<9 µg/kg	TM116		136	206			
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0			
Toluene	<6 µg/kg	TM116		183	203			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0			
1,1,2-Trichloroethane	<9 µg/kg	TM116		27.7	<9.00			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0			
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0			
Ethylbenzene	<9 µg/kg	TM116		839	122			

SDG: 091116-31
 Job: D_MOUCHEL_ELE-22
 Client Reference: 13/11/09 (J7 & 18)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66093

VOC MS (S)

Results Legend			Sample Identity		J7	J7				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	4.00 - 4.50					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	13/11/2009	17/11/2009					
			Date Received	13/11/2009	13/11/2009					
			SDG Ref	091116-31	091116-31					
			Lab Sample No.(s)	615504	615767					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	5980	843	#	#				
o-Xylene	<11 µg/kg	TM116	3880	344	M	M				
Styrene	<11 µg/kg	TM116	<11.0	<11.0	M	M				
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	M	M				
Isopropylbenzene	<9 µg/kg	TM116	185	41.4	M	M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	#	#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	M	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	M	M				
Propylbenzene	<6 µg/kg	TM116	311	82.3	M	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	#	#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	1520	419	M	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	#	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	16900	866	#	#				
sec-Butylbenzene	<8 µg/kg	TM116	45.8	17.2	#	#				
4-Isopropyltoluene	<8 µg/kg	TM116	148	54	#	#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	#	#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	M	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	#	#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	M	M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	M	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	#	#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	#	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	#	#				
Naphthalene	<7 µg/kg	TM116	500000	5320	#	#				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#				

Notification of NDPs (No determination possible)

SDG Number	091116-31	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	13/11/09 (I7 & I8)	Report No.	29399-0
Attention	Dave Watts	Date Received	16/11/2009 12:58:12

Sample No	Sample Identity	Depth (m)	Test	Comment
621372	I8	3.50 - 3.90	pH	Sample contains oil / product
621372	I8	3.50 - 3.90	pH	Sample contains oil / product
621372	I8	3.50 - 3.90	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 09 December 2009
Job: D_MOUCHEL_ELE-24
Sample Delivery Group (SDG): 091116-43
Your Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks
Report No.: 67033

A total of 5 samples was received on Friday November 13, 2009 and completed on Wednesday December 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091116-43
 Job: D_MOUCHEL_ELE-24
 Client Reference: 12/11/200/ (B5/A5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 67033

SOLID

Results Legend	Sample ID	A5						B5		Total		
		2.50 - 3.00		3.50 - 3.90		4.30 - 4.50		2.50 - 3.00			3.00 - 3.50	
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)			
Ammonium Soil by Titration	All									0		
		X		X		X		X		5		
Cyanides Complex/Free/Total/Thiocya	Total Cyanide									0		
		X		X		X		X		5		
Easily Liberated Sulphide	All									0		
		X		X		X		X		5		
EPH CWG (Aliphatic) GC (S)	All									0		
		X		X		X		X		5		
EPH CWG (Aromatic) GC (S)	All									0		
		X		X		X		X		5		
GRO BTEX MTBE GC (S)	All									0		
		X		X		X		X		5		
Hexavalent Chromium (s)	All									0		
		X		X		X		X		5		
Metals by iCap-OES (Soil)	Arsenic									0		
		X		X		X		X		5		
	Cadmium									0		
		X		X		X		X		5		
	Chromium									0		
		X		X		X		X		5		
	Copper									0		
		X		X		X		X		5		
	Lead									0		
		X		X		X		X		5		
	Mercury									0		
		X		X		X		X		5		
	Nickel									0		
		X		X		X		X		5		
	Selenium									0		
		X		X		X		X		5		
	Zinc									0		
		X		X		X		X		5		
PAH micro by GCMS	All									0		
		X		X		X		X		5		
PCBs by GCMS	All									0		
								X		1		
pH	All									0		
			X		X		X		X	5		
Phenols by HPLC (S)	All									0		
			X		X		X		X	5		
Sample description	All									0		
		X		X		X		X		5		
Total Sulphate	All									0		
		X		X		X		X		5		
TPH CWG GC (S)	All									0		
		X		X		X		X		5		
VOC MS (S)	All									0		
		X		X		X		X		4		

SDG:	091116-43	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-24	Attention:	Verity Sankey
Client Reference:	12/11/200/ (B5/A5)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67033

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
A5	2.50 - 3.00	Grey	Sandy Clay	0.1 - 2 mm	Stones
	3.50 - 3.90	Grey	Silty Sand	0.063 - 0.1 mm	Oil/Petroleum
	4.30 - 4.50	Grey	Sand	0.1 - 2 mm	Oil/Petroleum
B5	2.50 - 3.00	Grey	Sandy Clay	0.1 - 2 mm	Stones
	3.00 - 3.50	Grey	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091116-43
Job: D_MOUCHEL_ELE-24
Client Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67033

Test Completion dates

SDG reference: 091116-43

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
A5	2.50 - 3.00	SOLID	24/11/2009	23/11/2009	19/11/2009	17/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	23/11/2009	20/11/2009	20/11/2009	19/11/2009	19/11/2009	23/11/2009
	3.50 - 3.90	SOLID	24/11/2009	25/11/2009	20/11/2009	18/11/2009	20/11/2009	20/11/2009	21/11/2009	20/11/2009	19/11/2009	20/11/2009	24/11/2009	23/11/2009	20/11/2009	20/11/2009	20/11/2009	25/11/2009
	4.30 - 4.50	SOLID	23/11/2009	23/11/2009	19/11/2009	17/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	23/11/2009	19/11/2009	19/11/2009	20/11/2009	20/11/2009	25/11/2009
B5	2.50 - 3.00	SOLID	24/11/2009	23/11/2009	20/11/2009	18/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	23/11/2009	23/11/2009	20/11/2009	19/11/2009	20/11/2009	25/11/2009
	3.00 - 3.50	SOLID	24/11/2009	25/11/2009	19/11/2009	17/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	24/11/2009	19/11/2009	19/11/2009	20/11/2009	20/11/2009	25/11/2009

SDG: 091116-43
Job: D_MOUCHEL_ELE-24
Client Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65786

Results Legend			Sample Identity		A5	A5	A5	B5	B5
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	2.50 - 3.00	3.50 - 3.90	4.30 - 4.50	2.50 - 3.00	3.00 - 3.50
Component	LOD/Units	Method	Date Sampled	Date Received	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			12/11/2009	13/11/2009	12/11/2009	13/11/2009	13/11/2009	12/11/2009	13/11/2009
			091116-43	091116-43	091116-43	091116-43	091116-43	091116-43	091116-43
			616094	647609	647612	647613	647614		
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	17.6	64.4	<15.0	<15.0	82.9		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	50.1	<15.0	<15.0	64.5		
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.0100	<0.100		
Phenol	<0.01 mg/kg	TM062 (S)	8.95	0.459	<0.0100	6.24	2.28		
Cresols	<0.01 mg/kg	TM062 (S)	7.76	1.72	<0.0100	4.70	7.30		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.500	<0.0500	<0.0500	<0.500		
Xylenols	<0.015 mg/kg	TM062 (S)	11.5	23.6	<0.0150	9.56	16.5		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.0100	<0.100		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.0100	<0.100		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.150	<0.0150	<0.0150	<0.150		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	28.2	25.7	0.00	20.5	26.0		
pH value of soil	1 pH Units	TM133	12.03	9.02	10.08	12.73	10.50		
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0981	<3.00	<0.600	<0.600	<3.00		
Total Cyanide	<1 mg/kg	TM153	1.41	176	<1.00	<1.00	3.85		
PCB congener 28	<3 µg/kg	TM168				<3.00			
PCB congener 52	<3 µg/kg	TM168				<3.00			
PCB congener 101	<3 µg/kg	TM168				<3.00			
PCB congener 118	<3 µg/kg	TM168				<3.00			
PCB congener 138	<3 µg/kg	TM168				<3.00			
PCB congener 153	<3 µg/kg	TM168				<3.00			
PCB congener 180	<3 µg/kg	TM168				<3.00			
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00			
Easily Liberated Sulphide	<15 mg/kg	TM180	257	30.8	45.5	<15.0	253		
Arsenic	<0.6 mg/kg	TM181	11.6	9.32	4.34	2.81	6.37		
Cadmium	<0.02 mg/kg	TM181	0.325	<0.0200	0.300	<0.0200	<0.0200		
Chromium	<0.9 mg/kg	TM181	8.66	6.74	4.95	14.7	6.07		
Copper	<1.4 mg/kg	TM181	12.0	5.04	2.03	6.50	10.6		
Lead	<0.7 mg/kg	TM181	18.0	17.9	2.31	3.65	22.0		
Mercury	<0.14 mg/kg	TM181	0.234	<0.140	<0.140	<0.140	<0.140		
Nickel	<0.2 mg/kg	TM181	11.7	6.51	7.14	11.0	6.70		
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	<1.00		
Zinc	<1.9 mg/kg	TM181	42.0	20.0	17.8	27.1	17.6		
Total Sulphate	<48 mg/kg	TM221	2920	2100	2390	4100	2450		

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SDG: 091116-43
Job: D_MOUCHEL_ELE-24
Client Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65786

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A5	A5	A5	B5	B5
Depth (m)	2.50 - 3.00	3.50 - 3.90	4.30 - 4.50	2.50 - 3.00	3.00 - 3.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	12/11/2009	12/11/2009		12/11/2009	12/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-43	091116-43	091116-43	091116-43	091116-43
Lab Sample No.(s)	616094	647609	647612	647613	647614

Component	LOD/Units	Method	A5	A5	A5	B5	B5
Aliphatics >C12-C16	<100 µg/kg	TM173	122000	165000	4160	69100	107000
Aliphatics >C16-C21	<100 µg/kg	TM173	232000	283000	4180	96000	139000
Aliphatics >C21-C35	<100 µg/kg	TM173	357000	428000	9500	205000	223000
Aliphatics >C35-C44	<100 µg/kg	TM173	56300	73300	2950	37600	48700
Total Aliphatics >C12-C44	<100 µg/kg	TM173	767000	950000	20800	407000	518000
Aliphatics >C16-C35	<100 µg/kg	TM173	589000	711000	13700	301000	362000

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SDG: 091116-43
Job: D_MOUCHEL_ELE-24
Client Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65786

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	A5	A5	A5	B5	B5
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	3.50 - 3.90	4.30 - 4.50	2.50 - 3.00	3.00 - 3.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref	091116-43	091116-43	091116-43	091116-43	091116-43
			Lab Sample No.(s)	616094	647609	647612	647613	647614
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	46800	299000	9480	26200	242000	
			#	#	#	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	632	<5.00	<5.00	<5.00	
			#	#	#	#	#	#
Benzene	<10 µg/kg	TM089	1140	7500	41.6	144	3470	
			M	M	M	M	M	M
Toluene	<2 µg/kg	TM089	2070	33200	142	349	15500	
			M	M	M	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	988	8640	84.2	262	5800	
			M	M	M	M	M	M
m & p Xylene	<6 µg/kg	TM089	6810	59200	722	2140	42200	
			M	M	M	M	M	M
o Xylene	<3 µg/kg	TM089	2900	21900	327	1090	17100	
			M	M	M	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	9710	81100	1050	3230	59300	
			M	M	M	M	M	M
Sum of BTEX	<10 µg/kg	TM089	13900	130000	1320	3980	84000	
			M	M	M	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	96.2	45.6	<10.0	<10.0	565	
Aliphatics >C6-C8	<10 µg/kg	TM089	1440	11100	96.0	101	12500	
Aliphatics >C8-C10	<10 µg/kg	TM089	4800	23200	706	2340	25600	
Aliphatics >C10-C12	<10 µg/kg	TM089	7760	39500	2430	6500	32500	
Total Aliphatics C5-C12	<10 µg/kg	TM089	14100	73800	3320	8940	71200	
Aromatics C6-C7	<10 µg/kg	TM089	1140	7500	41.6	144	3470	
Aromatics >C7-C8	<10 µg/kg	TM089	2070	33200	142	349	15500	
Aromatics >EC8-EC10	<10 µg/kg	TM089	17900	125000	2330	7000	103000	
Aromatics >EC10-EC12	<10 µg/kg	TM089	11600	59200	3640	9760	48800	
Total Aromatics C6-C12	<10 µg/kg	TM089	32700	224000	6150	17200	171000	

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SDG: 091116-43
Job: D_MOUCHEL_ELE-24
Client Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65786

PAH micro by GCMS

Results Legend			Sample Identity		A5	A5	A5	B5	B5	
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	3.50 - 3.90	4.30 - 4.50	2.50 - 3.00	3.00 - 3.50		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	12/11/2009	12/11/2009	13/11/2009	12/11/2009	12/11/2009		
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
			SDG Ref	091116-43	091116-43	091116-43	091116-43	091116-43		
			Lab Sample No.(s)	616094	647609	647612	647613	647614		
Component	LOD/Units	Method								
Naphthalene (S)	<9 µg/kg	TM218	85900	2180000	11500	325000	828000			
Acenaphthylene (S)	<12 µg/kg	TM218	22700	277000	3000	50400	120000			
Acenaphthene (S)	<8 µg/kg	TM218	7330	65000	869	14800	27600			
Fluorene (S)	<10 µg/kg	TM218	25700	290000	2430	50300	118000			
Phenanthrene (S)	<15 µg/kg	TM218	67200	732000	10300	131000	295000			
Anthracene (S)	<16 µg/kg	TM218	28100	226000	3440	46900	103000			
Fluoranthene (S)	<17 µg/kg	TM218	54200	489000	7110	90500	191000			
Pyrene (S)	<15 µg/kg	TM218	34700	343000	4770	60400	124000			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	20200	145000	2490	30800	61200			
Chrysene (S)	<10 µg/kg	TM218	14800	216000	1880	22900	47000			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	17700	142000	1990	25100	46400			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	7590	53800	889	10600	20400			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	15700	122000	2020	23900	45800			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	7360	71400	980	10900	20700			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	2250	19000	288	3010	6320			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	7750	70800	1080	11500	23300			
PAH 16 EPA Total	<118 µg/kg	TM218	419000	5440000	55100	908000	2080000			

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SDG: 091116-43
Job: D_MOUCHEL_ELE-24
Client Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65786

VOC MS (S)

Results Legend			Sample Identity		A5	A5	B5	B5
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		2.50 - 3.00	3.50 - 3.90	2.50 - 3.00	3.00 - 3.50
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled		12/11/2009	12/11/2009	12/11/2009	12/11/2009
			Date Received		13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref		091116-43	091116-43	091116-43	091116-43
			Lab Sample No.(s)		616094	647609	647613	647614
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116			0.840	189	0.910	125
Toluene-d8**	%	TM116			67.6	54.4	125	56.7
4-Bromofluorobenzene**	%	TM116			60.4	72.2	104	59.1
Dichlorodifluoromethane	<13 µg/kg	TM116			<13.0	<13.0	<13.0	<13.0
Chloromethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Vinyl Chloride	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Bromoethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Chloroethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Trichlorofluoromethane	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
1,1-Dichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Carbon Disulphide	<9 µg/kg	TM116			86.8	<9.00	<9.00	39.0
Dichloromethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
trans-1,2-Dichloroethene	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
1,1-Dichloroethane	<8 µg/kg	TM116			<8.00	<8.00	<8.00	<8.00
cis-1,2-Dichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
2,2-Dichloropropane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Bromochloromethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Chloroform	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
1,1,1-Trichloroethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
1,1-Dichloropropene	<13 µg/kg	TM116			<13.0	<13.0	<13.0	<13.0
Carbontetrachloride	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
1,2-Dichloroethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Benzene	<9 µg/kg	TM116			3230	34600	237	7970
Trichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
1,2-Dichloropropane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Dibromomethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Bromodichloromethane	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
cis-1,3-Dichloropropene	<25 µg/kg	TM116			<25.0	<25.0	<25.0	<25.0
Toluene	<6 µg/kg	TM116			5850	97000	721	38000
trans-1,3-Dichloropropene	<27 µg/kg	TM116			<27.0	<27.0	<27.0	<27.0
1,1,2-Trichloroethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
1,3-Dichloropropane	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
Tetrachloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Dibromochloromethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
1,2-Dibromoethane	<14 µg/kg	TM116			<14.0	<14.0	<14.0	<14.0
Chorobenzene	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
Ethylbenzene	<9 µg/kg	TM116			4570	25600	329	81300

SDG: 091116-43
Job: D_MOUCHEL_ELE-24
Client Reference: 12/11/200/ (B5/A5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65786

VOC MS (S)

Results Legend		Sample Identity	A5	A5	B5	B5
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 12/11/2009 13/11/2009 091116-43 616094	3.50 - 3.90 Soil/Solid 12/11/2009 13/11/2009 091116-43 647609	2.50 - 3.00 Soil/Solid 12/11/2009 13/11/2009 091116-43 647613	3.00 - 3.50 Soil/Solid 12/11/2009 13/11/2009 091116-43 647614
Component	LOD/Units	Method				
p/m-Xylene	<13 µg/kg	TM116	49500 #	193000 #	2450 #	32100 #
o-Xylene	<11 µg/kg	TM116	20900 M	73400 M	1080 M	20200 M
Styrene	<11 µg/kg	TM116	<11.0 M	18000 M	<11.0 M	<11.0 M
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	<12.0 M
Isopropylbenzene	<9 µg/kg	TM116	413 M	1790 M	56.8 M	813 M
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	<13.0 M
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	<14.0 M
Propylbenzene	<6 µg/kg	TM116	912 M	6620 M	<6.00 M	1590 M
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #	<14.0 #
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	6760 M	35000 M	757 M	18500 M
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	<12.0 #
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	37800 #	73000 #	1610 #	42100 #
sec-Butylbenzene	<8 µg/kg	TM116	87.4 #	281 #	23.2 #	150 #
4-Isopropyltoluene	<8 µg/kg	TM116	375 #	1550 #	81.9 #	658 #
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	<8.00 #
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	<8.00 M
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #
Naphthalene	<7 µg/kg	TM116	1020000	2200000	142000	1200000
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	<12.0 #

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-25
Sample Delivery Group (SDG): 091116-48
Your Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks
Report No.: 66879

A total of 5 samples was received on Friday November 13, 2009 and completed on Wednesday December 02, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091116-48
Job: D_MOUCHEL_ELE-25
Client Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66879

SOLID

Results Legend	Sample ID	K6				K7				Total	
		1.00 - 1.50		3.00 - 3.50		0.00 - 0.50		3.00 - 6.00			8.70 - 8.90
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)		
X Test											
N No Determination Possible											
Ammonium Soil by Titration	All		X		X		X		X		0
Asbestos Presence Screen	All		X		X		X		X		5
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X		0
Easily Liberated Sulphide	All		X		X		X		X		5
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X		0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X		5
GRO BTEX MTBE GC (S)	All		X		X		X		X		0
Hexavalent Chromium (s)	All	X		X		X		X		X	5
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X		0
	Cadmium		X		X		X		X		5
	Chromium		X		X		X		X		0
	Copper		X		X		X		X		5
	Lead		X		X		X		X		0
	Mercury		X		X		X		X		5
	Nickel		X		X		X		X		0
	Selenium		X		X		X		X		5
	Zinc		X		X		X		X		0
PAH micro by GCMS	All		X		X		X		X		5
pH	All		X		X		X		X		0
Phenols by HPLC (S)	All		X		X		X		X		5
Sample description	All		X		X		X		X		0
Total Sulphate	All		X		X		X		X		5
TPH CWG GC (S)	All		X		X		X		X		0
VOC MS (S)	All	X		X			X		X		0
											4

SDG:	091116-48	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-25	Attention:	Verity Sankey
Client Reference:	12/11/09 (K7 & K6)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66879

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
K6	1.00 - 1.50	Grey	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	3.00 - 3.50	Grey	Gravel	2 - 10 mm	Oil/Petroleum
K7	0.00 - 0.50	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	3.00 - 6.00	Black	Gravel	0.1 - 2 mm	Stones
	8.70 - 8.90	Grey	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091116-48
Job: D_MOUCHEL_ELE-25
Client Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66879

Test Completion dates

SDG reference: 091116-48

Sample ID	Depth	Type	Ammonium Sulf by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyanate	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX/MTBE GC (S)	Hexavalent Chromium (s)	Metals by Cap-QES (Soil)	PAH by GC/MS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	THH CWG GC (S)	VOC MS (S)
K6	1.00 - 1.50	SOLID	23/11/2009	17/11/2009	19/11/2009	20/11/2009	28/11/2009	28/11/2009	24/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	17/11/2009	20/11/2009	28/11/2009	23/11/2009
	3.00 - 3.50	SOLID	23/11/2009	19/11/2009	20/11/2009	28/11/2009	28/11/2009	24/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	17/11/2009	20/11/2009	28/11/2009	24/11/2009
K7	0.00 - 0.50	SOLID	23/11/2009	17/11/2009	19/11/2009	20/11/2009	23/11/2009	23/11/2009	21/11/2009	19/11/2009	20/11/2009	20/11/2009	19/11/2009	19/11/2009	17/11/2009	20/11/2009	23/11/2009	23/11/2009
	3.00 - 6.00	SOLID	23/11/2009	19/11/2009	20/11/2009	23/11/2009	23/11/2009	21/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	19/11/2009	19/11/2009	17/11/2009	20/11/2009	23/11/2009	23/11/2009
	8.70 - 8.90	SOLID	23/11/2009	19/11/2009	20/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	20/11/2009	20/11/2009	19/11/2009	19/11/2009	19/11/2009	17/11/2009	20/11/2009	23/11/2009	02/12/2009

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SDG 091116-48
Job: D_MOUCHEL_ELE-25
Client Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66879

Results Legend			Sample Identity		K6	K6	K7	K7	K7	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.00 - 1.50	3.00 - 3.50	0.00 - 0.50	3.00 - 6.00	8.70 - 8.90	
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled		12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009	
			Date Received		13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	
			SDG Ref		091116-48	091116-48	091116-48	091116-48	091116-48	
			Lab Sample No.(s)		616345	616359	616260	616310	616326	
Component	LOD/Units	Method								
Asbestos Presence Screen	-	TM001	No ACM Detected		No ACM Detected					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	42.4	M	280	M	27.4	M	20.1	M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	33.0		218		21.3		<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.500		<0.500		<0.0100		<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	93.8	M	34.8	M	<0.0100	M	0.921	M
Cresols	<0.01 mg/kg	TM062 (S)	334	M	77.1	M	<0.0100	M	1.93	M
Resorcinol	<0.05 mg/kg	TM062 (S)	<2.50		<2.50		<0.0500		<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	536	M	103	M	<0.0150	M	3.32	M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.500		<0.500		<0.0100		<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.500	M	<0.500	M	<0.0100	M	<0.0100	M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.750	M	<0.750	M	<0.0150	M	<0.0150	M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	965		215		6.00		6.23	
pH value of soil	1 pH Units	TM133	11.04	M	9.74	M	8.93	M	8.60	M
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	#	<6.00	#	<0.600	#	<0.600	#
Total Cyanide	<1 mg/kg	TM153	29.6	M	30.5	M	86.6	M	8.31	M
Easily Liberated Sulphide	<15 mg/kg	TM180	124	#	131	#	47.3	#	210	#
Arsenic	<0.6 mg/kg	TM181	9.38	M	12.3	M	6.10	M	5.72	M
Cadmium	<0.02 mg/kg	TM181	0.173	M	0.389	M	<0.0200	M	<0.0200	M
Chromium	<0.9 mg/kg	TM181	13.6	M	12.1	M	20.7	M	4.23	M
Copper	<1.4 mg/kg	TM181	12.2	M	13.7	M	15.8	M	5.53	M
Lead	<0.7 mg/kg	TM181	60.3	M	85.5	M	41.5	M	5.32	M
Mercury	<0.14 mg/kg	TM181	0.140	M	0.375	M	<0.140	M	0.184	M
Nickel	<0.2 mg/kg	TM181	18.9	M	15.9	M	24.0	M	4.37	M
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	<1.00	#	<1.00	#
Zinc	<1.9 mg/kg	TM181	49.0	M	55.0	M	57.8	M	31.2	M
Total Sulphate	<48 mg/kg	TM221	819	M	1920	M	1200	M	3150	M

SDG: 091116-48
Job: D_MOUCHEL_ELE-25
Client Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66879

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	K6	K6	K7	K7	K7	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	3.00 - 3.50	0.00 - 0.50	3.00 - 6.00	8.70 - 8.90	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009	
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	
			SDG Ref	091116-48	091116-48	091116-48	091116-48	091116-48	
			Lab Sample No.(s)	616345	616359	616260	616310	616326	
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	785000	1210000	878	3640	383000		
			#	M	#	#	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<6.00	1140		
			#	M	#	#	#	#	#
Benzene	<10 µg/kg	TM089	28100	78700	41.8	411	9970		
			M	M	M	M	M	M	M
Toluene	<2 µg/kg	TM089	93400	145000	68.2	225	26200		
			M	M	M	M	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	19500	25100	20.9	78.8	7820		
			M	M	M	M	M	M	M
m & p Xylene	<6 µg/kg	TM089	110000	150000	122	249	42600		
			M	M	M	M	M	M	M
o Xylene	<3 µg/kg	TM089	48200	62500	62.7	102	21400		
			M	M	M	M	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	158000	213000	185	351	64000		
			M	M	M	M	M	M	M
Sum of BTEX	<10 µg/kg	TM089	299000	461000	316	1070	108000		
			M	M	M	M	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	432	4160	<10.0	28.3	126		
				M					
Aliphatics >C6-C8	<10 µg/kg	TM089	539	37700	24.7	74.5	15800		
				M					
Aliphatics >C8-C10	<10 µg/kg	TM089	69300	121000	84.6	297	37100		
				M					
Aliphatics >C10-C12	<10 µg/kg	TM089	125000	161000	123	693	66200		
				M					
Total Aliphatics C5-C12	<10 µg/kg	TM089	195000	323000	232	1090	119000		
				M					
Aromatics C6-C7	<10 µg/kg	TM089	28100	78700	41.8	411	9970		
				M					
Aromatics >C7-C8	<10 µg/kg	TM089	93400	145000	68.2	225	26200		
				M					
Aromatics >EC8-EC10	<10 µg/kg	TM089	281000	419000	333	875	128000		
				M					
Aromatics >EC10-EC12	<10 µg/kg	TM089	187000	241000	184	1040	99300		
				M					
Total Aromatics C6-C12	<10 µg/kg	TM089	590000	883000	627	2550	263000		
				M					

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SDG: 091116-48
Job: D_MOUCHEL_ELE-25
Client Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66879

PAH micro by GCMS

Results Legend			Sample Identity	K6	K6	K7	K7	K7
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	3.00 - 3.50	0.00 - 0.50	3.00 - 6.00	8.70 - 8.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009	12/11/2009
			Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref	091116-48	091116-48	091116-48	091116-48	091116-48
			Lab Sample No.(s)	616345	616359	616260	616310	616326
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	2470000	1360000	551	9570	235000	
			M	M	M	M	M	M
Acenaphthylene (S)	<12 µg/kg	TM218	628000	303000	466	1940	56300	
			M	M	M	M	M	M
Acenaphthene (S)	<8 µg/kg	TM218	130000	51700	94.8	667	8740	
			M	M	M	M	M	M
Fluorene (S)	<10 µg/kg	TM218	461000	231000	250	9540	35500	
			M	M	M	M	M	M
Phenanthrene (S)	<15 µg/kg	TM218	1140000	595000	831	6780	86300	
			M	M	M	M	M	M
Anthracene (S)	<16 µg/kg	TM218	422000	241000	401	3530	30600	
			M	M	M	M	M	M
Fluoranthene (S)	<17 µg/kg	TM218	780000	415000	1330	3560	60800	
			M	M	M	M	M	M
Pyrene (S)	<15 µg/kg	TM218	520000	280000	1090	2260	39100	
			M	M	M	M	M	M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	251000	146000	612	1040	17800	
			M	M	M	M	M	M
Chrysene (S)	<10 µg/kg	TM218	186000	115000	500	746	12600	
			M	M	M	M	M	M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	230000	130000	896	914	17200	
			M	M	M	M	M	M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	92200	54900	350	388	6540	
			M	M	M	M	M	M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	187000	109000	534	792	12900	
			M	M	M	M	M	M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	85100	48800	534	464	6030	
			M	M	M	M	M	M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	25300	16000	153	141	1690	
			M	M	M	M	M	M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	91900	52500	632	512	6650	
			M	M	M	M	M	M
PAH 16 EPA Total	<118 µg/kg	TM218	7700000	4150000	9510	42800	633000	
			M	M	M	M	M	M

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SDG 091116-48
Job: D_MOUCHEL_ELE-25
Client Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66879

VOC MS (S)

Results Legend			Sample Identity		K6	K6	K7	K7
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.00 - 1.50	3.00 - 3.50	3.00 - 6.00	8.70 - 8.90
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled		12/11/2009	12/11/2009	12/11/2009	12/11/2009
			Date Received		13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref		091116-48	091116-48	091116-48	091116-48
			Lab Sample No.(s)		616345	616359	616310	616326
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116			34.7	135	108	114
Toluene-d8**	%	TM116			57.0	47.5	94.7	62.9
4-Bromofluorobenzene**	%	TM116			129	117	86.3	52.1
Dichlorodifluoromethane	<13 µg/kg	TM116			<13.0	<13.0	<13.0	<13.0
Chloromethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Vinyl Chloride	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Bromoethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Chloroethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Trichlorofluoromethane	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
1,1-Dichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Carbon Disulphide	<9 µg/kg	TM116			100	43.3	47.1	34.5
Dichloromethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
trans-1,2-Dichloroethene	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
1,1-Dichloroethane	<8 µg/kg	TM116			<8.00	<8.00	<8.00	<8.00
cis-1,2-Dichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
2,2-Dichloropropane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Bromochloromethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Chloroform	<10 µg/kg	TM116			44.3	<10.0	<10.0	<10.0
1,1,1-Trichloroethane	<12 µg/kg	TM116			96.0	<12.0	<12.0	<12.0
1,1-Dichloropropene	<13 µg/kg	TM116			<13.0	<13.0	<13.0	<13.0
Carbontetrachloride	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
1,2-Dichloroethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Benzene	<9 µg/kg	TM116			145000	117000	158	7950
Trichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
1,2-Dichloropropane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Dibromomethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Bromodichloromethane	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
cis-1,3-Dichloropropene	<25 µg/kg	TM116			<25.0	<25.0	<25.0	<25.0
Toluene	<6 µg/kg	TM116			215000	135000	77.8	16800
trans-1,3-Dichloropropene	<27 µg/kg	TM116			<27.0	<27.0	<27.0	<27.0
1,1,2-Trichloroethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
1,3-Dichloropropane	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
Tetrachloroethene	<9 µg/kg	TM116			106	<9.00	<9.00	<9.00
Dibromochloromethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
1,2-Dibromoethane	<14 µg/kg	TM116			<14.0	<14.0	<14.0	<14.0
Chorobenzene	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
Ethylbenzene	<9 µg/kg	TM116			47600	22900	26.8	4910

SDG 091116-48
Job: D_MOUCHEL_ELE-25
Client Reference: 12/11/09 (K7 & K6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66879

VOC MS (S)

Results Legend			Sample Identity		K6	K6	K7	K7
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.00 - 1.50	3.00 - 3.50	3.00 - 6.00	8.70 - 8.90
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled		12/11/2009	12/11/2009	12/11/2009	12/11/2009
			Date Received		13/11/2009	13/11/2009	13/11/2009	13/11/2009
			SDG Ref		091116-48	091116-48	091116-48	091116-48
			Lab Sample No.(s)		616345	616359	616310	616326
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	298000	151000		79.0	28000	
				#		#	#	
o-Xylene	<11 µg/kg	TM116	124000	60900		30.6	12400	
				M		M	M	
Styrene	<11 µg/kg	TM116	<11.0	<11.0		<11.0	<11.0	
				M		M	M	
Bromoform	<12 µg/kg	TM116	<12.0	<12.0		<12.0	<12.0	
				M		M	M	
Isopropylbenzene	<9 µg/kg	TM116	1850	1430		<9.00	579	
				M		M	M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0		<15.0	<15.0	
				#		#	#	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0		<13.0	<13.0	
				M		M	M	
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0		<14.0	<14.0	
				M		M	M	
Propylbenzene	<6 µg/kg	TM116	4180	3800		<6.00	796	
				M		M	M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0		<14.0	<14.0	
				#		#	#	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	38200	25100		9.62	5170	
				M		M	M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00		<9.00	<9.00	
				#		#	#	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0		<12.0	<12.0	
				#		#	#	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	88800	56400		28.1	11200	
				#		#	#	
sec-Butylbenzene	<8 µg/kg	TM116	335	241		<8.00	96.4	
				#		#	#	
4-Isopropyltoluene	<8 µg/kg	TM116	1590	1420		<8.00	329	
				#		#	#	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00		<8.00	<8.00	
				#		#	#	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0		<11.0	<11.0	
				M		M	M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00		<7.00	<7.00	
				#		#	#	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00		<8.00	<8.00	
				M		M	M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0		<11.0	<11.0	
				M		M	M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00		<7.00	<7.00	
				#		#	#	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	132		<9.00	<9.00	
				#		#	#	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0		<15.0	<15.0	
				#		#	#	
Naphthalene	<7 µg/kg	TM116	3790000	1930000		983	359000	
				#		#	#	
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0		<12.0	34.7	
				#		#	#	

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-26
Sample Delivery Group (SDG): 091116-53
Your Reference: 12/11/2009 (K5)
Location: Limerick Gasworks
Report No.: 66627

A total of 4 samples was received on Friday November 13, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091116-53
 Job: D_MOUCHEL_ELE-26
 Client Reference: 12/11/2009 (K5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66627

SOLID

Results Legend	Sample ID	K5								Total
		0.25 - 0.70		1.25 - 1.50		4.00 - 4.50		8.70 - 9.00		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
Ammonium Soil by Titration	All		X		X		X		X	0
Asbestos Presence Screen	All				X					0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	0
Easily Liberated Sulphide	All		X		X		X		X	4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	4
GRO BTEX MTBE GC (S)	All	X		X		X		X		0
Hexavalent Chromium (s)	All		X		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0
	Cadmium		X		X		X		X	4
	Chromium		X		X		X		X	0
	Copper		X		X		X		X	4
	Lead		X		X		X		X	0
	Mercury		X		X		X		X	4
	Nickel		X		X		X		X	0
	Selenium		X		X		X		X	4
	Zinc		X		X		X		X	0
PAH micro by GCMS	All		X		X		X		X	0
pH	All		X		X		X		X	4
Phenols by HPLC (S)	All		X		X		X		X	0
Sample description	All		X		X		X		X	4
Total Sulphate	All		X		X		X		X	0
TPH CWG GC (S)	All		X		X		X		X	4
VOC MS (S)	All	X		X		X				0
										3

SDG:	091116-53	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-26	Attention:	Verity Sankey
Client Reference:	12/11/2009 (K5)	Order No.:	
Location:	Limerick Gasworks	Report No:	66627

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
K5	0.25 - 0.70	Brown	Silty Sand	0.063 - 0.1 mm	Oil/Petroleum
	1.25 - 1.50	Grey	Silty Sand	0.063 - 0.1 mm	Oil/Petroleum
	4.00 - 4.50	Grey	Silty Sand	0.063 - 0.1 mm	Oil/Petroleum
	8.70 - 9.00	Grey	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091116-53
 Job: D_MOUCHEL_ELE-26
 Client Reference: 12/11/2009 (K5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66627

Test Completion dates

SDG reference: 091116-53

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
K5	0.25 - 0.70	SOLID	23/11/2009	30/11/2009	20/11/2009	17/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	19/11/2009	26/11/2009	24/11/2009	24/11/2009	20/11/2009	19/11/2009	17/11/2009	23/11/2009
	1.25 - 1.50	SOLID	23/11/2009	27/11/2009	20/11/2009	17/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	19/11/2009	26/11/2009	24/11/2009	24/11/2009	20/11/2009	19/11/2009	17/11/2009	23/11/2009
	4.00 - 4.50	SOLID	23/11/2009	25/11/2009	20/11/2009	17/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	19/11/2009	26/11/2009	24/11/2009	24/11/2009	20/11/2009	19/11/2009	17/11/2009	23/11/2009
	8.70 - 9.00	SOLID	23/11/2009	23/11/2009	20/11/2009	17/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	19/11/2009	26/11/2009	24/11/2009	24/11/2009	20/11/2009	19/11/2009	17/11/2009	23/11/2009

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SDG: 091116-53
Job: D_MOUCHEL_ELE-26
Client Reference: 12/11/2009 (K5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65662

Results Legend		Sample Identity	K5	K5	K5	K5		
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.25 - 0.70 Soil/Solid 12/11/2009 13/11/2009 091116-53 616638	1.25 - 1.50 Soil/Solid 12/11/2009 13/11/2009 091116-53 616639	4.00 - 4.50 Soil/Solid 12/11/2009 13/11/2009 091116-53 616642	8.70 - 9.00 Soil/Solid 12/11/2009 13/11/2009 091116-53 616644		
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001		No ACM Detected				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	68.9	44.7	134	<15.0		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	53.6	34.8	104	<15.0		
Catechol	<0.01 mg/kg	TM062 (S)	<0.500	<0.500	<0.500	<0.0100		
Phenol	<0.01 mg/kg	TM062 (S)	79.7	85.0	183	0.744		
Cresols	<0.01 mg/kg	TM062 (S)	398	309	301	1.31		
Resorcinol	<0.05 mg/kg	TM062 (S)	<2.50	<2.50	<2.50	<0.0500		
Xylenols	<0.015 mg/kg	TM062 (S)	763	454	379	0.977		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.500	<0.500	<0.500	<0.0100		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.500	<0.500	<0.500	<0.0100		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.750	<0.750	<0.750	<0.0150		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	1240	847	864	3.03		
pH value of soil	1 pH Units	TM133	9.21	11.09	10.65	8.51		
Hexavalent Chromium	<0.6 mg/kg	TM151	<12.0	<6.00	<6.00	<0.600		
Total Cyanide	<1 mg/kg	TM153	15.1	9.50	44.9	<1.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	52.8	89.8	5220	55.3		
Arsenic	<0.6 mg/kg	TM181	10.1	14.0	12.1	2.11		
Cadmium	<0.02 mg/kg	TM181	0.291	0.215	0.0770	<0.0200		
Chromium	<0.9 mg/kg	TM181	18.9	14.2	16.8	2.82		
Copper	<1.4 mg/kg	TM181	18.0	20.6	21.6	1.54		
Lead	<0.7 mg/kg	TM181	79.1	89.4	110	1.37		
Mercury	<0.14 mg/kg	TM181	0.855	0.359	1.53	<0.140		
Nickel	<0.2 mg/kg	TM181	22.7	16.3	19.4	0.952		
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00		
Zinc	<1.9 mg/kg	TM181	70.2	84.8	94.9	8.40		
Total Sulphate	<48 mg/kg	TM221	1680	2910	7040	2170		

SDG: 091116-53
Job: D_MOUCHEL_ELE-26
Client Reference: 12/11/2009 (K5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65662

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K5	K5	K5	K5
Depth (m)	0.25 - 0.70	1.25 - 1.50	4.00 - 4.50	8.70 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009
SDG Ref	091116-53	091116-53	091116-53	091116-53
Lab Sample No.(s)	616638	616639	616642	616644

Component	LOD/Units	Method	K5	K5	K5	K5
Aliphatics >C12-C16	<100 µg/kg	TM173	788000	1510000	1560000	8800
Aliphatics >C16-C21	<100 µg/kg	TM173	1230000	1300000	1630000	4940
Aliphatics >C21-C35	<100 µg/kg	TM173	2210000	1470000	2050000	3130
Aliphatics >C35-C44	<100 µg/kg	TM173	264000	238000	248000	580
Total Aliphatics >C12-C44	<100 µg/kg	TM173	4490000	4520000	5480000	17400
Aliphatics >C16-C35	<100 µg/kg	TM173	3440000	2770000	3680000	8070

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SDG: 091116-53
 Job: D_MOUCHEL_ELE-26
 Client Reference: 12/11/2009 (K5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65662

GRO BTEX MTBE GC (S)

Results Legend # ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Sample Identity	K5	K5	K5	K5
	Depth (m)	0.25 - 0.70	1.25 - 1.50	4.00 - 4.50	8.70 - 9.00
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009
	Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009
	SDG Ref	091116-53	091116-53	091116-53	091116-53
Lab Sample No.(s)	616638	616639	616642	616644	

Component	LOD/Units	Method	K5	K5	K5	K5
GRO C5-C12	<44 µg/kg	TM089	1360	651000	1260000	2920
MTBE	<5 µg/kg	TM089	<5.00	997	<5.00	<5.00
Benzene	<10 µg/kg	TM089	13200	31700	172000	1780
Toluene	<2 µg/kg	TM089	53300	52800	244000	635
Ethyl Benzene	<3 µg/kg	TM089	10700	12600	31100	26.6
m & p Xylene	<6 µg/kg	TM089	70400	73500	197000	133
o Xylene	<3 µg/kg	TM089	31500	35600	71900	69.9
Sum m&p and o Xylene	<10 µg/kg	TM089	102000	109000	269000	203
Sum of BTEX	<10 µg/kg	TM089	179000	206000	716000	2650
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	675	6330	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	14500	49500	<10.0
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	51500	99700	37.1
Aliphatics >C10-C12	<10 µg/kg	TM089	235	120000	96700	99.0
Total Aliphatics C5-C12	<10 µg/kg	TM089	235	187000	251000	136
Aromatics C6-C7	<10 µg/kg	TM089	13200	31700	172000	1780
Aromatics >C7-C8	<10 µg/kg	TM089	53300	52800	244000	635
Aromatics >EC8-EC10	<10 µg/kg	TM089	45400	199000	450000	285
Aromatics >EC10-EC12	<10 µg/kg	TM089	352	180000	144000	149
Total Aromatics C6-C12	<10 µg/kg	TM089	112000	464000	1010000	2850

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SDG: 091116-53
Job: D_MOUCHEL_ELE-26
Client Reference: 12/11/2009 (K5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65662

PAH micro by GCMS

Results Legend		Sample Identity	K5	K5	K5	K5		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.25 - 0.70 Soil/Solid 12/11/2009 13/11/2009 091116-53 616638	1.25 - 1.50 Soil/Solid 12/11/2009 13/11/2009 091116-53 616639	4.00 - 4.50 Soil/Solid 12/11/2009 13/11/2009 091116-53 616642	8.70 - 9.00 Soil/Solid 12/11/2009 13/11/2009 091116-53 616644		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	2150000 M	1720000 M	3300000 M	4870 M		
Acenaphthylene (S)	<12 µg/kg	TM218	483000 M	348000 M	460000 M	509 M		
Acenaphthene (S)	<8 µg/kg	TM218	87300 M	96700 M	208000 M	135 M		
Fluorene (S)	<10 µg/kg	TM218	337000 M	276000 M	445000 M	432 M		
Phenanthrene (S)	<15 µg/kg	TM218	845000 M	687000 M	1090000 M	1030 M		
Anthracene (S)	<16 µg/kg	TM218	305000 M	250000 M	389000 M	360 M		
Fluoranthene (S)	<17 µg/kg	TM218	580000 M	483000 M	737000 M	589 M		
Pyrene (S)	<15 µg/kg	TM218	389000 M	318000 M	492000 M	417 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	181000 M	150000 M	226000 M	198 M		
Chrysene (S)	<10 µg/kg	TM218	135000 M	113000 M	170000 M	136 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	169000 M	143000 M	205000 M	143 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	67100 M	53100 M	85200 M	68.2 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	135000 M	110000 M	164000 M	130 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	62600 M	51900 M	77600 M	53.9 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	18500 M	15300 M	22400 M	<23.0 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	68500 M	55600 M	83600 M	56.8 M		
PAH 16 EPA Total	<118 µg/kg	TM218	6010000 M	4870000 M	8150000 M	9130 M		

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SDG: 091116-53
Job: D_MOUCHEL_ELE-26
Client Reference: 12/11/2009 (K5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65662

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K5	K5	K5	K5		
Depth (m)	0.25 - 0.70	1.25 - 1.50	4.00 - 4.50	8.70 - 9.00		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	12/11/2009	12/11/2009	12/11/2009	12/11/2009		
Date Received	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
SDG Ref	091116-53	091116-53	091116-53	091116-53		
Lab Sample No.(s)	616638	616639	616642	616644		

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	4490000	4710000	5730000	17600
Total Aromatics >C6-C44	<100 µg/kg	TM173	14300000	8720000	10100000	54800
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	18800000	13400000	15900000	72400

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SDG: 091116-53
Job: D_MOUCHEL_ELE-26
Client Reference: 12/11/2009 (K5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65662

VOC MS (S)

Results Legend			Sample Identity	K5	K5	K5			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.25 - 0.70	1.25 - 1.50	4.00 - 4.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	12/11/2009	12/11/2009	12/11/2009			
			Date Received	13/11/2009	13/11/2009	13/11/2009			
			SDG Ref	091116-53	091116-53	091116-53			
			Lab Sample No.(s)	616638	616639	616642			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	146	134	134				
Toluene-d8**	%	TM116	43.4	57.4	52.2				
4-Bromofluorobenzene**	%	TM116	113	102	103				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#	#	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
Carbon Disulphide	<9 µg/kg	TM116	56.4	39.2	265	M	M	M	
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	M	M	M	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
1,1,1-Trichloroethane	<12 µg/kg	TM116	117	<12.0	<12.0	M	M	M	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Benzene	<9 µg/kg	TM116	35700	64900	229000	M	M	M	
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	M	M	M	
Toluene	<6 µg/kg	TM116	103000	98800	384000	M	M	M	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0	M	M	M	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
Tetrachloroethene	<9 µg/kg	TM116	<9.00	20.2	<9.00	M	M	M	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	M	M	M	
Chlorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
Ethylbenzene	<9 µg/kg	TM116	25800	20700	78700	M	M	M	

SDG: 091116-53
Job: D_MOUCHEL_ELE-26
Client Reference: 12/11/2009 (K5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65662

VOC MS (S)

Results Legend		Sample Identity	K5	K5	K5
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.25 - 0.70 Soil/Solid 12/11/2009 13/11/2009 091116-53 616638	1.25 - 1.50 Soil/Solid 12/11/2009 13/11/2009 091116-53 616639	4.00 - 4.50 Soil/Solid 12/11/2009 13/11/2009 091116-53 616642
Component	LOD/Units	Method			
p/m-Xylene	<13 µg/kg	TM116	181000 #	137000 #	534000
o-Xylene	<11 µg/kg	TM116	76000 M	55100 M	210000 M
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M
Isopropylbenzene	<9 µg/kg	TM116	1660 M	1070 M	6220 M
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M
Propylbenzene	<6 µg/kg	TM116	4020 M	1990 M	126000 M
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	33700 M	11800 M	70700 M
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	75500 #	54700 #	149000 #
sec-Butylbenzene	<8 µg/kg	TM116	274 #	190 #	986 #
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
Naphthalene	<7 µg/kg	TM116	2930000	1540000	4960000
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 27 November 2009
Job: D_MOUCHEL_ELE-27
Sample Delivery Group (SDG): 091117-11 **Report No.:** 65980
Your Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

A total of 6 samples was received on Monday November 16, 2009 and completed on Friday November 27, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 65980

SOLID

Results Legend	Sample ID	A4		C3		C4		D4		Total
		Depth (m)		Depth (m)		Depth (m)		Depth (m)		
		0.30 - 0.80	1.10 - 1.50	0.00 - 0.50	0.30 - 0.80	1.70 - 2.00	1.00 - 1.50			
	Container	JAR (D)	60g VOC Dublin TUB (D)	JAR (D)	60g VOC Dublin TUB (D)	JAR (D)	60g VOC Dublin TUB (D)	JAR (D)	60g VOC Dublin TUB (D)	
Ammonium Soil by Titration	All		X	X		X		X		0
Asbestos Presence Screen	All									4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X								0
Easily Liberated Sulphide	All		X	X		X		X		4
EPH CWG (Aliphatic) GC (S)	All		X	X		X		X		0
EPH CWG (Aromatic) GC (S)	All		X	X		X		X		4
GRO BTEX MTBE GC (S)	All		X	X		X		X		0
Hexavalent Chromium (s)	All	X				X		X		4
Metals by iCap-OES (Soil)	Arsenic		X	X		X		X		0
	Cadmium		X	X		X		X		4
	Chromium		X	X		X		X		0
	Copper		X	X		X		X		4
	Lead		X	X		X		X		0
	Mercury		X	X		X		X		4
	Nickel		X	X		X		X		0
	Selenium		X	X		X		X		4
	Zinc		X	X		X		X		0
PAH micro by GCMS	All		X	X		X		X		4
pH	All		X	X		X		X		0
Phenols by HPLC (S)	All		X	X		X		X		4
Sample description	All	X	X	X	X	X	X	X	X	0
Total Sulphate	All		X	X		X		X		6
TPH CWG GC (S)	All		X	X		X		X		0
VOC MS (S)	All		X	X		X		X		4
				X		X				0
										2

SDG:	091117-11	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-27	Attention:	Verity Sankey
Client Reference:	13/11/09 (A4, C4, D4 & C3)	Order No.:	
Location:	Limerick Gasworks	Report No.:	65980

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
A4	0.30 - 0.80	Brown	Sandy Clay	0.1 - 2 mm	Stones
	1.10 - 1.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
C3	0.00 - 0.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
C4	0.30 - 0.80	Brown	Sand	0.1 - 2 mm	Stones
	1.70 - 2.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
D4	1.00 - 1.50	Brown	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 65980

Test Completion dates

SDG reference: 091117-11

Sample ID	Depth	Type	SDG reference: 091117-11															
			VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
A4	0.30 - 0.80	SOLID	18/11/2009															
	1.10 - 1.50	SOLID	25/11/2009	25/11/2009	25/11/2009	18/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
C3	0.00 - 0.50	SOLID	27/10/2009	25/11/2009	20/11/2009	18/11/2009	23/11/2009	20/11/2009	21/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
C4	0.30 - 0.80	SOLID	18/11/2009															
	1.70 - 2.00	SOLID	25/11/2009	26/11/2009	23/11/2009	18/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
D4	1.00 - 1.50	SOLID	25/11/2009	23/11/2009	20/11/2009	18/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009

SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65980

Results Legend			Sample Identity	A4	A4	C3	C4	C4	D4	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.30 - 0.80	1.10 - 1.50	0.00 - 0.50	0.30 - 0.80	1.70 - 2.00	1.00 - 1.50	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	
			Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	
			SDG Ref	091117-11	091117-11	091117-11	091117-11	091117-11	091117-11	
Lab Sample No.(s)	618438	618474	618764	618544	618611	618630				
Component	LOD/Units	Method								
Asbestos Presence Screen	-	TM001	No ACM Detected				No ACM Detected			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024		<15.0	M	<15.0	M	<15.0	M	<15.0
Exchangeable Ammonium as NH4	<15 mg/kg	TM024		<15.0	M	<15.0	M	<15.0	M	<15.0
Ammoniacal Nitrogen as N	<15 mg/kg	TM024		<15.0		<15.0		<15.0		<15.0
Catechol	<0.01 mg/kg	TM062 (S)		<0.0100		<0.0500		<0.0100		<0.0100
Phenol	<0.01 mg/kg	TM062 (S)		<0.0300	M	0.259	M	<0.0200	M	<0.0100
Cresols	<0.01 mg/kg	TM062 (S)		<0.0200	M	0.291	M	<0.0400	M	<0.0100
Resorcinol	<0.05 mg/kg	TM062 (S)		<0.0500		<0.250		<0.0500		<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)		<0.0150	M	<0.0750	M	<0.0300	M	<0.0150
1-Naphthol	<0.01 mg/kg	TM062 (S)		<0.0100		<0.0500		<0.0100		<0.0100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)		<0.0100	M	<0.0500	M	<0.0100	M	<0.0100
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)		<0.0150	M	<0.0750	M	<0.0150	M	<0.0150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)		<0.0500		0.550		<0.0900		<0.0200
pH value of soil	1 pH Units	TM133		8.22		11.20		8.79		11.12
Hexavalent Chromium	<0.6 mg/kg	TM151		<0.60	#	0.075	#	<0.60	#	<0.60
Hexavalent Chromium	<0.6 mg/kg	TM151		<0.600	#	0.0810	#	<0.600	#	<0.600
Total Cyanide	<1 mg/kg	TM153		22.2	M	26.8	M	8.41	M	2.78
Easily Liberated Sulphide	<15 mg/kg	TM180		27.54	#	208.35	#	31.75	#	<15.00
Easily Liberated Sulphide	<15 mg/kg	TM180		30.6	#	225	#	35.9	#	<15.0
Arsenic	<0.6 mg/kg	TM181		5.31	M	7.09	M	4.57	M	7.88
Cadmium	<0.02 mg/kg	TM181		0.0513	M	<0.0200	M	<0.0200	M	0.0978
Chromium	<0.9 mg/kg	TM181		5.60	M	7.61	M	5.84	M	13.2
Copper	<1.4 mg/kg	TM181		5.00	M	7.40	M	1.76	M	14.3
Lead	<0.7 mg/kg	TM181		10.6	M	19.5	M	3.64	M	37.9
Mercury	<0.14 mg/kg	TM181		<0.140	M	<0.140	M	<0.140	M	<0.140
Nickel	<0.2 mg/kg	TM181		4.81	M	6.47	M	5.43	M	12.9
Selenium	<1 mg/kg	TM181		<1.00	#	<1.00	#	<1.00	#	<1.00
Zinc	<1.9 mg/kg	TM181		17.3	M	66.0	M	13.1	M	31.5
Total Sulphate	<48 mg/kg	TM221		1420	M	1950	M	858	M	1970

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SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65980

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
* This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A4	C3	C4	D4
Depth (m)	1.10 - 1.50	0.00 - 0.50	1.70 - 2.00	1.00 - 1.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-11	091117-11	091117-11	091117-11
Lab Sample No.(s)	618474	618764	618611	618630

Component	LOD/Units	Method	A4	C3	C4	D4
Aromatics >EC12-EC16	<100 µg/kg	TM173	163000	174000	105000	8870
Aromatics >EC16-EC21	<100 µg/kg	TM173	213000	400000	322000	10700
Aromatics >EC21-EC35	<100 µg/kg	TM173	445000	293000	387000	114000
Aromatics >EC35-EC44	<100 µg/kg	TM173	85900	11000	39700	28000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	906000	878000	854000	161000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	906000	878000	854000	161000

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SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65980

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	A4	C3	C4	D4		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.10 - 1.50	0.00 - 0.50	1.70 - 2.00	1.00 - 1.50		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
			Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009		
			SDG Ref	091117-11	091117-11	091117-11	091117-11		
			Lab Sample No.(s)	618474	618764	618611	618630		
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	1920	7080	4780	246			
			#	#	#	#			
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00			
			#	#	#	#			
Benzene	<10 µg/kg	TM089	38.9	<10.0	<10.0	<10.0			
			M	M	M	M			
Toluene	<2 µg/kg	TM089	15.5	11.9	<8.00	<8.00			
			M	M	M	M			
Ethyl Benzene	<3 µg/kg	TM089	26.6	<3.00	<3.00	<3.00			
			M	M	M	M			
m & p Xylene	<6 µg/kg	TM089	16.7	15.1	12.4	<9.00			
			M	M	M	M			
o Xylene	<3 µg/kg	TM089	18.9	<3.00	<3.00	<5.00			
			M	M	M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	35.5	15.1	12.4	<10.0			
			M	M	M	M			
Sum of BTEX	<10 µg/kg	TM089	117	27.0	12.4	<10.0			
			M	M	M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	12.2	<10.0	<10.0			
Aliphatics >C6-C8	<10 µg/kg	TM089	16.1	51.6	55.5	<10.0			
Aliphatics >C8-C10	<10 µg/kg	TM089	105	561	342	18.0			
Aliphatics >C10-C12	<10 µg/kg	TM089	606	2230	1540	80.3			
Total Aliphatics C5-C12	<10 µg/kg	TM089	727	2860	1930	98.4			
Aromatics C6-C7	<10 µg/kg	TM089	38.9	<10.0	<10.0	<10.0			
Aromatics >C7-C8	<10 µg/kg	TM089	15.5	10.9	<10.0	<10.0			
Aromatics >EC8-EC10	<10 µg/kg	TM089	220	867	525	27.1			
Aromatics >EC10-EC12	<10 µg/kg	TM089	909	3350	2310	120			
Total Aromatics C6-C12	<10 µg/kg	TM089	1180	4220	2830	148			

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SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65980

PAH micro by GCMS

Results Legend			Sample Identity	A4	C3	C4	D4
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.10 - 1.50 Soil/Solid 13/11/2009 16/11/2009 091117-11 618474	0.00 - 0.50 Soil/Solid 13/11/2009 16/11/2009 091117-11 618764	1.70 - 2.00 Soil/Solid 13/11/2009 16/11/2009 091117-11 618611	1.00 - 1.50 Soil/Solid 13/11/2009 16/11/2009 091117-11 618630
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	318	978	447	250	
Acenaphthylene (S)	<12 µg/kg	TM218	345	281	1500	132	
Acenaphthene (S)	<8 µg/kg	TM218	392	1770	839	26.8	
Fluorene (S)	<10 µg/kg	TM218	222	3320	2240	39.2	
Phenanthrene (S)	<15 µg/kg	TM218	163	6090	5750	757	
Anthracene (S)	<16 µg/kg	TM218	214	1840	2840	216	
Fluoranthene (S)	<17 µg/kg	TM218	598	1530	6120	970	
Pyrene (S)	<15 µg/kg	TM218	375	1970	4280	790	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	122	697	2050	746	
Chrysene (S)	<10 µg/kg	TM218	18.6	649	1550	710	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	149	1180	2130	1270	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	53.1	467	872	480	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	125	869	1210	890	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	84.3	623	852	660	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	25.0	181	214	191	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	102	896	910	781	
PAH 16 EPA Total	<118 µg/kg	TM218	3310	23100	34300	8910	

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SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65980

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A4	C3	C4	D4
Depth (m)	1.10 - 1.50	0.00 - 0.50	1.70 - 2.00	1.00 - 1.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-11	091117-11	091117-11	091117-11
Lab Sample No.(s)	618474	618764	618611	618630

Component	LOD/Units	Method	A4	C3	C4	D4
Total Aliphatics >C5-C44	<100 µg/kg	TM173	268000	1770000	1150000	299000
Total Aromatics >C6-C44	<100 µg/kg	TM173	907000	882000	857000	161000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	1170000	2650000	2010000	461000

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Consent of copyright owner required for any other use.

SDG: 091117-11
Job: D_MOUCHEL_ELE-27
Client Reference: 13/11/09 (A4, C4, D4 & C3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65980

VOC MS (S)

Results Legend			Sample Identity	C3	C4				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	1.70 - 2.00				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	13/11/2009	13/11/2009				
			Date Received	16/11/2009	16/11/2009				
			SDG Ref	091117-11	091117-11				
			Lab Sample No.(s)	618764	618611				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		0.770	94.2				
Toluene-d8**	%	TM116		64.2	66.2				
4-Bromofluorobenzene**	%	TM116		57.6	57.6				
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	M	M		
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	#	#		
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	M	M		
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	M	M		
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	M	M		
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	M	M		
1.1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	#	#		
Carbon Disulphide	<9 µg/kg	TM116		72.4	13.6	M	M		
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	M	M		
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	M	M		
trans-1-2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	M	M		
1.1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	M	M		
cis-1-2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	M	M		
2.2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	M	M		
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	M	M		
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	M	M		
1.1.1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	M	M		
1.1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	M	M		
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	M	M		
1.2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	M	M		
Benzene	<9 µg/kg	TM116		15.6	<9.00	M	M		
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	#	#		
1.2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	M	M		
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	M	M		
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	M	M		
cis-1-3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	M	M		
Toluene	<6 µg/kg	TM116		16.6	7.65	M	M		
trans-1-3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	M	M		
1.1.2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	M	M		
1.3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	M	M		
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	M	M		
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	M	M		
1.2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	M	M		
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00	M	M		
1.1.1.2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	M	M		
Ethylbenzene	<9 µg/kg	TM116		<9.00	<9.00	M	M		

SDG: 091117-11
 Job: D_MOUCHEL_ELE-27
 Client Reference: 13/11/09 (A4, C4, D4 & C3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65980

VOC MS (S)

Results Legend		Sample Identity	C3	C4				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 13/11/2009 16/11/2009 091117-11 618764	1.70 - 2.00 Soil/Solid 13/11/2009 16/11/2009 091117-11 618611				
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	24.0 #	<13.0 #				
o-Xylene	<11 µg/kg	TM116	<11.0 M	<11.0 M				
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M				
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M				
Isopropylbenzene	<9 µg/kg	TM116	26.1 M	<9.00 M				
1.1.2.2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #				
1.2.3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M				
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M				
Propylbenzene	<6 µg/kg	TM116	37.7 M	<6.00 M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #				
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #				
1.2.4-Trimethylbenzene	<10 µg/kg	TM116	14.2 #	<10.0 #				
sec-Butylbenzene	<8 µg/kg	TM116	44.0 #	11.1 #				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	<8.00 #				
1.3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #				
1.4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #				
1.2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M				
1.2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #				
1.2.4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #				
Naphthalene	<7 µg/kg	TM116	1430 #	258 #				
1.2.3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #				

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 25 November 2009
Job: D_MOUCHEL_ELE-28
Sample Delivery Group (SDG): 091117-24
Your Reference: 14/11/09 (11)
Location: Limerick Gasworks
Report No.: 65788

A total of 3 samples was received on Monday November 16, 2009 and completed on Wednesday November 25, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091117-24
 Job: D_MOUCHEL_ELE-28
 Client Reference: 14/11/09 (11)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 65788

SOLID

Results Legend	Sample ID	11						Total
		0.00 - 0.50		2.50 - 3.00		5.50 - 6.00		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0 3
Asbestos Presence Screen	All		X					0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0 3 3
Easily Liberated Sulphide	All		X		X		X	0 3 3
EPH CWG (Aliphatic) GC (S)	All		X		X			0 3
EPH CWG (Aromatic) GC (S)	All		X		X			0 3
GRO BTEX MTBE GC (S)	All		X		X			0 3
Hexavalent Chromium (s)	All	X		X		X		0 3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0 3
	Cadmium		X		X		X	0 3
	Chromium		X		X		X	0 3
	Copper		X		X		X	0 3
	Lead		X		X		X	0 3
	Mercury		X		X		X	0 3
	Nickel		X		X		X	0 3
	Selenium		X		X		X	0 3
	Zinc		X		X		X	0 3
PAH micro by GCMS	All		X		X		X	0 3
PCBs by GCMS	All		X					0 1
pH	All		X		X		X	0 3
Phenols by HPLC (S)	All		X		X		X	0 3
Sample description	All		X		X		X	0 3
Total Sulphate	All		X		X		X	0 3
TPH CWG GC (S)	All		X		X		X	0 3

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SDG:	091117-24	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-28	Attention:	Verity Sankey
Client Reference:	14/11/09 (11)	Order No.:	
Location:	Limerick Gasworks	Report No.:	65788

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
I1	0.00 - 0.50	Beige	Sand	0.1 - 2 mm	Stones
	2.50 - 3.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	5.50 - 6.00	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091117-24
Job: D_MOUCHEL_ELE-28
Client Reference: 14/11/09 (11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 65788

Test Completion dates

SDG reference: 091117-24

Sample ID	Depth	Type	SDG reference: 091117-24														
			Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate
I1	0.00 - 0.50	SOLID	25/11/2009	18/11/2009	19/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	23/11/2009	21/11/2009	20/11/2009	20/11/2009	23/11/2009	18/11/2009	20/11/2009	25/11/2009
	2.50 - 3.00	SOLID	25/11/2009	19/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	20/11/2009	21/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	20/11/2009	23/11/2009
	5.50 - 6.00	SOLID	25/11/2009	19/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	18/11/2009	20/11/2009	23/11/2009

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SDG: 091117-24
Job: D_MOUCHEL_ELE-28
Client Reference: 14/11/09 (I1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65788

Results Legend			Sample Identity	I1	I1	I1			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 14/11/2009 16/11/2009 091117-24 618905	2.50 - 3.00 Soil/Solid 14/11/2009 16/11/2009 091117-24 618946	5.50 - 6.00 Soil/Solid 14/11/2009 16/11/2009 091117-24 619036			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	M	30.5	M	29.3	M	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	M	47.5	M	44.0	M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		36.9		34.2		
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.0500		<0.0500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00		0.00		0.00		
pH value of soil	1 pH Units	TM133	10.08	M	7.92	M	7.89	M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	#	<0.60	#	<0.60	#	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#	<0.600	#	<0.600	#	
Total Cyanide	<1 mg/kg	TM153	6.05	M	1.90	M	<1.00	M	
PCB congener 28	<3 µg/kg	TM168	<3.00						
PCB congener 52	<3 µg/kg	TM168	<3.00						
PCB congener 101	<3 µg/kg	TM168	<3.00						
PCB congener 118	<3 µg/kg	TM168	<3.00						
PCB congener 138	<3 µg/kg	TM168	<3.00						
PCB congener 153	<3 µg/kg	TM168	<3.00						
PCB congener 180	<3 µg/kg	TM168	<3.00						
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00						
Easily Liberated Sulphide	<15 mg/kg	TM180	19.72	#	57.89	#	48.50	#	
Easily Liberated Sulphide	<15 mg/kg	TM180	22.7	#	70.0	#	56.7	#	
Arsenic	<0.6 mg/kg	TM181	10.2	M	6.18	M	6.03	M	
Cadmium	<0.02 mg/kg	TM181	0.166	M	0.0970	M	0.100	M	
Chromium	<0.9 mg/kg	TM181	18.8	M	13.9	M	9.93	M	
Copper	<1.4 mg/kg	TM181	21.8	M	5.80	M	14.2	M	
Lead	<0.7 mg/kg	TM181	1120	M	29.4	M	46.5	M	
Mercury	<0.14 mg/kg	TM181	0.253	M	<0.140	M	<0.140	M	
Nickel	<0.2 mg/kg	TM181	21.4	M	13.7	M	13.4	M	
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	<1.00	#	
Zinc	<1.9 mg/kg	TM181	93.8	M	36.0	M	29.5	M	
Total Sulphate	<48 mg/kg	TM221	2490	M	626	M	2160	M	

SDG: 091117-24
Job: D_MOUCHEL_ELE-28
Client Reference: 14/11/09 (11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65788

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I1	I1	I1
Depth (m)	0.00 - 0.50	2.50 - 3.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-24	091117-24	091117-24
Lab Sample No.(s)	618905	618946	619036

Component	LOD/Units	Method	I1	I1	I1
Aliphatics >C12-C16	<100 µg/kg	TM173	9570	3420	10500
Aliphatics >C16-C21	<100 µg/kg	TM173	41400	2730	4900
Aliphatics >C21-C35	<100 µg/kg	TM173	147000	8450	7750
Aliphatics >C35-C44	<100 µg/kg	TM173	47700	325	745
Total Aliphatics >C12-C44	<100 µg/kg	TM173	245000	14900	23900
Aliphatics >C16-C35	<100 µg/kg	TM173	188000	11200	12600

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SDG: 091117-24
Job: D_MOUCHEL_ELE-28
Client Reference: 14/11/09 (I1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65788

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I1	I1	I1
Depth (m)	0.00 - 0.50	2.50 - 3.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-24	091117-24	091117-24
Lab Sample No.(s)	618905	618946	619036

Component	LOD/Units	Method	I1	I1	I1
Aromatics >EC12-EC16	<100 µg/kg	TM173	25800	10700	23300
Aromatics >EC16-EC21	<100 µg/kg	TM173	27500	7160	33600
Aromatics >EC21-EC35	<100 µg/kg	TM173	119000	20400	210000
Aromatics >EC35-EC44	<100 µg/kg	TM173	43700	9700	60900
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	216000	48000	328000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	216000	48000	328000

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SDG: 091117-24
Job: D_MOUCHEL_ELE-28
Client Reference: 14/11/09 (I1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65788

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 # mCERTS accredited.
 # subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I1	I1	I1
Depth (m)	0.00 - 0.50	2.50 - 3.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-24	091117-24	091117-24
Lab Sample No.(s)	618905	618946	619036

Component	LOD/Units	Method	I1	I1	I1
GRO C5-C12	<44 µg/kg	TM089	69.0 #	<44.0 #	295 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	<10.0 M	<10.0 M	<10.0 M
Toluene	<2 µg/kg	TM089	<7.00 M	<4.00 M	12.9 M
Ethyl Benzene	<3 µg/kg	TM089	<3.00 M	<3.00 M	<3.00 M
m & p Xylene	<6 µg/kg	TM089	<9.00 M	<6.00 M	16.4 M
o Xylene	<3 µg/kg	TM089	<3.00 M	<3.00 M	<8.00 M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0 M	<10.0 M	16.4 M
Sum of BTEX	<10 µg/kg	TM089	<10.0 M	<10.0 M	29.3 M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	39.2
Aliphatics >C6-C8	<10 µg/kg	TM089	15.4	<10.0	92.3
Aliphatics >C8-C10	<10 µg/kg	TM089	17.5	<10.0	31.0
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	<10.0	2.7
Total Aliphatics C5-C12	<10 µg/kg	TM089	32.9	<10.0	185
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	12.9
Aromatics >EC8-EC10	<10 µg/kg	TM089	26.2	<10.0	62.9
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	<10.0	34.0
Total Aromatics C6-C12	<10 µg/kg	TM089	26.2	<10.0	110

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SDG: 091117-24
 Job: D_MOUCHEL_ELE-28
 Client Reference: 14/11/09 (I1)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 65788

PAH micro by GCMS

Results Legend			Sample Identity	I1	I1	I1			
# ISO17025 accredited. mCERES accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	2.50 - 3.00	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	14/11/2009	14/11/2009			
			Date Received	16/11/2009	16/11/2009	16/11/2009			
			SDG Ref	091117-24	091117-24	091117-24			
			Lab Sample No.(s)	618905	618946	619036			
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	116	25.5	530	M	M	M	
Acenaphthylene (S)	<12 µg/kg	TM218	96.9	<12.0	171	M	M	M	
Acenaphthene (S)	<8 µg/kg	TM218	21.5	493	155	M	M	M	
Fluorene (S)	<10 µg/kg	TM218	31.3	18.3	462	M	M	M	
Phenanthrene (S)	<15 µg/kg	TM218	719	97.8	2840	M	M	M	
Anthracene (S)	<16 µg/kg	TM218	172	41.6	1210	M	M	M	
Fluoranthene (S)	<17 µg/kg	TM218	1670	168	5550	M	M	M	
Pyrene (S)	<15 µg/kg	TM218	1440	136	4530	M	M	M	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	940	116	3900	M	M	M	
Chrysene (S)	<10 µg/kg	TM218	756	95.6	3260	M	M	M	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1820	132	4080	M	M	M	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	684	58.1	2150	M	M	M	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1250	96.1	3210	M	M	M	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	882	50.1	1910	M	M	M	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	240	23.8	733	M	M	M	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1070	541	1950	M	M	M	
PAH 16 EPA Total	<118 µg/kg	TM218	11900	610	37100	M	M	M	

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SDG: 091117-24
Job: D_MOUCHEL_ELE-28
Client Reference: 14/11/09 (I1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65788

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I1	I1	I1
Depth (m)	0.00 - 0.50	2.50 - 3.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-24	091117-24	091117-24
Lab Sample No.(s)	618905	618946	619036

Component	LOD/Units	Method			
Total Aliphatics >C5-C44	<100 µg/kg	TM173	245000	14900	24100
Total Aromatics >C6-C44	<100 µg/kg	TM173	216000	48000	328000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	462000	62900	352000

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 30 November 2009
Job: D_MOUCHEL_ELE-34
Sample Delivery Group (SDG): 091117-32
Your Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks
Report No.: 66101

A total of 4 samples was received on Monday November 16, 2009 and completed on Monday November 30, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091117-32
 Job: D_MOUCHEL_ELE-34
 Client Reference: 16/11/09 (E3 & B3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66101

SOLID

Results Legend	Sample ID	B3				E3				Total
		0.10 - 0.40		1.00 - 1.50		3.00 - 3.50		5.30 - 5.80		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
Ammonium Soil by Titration	All	X	X	X	X					0
Asbestos Presence Screen	All			X						4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X			X			X	X	0
Easily Liberated Sulphide	All	X	X		X			X	X	3
EPH CWG (Aliphatic) GC (S)	All	X	X	X	X	X	X	X	X	0
EPH CWG (Aromatic) GC (S)	All	X	X	X	X	X	X	X	X	4
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	X	X	X	0
Hexavalent Chromium (s)	All	X	X	X	X	X	X	X	X	4
Metals by iCap-OES (Soil)	Arsenic	X	X	X	X	X	X	X	X	0
	Cadmium	X	X	X	X	X	X	X	X	4
	Chromium	X	X	X	X	X	X	X	X	0
	Copper	X	X	X	X	X	X	X	X	4
	Lead	X	X	X	X	X	X	X	X	0
	Mercury	X	X	X	X	X	X	X	X	4
	Nickel	X	X	X	X	X	X	X	X	0
	Selenium	X	X	X	X	X	X	X	X	4
	Zinc	X	X	X	X	X	X	X	X	0
PAH micro by GCMS	All	X	X	X	X	X	X	X	X	0
pH	All	X	X	X	X	X	X	X	X	4
Phenols by HPLC (S)	All	X	X	X	X	X	X	X	X	0
Sample description	All	X	X	X	X	X	X	X	X	4
Total Sulphate	All	X	X	X	X	X	X	X	X	0
TPH CWG GC (S)	All	X	X	X	X	X	X	X	X	4
VOC MS (S)	All			X		X				0
										2

SDG:	091117-32	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-34	Attention:	Verity Sankey
Client Reference:	16/11/09 (E3 & B3)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66101

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
B3	0.10 - 0.40	Brown	Silty Clay	0.063 - 0.1 mm	Stones
E3	1.00 - 1.50	Brown	Sand	0.1 - 2 mm	Stones
	3.00 - 3.50	Brown	Sand	0.1 - 2 mm	Stones
	5.30 - 5.80	Black	Sand	0.1 - 2 mm	Oil/Petroleum

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66101

Test Completion dates

SDG reference: 091117-32

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GC/MS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
B3	0.10 - 0.40	SOLID	25/11/2009	19/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	23/11/2009	21/11/2009	20/11/2009	20/11/2009	18/11/2009	20/11/2009	25/11/2009	25/11/2009
E3	1.00 - 1.50	SOLID	25/11/2009	18/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	23/11/2009	20/11/2009	20/11/2009	19/11/2009	18/11/2009	20/11/2009	25/11/2009	25/11/2009
	3.00 - 3.50	SOLID	25/11/2009	19/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	23/11/2009	20/11/2009	20/11/2009	19/11/2009	18/11/2009	20/11/2009	25/11/2009	25/11/2009
	5.30 - 5.80	SOLID	25/11/2009	19/11/2009	20/11/2009	23/11/2009	28/11/2009	28/11/2009	24/11/2009	20/11/2009	23/11/2009	20/11/2009	20/11/2009	23/11/2009	18/11/2009	20/11/2009	25/11/2009	27/11/2009

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SDG: 091117-32
 Job: D_MOUCHEL_ELE-34
 Client Reference: 16/11/09 (E3 & B3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66101

Results Legend			Sample Identity	B3	E3	E3	E3	
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.40	1.00 - 1.50	3.00 - 3.50	5.30 - 5.80	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009	
			Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009	
			SDG Ref	091117-32	091117-32	091117-32	091117-32	
Lab Sample No.(s)	619265	619183	619230	619251				
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001		No ACM Detected				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	134		
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.100		
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	4.11		
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	17.1		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	132		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	14.9		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.100		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.150		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	0.00	168		
pH value of soil	1 pH Units	TM133	8.00	7.66	7.19	8.98		
Hexavalent Chromium	<0.6 mg/kg	TM151	<12	<0.60	<0.60	<6.0		
Hexavalent Chromium	<0.6 mg/kg	TM151	<12.0	<0.600	<0.600	<6.00		
Total Cyanide	<1 mg/kg	TM153	<1.00		4.30	36.6		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	<15.00	546.92	3272.97		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	<15.0	640	3530		
Arsenic	<0.6 mg/kg	TM181	7.98	10.2	7.38	6.60		
Cadmium	<0.02 mg/kg	TM181	0.0983	0.175	0.130	0.0477		
Chromium	<0.9 mg/kg	TM181	16.2	11.1	9.57	6.26		
Copper	<1.4 mg/kg	TM181	14.0	24.5	15.9	3.00		
Lead	<0.7 mg/kg	TM181	32.6	111	70.7	3.23		
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140	<0.140		
Nickel	<0.2 mg/kg	TM181	21.7	20.4	19.2	6.67		
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00		
Zinc	<1.9 mg/kg	TM181	106	117	51.2	14.6		
Total Sulphate	<48 mg/kg	TM221	1240	9130	6920	9860		

SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66101

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B3	E3	E3	E3
Depth (m)	0.10 - 0.40	1.00 - 1.50	3.00 - 3.50	5.30 - 5.80
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-32	091117-32	091117-32	091117-32
Lab Sample No.(s)	619265	619183	619230	619251

Component	LOD/Units	Method	B3	E3	E3	E3
Aliphatics >C12-C16	<100 µg/kg	TM173	6960	87800	769000	2060000
Aliphatics >C16-C21	<100 µg/kg	TM173	14100	101000	823000	1410000
Aliphatics >C21-C35	<100 µg/kg	TM173	196000	157000	347000	1280000
Aliphatics >C35-C44	<100 µg/kg	TM173	208000	45300	23100	61900
Total Aliphatics >C12-C44	<100 µg/kg	TM173	425000	391000	1960000	4820000
Aliphatics >C16-C35	<100 µg/kg	TM173	210000	258000	1170000	2700000

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SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66101

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
* This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B3	E3	E3	E3		
Depth (m)	0.10 - 0.40	1.00 - 1.50	3.00 - 3.50	5.30 - 5.80		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009		
SDG Ref	091117-32	091117-32	091117-32	091117-32		
Lab Sample No.(s)	619265	619183	619230	619251		

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	10100	48800	370000	6020000
Aromatics >EC16-EC21	<100 µg/kg	TM173	10700	136000	436000	7970000
Aromatics >EC21-EC35	<100 µg/kg	TM173	291000	597000	358000	15300000
Aromatics >EC35-EC44	<100 µg/kg	TM173	394000	174000	39600	2370000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	706000	957000	1200000	31700000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	706000	957000	1200000	31700000

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SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66101

GRO BTEX MTBE GC (S)

Sample Identity	B3	E3	E3	E3
	Depth (m)	0.10 - 0.40	1.00 - 1.50	3.00 - 3.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-32	091117-32	091117-32	091117-32
Lab Sample No.(s)	619265	619183	619230	619251

Component	LOD/Units	Method	B3	E3	E3	E3
GRO C5-C12	<44 µg/kg	TM089	1860	377	16600	1310000
MTBE	<5 µg/kg	TM089	132	<5.00	<5.00	<5.00
Benzene	<10 µg/kg	TM089	137	25.5	70.2	146000
Toluene	<2 µg/kg	TM089	177	27.8	92.4	236000
Ethyl Benzene	<3 µg/kg	TM089	116	<6.00	446	37200
m & p Xylene	<6 µg/kg	TM089	297	23.3	319	203000
o Xylene	<3 µg/kg	TM089	157	11.1	314	74900
Sum m&p and o Xylene	<10 µg/kg	TM089	454	34.4	633	278000
Sum of BTEX	<10 µg/kg	TM089	884	87.7	1240	696000
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	137	9650
Aliphatics >C6-C8	<10 µg/kg	TM089	76.3	<10.0	1960	92600
Aliphatics >C8-C10	<10 µg/kg	TM089	86.1	14.4	1630	113000
Aliphatics >C10-C12	<10 µg/kg	TM089	250	100	8630	92500
Total Aliphatics C5-C12	<10 µg/kg	TM089	412	114	7400	308000
Aromatics C6-C7	<10 µg/kg	TM089	137	25.5	70.2	146000
Aromatics >C7-C8	<10 µg/kg	TM089	177	27.8	92.4	236000
Aromatics >EC8-EC10	<10 µg/kg	TM089	699	66.0	3520	485000
Aromatics >EC10-EC12	<10 µg/kg	TM089	375	150	5510	139000
Total Aromatics C6-C12	<10 µg/kg	TM089	1390	259	9200	1000000

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SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66101

PAH micro by GCMS

Results Legend			Sample Identity	B3	E3	E3	E3		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.40	1.00 - 1.50	3.00 - 3.50	5.30 - 5.80		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
			Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009		
			SDG Ref	091117-32	091117-32	091117-32	091117-32		
			Lab Sample No.(s)	619265	619183	619230	619251		
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	236	17800	7210	5240000			
Acenaphthylene (S)	<12 µg/kg	TM218	38.4	6210	34100	1000000			
Acenaphthene (S)	<8 µg/kg	TM218	16.9	14500	13400	174000			
Fluorene (S)	<10 µg/kg	TM218	26.9	13300	17300	687000			
Phenanthrene (S)	<15 µg/kg	TM218	162	111000	23300	1760000			
Anthracene (S)	<16 µg/kg	TM218	60.4	22000	5600	517000			
Fluoranthene (S)	<17 µg/kg	TM218	243	108000	6880	997000			
Pyrene (S)	<15 µg/kg	TM218	267	96700	6920	767000			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	72.4	53900	3400	301000			
Chrysene (S)	<10 µg/kg	TM218	52.0	48800	2650	225000			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	90.8	51400	4670	242000			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	39.2	21400	1920	102000			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	61.5	51600	4250	239000			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	43.2	25600	443	103000			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0	8240	730	27900			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	72.7	29700	3010	116000			
PAH 16 EPA Total	<118 µg/kg	TM218	1480	680000	136000	<11800			

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SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66101

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B3	E3	E3	E3		
Depth (m)	0.10 - 0.40	1.00 - 1.50	3.00 - 3.50	5.30 - 5.80		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009		
SDG Ref	091117-32	091117-32	091117-32	091117-32		
Lab Sample No.(s)	619265	619183	619230	619251		

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	425000	391000	1970000	5130000
Total Aromatics >C6-C44	<100 µg/kg	TM173	708000	957000	1210000	32700000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	1130000	1350000	3180000	37800000

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SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66101

VOC MS (S)

Results Legend			Sample Identity		E3	E3					
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	5.30 - 5.80						
			Sample Type	Soil/Solid	Soil/Solid						
			Date Sampled	13/11/2009	13/11/2009						
			Date Received	16/11/2009	16/11/2009						
			SDG Ref	091117-32	091117-32						
			Lab Sample No.(s)	619230	619251						
			Method								
Component	LOD/Units	Method									
Dibromofluoromethane**	%	TM116		123	123						
Toluene-d8**	%	TM116		61.0	77.8						
4-Bromofluorobenzene**	%	TM116		56.3	71.8						
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0						
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0						
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0						
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00						
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0						
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00						
1.1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
Carbon Disulphide	<9 µg/kg	TM116		38.7	137						
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0						
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00						
trans-1-2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0						
1.1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00						
cis-1-2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
2.2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0						
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0						
Chloroform	<10 µg/kg	TM116		<10.0	<10.0						
1.1.1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0						
1.1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0						
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0						
1.2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0						
Benzene	<9 µg/kg	TM116		39.8	256000						
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00						
1.2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0						
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0						
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0						
cis-1-3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0						
Toluene	<6 µg/kg	TM116		41.6	450000						
trans-1-3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0						
1.1.2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00						
1.3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00						
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00						
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00						
1.2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0						
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00						
1.1.1.2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0						
Ethylbenzene	<9 µg/kg	TM116		701	123000						

SDG: 091117-32
Job: D_MOUCHEL_ELE-34
Client Reference: 16/11/09 (E3 & B3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66101

VOC MS (S)

Results Legend			Sample Identity		E3	E3				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	5.30 - 5.80					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	13/11/2009	13/11/2009					
			Date Received	16/11/2009	16/11/2009					
			SDG Ref	091117-32	091117-32					
			Lab Sample No.(s)	619230	619251					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	268	#	686000					
o-Xylene	<11 µg/kg	TM116	386	M	283000					
Styrene	<11 µg/kg	TM116	<11.0	M	<11.0					
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0					
Isopropylbenzene	<9 µg/kg	TM116	153	M	10300					
1.1.2.2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0					
1.2.3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0					
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0					
Propylbenzene	<6 µg/kg	TM116	500	M	23200					
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0					
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	420	M	91200					
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00					
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0					
1.2.4-Trimethylbenzene	<10 µg/kg	TM116	1560	#	193000					
sec-Butylbenzene	<8 µg/kg	TM116	50.8	#	1670					
4-Isopropyltoluene	<8 µg/kg	TM116	42.6	#	5670					
1.3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<8.00					
1.4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0					
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00					
1.2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00					
1.2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0					
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<7.00					
1.2.4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00					
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0					
Naphthalene	<7 µg/kg	TM116	2680	#	5530000					
1.2.3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0					

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-29
Sample Delivery Group (SDG): 091117-48
Your Reference: 20/11/09 (E4)
Location: Limerick Gasworks
Report No.: 66789

A total of 2 samples was received on Monday November 16, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091117-48
Job: D_MOUCHEL_ELE-29
Client Reference: 20/11/09 (E4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66789

SOLID

Results Legend	Sample ID	E4		Total		
		Depth (m)				
		0.10 - 0.90	1.80 - 1.80			
	Container	250g Glass Jar	400g Tub Vial	60g VOC Dublin JAR (D)	TUB (D)	
Ammonium Soil by Titration	All		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X	0
Easily Liberated Sulphide	All		X		X	0
EPH CWG (Aliphatic) GC (S)	All	X			X	0
EPH CWG (Aromatic) GC (S)	All	X			X	0
GRO BTEX MTBE GC (S)	All			N	X	0
Hexavalent Chromium (s)	All		X		X	0
Metals by iCap-OES (Soil)	Arsenic	X			X	0
	Cadmium	X			X	0
	Chromium	X			X	0
	Copper	X			X	0
	Lead	X			X	0
	Mercury	X			X	0
	Nickel	X			X	0
	Selenium	X			X	0
	Zinc	X			X	0
PAH micro by GCMS	All	X			X	0
PCBs by GCMS	All	X				0
pH	All		N			1
Phenols by HPLC (S)	All		X		X	0
Sample description	All	X			X	0
Total Sulphate	All	X			X	0
TPH CWG GC (S)	All		N		X	1
VOC MS (S)	All			N	X	1

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SDG:	091117-48	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-29	Attention:	Verity Sankey
Client Reference:	20/11/09 (E4)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66789

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E4	0.10 - 0.90	Black	N/A	N/A	Tar
	1.60 - 1.80	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091117-48
Job: D_MOUCHEL_ELE-29
Client Reference: 20/11/09 (E4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66789

Test Completion dates

SDG reference: 091117-48

Sample ID	Depth	Type	SDG reference: 091117-48															
			VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
E4	0.10 - 0.90	SOLID																
	1.60 - 1.80	SOLID	22/11/2009	23/11/2009	20/11/2009	18/11/2009	23/11/2009	19/11/2009	07/12/2009	21/11/2009	20/11/2009	20/11/2009	20/11/2009	24/11/2009	23/11/2009	20/11/2009	19/11/2009	03/12/2009

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SDG: 091117-48
Job: D_MOUCHEL_ELE-29
Client Reference: 20/11/09 (E4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66789

Results Legend			Sample Identity		E4	E4				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.90	1.60 - 1.80					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	13/11/2009	13/11/2009					
			Date Received	16/11/2009	16/11/2009					
			SDG Ref	091117-48	091117-48					
			Lab Sample No.(s)	619896	619933					
Component	LOD/Units	Method								
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	205		<15.0	M	M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	160		<15.0					
Catechol	<0.01 mg/kg	TM062 (S)	<1.00		<0.0500					
Phenol	<0.01 mg/kg	TM062 (S)	507	M	1.23		M			
Cresols	<0.01 mg/kg	TM062 (S)	1520	M	2.25		M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<5.00		<0.250					
Xylenols	<0.015 mg/kg	TM062 (S)	1360	M	8.00		M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<1.00		<0.0500					
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<1.00	M	<0.0500		M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<1.50	M	<0.0750		M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	3390		11.5					
pH value of soil	1 pH Units	TM133			8.31		M			
Hexavalent Chromium	<0.6 mg/kg	TM151	<48.0	#	<3.00		#			
Total Cyanide	<1 mg/kg	TM153	20.1	M	88.6					
PCB congener 28	<3 µg/kg	TM168	<3.00							
PCB congener 52	<3 µg/kg	TM168	<3.00							
PCB congener 101	<3 µg/kg	TM168	<3.00							
PCB congener 118	<3 µg/kg	TM168	<3.00							
PCB congener 138	<3 µg/kg	TM168	<3.00							
PCB congener 153	<3 µg/kg	TM168	<3.00							
PCB congener 180	<3 µg/kg	TM168	<3.00							
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00							
Easily Liberated Sulphide	<15 mg/kg	TM180	297	#	805		#			
Arsenic	<0.6 mg/kg	TM181	3.82	M	7.52		M			
Cadmium	<0.02 mg/kg	TM181	<0.0200	M	0.0866		M			
Chromium	<0.9 mg/kg	TM181	1.69	M	20.4		M			
Copper	<1.4 mg/kg	TM181	5.96	M	30.9		M			
Lead	<0.7 mg/kg	TM181	23.9	M	49.2		M			
Mercury	<0.14 mg/kg	TM181	0.365	M	<0.140		M			
Nickel	<0.2 mg/kg	TM181	1.67	M	23.5		M			
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00		#			
Zinc	<1.9 mg/kg	TM181	21.2	M	46.7		M			
Total Sulphate	<48 mg/kg	TM221	3020	M	1240		M			

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SDG: 091117-48
Job: D_MOUCHEL_ELE-29
Client Reference: 20/11/09 (E4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66789

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E4	E4				
Depth (m)	0.10 - 0.90	1.60 - 1.80				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	13/11/2009	13/11/2009				
Date Received	16/11/2009	16/11/2009				
SDG Ref	091117-48	091117-48				
Lab Sample No.(s)	619896	619933				

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	10600000	14200		
Aliphatics >C16-C21	<100 µg/kg	TM173	6530000	16200		
Aliphatics >C21-C35	<100 µg/kg	TM173	8060000	90400		
Aliphatics >C35-C44	<100 µg/kg	TM173	556000	44500		
Total Aliphatics >C12-C44	<100 µg/kg	TM173	25700000	165000		
Aliphatics >C16-C35	<100 µg/kg	TM173	14600000	107000		

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SDG: 091117-48
Job: D_MOUCHEL_ELE-29
Client Reference: 20/11/09 (E4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66789

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E4	E4				
Depth (m)	0.10 - 0.90	1.60 - 1.80				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	13/11/2009	13/11/2009				
Date Received	16/11/2009	16/11/2009				
SDG Ref	091117-48	091117-48				
Lab Sample No.(s)	619896	619933				

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	20300000	39100		
Aromatics >EC16-EC21	<100 µg/kg	TM173	26700000	77500		
Aromatics >EC21-EC35	<100 µg/kg	TM173	59000000	335000		
Aromatics >EC35-EC44	<100 µg/kg	TM173	7520000	106000		
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	114000000	558000		
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	114000000	558000		

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SDG: 091117-48
Job: D_MOUCHEL_ELE-29
Client Reference: 20/11/09 (E4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66789

GRO BTEX MTBE GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E4
Depth (m)	1.60 - 1.80
Sample Type	Soil/Solid
Date Sampled	13/11/2009
Date Received	16/11/2009
SDG Ref	091117-48
Lab Sample No.(s)	619933

Component	LOD/Units	Method					
GRO C5-C12	<44 µg/kg	TM089	6470	#			
MTBE	<5 µg/kg	TM089	<5.00	#			
Benzene	<10 µg/kg	TM089	197	M			
Toluene	<2 µg/kg	TM089	344	M			
Ethyl Benzene	<3 µg/kg	TM089	141	M			
m & p Xylene	<6 µg/kg	TM089	522	M			
o Xylene	<3 µg/kg	TM089	235	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	757	M			
Sum of BTEX	<10 µg/kg	TM089	1440	M			
Aliphatics C5-C6	<10 µg/kg	TM089	64.0				
Aliphatics >C6-C8	<10 µg/kg	TM089	191				
Aliphatics >C8-C10	<10 µg/kg	TM089	606				
Aliphatics >C10-C12	<10 µg/kg	TM089	1300				
Total Aliphatics C5-C12	<10 µg/kg	TM089	2170				
Aromatics C6-C7	<10 µg/kg	TM089	197				
Aromatics >C7-C8	<10 µg/kg	TM089	344				
Aromatics >EC8-EC10	<10 µg/kg	TM089	1810				
Aromatics >EC10-EC12	<10 µg/kg	TM089	1960				
Total Aromatics C6-C12	<10 µg/kg	TM089	4310				

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SDG: 091117-48
Job: D_MOUCHEL_ELE-29
Client Reference: 20/11/09 (E4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66789

PAH micro by GCMS

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E4	E4				
Depth (m)	0.10 - 0.90	1.60 - 1.80				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	13/11/2009	13/11/2009				
Date Received	16/11/2009	16/11/2009				
SDG Ref	091117-48	091117-48				
Lab Sample No.(s)	619896	619933				

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	20300000	10200		
Acenaphthylene (S)	<12 µg/kg	TM218	3530000	3260		
Acenaphthene (S)	<8 µg/kg	TM218	482000	929		
Fluorene (S)	<10 µg/kg	TM218	2350000	3050		
Phenanthrene (S)	<15 µg/kg	TM218	5980000	10900		
Anthracene (S)	<16 µg/kg	TM218	2190000	4960		
Fluoranthene (S)	<17 µg/kg	TM218	3900000	16500		
Pyrene (S)	<15 µg/kg	TM218	2330000	13600		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1410000	9820		
Chrysene (S)	<10 µg/kg	TM218	1100000	7670		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1260000	13300		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	552000	4570		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	921000	10300		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	402000	5670		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	118000	1650		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	399000	6290		
PAH 16 EPA Total	<118 µg/kg	TM218	47200000	123000		

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SDG: 091117-48
 Job: D_MOUCHEL_ELE-29
 Client Reference: 20/11/09 (E4)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66789

VOC MS (S)

Results Legend		Sample Identity	E4				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.60 - 1.80 Soil/Solid 13/11/2009 16/11/2009 091117-48 619933				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	92.4				
Toluene-d8**	%	TM116	79.7				
4-Bromofluorobenzene**	%	TM116	62.7				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	<9.00				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	379				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	624				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	223				

SDG: 091117-48
 Job: D_MOUCHEL_ELE-29
 Client Reference: 20/11/09 (E4)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66789

VOC MS (S)

Results Legend		Sample Identity	E4				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.60 - 1.80				
		Sample Type	Soil/Solid				
		Date Sampled	13/11/2009				
		Date Received	16/11/2009				
		SDG Ref	091117-48				
		Lab Sample No.(s)	619933				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	999	#			
o-Xylene	<11 µg/kg	TM116	400	M			
Styrene	<11 µg/kg	TM116	281	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	39.4	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	78.3	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	157	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	301	#			
sec-Butylbenzene	<8 µg/kg	TM116	13.5	#			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	4810	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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Notification of NDPs (No determination possible)

SDG Number	091117-48	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	20/11/09 (E4)	Report No.	29152-0
Attention	Dave Watts	Date Received	17/11/2009 14:39:59

Sample No	Sample Identity	Depth (m)	Test	Comment
619894	E4	0.10 - 0.90	GRO BTEX MTBE GC (S)	Sample contains oil / product
619894	E4	0.10 - 0.90	GRO BTEX MTBE GC (S)	Sample contains oil / product
619894	E4	0.10 - 0.90	GRO BTEX MTBE GC (S)	Sample contains oil / product
619894	E4	0.10 - 0.90	VOC MS (S)	Sample contains oil / product
619894	E4	0.10 - 0.90	VOC MS (S)	Sample contains oil / product
619894	E4	0.10 - 0.90	VOC MS (S)	Sample contains oil / product
619904	E4	0.10 - 0.90	TPH CWG GC (S)	Sample contains oil / product
619904	E4	0.10 - 0.90	TPH CWG GC (S)	Sample contains oil / product
619904	E4	0.10 - 0.90	TPH CWG GC (S)	Sample contains oil / product
623182	E4	0.10 - 0.90	pH	Sample contains oil / product
623182	E4	0.10 - 0.90	pH	Sample contains oil / product
623182	E4	0.10 - 0.90	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 15 December 2009
Job: D_MOUCHEL_ELE-30
Sample Delivery Group (SDG): 091117-59
Your Reference: 20/11/09 (F4)
Location: Limerick Gasworks
Report No.: 67503

A total of 3 samples was received on Monday November 16, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67503

SOLID

Results Legend	Sample ID	F4						Total
		1.50 - 2.00		2.50 - 3.00		3.00 - 3.50		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All	X		X		X		0
Hexavalent Chromium (s)	All		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
	Cadmium		X		X		X	0
	Chromium		X		X		X	0
	Copper		X		X		X	0
	Lead		X		X		X	0
	Mercury		X		X		X	0
	Nickel		X		X		X	0
	Selenium		X		X		X	0
	Zinc		X		X		X	0
PAH micro by GCMS	All		X		X		X	0
pH	All		X		X		X	0
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	0
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	0
VOC MS (S)	All	X		X		X		0

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SDG:	091117-59	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-30	Attention:	Verity Sankey
Client Reference:	20/11/09 (F4)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67503

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
F4	1.50 - 2.00	Black	Sand	0.1 - 2 mm	Oil/Petroleum
	2.50 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	3.00 - 3.50	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67503

Test Completion dates

SDG reference: 091117-59

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Pherids by HPLC (S)	pH	PAH by GCMS	Metals by Cap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyanate	Ammonium Soil by Titration
F4	1.50 - 2.00	SOLID	23/11/2009	26/11/2009	20/11/2009	18/11/2009	23/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	26/11/2009	24/11/2009	24/11/2009	20/11/2009	19/11/2009	04/12/2009
	2.50 - 3.00	SOLID	23/11/2009	25/11/2009	20/11/2009	18/11/2009	20/11/2009	19/11/2009	20/11/2009	20/11/2009	20/11/2009	24/11/2009	24/11/2009	24/11/2009	20/11/2009	19/11/2009	23/11/2009
	3.00 - 3.50	SOLID	24/11/2009	28/11/2009	20/11/2009	18/11/2009	20/11/2009	19/11/2009	20/11/2009	23/11/2009	20/11/2009	26/11/2009	28/11/2009	28/11/2009	20/11/2009	19/11/2009	25/11/2009

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SDG 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67503

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	F4	F4	F4
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	35.9 M	43.5 M	63.3 M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	27.9	33.9	49.3
Catechol	<0.01 mg/kg	TM062 (S)	<0.0500	<0.100	<0.0100
Phenol	<0.01 mg/kg	TM062 (S)	2.21 M	9.29 M	0.207 M
Cresols	<0.01 mg/kg	TM062 (S)	2.21 M	12.7 M	0.683 M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.250	<0.500	<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0750 M	16.5 M	1.74 M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0500	<0.100	0.464
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0500 M	<0.100 M	<0.0100 M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0750 M	<0.150 M	<0.0150 M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	4.41	38.5	3.10
pH value of soil	1 pH Units	TM133	8.93 M	11.50 M	8.91 M
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00 #	<0.600 #	12.00 #
Total Cyanide	<1 mg/kg	TM153	<1.00 M	4.08 M	12.9 M
Easily Liberated Sulphide	<15 mg/kg	TM180	216 #	72.4 #	357 #
Arsenic	<0.6 mg/kg	TM181	8.99 M	8.35 M	8.73 M
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M	0.732 M
Chromium	<0.9 mg/kg	TM181	13.3 M	16.1 M	65.4 M
Copper	<1.4 mg/kg	TM181	24.9 M	35.7 M	39.7 M
Lead	<0.7 mg/kg	TM181	23.0 M	27.0 M	213 M
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M	4.44 M
Nickel	<0.2 mg/kg	TM181	35.5 M	20.7 M	74.2 M
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #
Zinc	<1.9 mg/kg	TM181	14.5 M	22.3 M	127 M
Total Sulphate	<48 mg/kg	TM221	4450 M	9290 M	3370 M

SDG 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67503

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F4	F4	F4
Depth (m)	1.50 - 2.00	2.50 - 3.00	3.00 - 3.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091117-59	091117-59	091117-59
Lab Sample No.(s)	620485	620506	620518

Component	LOD/Units	Method	F4	F4	F4
Aromatics >EC12-EC16	<100 µg/kg	TM173	471000	1490000	798000
Aromatics >EC16-EC21	<100 µg/kg	TM173	752000	2000000	982000
Aromatics >EC21-EC35	<100 µg/kg	TM173	1750000	4140000	2120000
Aromatics >EC35-EC44	<100 µg/kg	TM173	317000	614000	356000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	3300000	8250000	4260000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	3300000	8250000	4260000

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SDG: 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67503

GRO BTEX MTBE GC (S)

Results Legend		Sample Identity	F4	F4	F4
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 13/11/2009 16/11/2009 091117-59 620485	2.50 - 3.00 Soil/Solid 13/11/2009 16/11/2009 091117-59 620506	3.00 - 3.50 Soil/Solid 13/11/2009 16/11/2009 091117-59 620518
Component	LOD/Units	Method			
GRO C5-C12	<44 µg/kg	TM089	540000	180000	500000
MTBE	<5 µg/kg	TM089	1120	<5.00	925
Benzene	<10 µg/kg	TM089	5860	3350	3620
Toluene	<2 µg/kg	TM089	22300	14400	13800
Ethyl Benzene	<3 µg/kg	TM089	16300	4990	15500
m & p Xylene	<6 µg/kg	TM089	83100	31600	79400
o Xylene	<3 µg/kg	TM089	36500	14400	34100
Sum m&p and o Xylene	<10 µg/kg	TM089	120000	45900	113000
Sum of BTEX	<10 µg/kg	TM089	164000	68600	146000
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	26800	456	25800
Aliphatics >C8-C10	<10 µg/kg	TM089	49100	15600	48200
Aliphatics >C10-C12	<10 µg/kg	TM089	90100	28800	84700
Total Aliphatics C5-C12	<10 µg/kg	TM089	166000	44800	157000
Aromatics C6-C7	<10 µg/kg	TM089	5860	3350	3620
Aromatics >C7-C8	<10 µg/kg	TM089	22300	14200	13800
Aromatics >EC8-EC10	<10 µg/kg	TM089	209000	74300	198000
Aromatics >EC10-EC12	<10 µg/kg	TM089	135000	43200	127000
Total Aromatics C6-C12	<10 µg/kg	TM089	373000	135000	343000

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SDG: 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67503

PAH micro by GCMS

Results Legend		Sample Identity	F4	F4	F4
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 13/11/2009 16/11/2009 091117-59 620485	2.50 - 3.00 Soil/Solid 13/11/2009 16/11/2009 091117-59 620506	3.00 - 3.50 Soil/Solid 13/11/2009 16/11/2009 091117-59 620518
Component	LOD/Units	Method			
Naphthalene (S)	<9 µg/kg	TM218	716000 M	2240000 M	852000 M
Acenaphthylene (S)	<12 µg/kg	TM218	69600 M	254000 M	73900 M
Acenaphthene (S)	<8 µg/kg	TM218	28300 M	81100 M	32400 M
Fluorene (S)	<10 µg/kg	TM218	80000 M	253000 M	89100 M
Phenanthrene (S)	<15 µg/kg	TM218	209000 M	632000 M	216000 M
Anthracene (S)	<16 µg/kg	TM218	61700 M	196000 M	68200 M
Fluoranthene (S)	<17 µg/kg	TM218	134000 M	430000 M	144000 M
Pyrene (S)	<15 µg/kg	TM218	89700 M	281000 M	93300 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	35000 M	131000 M	43300 M
Chrysene (S)	<10 µg/kg	TM218	31100 M	97200 M	31900 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	35100 M	113000 M	39800 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	16000 M	49600 M	16300 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	29300 M	114000 M	34300 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	17600 M	53200 M	15600 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	4790 M	14200 M	4080 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	19400 M	61000 M	17200 M
PAH 16 EPA Total	<118 µg/kg	TM218	1580000 M	5000000 M	1770000 M

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SDG 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67503

VOC MS (S)

Results Legend			Sample Identity	F4	F4	F4
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	2.50 - 3.00	3.00 - 3.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	13/11/2009	13/11/2009	13/11/2009
			Date Received	16/11/2009	16/11/2009	16/11/2009
			SDG Ref	091117-59	091117-59	091117-59
			Lab Sample No.(s)	620485	620506	620518
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM116	121	1.24	114	
Toluene-d8**	%	TM116	69.5	75.1	53.3	
4-Bromofluorobenzene**	%	TM116	96.0	115	75.7	
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Carbon Disulphide	<9 µg/kg	TM116	58.4	12.0	31.8	
Dichloromethane	<10 µg/kg	TM116	85.4	<10.0	<10.0	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Benzene	<9 µg/kg	TM116	9970	14400	7200	
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	
Toluene	<6 µg/kg	TM116	24600	35900	15000	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	
Chlorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	
Ethylbenzene	<9 µg/kg	TM116	10800	10600	17100	

SDG 091117-59
Job: D_MOUCHEL_ELE-30
Client Reference: 20/11/09 (F4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67503

VOC MS (S)

Results Legend			Sample Identity	F4	F4	F4			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	2.50 - 3.00	3.00 - 3.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	13/11/2009	13/11/2009	13/11/2009			
			Date Received	16/11/2009	16/11/2009	16/11/2009			
			SDG Ref	091117-59	091117-59	091117-59			
			Lab Sample No.(s)	620485	620506	620518			
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	72100	#	68200	#	98500	#	
o-Xylene	<11 µg/kg	TM116	30500	M	27900	M	41300	M	
Styrene	<11 µg/kg	TM116	<11.0	M	<11.0	M	<11.0	M	
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0	M	<12.0	M	
Isopropylbenzene	<9 µg/kg	TM116	1480	M	2390	M	1580	M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0	#	<15.0	#	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0	M	<13.0	M	
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0	M	<14.0	M	
Propylbenzene	<6 µg/kg	TM116	2230	M	3800	M	2360	M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0	#	<14.0	#	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	10500	M	17600	M	31400	M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00	#	<9.00	#	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	<12.0	#	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	43500	#	39800	#	69100	#	
sec-Butylbenzene	<8 µg/kg	TM116	233	#	385	#	236	#	
4-Isopropyltoluene	<8 µg/kg	TM116	962	#	1670	#	908	#	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<8.00	#	<8.00	#	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0	M	<11.0	M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00	#	<7.00	#	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00	M	<8.00	M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0	M	<11.0	M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<7.00	#	<7.00	#	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00	#	<9.00	#	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0	#	<15.0	#	
Naphthalene	<7 µg/kg	TM116	732000		1250000		1140000		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	<12.0	#	

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 01 December 2009
Job: D_MOUCHEL_ELE-32
Sample Delivery Group (SDG): 091118-47
Your Reference: 15/11/09 (I6)
Location: Limerick Gasworks
Report No.: 66198

A total of 3 samples was received on Tuesday November 17, 2009 and completed on Tuesday December 01, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66198

SOLID

Results Legend	Sample ID	16						Total
		2.50 - 3.00		4.00 - 4.50		5.00 - 5.50		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All	X		X		X		3
Hexavalent Chromium (s)	All		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
	Cadmium		X		X		X	3
	Chromium		X		X		X	0
	Copper		X		X		X	3
	Lead		X		X		X	0
	Mercury		X		X		X	3
	Nickel		X		X		X	0
	Selenium		X		X		X	3
	Zinc		X		X		X	0
PAH by GCMS	All		X		X		X	0
pH	All		X		X		X	3
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	3
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	3
VOC MS (S)	All	X		X		X		0
								3

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SDG:	091118-47	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-32	Attention:	Verity Sankey
Client Reference:	15/11/09 (I6)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66198

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
I6	2.50 - 3.00	Grey	Sand	0.1 - 2 mm	Stones
	4.00 - 4.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	5.00 - 5.50	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66198

Test Completion dates

SDG reference: 091118-47

Sample ID	Depth	Type	Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyanate	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
I6	2.50 - 3.00	SOLID	26/11/2009	23/11/2009	23/11/2009	28/11/2009	28/11/2009	27/11/2009	23/11/2009	24/11/2009	26/11/2009	20/11/2009	23/11/2009	19/11/2009	23/11/2009	29/11/2009	01/12/2009
	4.00 - 4.50	SOLID	26/11/2009	23/11/2009	23/11/2009	28/11/2009	28/11/2009	25/11/2009	23/11/2009	24/11/2009	26/11/2009	20/11/2009	23/11/2009	19/11/2009	23/11/2009	29/11/2009	01/12/2009
	5.00 - 5.50	SOLID	26/11/2009	23/11/2009	23/11/2009	28/11/2009	28/11/2009	27/11/2009	23/11/2009	24/11/2009	26/11/2009	20/11/2009	23/11/2009	19/11/2009	23/11/2009	29/11/2009	01/12/2009

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SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66198

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I6	I6	I6
Depth (m)	2.50 - 3.00	4.00 - 4.50	5.00 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	15/11/2009	15/11/2009	15/11/2009
Date Received	17/11/2009	17/11/2009	17/11/2009
SDG Ref	091118-47	091118-47	091118-47
Lab Sample No.(s)	623229	623282	623307

Component	LOD/Units	Method	I6	I6	I6
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	16.8 M	339 M	49.4 M
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.100
Phenol	<0.01 mg/kg	TM062 (S)	<0.0200 M	<0.100 M	<0.250 M
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.100 M	<0.100 M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.500	<0.500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.150 M	<0.150 M
1-Naphthol	<0.01 mg/kg	TM062 (S)	0.0298	<0.100	<0.100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.100 M	<0.100 M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.150 M	<0.150 M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0400	0.00	0.408
pH value of soil	1 pH Units	TM133	8.20 M	8.85 M	8.68 M
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.0 #	<3.0 #	<3.0 #
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00 #	<3.00 #	<3.00 #
Total Cyanide	<1 mg/kg	TM153	1970 M	1100 M	1130 M
Easily Liberated Sulphide	<15 mg/kg	TM180	769.40 #	47.27 #	1232.15 #
Easily Liberated Sulphide	<15 mg/kg	TM180	1150 #	80.0 #	1480 #
Arsenic	<0.6 mg/kg	TM181	6.64 M	18.3 M	4.92 M
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	0.0530 M	<0.0200 M
Chromium	<0.9 mg/kg	TM181	8.55 M	18.5 M	12.2 M
Copper	<1.4 mg/kg	TM181	21.6 M	20.0 M	19.6 M
Lead	<0.7 mg/kg	TM181	14.2 M	73.7 M	62.1 M
Mercury	<0.14 mg/kg	TM181	0.452 M	0.163 M	0.415 M
Nickel	<0.2 mg/kg	TM181	18.9 M	22.8 M	17.9 M
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	1.08 #
Zinc	<1.9 mg/kg	TM181	11.6 M	43.6 M	63.3 M
Total Sulphate	<48 mg/kg	TM221	35200 M	1160 M	5640 M

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SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66198

EPH CWG (Aromatic) GC (S)

Results Legend		Sample Identity	I6	I6	I6
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	2.50 - 3.00	4.00 - 4.50	5.00 - 5.50
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
		Date Sampled	15/11/2009	15/11/2009	15/11/2009
		Date Received	17/11/2009	17/11/2009	17/11/2009
		SDG Ref	091118-47	091118-47	091118-47
		Lab Sample No.(s)	623229	623282	623307
Component	LOD/Units	Method			
Aromatics >EC12-EC16	<100 µg/kg	TM173	808000	219000	530000
Aromatics >EC16-EC21	<100 µg/kg	TM173	1950000	391000	1210000
Aromatics >EC21-EC35	<100 µg/kg	TM173	4470000	1200000	2910000
Aromatics >EC35-EC44	<100 µg/kg	TM173	725000	245000	499000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	7960000	2060000	5150000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	7960000	2060000	5150000

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SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66198

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	I6	I6	I6			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	4.00 - 4.50	5.00 - 5.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	15/11/2009	15/11/2009	15/11/2009			
			Date Received	17/11/2009	17/11/2009	17/11/2009			
			SDG Ref	091118-47	091118-47	091118-47			
			Lab Sample No.(s)	623229	623282	623307			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	190000	56100	222000	#	#	#	
MTBE	<5 µg/kg	TM089	226	<5.00	<5.00	#	#	#	
Benzene	<10 µg/kg	TM089	95.4	3020	1560	M	M	M	
Toluene	<2 µg/kg	TM089	<2.00	5430	4500	M	M	M	
Ethyl Benzene	<3 µg/kg	TM089	<3.00	1280	7590	M	M	M	
m & p Xylene	<6 µg/kg	TM089	<6.00	8430	23000	M	M	M	
o Xylene	<3 µg/kg	TM089	<3.00	3640	13900	M	M	M	
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	12100	36900	M	M	M	
Sum of BTEX	<10 µg/kg	TM089	95.4	21800	50600	M	M	M	
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	154	1850				
Aliphatics >C6-C8	<10 µg/kg	TM089	20500	1160	44200				
Aliphatics >C8-C10	<10 µg/kg	TM089	43100	4730	30600				
Aliphatics >C10-C12	<10 µg/kg	TM089	24700	8450	19700				
Total Aliphatics C5-C12	<10 µg/kg	TM089	88400	14500	96300				
Aromatics C6-C7	<10 µg/kg	TM089	95.4	3020	1560				
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	5430	4500				
Aromatics >EC8-EC10	<10 µg/kg	TM089	64700	20400	90400				
Aromatics >EC10-EC12	<10 µg/kg	TM089	37100	12700	29500				
Total Aromatics C6-C12	<10 µg/kg	TM089	102000	41600	126000				

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SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66198

PAH by GCMS

Results Legend		Sample Identity	I6	I6	I6
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 15/11/2009 17/11/2009 091118-47 623229	4.00 - 4.50 Soil/Solid 15/11/2009 17/11/2009 091118-47 623282	5.00 - 5.50 Soil/Solid 15/11/2009 17/11/2009 091118-47 623307
Component	LOD/Units	Method			
Naphthalene (S)	<9 µg/kg	TM218	36400 M	22600 M	589000 M
Acenaphthylene (S)	<12 µg/kg	TM218	67000 M	4210 M	176000 M
Acenaphthene (S)	<8 µg/kg	TM218	34400 M	781 M	41800 M
Fluorene (S)	<10 µg/kg	TM218	98300 M	3370 M	143000 M
Phenanthrene (S)	<15 µg/kg	TM218	287000 M	8150 M	383000 M
Anthracene (S)	<16 µg/kg	TM218	95300 M	3150 M	134000 M
Fluoranthene (S)	<17 µg/kg	TM218	188000 M	6480 M	262000 M
Pyrene (S)	<15 µg/kg	TM218	124000 M	4360 M	172000 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	54800 M	2410 M	82000 M
Chrysene (S)	<10 µg/kg	TM218	42600 M	1910 M	62000 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	73700 M	1800 M	107000 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	20300 M	1010 M	29000 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	41600 M	1860 M	60400 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	20000 M	875 M	28800 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	5460 M	346 M	8200 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	21800 M	970 M	30400 M
PAH 16 EPA Total	<118 µg/kg	TM218	1210000 M	64300 M	2310000 M

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SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66198

VOC MS (S)

Results Legend			Sample Identity	I6	I6	I6
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 15/11/2009 17/11/2009 091118-47 623229	4.00 - 4.50 Soil/Solid 15/11/2009 17/11/2009 091118-47 623282	5.00 - 5.50 Soil/Solid 15/11/2009 17/11/2009 091118-47 623307
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM116	122	155	141	
Toluene-d8**	%	TM116	51.1	104	63.3	
4-Bromofluorobenzene**	%	TM116	135	87.4	87.8	
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	
Chloromethane	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	
Vinyl Chloride	<10 µg/kg	TM116	<10.0 M	<10.0 M	<10.0 M	
Bromoethane	<9 µg/kg	TM116	<9.00 M	<9.00 M	<9.00 M	
Chloroethane	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00 M	<7.00 M	<7.00 M	
1.1-Dichloroethene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
Carbon Disulphide	<9 µg/kg	TM116	183 M	<9.00 M	31.6 M	
Dichloromethane	<10 µg/kg	TM116	<10.0 M	<10.0 M	<10.0 M	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00 M	<9.00 M	<9.00 M	
trans-1-2-Dichloroethene	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	
1.1-Dichloroethane	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	
cis-1-2-Dichloroethene	<9 µg/kg	TM116	<9.00 M	<9.00 M	<9.00 M	
2.2-Dichloropropane	<10 µg/kg	TM116	<10.0 M	<10.0 M	<10.0 M	
Bromochloromethane	<10 µg/kg	TM116	<10.0 M	<10.0 M	<10.0 M	
Chloroform	<10 µg/kg	TM116	<10.0 M	<10.0 M	<10.0 M	
1.1.1-Trichloroethane	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	
1.1-Dichloropropene	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	
Carbontetrachloride	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
1.2-Dichloroethane	<10 µg/kg	TM116	<10.0 M	<10.0 M	<10.0 M	
Benzene	<9 µg/kg	TM116	<9.00 M	1100 M	522 M	
Trichloroethene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
1.2-Dichloropropane	<10 µg/kg	TM116	<10.0 M	<10.0 M	<10.0 M	
Dibromomethane	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	
Bromodichloromethane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
cis-1-3-Dichloropropene	<25 µg/kg	TM116	<25.0 M	<25.0 M	<25.0 M	
Toluene	<6 µg/kg	TM116	<6.00 M	1820 M	1050 M	
trans-1-3-Dichloropropene	<27 µg/kg	TM116	<27.0 M	<27.0 M	<27.0 M	
1.1.2-Trichloroethane	<9 µg/kg	TM116	<9.00 M	<9.00 M	<9.00 M	
1.3-Dichloropropane	<7 µg/kg	TM116	<7.00 M	<7.00 M	<7.00 M	
Tetrachloroethene	<9 µg/kg	TM116	<9.00 M	<9.00 M	<9.00 M	
Dibromochloromethane	<9 µg/kg	TM116	<9.00 M	<9.00 M	<9.00 M	
1.2-Dibromoethane	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	
Chorobenzene	<7 µg/kg	TM116	<7.00 M	<7.00 M	<7.00 M	
1.1.1.2-Tetrachloroethane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
Ethylbenzene	<9 µg/kg	TM116	<9.00 M	428 M	5330 M	

SDG: 091118-47
Job: D_MOUCHEL_ELE-32
Client Reference: 15/11/09 (I6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66198

VOC MS (S)

Component	LOD/Units	Method	Sample Identity			
			I6	I6	I6	
Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 15/11/2009 17/11/2009 091118-47 623229	4.00 - 4.50 Soil/Solid 15/11/2009 17/11/2009 091118-47 623282	5.00 - 5.50 Soil/Solid 15/11/2009 17/11/2009 091118-47 623307
p/m-Xylene	<13 µg/kg	TM116	313 #	2950 #	13900 #	
o-Xylene	<11 µg/kg	TM116	726 M	1330 M	11100 M	
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	
Isopropylbenzene	<9 µg/kg	TM116	133 M	60.0 M	1430 M	
1.1.2.2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	
1.2.3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	
Propylbenzene	<6 µg/kg	TM116	209 M	97.6 M	1980 M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #	
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8.00 M	428 M	1910 M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	
1.2.4-Trimethylbenzene	<10 µg/kg	TM116	857 #	998 #	144000 #	
sec-Butylbenzene	<8 µg/kg	TM116	<8.00 #	10.2 #	237 #	
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	<8.00 #	619 #	
1.3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	
1.4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	
1.2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	
1.2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	
1.2.4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	
Naphthalene	<7 µg/kg	TM116	48500 #	23200 #	1200000 #	
1.2.3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 26 November 2009
Job: D_MOUCHEL_ELE-33
Sample Delivery Group (SDG): 091118-58 **Report No.:** 65879
Your Reference: 15/11/09 (14)
Location: Limerick Gasworks

A total of 3 samples was received on Tuesday November 17, 2009 and completed on Thursday November 26, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091118-58
Job: D_MOUCHEL_ELE-33
Client Reference: 15/11/09 (I4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 65879

SOLID

Results Legend	Sample ID	14						Total
		2.80 - 3.00		5.50 - 6.00		7.50 - 8.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All	X		X		X		0
Hexavalent Chromium (s)	All		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
	Cadmium		X		X		X	0
	Chromium		X		X		X	0
	Copper		X		X		X	0
	Lead		X		X		X	0
	Mercury		X		X		X	0
	Nickel		X		X		X	0
	Selenium		X		X		X	0
	Zinc		X		X		X	0
PAH micro by GCMS	All		X		X		X	0
pH	All		X		X		X	0
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	0
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	0

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SDG:	091118-58	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-33	Attention:	Verity Sankey
Client Reference:	15/11/09 (I4)	Order No.:	
Location:	Limerick Gasworks	Report No.:	65879

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
I4	2.80 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	5.50 - 6.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	7.50 - 8.00	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091118-58
Job: D_MOUCHEL_ELE-33
Client Reference: 15/11/09 (I4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 65879

Test Completion dates

SDG reference: 091118-58

Sample ID	Depth	Type	SDG reference: 091118-58														
			Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	
I4	2.80 - 3.00	SOLID	26/11/2009	20/11/2009	24/11/2009	25/11/2009	25/11/2009	25/11/2009	23/11/2009	24/11/2009	23/11/2009	23/11/2009	21/11/2009	24/11/2009	20/11/2009	23/11/2009	25/11/2009
	5.50 - 6.00	SOLID	26/11/2009	20/11/2009	24/11/2009	25/11/2009	25/11/2009	23/11/2009	24/11/2009	23/11/2009	23/11/2009	21/11/2009	24/11/2009	20/11/2009	23/11/2009	25/11/2009	25/11/2009
	7.50 - 8.00	SOLID	26/11/2009	20/11/2009	24/11/2009	25/11/2009	25/11/2009	23/11/2009	24/11/2009	23/11/2009	23/11/2009	21/11/2009	24/11/2009	20/11/2009	23/11/2009	25/11/2009	25/11/2009

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SDG: 091118-58
Job: D_MOUCHEL_ELE-33
Client Reference: 15/11/09 (I4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65879

Results Legend			Sample Identity			I4			I4			I4				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.80 - 3.00	5.50 - 6.00	7.50 - 8.00	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Date Sampled	15/11/2009	15/11/2009	15/11/2009		
			Date Received	17/11/2009	17/11/2009	17/11/2009	SDG Ref	091118-58	091118-58	091118-58	Lab Sample No.(s)	623517	623714	623762		
			Component	LOD/Units	Method											
			Ammoniacal Nitrogen as N	<15 mg/kg	TM024	20.7	38.8	171	M	M	M					
			Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100								
			Phenol	<0.01 mg/kg	TM062 (S)	0.0590	<0.0100	0.0480	M	M	M					
Cresols	<0.01 mg/kg	TM062 (S)	0.236	<0.0100	0.384	M	M	M								
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500											
Xylenols	<0.015 mg/kg	TM062 (S)	<0.100	<0.0150	0.924	M	M	M								
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100											
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	M	M	M								
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	M	M	M								
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.413	<0.0100	1.36											
pH value of soil	1 pH Units	TM133	11.18	9.05	8.99	M	M	M								
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<3.0	0.0097	#	#	#								
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<3.00	<0.600	#	#	#								
Total Cyanide	<1 mg/kg	TM153	7.65	63.3	2.00	M	M	M								
Easily Liberated Sulphide	<15 mg/kg	TM180	652.25	426.71	67.45	#	#	#								
Easily Liberated Sulphide	<15 mg/kg	TM180	770	498	80.9	#	#	#								
Arsenic	<0.6 mg/kg	TM181	4.05	4.86	5.06	M	M	M								
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	M	M	M								
Chromium	<0.9 mg/kg	TM181	8.33	4.97	12.6	M	M	M								
Copper	<1.4 mg/kg	TM181	13.3	9.19	22.4	M	M	M								
Lead	<0.7 mg/kg	TM181	38.8	21.0	80.2	M	M	M								
Mercury	<0.14 mg/kg	TM181	0.448	0.333	<0.140	M	M	M								
Nickel	<0.2 mg/kg	TM181	10.5	4.49	15.0	M	M	M								
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	#	#	#								
Zinc	<1.9 mg/kg	TM181	33.8	31.5	24.9	M	M	M								
Total Sulphate	<48 mg/kg	TM221	19900	4480	5750	M	M	M								

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SDG: 091118-58
Job: D_MOUCHEL_ELE-33
Client Reference: 15/11/09 (I4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65879

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I4	I4	I4
Depth (m)	2.80 - 3.00	5.50 - 6.00	7.50 - 8.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	15/11/2009	15/11/2009	15/11/2009
Date Received	17/11/2009	17/11/2009	17/11/2009
SDG Ref	091118-58	091118-58	091118-58
Lab Sample No.(s)	623517	623714	623762

Component	LOD/Units	Method	I4	I4	I4
Aliphatics >C12-C16	<100 µg/kg	TM173	9150	9330	6230
Aliphatics >C16-C21	<100 µg/kg	TM173	10800	9930	4800
Aliphatics >C21-C35	<100 µg/kg	TM173	17400	14100	4460
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	37400	33400	15500
Aliphatics >C16-C35	<100 µg/kg	TM173	28200	24100	9260

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SDG: 091118-58
Job: D_MOUCHEL_ELE-33
Client Reference: 15/11/09 (I4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65879

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I4	I4	I4
Depth (m)	2.80 - 3.00	5.50 - 6.00	7.50 - 8.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	15/11/2009	15/11/2009	15/11/2009
Date Received	17/11/2009	17/11/2009	17/11/2009
SDG Ref	091118-58	091118-58	091118-58
Lab Sample No.(s)	623517	623714	623762

Component	LOD/Units	Method	I4	I4	I4
Aromatics >EC12-EC16	<100 µg/kg	TM173	13200	12100	34700
Aromatics >EC16-EC21	<100 µg/kg	TM173	24800	17900	79700
Aromatics >EC21-EC35	<100 µg/kg	TM173	107000	71300	251000
Aromatics >EC35-EC44	<100 µg/kg	TM173	31200	16800	67200
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	176000	118000	432000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	176000	118000	432000

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SDG: 091118-58
Job: D_MOUCHEL_ELE-33
Client Reference: 15/11/09 (I4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65879

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	I4	I4	I4			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.80 - 3.00	5.50 - 6.00	7.50 - 8.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	15/11/2009	15/11/2009	15/11/2009			
			Date Received	17/11/2009	17/11/2009	17/11/2009			
			SDG Ref	091118-58	091118-58	091118-58			
			Lab Sample No.(s)	623517	623714	623762			
			Method						
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	392	191	6920				
			#	#	#				
MTBE	<5 µg/kg	TM089	18.9	<5.00	<5.00				
			#	#	#				
Benzene	<10 µg/kg	TM089	132	20.9	470				
			M	M	M				
Toluene	<2 µg/kg	TM089	13.0	37.1	322				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	90.0				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	36.6	<6.00	757				
			M	M	M				
o Xylene	<3 µg/kg	TM089	<9.00	<3.00	298				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	36.6	<10.0	1050				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	182	58.0	1940				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	25.0				
Aliphatics >C6-C8	<10 µg/kg	TM089	16.1	<10.0	<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	34.8	26.1	83				
Aliphatics >C10-C12	<10 µg/kg	TM089	33.4	20.9	1630				
Total Aliphatics C5-C12	<10 µg/kg	TM089	84.3	47.0	2030				
Aromatics C6-C7	<10 µg/kg	TM089	132	20.9	470				
Aromatics >C7-C8	<10 µg/kg	TM089	13.0	37.1	322				
Aromatics >EC8-EC10	<10 µg/kg	TM089	88.8	89.1	1630				
Aromatics >EC10-EC12	<10 µg/kg	TM089	50.1	31.3	2520				
Total Aromatics C6-C12	<10 µg/kg	TM089	284	128	4940				

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SDG: 091118-58
Job: D_MOUCHEL_ELE-33
Client Reference: 15/11/09 (I4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 65879

PAH micro by GCMS

Results Legend		Sample Identity	I4	I4	I4
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.80 - 3.00 Soil/Solid 15/11/2009 17/11/2009 091118-58 623517	5.50 - 6.00 Soil/Solid 15/11/2009 17/11/2009 091118-58 623714	7.50 - 8.00 Soil/Solid 15/11/2009 17/11/2009 091118-58 623762
Component	LOD/Units	Method			
Naphthalene (S)	<9 µg/kg	TM218	992 M	502 M	97000 M
Acenaphthylene (S)	<12 µg/kg	TM218	153 M	91.5 M	14500 M
Acenaphthene (S)	<8 µg/kg	TM218	186 M	227 M	4440 M
Fluorene (S)	<10 µg/kg	TM218	572 M	283 M	21300 M
Phenanthrene (S)	<15 µg/kg	TM218	4670 M	812 M	70100 M
Anthracene (S)	<16 µg/kg	TM218	1090 M	282 M	19800 M
Fluoranthene (S)	<17 µg/kg	TM218	3510 M	968 M	49200 M
Pyrene (S)	<15 µg/kg	TM218	2630 M	718 M	34100 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1250 M	410 M	18200 M
Chrysene (S)	<10 µg/kg	TM218	1120 M	332 M	13600 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1580 M	470 M	17100 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	642 M	174 M	7540 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1400 M	357 M	13900 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	858 M	192 M	6180 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	288 M	75.3 M	2380 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1090 M	224 M	6680 M
PAH 16 EPA Total	<118 µg/kg	TM218	22000 M	6140 M	396000 M

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-90
Sample Delivery Group (SDG): 091118-7 **Report No.:** 66894
Your Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

A total of 8 samples was received on Monday November 16, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091118-7
 Job: D_MOUCHEL_ELE-90
 Client Reference: 13/11/09 (I9,D3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66894

SOLID

Results Legend	Sample ID	D3						I9			Total			
		0.50 - 1.00		2.50 - 3.00		3.50 - 4.00		0.00 - 0.50		1.00 - 1.50		3.00 - 3.50		4.00 - 4.50
		250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar		400g Tub	250g Amber Jar	400g Tub
Ammonium Soil by Titration	All													0
		X		X		X			X		X		X	6
Asbestos Presence Screen	All								X					0
		X												2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide													0
		X		X		X			X		X		X	6
Easily Liberated Sulphide	All													0
		X		X		X			X		X		X	6
EPH CWG (Aliphatic) GC (S)	All													0
		X		X		X			X		X		X	6
EPH CWG (Aromatic) GC (S)	All													0
		X		X		X			X		X		X	6
GRO BTEX MTBE GC (S)	All													0
			X	X		X			X		X		X	6
Hexavalent Chromium (s)	All													0
		X		X		X			X		X		X	6
Metals by iCap-OES (Soil)	Arsenic													0
		X		X		X			X		X		X	6
	Cadmium													0
		X		X		X			X		X		X	6
	Chromium													0
		X		X		X			X		X		X	6
	Copper													0
		X		X		X			X		X		X	6
	Lead													0
		X		X		X			X		X		X	6
	Mercury													0
		X		X		X			X		X		X	6
	Nickel													0
		X		X		X			X		X		X	6
	Selenium													0
		X		X		X			X		X		X	6
	Zinc													0
		X		X		X			X		X		X	6
PAH by GCMS	All													0
		X									X			2
PAH micro by GCMS	All													0
				X		X			X			X		4
PCBs by GCMS	All													0
		X							X					2
pH	All													0
		X		X		X			X		X		X	6
Phenols by HPLC (S)	All													0
		X		X		X			X		X		X	6
Sample description	All													0
		X		X		X		X	X		X		X	7
Total Sulphate	All													0
		X		X		X			X		X		X	6
TPH CWG GC (S)	All													0
		X		X		X			X		X		X	6
VOC MS (S)	All													0
				X					X		X		X	4

SDG:	091118-7	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-90	Attention:	Verity Sankey
Client Reference:	13/11/09 (I9,D3)	Order No.:	
Location:	LIMERICK GASWORKS	Report No.:	66894

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D3	0.50 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.50 - 3.00	Brown	Silty Sand	<0.063 mm	Stones
	3.50 - 4.00	Grey	Silty Sand	<0.063 mm	Stones
I9	0.00 - 0.50	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	1.00 - 1.50	Brown	Silty Sand	<0.063 mm	Stones
	3.00 - 3.50	Black	Silt	<0.063 mm	N/A
	4.00 - 4.50	Brown	Silt	<0.063 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091118-7
 Job: D_MOUCHEL_ELE-90
 Client Reference: 13/11/09 (I9,D3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66894

Test Completion dates

SDG reference: 091118-7

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
D3	0.50 - 1.00	SOLID	26/11/2009	20/11/2009	18/11/2009	23/11/2009	20/11/2009	08/12/2009	28/11/2009	23/11/2009	26/11/2009	26/11/2009	26/11/2009	23/11/2009	23/11/2009	28/11/2009	20/11/2009	18/11/2009	04/12/2009
	2.50 - 3.00	SOLID	27/11/2009	26/11/2009	24/11/2009	27/11/2009	23/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	26/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	27/11/2009
	3.50 - 4.00	SOLID	28/11/2009	28/11/2009	23/11/2009	27/11/2009	23/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	28/11/2009	27/11/2009
I9	0.00 - 0.50	SOLID	18/11/2009																
	1.00 - 1.50	SOLID	04/12/2009	01/12/2009	23/11/2009	19/11/2009	20/11/2009	07/12/2009	22/11/2009	22/11/2009	22/11/2009	22/11/2009	20/11/2009	24/11/2009	24/11/2009	27/11/2009	20/11/2009	04/12/2009	04/12/2009
	3.00 - 3.50	SOLID	27/11/2009	01/12/2009	23/11/2009	19/11/2009	27/11/2009	23/11/2009	02/12/2009	02/12/2009	23/11/2009	24/11/2009	30/11/2009	28/11/2009	28/11/2009	27/11/2009	24/11/2009	27/11/2009	27/11/2009
	4.00 - 4.50	SOLID	04/12/2009	01/12/2009	23/11/2009	19/11/2009	25/11/2009	20/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	04/12/2009

SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

Results Legend			Sample Identity		D3	D3	D3	I9	I9
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	0.50 - 1.00	2.50 - 3.00	3.50 - 4.00	0.00 - 0.50	1.00 - 1.50
			Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009	13/11/2009	
			Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	
			SDG Ref	091118-7	091118-7	091118-7	091118-7	091118-7	
			Lab Sample No.(s)	623040	623087	623109	622899	622913	
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected			No ACM Detected			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	36.2	20.4		<15.0		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	28.2	<15.0		<15.0		
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100		<0.0100		
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.235		2.59		
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100		10.3		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500		<0.0500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0300		19.0		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100		<0.0100		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100		<0.0100		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150		<0.0150		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.240		31.9		
pH value of soil	1 pH Units	TM133	9.12	7.78	7.94		8.48		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600		<3.00		
Total Cyanide	<1 mg/kg	TM153	6.17	8.46	219		2.98		
PCB congener 28	<3 µg/kg	TM168	<3.00				<3.00		
PCB congener 52	<3 µg/kg	TM168	<3.00				<3.00		
PCB congener 101	<3 µg/kg	TM168	<3.00				<3.00		
PCB congener 118	<3 µg/kg	TM168	<3.00				<3.00		
PCB congener 138	<3 µg/kg	TM168	<3.00				<3.00		
PCB congener 153	<3 µg/kg	TM168	<3.00				<3.00		
PCB congener 180	<3 µg/kg	TM168	<3.00				<3.00		
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00				<3.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	22.6	95.6	315		<15.0		
Arsenic	<0.6 mg/kg	TM181	14.4	12.3	6.48		10.8		
Cadmium	<0.02 mg/kg	TM181	0.533	<0.0200	0.237		<0.0200		
Chromium	<0.9 mg/kg	TM181	13.4	14.0	8.21		12.9		
Copper	<1.4 mg/kg	TM181	42.2	11.5	3.57		12.8		
Lead	<0.7 mg/kg	TM181	151	43.2	11.3		37.8		
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140		<0.140		
Nickel	<0.2 mg/kg	TM181	21.6	18.1	4.01		14.1		
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00		<1.00		
Zinc	<1.9 mg/kg	TM181	99.3	41.8	23.9		36.2		
Total Sulphate	<48 mg/kg	TM221	2250	1220	1740		763		

SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D3	D3	D3	I9
Depth (m)	0.50 - 1.00	2.50 - 3.00	3.50 - 4.00	1.00 - 1.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009
SDG Ref	091118-7	091118-7	091118-7	091118-7
Lab Sample No.(s)	623040	623087	623109	622913

Component	LOD/Units	Method	D3	D3	D3	I9
Aromatics >EC12-EC16	<100 µg/kg	TM173	10600	88800	12400	62500
Aromatics >EC16-EC21	<100 µg/kg	TM173	18300	236000	5440	158000
Aromatics >EC21-EC35	<100 µg/kg	TM173	173000	227000	2850	630000
Aromatics >EC35-EC44	<100 µg/kg	TM173	73500	25700	<100	133000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	275000	578000	20600	983000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	275000	578000	20600	983000

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	D3	D3	D3	I9		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	2.50 - 3.00	3.50 - 4.00	1.00 - 1.50		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
			Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009		
			SDG Ref	091118-7	091118-7	091118-7	091118-7		
			Lab Sample No.(s)	623040	623087	660280	622913		
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	503	3390	1310	17400	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<9.00	<5.00	<5.00	#	#	#
Benzene	<10 µg/kg	TM089	83.3	38.9	774	1560	M	M	M
Toluene	<2 µg/kg	TM089	54.7	13.0	98.6	1050	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<7.00	<6.00	68.3	371	M	M	M
m & p Xylene	<6 µg/kg	TM089	34.5	20.1	61.6	1780	M	M	M
o Xylene	<3 µg/kg	TM089	15.5	24.8	32.5	982	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	50.0	44.8	94.1	2760	M	M	M
Sum of BTEX	<10 µg/kg	TM089	188	96.8	1030	5740	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	16.0	14.7	18.0	81.7			
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	198	<10.0	79.3			
Aliphatics >C8-C10	<10 µg/kg	TM089	33.3	324	49.9	1420			
Aliphatics >C10-C12	<10 µg/kg	TM089	85.9	910	129	3190			
Total Aliphatics C5-C12	<10 µg/kg	TM089	135	1450	190	4780			
Aromatics C6-C7	<10 µg/kg	TM089	83.3	38.9	774	1560			
Aromatics >C7-C8	<10 µg/kg	TM089	54.7	13.0	98.6	1050			
Aromatics >EC8-EC10	<10 µg/kg	TM089	99.9	530	227	5260			
Aromatics >EC10-EC12	<10 µg/kg	TM089	129	1360	193	4790			
Total Aromatics C6-C12	<10 µg/kg	TM089	367	1950	1290	12700			

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

PAH by GCMS

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D3
Depth (m)	0.50 - 1.00
Sample Type	Soil/Solid
Date Sampled	13/11/2009
Date Received	16/11/2009
SDG Ref	091118-7
Lab Sample No.(s)	623040

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	1620	M		
Acenaphthylene (S)	<12 µg/kg	TM218	1500	M		
Acenaphthene (S)	<8 µg/kg	TM218	484	M		
Fluorene (S)	<10 µg/kg	TM218	723	M		
Phenanthrene (S)	<15 µg/kg	TM218	8180	M		
Anthracene (S)	<16 µg/kg	TM218	2290	M		
Fluoranthene (S)	<17 µg/kg	TM218	17000	M		
Pyrene (S)	<15 µg/kg	TM218	14200	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	9540	M		
Chrysene (S)	<10 µg/kg	TM218	7780	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	11100	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	5110	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	9720	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	6660	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	2020	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	6840	M		
PAH 16 EPA Total	<118 µg/kg	TM218	105000	M		

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66894

PAH micro by GCMS

Results Legend			Sample Identity	D3	D3	I9			
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	3.50 - 4.00	1.00 - 1.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	13/11/2009	13/11/2009	13/11/2009			
			Date Received	16/11/2009	16/11/2009	16/11/2009			
			SDG Ref	091118-7	091118-7	091118-7			
			Lab Sample No.(s)	623087	623109	622913			
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	314	2250	21700				
			M	M	M				
Acenaphthylene (S)	<12 µg/kg	TM218	1380	495	8510				
			M	M	M				
Acenaphthene (S)	<8 µg/kg	TM218	1750	574	1680				
			M	M	M				
Fluorene (S)	<10 µg/kg	TM218	1550	826	7100				
			M	M	M				
Phenanthrene (S)	<15 µg/kg	TM218	12000	736	21600				
			M	M	M				
Anthracene (S)	<16 µg/kg	TM218	1220	293	8060				
			M	M	M				
Fluoranthene (S)	<17 µg/kg	TM218	11600	800	22600				
			M	M	M				
Pyrene (S)	<15 µg/kg	TM218	8040	556	15900				
			M	M	M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	3670	191	10300				
			M	M	M				
Chrysene (S)	<10 µg/kg	TM218	3920	129	7050				
			M	M	M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	4900	188	8840				
			M	M	M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	2240	79.3	4190				
			M	M	M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	3480	145	8630				
			M	M	M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	1740	75.3	4310				
			M	M	M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	615	28.5	1210				
			M	M	M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1700	90.8	4440				
			M	M	M				
PAH 16 EPA Total	<118 µg/kg	TM218	60100	7430	156000				
			M	M	M				

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D3	D3	D3	I9		
Depth (m)	0.50 - 1.00	2.50 - 3.00	3.50 - 4.00	1.00 - 1.50		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	13/11/2009	13/11/2009	13/11/2009	13/11/2009		
Date Received	16/11/2009	16/11/2009	16/11/2009	16/11/2009		
SDG Ref	091118-7	091118-7	091118-7	091118-7		
Lab Sample No.(s)	623040	623087	623109	622913		

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	239000	770000	10600	141000
Total Aromatics >C6-C44	<100 µg/kg	TM173	276000	580000	21900	996000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	515000	1350000	32600	1140000

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SDG: 091118-7
 Job: D_MOUCHEL_ELE-90
 Client Reference: 13/11/09 (I9,D3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66894

VOC MS (S)

Results Legend			Sample Identity	D3	I9				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	1.00 - 1.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	13/11/2009	13/11/2009				
			Date Received	16/11/2009	16/11/2009				
			SDG Ref	091118-7	091118-7				
			Lab Sample No.(s)	623087	622913				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	133	114					
Toluene-d8**	%	TM116	73.5	85.8					
4-Bromofluorobenzene**	%	TM116	67.2	73.2					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	#	#			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
Carbon Disulphide	<9 µg/kg	TM116	18.5	<9.00	M	M			
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Benzene	<9 µg/kg	TM116	104	1210	M	M			
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	M	M			
Toluene	<6 µg/kg	TM116	17.7	896	M	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	M	M			
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	M	M			
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
Ethylbenzene	<9 µg/kg	TM116	22.9	378	M	M			

SDG: 091118-7
 Job: D_MOUCHEL_ELE-90
 Client Reference: 13/11/09 (I9,D3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66894

VOC MS (S)

Results Legend			Sample Identity		D3	I9				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	1.00 - 1.50					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	13/11/2009	13/11/2009					
			Date Received	16/11/2009	16/11/2009					
			SDG Ref	091118-7	091118-7					
			Lab Sample No.(s)	623087	622913					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	45.9	2010	#	#				
o-Xylene	<11 µg/kg	TM116	53.4	1090	M	M				
Styrene	<11 µg/kg	TM116	<11.0	<11.0	M	M				
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	M	M				
Isopropylbenzene	<9 µg/kg	TM116	63.5	56.4	M	M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	#	#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	M	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	M	M				
Propylbenzene	<6 µg/kg	TM116	61.7	85.1	M	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	#	#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	19.5	507	M	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	#	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	85.5	1090	#	#				
sec-Butylbenzene	<8 µg/kg	TM116	14.0	<8.00	#	#				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	<8.00	#	#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	#	#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	M	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	#	#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	M	M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	M	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	#	#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	#	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	#	#				
Naphthalene	<7 µg/kg	TM116	1120	126000	#	#				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#				

SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66894

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I9	I9				
Depth (m)	3.00 - 3.50	4.00 - 4.50				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	13/11/2009	13/11/2009				
Date Received	16/11/2009	16/11/2009				
SDG Ref	091118-7	091118-7				
Lab Sample No.(s)	622965	623002				

Component	LOD/Units	Method	I9	I9			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	592 M	109 M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	460	84.6			
Catechol	<0.01 mg/kg	TM062 (S)	<1.00	<1.00			
Phenol	<0.01 mg/kg	TM062 (S)	407 M	329 M			
Cresols	<0.01 mg/kg	TM062 (S)	862 M	343 M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<5.00	<5.00			
Xylenols	<0.015 mg/kg	TM062 (S)	767 M	149 M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<1.00	<1.00			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<1.00 M	<1.00 M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<1.50 M	<1.50 M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	2040	821			
pH value of soil	1 pH Units	TM133	8.38 M	8.84 M			
Hexavalent Chromium	<0.6 mg/kg	TM151	<12.0 #	<3.00 #			
Total Cyanide	<1 mg/kg	TM153	15.0 M	3.26 M			
Easily Liberated Sulphide	<15 mg/kg	TM180	543 #	<15.0 #			
Arsenic	<0.6 mg/kg	TM181	22.5 M	9.95 M			
Cadmium	<0.02 mg/kg	TM181	0.819 M	<0.0200 M			
Chromium	<0.9 mg/kg	TM181	20.9 M	14.8 M			
Copper	<1.4 mg/kg	TM181	41.9 M	10.7 M			
Lead	<0.7 mg/kg	TM181	283 M	34.5 M			
Mercury	<0.14 mg/kg	TM181	0.950 M	<0.140 M			
Nickel	<0.2 mg/kg	TM181	32.8 M	19.5 M			
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #			
Zinc	<1.9 mg/kg	TM181	149 M	41.7 M			
Total Sulphate	<48 mg/kg	TM221	9840 M	421 M			

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I9	I9				
Depth (m)	3.00 - 3.50	4.00 - 4.50				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	13/11/2009	13/11/2009				
Date Received	16/11/2009	16/11/2009				
SDG Ref	091118-7	091118-7				
Lab Sample No.(s)	622965	623002				

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	4400000	439000		
Aromatics >EC16-EC21	<100 µg/kg	TM173	6850000	890000		
Aromatics >EC21-EC35	<100 µg/kg	TM173	14300000	2140000		
Aromatics >EC35-EC44	<100 µg/kg	TM173	1880000	304000		
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	27400000	3770000		
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	27400000	3770000		

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	I9	I9				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.00 - 4.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	13/11/2009	13/11/2009				
			Date Received	16/11/2009	16/11/2009				
			SDG Ref	091118-7	091118-7				
			Lab Sample No.(s)	622965	623002				
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	231000		107000				
MTBE	<5 µg/kg	TM089	<5.00		<5.00				
Benzene	<10 µg/kg	TM089	100000	M	27100		M		
Toluene	<2 µg/kg	TM089	48600	M	37700		M		
Ethyl Benzene	<3 µg/kg	TM089	4260	M	3490		M		
m & p Xylene	<6 µg/kg	TM089	21600	M	15300		M		
o Xylene	<3 µg/kg	TM089	7160	M	4930		M		
Sum m&p and o Xylene	<10 µg/kg	TM089	28800	M	20300		M		
Sum of BTEX	<10 µg/kg	TM089	182000	M	88500		M		
Aliphatics C5-C6	<10 µg/kg	TM089	5480		935				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0		<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	10800		6020				
Aliphatics >C10-C12	<10 µg/kg	TM089	9080		8570				
Total Aliphatics C5-C12	<10 µg/kg	TM089	25400		15500				
Aromatics C6-C7	<10 µg/kg	TM089	100000		27100				
Aromatics >C7-C8	<10 µg/kg	TM089	48600		37700				
Aromatics >EC8-EC10	<10 µg/kg	TM089	49300		32800				
Aromatics >EC10-EC12	<10 µg/kg	TM089	13600		12900				
Total Aromatics C6-C12	<10 µg/kg	TM089	212000		110000				

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

PAH by GCMS

Results Legend		Sample Identity	I9				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 3.50 Soil/Solid 13/11/2009 16/11/2009 091118-7 622965				
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	2900000				
				M			
Acenaphthylene (S)	<12 µg/kg	TM218	582000				
				M			
Acenaphthene (S)	<8 µg/kg	TM218	92600				
				M			
Fluorene (S)	<10 µg/kg	TM218	423000				
				M			
Phenanthrene (S)	<15 µg/kg	TM218	1120000				
				M			
Anthracene (S)	<16 µg/kg	TM218	389000				
				M			
Fluoranthene (S)	<17 µg/kg	TM218	749000				
				M			
Pyrene (S)	<15 µg/kg	TM218	512000				
				M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	234000				
				M			
Chrysene (S)	<10 µg/kg	TM218	190000				
				M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	188000				
				M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	75900				
				M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	158000				
				M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	75400				
				M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	23100				
				M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	84100				
				M			
PAH 16 EPA Total	<118 µg/kg	TM218	7800000				
				M			

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SDG: 091118-7
 Job: D_MOUCHEL_ELE-90
 Client Reference: 13/11/09 (I9,D3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66894

PAH micro by GCMS

Results Legend		Sample Identity	I9				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	4.00 - 4.50				
		Sample Type	Soil/Solid				
		Date Sampled	13/11/2009				
		Date Received	16/11/2009				
		SDG Ref	091118-7				
		Lab Sample No.(s)	623002				
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	31200	M			
Acenaphthylene (S)	<12 µg/kg	TM218	6880	M			
Acenaphthene (S)	<8 µg/kg	TM218	1060	M			
Fluorene (S)	<10 µg/kg	TM218	5280	M			
Phenanthrene (S)	<15 µg/kg	TM218	13100	M			
Anthracene (S)	<16 µg/kg	TM218	4180	M			
Fluoranthene (S)	<17 µg/kg	TM218	8570	M			
Pyrene (S)	<15 µg/kg	TM218	5530	M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	2620	M			
Chrysene (S)	<10 µg/kg	TM218	1920	M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1900	M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	878	M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1800	M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	871	M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	275	M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	907	M			
PAH 16 EPA Total	<118 µg/kg	TM218	87000	M			

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SDG: 091118-7
Job: D_MOUCHEL_ELE-90
Client Reference: 13/11/09 (I9,D3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66894

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I9	I9				
Depth (m)	3.00 - 3.50	4.00 - 4.50				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	13/11/2009	13/11/2009				
Date Received	16/11/2009	16/11/2009				
SDG Ref	091118-7	091118-7				
Lab Sample No.(s)	622965	623002				

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	5350000	777000		
Total Aromatics >C6-C44	<100 µg/kg	TM173	27600000	3880000		
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	33000000	4660000		

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SDG: 091118-7
 Job: D_MOUCHEL_ELE-90
 Client Reference: 13/11/09 (I9,D3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66894

VOC MS (S)

Results Legend			Sample Identity	I9	I9				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.00 - 4.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	13/11/2009	13/11/2009				
			Date Received	16/11/2009	16/11/2009				
			SDG Ref	091118-7	091118-7				
			Lab Sample No.(s)	622965	623002				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	138	119					
Toluene-d8**	%	TM116	62.4	68.9					
4-Bromofluorobenzene**	%	TM116	59.3	57.3					
Dichlorodifluoromethane	<13 µg/kg	TM116	<130	<13.0	M	M			
Chloromethane	<12 µg/kg	TM116	<120	<12.0	#	#			
Vinyl Chloride	<10 µg/kg	TM116	<100	<10.0	M	M			
Bromoethane	<9 µg/kg	TM116	<90.0	<9.00	M	M			
Chloroethane	<12 µg/kg	TM116	<120	<12.0	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<70.0	<7.00	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<90.0	<9.00	#	#			
Carbon Disulphide	<9 µg/kg	TM116	249	<9.00	M	M			
Dichloromethane	<10 µg/kg	TM116	<100	<10.0	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<90.0	<9.00	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<120	<12.0	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<80.0	<8.00	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<90.0	<9.00	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<100	<10.0	M	M			
Bromochloromethane	<10 µg/kg	TM116	<100	<10.0	M	M			
Chloroform	<10 µg/kg	TM116	<100	<10.0	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<120	<12.0	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<130	<13.0	M	M			
Carbontetrachloride	<11 µg/kg	TM116	<110	<11.0	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116	<100	<10.0	M	M			
Benzene	<9 µg/kg	TM116	220000	13200	M	M			
Trichloroethene	<9 µg/kg	TM116	<90.0	<9.00	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<100	<10.0	M	M			
Dibromomethane	<12 µg/kg	TM116	<120	<12.0	M	M			
Bromodichloromethane	<11 µg/kg	TM116	<110	<11.0	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<250	<25.0	M	M			
Toluene	<6 µg/kg	TM116	313000	21400	M	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<270	<27.0	M	M			
1,1,2-Trichloroethane	<9 µg/kg	TM116	<90.0	<9.00	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<70.0	<7.00	M	M			
Tetrachloroethene	<9 µg/kg	TM116	<90.0	<9.00	M	M			
Dibromochloromethane	<9 µg/kg	TM116	<90.0	<9.00	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<140	<14.0	M	M			
Chorobenzene	<7 µg/kg	TM116	<70.0	<7.00	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<110	<11.0	M	M			
Ethylbenzene	<9 µg/kg	TM116	62900	7920	M	M			

SDG: 091118-7
 Job: D_MOUCHEL_ELE-90
 Client Reference: 13/11/09 (I9,D3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66894

VOC MS (S)

Results Legend			Sample Identity		I9	I9				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.00 - 4.50					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	13/11/2009	13/11/2009					
			Date Received	16/11/2009	16/11/2009					
			SDG Ref	091118-7	091118-7					
			Lab Sample No.(s)	622965	623002					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	376000		33500					
					#					
o-Xylene	<11 µg/kg	TM116	135000		11800					
				M		M				
Styrene	<11 µg/kg	TM116	88600		6090					
				M		M				
Bromoform	<12 µg/kg	TM116	<120		<12.0					
				M		M				
Isopropylbenzene	<9 µg/kg	TM116	4140		402					
				M		M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<150		<15.0					
				#		#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<130		<13.0					
				M		M				
Bromobenzene	<14 µg/kg	TM116	<140		<14.0					
				M		M				
Propylbenzene	<6 µg/kg	TM116	7100		685					
				M		M				
2-Chlorotoluene	<14 µg/kg	TM116	<140		<14.0					
				#		#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	48600		5200					
				M		M				
4-Chlorotoluene	<9 µg/kg	TM116	<90.0		<9.00					
				#		#				
tert-Butylbenzene	<12 µg/kg	TM116	<120		<12.0					
				#		#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	103000		10600					
				#		#				
sec-Butylbenzene	<8 µg/kg	TM116	654		56.8					
				#		#				
4-Isopropyltoluene	<8 µg/kg	TM116	<80.0		<8.00					
				#		#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<80.0		<8.00					
				#		#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<110		<11.0					
				M		M				
n-Butylbenzene	<7 µg/kg	TM116	<70.0		<7.00					
				#		#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<80.0		<8.00					
				M		M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<110		<11.0					
				M		M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<70.0		<7.00					
				#		#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<90.0		<9.00					
				#		#				
Hexachlorobutadiene	<15 µg/kg	TM116	<150		<15.0					
				#		#				
Naphthalene	<7 µg/kg	TM116	3480000		484000					
				#		#				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<120		<12.0					
				#		#				

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 21 January 2010
Job: D_MOUCHEL_ELE-35
Sample Delivery Group (SDG): 091118-70 **Report No.:** 70364
Your Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

A total of 3 samples was received on Tuesday November 17, 2009 and completed on Thursday January 21, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 70364

SOLID

Results Legend	Sample ID	G7						Total
		1.50 - 2.00		4.50 - 5.00		5.50 - 6.00		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test								
N No Determination Possible								
Alkali Metals by iCap-OES (Soil)	All			X			0	
Ammonium Soil by Titration	All						1	
Asbestos Presence Screen	All						0	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X					3	
Easily Liberated Sulphide	All						0	
EPH CWG (Aliphatic) GC (S)	All	X					3	
EPH CWG (Aromatic) GC (S)	All						0	
GRO BTEX MTBE GC (S)	All	X					3	
Hexavalent Chromium (s)	All						0	
Metals by iCap-OES (Soil)	Arsenic						3	
	Cadmium	X					0	
	Chromium	X					3	
	Copper	X					0	
	Lead	X					3	
	Mercury	X					0	
	Nickel	X					3	
	Selenium	X					0	
	Zinc	X					3	
PAH micro by GCMS	All	X					0	
PCBs by GCMS	All						3	
pH	All				N	N	1	
Phenols by HPLC (S)	All	X					2	
Sample description	All						1	
Total Sulphate	All	X					3	
TPH CWG GC (S)	All						0	
VOC MS (S)	All	X					3	
							0	
							1	

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SDG:	091118-70	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-35	Attention:	Verity Sankey
Client Reference:	15/11/09 and 16/11/09 (G7/C7)	Order No.:	
Location:	Limerick Gasworks	Report No.:	70364

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
G7	1.50 - 2.00	Brown	Sand	0.1 - 2 mm	Stones
	4.50 - 5.00	Brown	Sand	0.1 - 2 mm	Oil/Petroleum
	5.50 - 6.00	Brown	Sand	0.1 - 2 mm	Oil/Petroleum

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 70364

Test Completion dates

SDG reference: 091118-70

Sample ID	Depth	Type	SDG reference: 091118-70																
			Alkali Metals by ICap-OES (Soil)	Asbestos Presence Screen	Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyanate	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)
G7	1.50 - 2.00	SOLID	26/11/2009	19/11/2009	23/11/2009	23/11/2009	23/11/2009	28/11/2009	25/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	21/11/2009	24/11/2009	20/11/2009	23/11/2009	29/11/2009	03/12/2009
	4.50 - 5.00	SOLID	26/11/2009	19/11/2009	23/11/2009	23/11/2009	28/11/2009	25/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	24/11/2009	20/11/2009	23/11/2009	29/11/2009	03/12/2009
	5.50 - 6.00	SOLID	26/11/2009	19/11/2009	23/11/2009	23/11/2009	28/11/2009	25/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	24/11/2009	20/11/2009	23/11/2009	29/11/2009	03/12/2009

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SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 70364

Results Legend			Sample Identity	G7	G7	G7			
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	4.50 - 5.00	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	15/11/2009	15/11/2009	15/11/2009			
			Date Received	17/11/2009	17/11/2009	17/11/2009			
			SDG Ref	091118-70	091118-70	091118-70			
			Lab Sample No.(s)	623912	623936	623943			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15	127	74.9	M	M	M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15	99	58.2				
Catechol	<0.01 mg/kg	TM062 (S)	<0.1	<0.1	<0.1				
Phenol	<0.01 mg/kg	TM062 (S)	<0.1	<0.1	<0.19	M	M	M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.1	1.19	<0.46	M	M	M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.5	<0.5	<0.5				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.15	<0.15	<0.15	M	M	M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.1	<0.1	<0.1				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.1	<0.1	<0.1	M	M	M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.15	<0.15	<0.15	M	M	M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0	1.19	0.004				
pH value of soil	1 pH Units	TM133	8.15			M			
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0764	<3	<0.6	#	#	#	
Total Cyanide	<1 mg/kg	TM153	13	1760	1540	M	M	M	
PCB congener 28	<3 µg/kg	TM168							
PCB congener 52	<3 µg/kg	TM168							
PCB congener 101	<3 µg/kg	TM168		<3					
PCB congener 118	<3 µg/kg	TM168		<3					
PCB congener 138	<3 µg/kg	TM168		<3					
PCB congener 153	<3 µg/kg	TM168		<3					
PCB congener 180	<3 µg/kg	TM168		<3					
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3					
Easily Liberated Sulphide	<15 mg/kg	TM180	18.7	850	1050	#	#	#	
Arsenic	<0.6 mg/kg	TM181	12.8	21.2	11.7	M	M	M	
Cadmium	<0.02 mg/kg	TM181	<0.02	<0.02	<0.02	M	M	M	
Chromium	<0.9 mg/kg	TM181	19	8.61	12.7	M	M	M	
Copper	<1.4 mg/kg	TM181	70.1	20.1	44.4	M	M	M	
Lead	<0.7 mg/kg	TM181	123	15.3	18.6	M	M	M	
Mercury	<0.14 mg/kg	TM181	<0.14	<0.14	<0.14	M	M	M	
Nickel	<0.2 mg/kg	TM181	18	12	20.2	M	M	M	
Selenium	<1 mg/kg	TM181	<1	<1	<1	#	#	#	
Zinc	<1.9 mg/kg	TM181	97.7	16.4	18.6	M	M	M	
Total Sulphate	<48 mg/kg	TM221	6500	156000	86200	M	M	M	
Calcium	<21 mg/kg	TM224		288000					

SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 70364

EPH CWG (Aromatic) GC (S)

Results Legend		Sample Identity	G7	G7	G7
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.50 - 2.00	4.50 - 5.00	5.50 - 6.00
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
		Date Sampled	15/11/2009	15/11/2009	15/11/2009
		Date Received	17/11/2009	17/11/2009	17/11/2009
		SDG Ref	091118-70	091118-70	091118-70
		Lab Sample No.(s)	623912	623936	623943
Component	LOD/Units	Method			
Aromatics >EC12-EC16	<100 µg/kg	TM173	96400	2940000	1540000
Aromatics >EC16-EC21	<100 µg/kg	TM173	366000	4540000	1920000
Aromatics >EC21-EC35	<100 µg/kg	TM173	1050000	10700000	3740000
Aromatics >EC35-EC44	<100 µg/kg	TM173	235000	1740000	635000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	1750000	19900000	7830000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	1750000	19900000	7830000

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SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 70364

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	G7	G7	G7			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	4.50 - 5.00	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	15/11/2009	15/11/2009	15/11/2009			
			Date Received	17/11/2009	17/11/2009	17/11/2009			
			SDG Ref	091118-70	091118-70	091118-70			
			Lab Sample No.(s)	623912	623936	623943			
			Method	TM089	TM089	TM089			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	519	417000	522000				
MTBE	<5 µg/kg	TM089	<5	<5	<5				
Benzene	<10 µg/kg	TM089	25.1	28600	18700				
Toluene	<2 µg/kg	TM089	67.3	125000	132000				
Ethyl Benzene	<3 µg/kg	TM089	27.4	14200	15600				
m & p Xylene	<6 µg/kg	TM089	67.3	71500	84800				
o Xylene	<3 µg/kg	TM089	31.9	28900	33500				
Sum m&p and o Xylene	<10 µg/kg	TM089	99.2	100000	118000				
Sum of BTEX	<10 µg/kg	TM089	219	268000	284000				
Aliphatics C5-C6	<10 µg/kg	TM089	32.3	2270	1870				
Aliphatics >C6-C8	<10 µg/kg	TM089	46.9	4640	11800				
Aliphatics >C8-C10	<10 µg/kg	TM089	27.5	21100	28600				
Aliphatics >C10-C12	<10 µg/kg	TM089	60.7	35600	63400				
Total Aliphatics C5-C12	<10 µg/kg	TM089	167	63600	103000				
Aromatics C6-C7	<10 µg/kg	TM089	25.1	28600	18700				
Aromatics >C7-C8	<10 µg/kg	TM089	67.3	125000	132000				
Aromatics >EC8-EC10	<10 µg/kg	TM089	168	146000	174000				
Aromatics >EC10-EC12	<10 µg/kg	TM089	91.1	53400	94600				
Total Aromatics C6-C12	<10 µg/kg	TM089	351	353000	419000				

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SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 70364

PAH micro by GCMS

Results Legend			Sample Identity	G7	G7	G7			
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	4.50 - 5.00	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	15/11/2009	15/11/2009	15/11/2009			
			Date Received	17/11/2009	17/11/2009	17/11/2009			
			SDG Ref	091118-70	091118-70	091118-70			
			Lab Sample No.(s)	623912	623936	623943			
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	1930	10400000	2480000				
			M	M	M				
Acenaphthylene (S)	<12 µg/kg	TM218	1380	640000	59700				
			M	M	M				
Acenaphthene (S)	<8 µg/kg	TM218	567	243000	69800				
			M	M	M				
Fluorene (S)	<10 µg/kg	TM218	408	682000	110000				
			M	M	M				
Phenanthrene (S)	<15 µg/kg	TM218	2500	1780000	247000				
			M	M	M				
Anthracene (S)	<16 µg/kg	TM218	1270	558000	70900				
			M	M	M				
Fluoranthene (S)	<17 µg/kg	TM218	5750	1170000	135000				
			M	M	M				
Pyrene (S)	<15 µg/kg	TM218	4930	752000	89600				
			M	M	M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	2230	312000	30800				
			M	M	M				
Chrysene (S)	<10 µg/kg	TM218	1860	258000	24200				
			M	M	M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	4250	256000	32300				
			M	M	M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	1470	120000	14900				
			M	M	M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	3100	247000	26400				
			M	M	M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	2280	121000	12700				
			M	M	M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	625	31000	3630				
			M	M	M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	2890	146000	15800				
			M	M	M				
PAH 16 EPA Total	<118 µg/kg	TM218	37400	17700000	3420000				
			M	M	M				

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SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 70364

VOC MS (S)

Results Legend		Sample Identity	G7				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	4.50 - 5.00				
		Sample Type	Soil/Solid				
		Date Sampled	15/11/2009				
		Date Received	17/11/2009				
		SDG Ref	091118-70				
		Lab Sample No.(s)	623936				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	174				
Toluene-d8**	%	TM116	56.9				
4-Bromofluorobenzene**	%	TM116	137				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13		M		
Chloromethane	<12 µg/kg	TM116	<12		#		
Vinyl Chloride	<10 µg/kg	TM116	<10		M		
Bromoethane	<9 µg/kg	TM116	<9		M		
Chloroethane	<12 µg/kg	TM116	<12		M		
Trichlorofluoromethane	<7 µg/kg	TM116	<7		M		
1,1-Dichloroethene	<9 µg/kg	TM116	<9		#		
Carbon Disulphide	<9 µg/kg	TM116	314		M		
Dichloromethane	<10 µg/kg	TM116	<10		M		
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9		M		
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12		M		
1,1-Dichloroethane	<8 µg/kg	TM116	<8		M		
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9		M		
2,2-Dichloropropane	<10 µg/kg	TM116	<10		M		
Bromochloromethane	<10 µg/kg	TM116	<10		M		
Chloroform	<10 µg/kg	TM116	<10		M		
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12		M		
1,1-Dichloropropene	<13 µg/kg	TM116	<13		M		
Carbontetrachloride	<11 µg/kg	TM116	<11		M		
1,2-Dichloroethane	<10 µg/kg	TM116	<10		M		
Benzene	<9 µg/kg	TM116	28800		M		
Trichloroethene	<9 µg/kg	TM116	<9		#		
1,2-Dichloropropane	<10 µg/kg	TM116	<10		M		
Dibromomethane	<12 µg/kg	TM116	<12		M		
Bromodichloromethane	<11 µg/kg	TM116	<11		M		
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25		M		
Toluene	<6 µg/kg	TM116	324000		M		
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9		M		
1,3-Dichloropropane	<7 µg/kg	TM116	<7		M		
Tetrachloroethene	<9 µg/kg	TM116	<9		M		
Dibromochloromethane	<9 µg/kg	TM116	<9		M		
1,2-Dibromoethane	<14 µg/kg	TM116	<14		M		
Chorobenzene	<7 µg/kg	TM116	<7		M		
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11		M		
Ethylbenzene	<9 µg/kg	TM116	92300		M		

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SDG: 091118-70
Job: D_MOUCHEL_ELE-35
Client Reference: 15/11/09 and 16/11/09 (G7/C7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 70364

VOC MS (S)

Results Legend		Sample Identity	G7				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	4.50 - 5.00 Soil/Solid 15/11/2009 17/11/2009 091118-70 623936				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	557000	#			
o-Xylene	<11 µg/kg	TM116	229000	M			
Styrene	<11 µg/kg	TM116	<11	M			
Bromoform	<12 µg/kg	TM116	<12	M			
Isopropylbenzene	<9 µg/kg	TM116	10800	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13	M			
Bromobenzene	<14 µg/kg	TM116	<14	M			
Propylbenzene	<6 µg/kg	TM116	11500	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	96100	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	213000	#			
sec-Butylbenzene	<8 µg/kg	TM116	523	#			
4-Isopropyltoluene	<8 µg/kg	TM116	2860	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11	M			
n-Butylbenzene	<7 µg/kg	TM116	<7	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15	#			
Naphthalene	<7 µg/kg	TM116	6110000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12	#			

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Table of Results - Appendix

SDG Number : 091118-70

Client : Mouchel

Client Ref : 15/11/09 and 16/11/09 (G7/C

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹
PM001		Preparation of Samples for Metals Analysis	Dry
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material	Wet
TM001	In - house Method	Determination of asbestos containing material by screening on solids	
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids	Wet
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC	Wet
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter	Wet
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser	Wet
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser	Wet
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO ₁₂ and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils	Dry
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID	Dry
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique	Wet
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES	Dry
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546	Wet
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer	Dry
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES	Dry

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Notification of NDPs (No determination possible)

SDG Number	091118-70	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	15/11/09 and 16/11/09 (G7/C7)	Report No.	33459-0
Attention	Dave Watts	Date Received	18/11/2009 13:46:07

Sample No	Sample Identity	Depth (m)	Test	Comment
632895	G7	4.50 - 5.00	pH	Sample contains oil / product
632895	G7	4.50 - 5.00	pH	Sample contains oil / product
632895	G7	4.50 - 5.00	pH	Sample contains oil / product
632973	G7	5.50 - 6.00	pH	Sample contains oil / product
632973	G7	5.50 - 6.00	pH	Sample contains oil / product
632973	G7	5.50 - 6.00	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 06 January 2010
Job: D_MOUCHEL_ELE-36
Sample Delivery Group (SDG): 091118-77
Your Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks
Report No.: 68803

A total of 5 samples was received on Tuesday November 17, 2009 and completed on Wednesday January 06, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091118-77
Job: D_MOUCHEL_ELE-36
Client Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 68803

SOLID

Results Legend	Sample ID	C7						J12		K12		Total
		1.50 - 2.00		2.00 - 2.50		4.00 - 4.50		0.50 - 1.00		0.00 - 0.50		
		60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	
X Test												
N No Determination Possible												
Ammonium Soil by Titration	All		X		X		X		X		X	
Cyanide Comp/Free/Total/Thiocyanate	All										X	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X			
Easily Liberated Sulphide	All		X		X		X		X		X	
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X		X	
EPH CWG (Aromatic) GC (S)	All		X		X		X		X		X	
GRO BTEX MTBE GC (S)	All	N				N						
Hexavalent Chromium (s)	All		X		X		X		X		X	
Metals by iCap-OES (Soil)	Arsenic				X		X		X		X	
	Cadmium		X		X		X		X		X	
	Chromium		X		X		X		X		X	
	Copper		X		X		X		X		X	
	Lead		X		X		X		X		X	
	Mercury		X		X		X		X		X	
	Nickel		X		X		X		X		X	
	Selenium		X		X		X		X		X	
	Zinc		X		X		X		X		X	
PAH by GCMS	All		X									
PAH micro by GCMS	All				X		X		X		X	
pH	All		X		X		X		X		X	
Phenols by HPLC (S)	All		X		X		X		X		X	
Sample description	All		X		X		X		X		X	
Total Sulphate	All		X		X		X		X		X	
TPH CWG GC (S)	All				X				X		X	
VOC MS (S)	All	N				N						

SDG:	091118-77	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-36	Attention:	Verity Sankey
Client Reference:	16/11/09 (C7/J12/K12)	Order No.:	
Location:	Limerick Gasworks	Report No:	68803

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C7	1.50 - 2.00	Black	Sand	0.1 - 2 mm	Oil/Petroleum
	2.00 - 2.50	Grey	Gravel	0.1 - 2 mm	Oil/Petroleum
	4.00 - 4.50	Black	Gravel	2 - 10 mm	Tar
J12	0.50 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
K12	0.00 - 0.50	Brown	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091118-77
Job: D_MOUCHEL_ELE-36
Client Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 68803

Test Completion dates

SDG reference: 091118-77

Sample ID	Depth	Type	Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
C7	1.50 - 2.00	SOLID	26/11/2009	23/11/2009	23/11/2009	29/11/2009	28/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	26/11/2009	19/11/2009	23/11/2009	23/11/2009	23/11/2009
	2.00 - 2.50	SOLID	26/11/2009	23/11/2009	24/11/2009	28/11/2009	28/11/2009	23/11/2009	23/11/2009	24/11/2009	21/11/2009	26/11/2009	19/11/2009	23/11/2009	23/11/2009	03/12/2009
	4.00 - 4.50	SOLID	03/12/2009	23/11/2009	24/11/2009	28/11/2009	28/11/2009	23/11/2009	23/11/2009	24/11/2009	21/11/2009	24/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009
J12	0.50 - 1.00	SOLID	26/11/2009	23/11/2009	23/11/2009	25/11/2009	25/11/2009	23/11/2009	23/11/2009	24/11/2009	21/11/2009	24/11/2009	20/11/2009	23/11/2009	23/11/2009	25/11/2009
K12	0.00 - 0.50	SOLID	26/11/2009	24/11/2009	23/11/2009	25/11/2009	25/11/2009	23/11/2009	23/11/2009	24/11/2009	21/11/2009	24/11/2009	20/11/2009	23/11/2009	23/11/2009	25/11/2009

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SDG: 091118-77
Job: D_MOUCHEL_ELE-36
Client Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 68803

Results Legend			Sample Identity		C7	C7	C7	J12	K12
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	1.50 - 2.00 Soil/Solid	2.00 - 2.50 Soil/Solid	4.00 - 4.50 Soil/Solid	0.50 - 1.00 Soil/Solid	0.00 - 0.50 Soil/Solid
Component	LOD/Units	Method	Date Sampled	Date Received	19/11/2009	16/11/2009	17/11/2009	16/11/2009	17/11/2009
			SDG Ref	Lab Sample No.(s)	091118-77 624701	091118-77 624702	091118-77 624704	091118-77 624705	091118-77 624706
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	922	489	1470	64.1	<15		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	717	380	1150	49.8	<15		
Catechol	<0.01 mg/kg	TM062 (S)	<1	<0.5	<0.1	<0.01	<0.01		
Phenol	<0.01 mg/kg	TM062 (S)	304	142	31.5	<0.01	<0.01		
Cresols	<0.01 mg/kg	TM062 (S)	886	502	104	<0.01	<0.01		
Resorcinol	<0.05 mg/kg	TM062 (S)	<5	<2.5	<0.5	<0.05	<0.05		
Xylenols	<0.015 mg/kg	TM062 (S)	1070	585	142	<0.015	<0.015		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<1	<0.5	<0.1	<0.01	<0.01		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<1	<0.5	<0.1	<0.01	<0.01		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<1.5	<0.75	<0.15	<0.015	<0.015		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	2260	1230	278	0	0		
pH value of soil	1 pH Units	TM133	9.27	9.29	9.2	8.6	8.81		
Hexavalent Chromium	<0.6 mg/kg	TM151	<3	<6	<12	0.0901	0.0785		
Total Cyanide	<1 mg/kg	TM153	6270	4810	2660	<1	<1		
Easily Liberated Sulphide	<15 mg/kg	TM180	142	203	143	<15	<15		
Arsenic	<0.6 mg/kg	TM181	40.7	5.25	8.95	3.2	3.02		
Cadmium	<0.02 mg/kg	TM181	2.86	<0.02	<0.02	<0.02	<0.02		
Chromium	<0.9 mg/kg	TM181	15.9	7.73	9.87	5.15	4.38		
Copper	<1.4 mg/kg	TM181	17.3	21.3	65.6	4.08	3.06		
Lead	<0.7 mg/kg	TM181	443	23	120	6.81	4.48		
Mercury	<0.14 mg/kg	TM181	5.76	0.36	1.04	0.23	0.272		
Nickel	<0.2 mg/kg	TM181	15	9.1	16.7	5.59	4.03		
Selenium	<1 mg/kg	TM181	2.71	<1	1.53	<1	<1		
Zinc	<1.9 mg/kg	TM181	679	26.7	22.3	18.3	14		
Total Sulphate	<48 mg/kg	TM221	69500	11400	7910	478	698		

SDG: 091118-77
Job: D_MOUCHEL_ELE-36
Client Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 68803

GRO BTEX MTBE GC (S)

Results Legend		Sample Identity	C7	J12	K12			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.00 - 2.50 Soil/Solid 16/11/2009 17/11/2009 091118-77 624702	0.50 - 1.00 Soil/Solid 16/11/2009 17/11/2009 091118-77 624705	0.00 - 0.50 Soil/Solid 16/11/2009 17/11/2009 091118-77 624706			
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	1410000	83.1	96.1	#	#	
MTBE	<5 µg/kg	TM089	<5	<5	<5	#	#	
Benzene	<10 µg/kg	TM089	128000	<10	<10	M	M	
Toluene	<2 µg/kg	TM089	203000	<2	10.7	M	M	
Ethyl Benzene	<3 µg/kg	TM089	31700	<3	<3	M	M	
m & p Xylene	<6 µg/kg	TM089	230000	<6	11.7	M	M	
o Xylene	<3 µg/kg	TM089	86600	<3	<3	M	M	
Sum m&p and o Xylene	<10 µg/kg	TM089	316000	<10	11.7	M	M	
Sum of BTEX	<10 µg/kg	TM089	680000	<10	22.4	M	M	
Aliphatics C5-C6	<10 µg/kg	TM089	10400	<10	<10			
Aliphatics >C6-C8	<10 µg/kg	TM089	24800	<10	<10			
Aliphatics >C8-C10	<10 µg/kg	TM089	106000	<10	<10			
Aliphatics >C10-C12	<10 µg/kg	TM089	174000	24.9	25.8			
Total Aliphatics C5-C12	<10 µg/kg	TM089	315000	24.9	25.8			
Aromatics C6-C7	<10 µg/kg	TM089	128000	<10	<10			
Aromatics >C7-C8	<10 µg/kg	TM089	203000	<10	10.7			
Aromatics >EC8-EC10	<10 µg/kg	TM089	507000	12.5	17.5			
Aromatics >EC10-EC12	<10 µg/kg	TM089	261000	37.3	38.8			
Total Aromatics C6-C12	<10 µg/kg	TM089	1100000	49.8	67			

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SDG: 091118-77
Job: D_MOUCHEL_ELE-36
Client Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 68803

PAH by GCMS

Results Legend		Sample Identity	C7				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 19/11/2009 17/11/2009 091118-77 624701				
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	11600000				
			M				
Acenaphthylene (S)	<12 µg/kg	TM218	2390000				
			M				
Acenaphthene (S)	<8 µg/kg	TM218	379000				
			M				
Fluorene (S)	<10 µg/kg	TM218	1820000				
			M				
Phenanthrene (S)	<15 µg/kg	TM218	4490000				
			M				
Anthracene (S)	<16 µg/kg	TM218	1570000				
			M				
Fluoranthene (S)	<17 µg/kg	TM218	3010000				
			M				
Pyrene (S)	<15 µg/kg	TM218	1940000				
			M				
Benz(a)anthracene (S)	<14 µg/kg	TM218	983000				
			M				
Chrysene (S)	<10 µg/kg	TM218	697000				
			M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	821000				
			M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	357000				
			M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	677000				
			M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	299000				
			M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	90400				
			M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	321000				
			M				
PAH 16 EPA Total	<118 µg/kg	TM218	31400000				
			M				

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SDG: 091118-77
Job: D_MOUCHEL_ELE-36
Client Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 68803

PAH micro by GCMS

Results Legend		Sample Identity	C7	C7	J12	K12		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	2.00 - 2.50	4.00 - 4.50	0.50 - 1.00	0.00 - 0.50		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	16/11/2009	16/11/2009	16/11/2009	16/11/2009		
		Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009		
		SDG Ref	091118-77	091118-77	091118-77	091118-77		
		Lab Sample No.(s)	624702	624704	624705	624706		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	3800000	3980000	44	16.5		
Acenaphthylene (S)	<12 µg/kg	TM218	620000	551000	41.4	21.9		
Acenaphthene (S)	<8 µg/kg	TM218	94500	94400	<8	<8		
Fluorene (S)	<10 µg/kg	TM218	430000	432000	<10	<10		
Phenanthrene (S)	<15 µg/kg	TM218	1120000	1170000	21.9	<15		
Anthracene (S)	<16 µg/kg	TM218	359000	374000	<16	<16		
Fluoranthene (S)	<17 µg/kg	TM218	732000	761000	<17	<17		
Pyrene (S)	<15 µg/kg	TM218	476000	508000	<15	<15		
Benz(a)anthracene (S)	<14 µg/kg	TM218	193000	201000	<14	<14		
Chrysene (S)	<10 µg/kg	TM218	168000	166000	<10	<10		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	161000	179000	<15	<15		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	71200	80500	<14	<14		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	133000	145000	<15	<15		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	62700	68400	<18	<18		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	17300	21200	<23	<23		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	76300	82500	<24	<24		
PAH 16 EPA Total	<118 µg/kg	TM218	8510000	8810000	<118	<118		

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SDG: 091118-77
Job: D_MOUCHEL_ELE-36
Client Reference: 16/11/09 (C7/J12/K12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 68803

TPH CWG GC (S)

Results Legend	Sample Identity	C7	J12	K12			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Depth (m)	2.00 - 2.50	0.50 - 1.00	0.00 - 0.50			
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
	Date Sampled	16/11/2009	16/11/2009	16/11/2009			
	Date Received	17/11/2009	17/11/2009	17/11/2009			
	SDG Ref	091118-77	091118-77	091118-77			
	Lab Sample No.(s)	624702	624705	624706			

Component	LOD/Units	Method					
Total Aliphatics >C5-C44	<100 µg/kg	TM173	1640000	1620	3480		
Total Aromatics >C6-C44	<100 µg/kg	TM173	10300000	3060	3660		
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	11900000	4670	7140		

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SDG: 091118-77
 Job: D_MOUCHEL_ELE-36
 Client Reference: 16/11/09 (C7/J12/K12)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 68803

VOC MS (S)

Results Legend		Sample Identity	C7			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.00 - 2.50 Soil/Solid 16/11/2009 17/11/2009 091118-77 624702			
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM116	201			
Toluene-d8**	%	TM116	59.8			
4-Bromofluorobenzene**	%	TM116	119			
Dichlorodifluoromethane	<13 µg/kg	TM116	<13	M		
Chloromethane	<12 µg/kg	TM116	<12	#		
Vinyl Chloride	<10 µg/kg	TM116	<10	M		
Bromoethane	<9 µg/kg	TM116	<9	M		
Chloroethane	<12 µg/kg	TM116	<12	M		
Trichlorofluoromethane	<7 µg/kg	TM116	<7	M		
1,1-Dichloroethene	<9 µg/kg	TM116	<9	#		
Carbon Disulphide	<9 µg/kg	TM116	49	M		
Dichloromethane	<10 µg/kg	TM116	<10	M		
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9	M		
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12	M		
1,1-Dichloroethane	<8 µg/kg	TM116	<8	M		
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9	M		
2,2-Dichloropropane	<10 µg/kg	TM116	<10	M		
Bromochloromethane	<10 µg/kg	TM116	<10	M		
Chloroform	<10 µg/kg	TM116	<10	M		
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12	M		
1,1-Dichloropropene	<13 µg/kg	TM116	<13	M		
Carbontetrachloride	<11 µg/kg	TM116	<11	M		
1,2-Dichloroethane	<10 µg/kg	TM116	<10	M		
Benzene	<9 µg/kg	TM116	-			
Trichloroethene	<9 µg/kg	TM116	<9	#		
1,2-Dichloropropane	<10 µg/kg	TM116	<10	M		
Dibromomethane	<12 µg/kg	TM116	<12	M		
Bromodichloromethane	<11 µg/kg	TM116	<11	M		
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25	M		
Toluene	<6 µg/kg	TM116	-			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27			
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9	M		
1,3-Dichloropropane	<7 µg/kg	TM116	<7	M		
Tetrachloroethene	<9 µg/kg	TM116	<9	M		
Dibromochloromethane	<9 µg/kg	TM116	<9	M		
1,2-Dibromoethane	<14 µg/kg	TM116	<14	M		
Chorobenzene	<7 µg/kg	TM116	<7	M		
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11	M		
Ethylbenzene	<9 µg/kg	TM116	42000	M		

SDG: 091118-77
 Job: D_MOUCHEL_ELE-36
 Client Reference: 16/11/09 (C7/J12/K12)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 68803

VOC MS (S)

Results Legend		Sample Identity	C7				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.00 - 2.50 Soil/Solid 16/11/2009 17/11/2009 091118-77 624702				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	310000				
o-Xylene	<11 µg/kg	TM116	124000				
Styrene	<11 µg/kg	TM116	<11	M			
Bromoform	<12 µg/kg	TM116	<12	M			
Isopropylbenzene	<9 µg/kg	TM116	1110	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13	M			
Bromobenzene	<14 µg/kg	TM116	<14	M			
Propylbenzene	<6 µg/kg	TM116	1860	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	43000	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	103000	#			
sec-Butylbenzene	<8 µg/kg	TM116	196	#			
4-Isopropyltoluene	<8 µg/kg	TM116	781	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11	M			
n-Butylbenzene	<7 µg/kg	TM116	<7	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15	#			
Naphthalene	<7 µg/kg	TM116	4730000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12	#			

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Table of Results - Appendix

SDG Number : 091118-77

Client : Mouchel

Client Ref : 16/11/09 (C7/J12/K12)

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10 ⁻⁷							
NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹
PM001		Preparation of Samples for Metals Analysis	Dry
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material	Wet
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids	Wet
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC	Wet
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter	Wet
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser	Wet
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SAAS+ System" Segmented Flow Analyser	Wet
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID	Dry
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique	Wet
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES	Dry
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546	Wet
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer	Dry

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Notification of NDPs (No determination possible)

SDG Number	091118-77	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	16/11/09 (C7/J12/K12)	Report No.	31703-0
Attention	Dave Watts	Date Received	18/11/2009 15:22:34

Sample No	Sample Identity	Depth (m)	Test	Comment
624473	C7	1.50 - 2.00	GRO BTEX MTBE GC (S)	Sample contains oil / product
624473	C7	1.50 - 2.00	GRO BTEX MTBE GC (S)	Sample contains oil / product
624473	C7	1.50 - 2.00	GRO BTEX MTBE GC (S)	Sample contains oil / product
624473	C7	1.50 - 2.00	VOC MS (S)	Sample contains oil / product
624473	C7	1.50 - 2.00	VOC MS (S)	Sample contains oil / product
624473	C7	1.50 - 2.00	VOC MS (S)	Sample contains oil / product
624635	C7	4.00 - 4.50	GRO BTEX MTBE GC (S)	Sample contains oil / product
624635	C7	4.00 - 4.50	GRO BTEX MTBE GC (S)	Sample contains oil / product
624635	C7	4.00 - 4.50	GRO BTEX MTBE GC (S)	Sample contains oil / product
624635	C7	4.00 - 4.50	VOC MS (S)	Sample contains oil / product
624635	C7	4.00 - 4.50	VOC MS (S)	Sample contains oil / product
624635	C7	4.00 - 4.50	VOC MS (S)	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 01 December 2009
Job: D_MOUCHEL_ELE-37
Sample Delivery Group (SDG): 091118-92 **Report No.:** 66163
Your Reference: 15/11/09 (15)
Location: Limerick Gasworks

A total of 3 samples was received on Tuesday November 17, 2009 and completed on Tuesday December 01, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091118-92
Job: D_MOUCHEL_ELE-37
Client Reference: 15/11/09 (15)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66163

SOLID

Results Legend	Sample ID	15						Total
		3.50 - 4.00		5.50 - 6.00		7.00 - 7.20		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All	X		X		X		3
Hexavalent Chromium (s)	All		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X	3
	Cadmium		X		X		X	0
	Chromium		X		X		X	3
	Copper		X		X		X	0
	Lead		X		X		X	3
	Mercury		X		X		X	0
	Nickel		X		X		X	3
	Selenium		X		X		X	0
	Zinc		X		X		X	3
PAH by GCMS	All		X		X			0
PAH micro by GCMS	All						X	1
pH	All		X		X		X	0
Phenols by HPLC (S)	All		X		X		X	3
Sample description	All		X		X		X	0
Total Sulphate	All		X		X		X	3
TPH CWG GC (S)	All		X		X		X	0
			X		X		X	3

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SDG:	091118-92	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-37	Attention:	Verity Sankey
Client Reference:	15/11/09 (I5)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66163

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
I5	3.50 - 4.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	5.90 - 6.00	Brown	Sand	0.1 - 2 mm	Stones
	7.00 - 7.20	Brown	Sandy Clay	0.1 - 2 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091118-92
Job: D_MOUCHEL_ELE-37
Client Reference: 15/11/09 (I5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66163

Test Completion dates

SDG reference: 091118-92

Sample ID	Depth	Type	SDG reference: 091118-92												
			TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana
I5	3.50 - 4.00	SOLID	25/11/2009	25/11/2009	23/11/2009	19/11/2009	21/11/2009	01/12/2009	24/11/2009	23/11/2009	25/11/2009	25/11/2009	23/11/2009	23/11/2009	27/11/2009
	5.90 - 6.00	SOLID	25/11/2009	23/11/2009	19/11/2009	24/11/2009	21/11/2009	01/12/2009	23/11/2009	23/11/2009	24/11/2009	25/11/2009	23/11/2009	23/11/2009	23/11/2009
	7.00 - 7.20	SOLID	25/11/2009	25/11/2009	20/11/2009	24/11/2009	20/11/2009	23/11/2009	24/11/2009	23/11/2009	25/11/2009	25/11/2009	24/11/2009	20/11/2009	30/11/2009

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SDG: 091118-92
Job: D_MOUCHEL_ELE-37
Client Reference: 15/11/09 (I5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66163

Results Legend			Sample Identity	I5	I5	I5
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.50 - 4.00 Soil/Solid 15/11/2009 17/11/2009 091118-92 625006	5.90 - 6.00 Soil/Solid 15/11/2009 17/11/2009 091118-92 625070	7.00 - 7.20 Soil/Solid 15/11/2009 17/11/2009 091118-92 625129
Component	LOD/Units	Method				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	91.9	45.8	107	
			M	M	M	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0200	<0.0300	
			M	M	M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0200	0.0696	0.0690	
			M	M	M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	1.83	
			M	M	M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
			M	M	M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	
			M	M	M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0200	<0.0800	1.93	
pH value of soil	1 pH Units	TM133	8.80	10.81	8.39	
			M	M	M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<0.60	
			#	#	#	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	
			#	#	#	
Total Cyanide	<1 mg/kg	TM153	4030	4520	<1.00	
			M	M	M	
Easily Liberated Sulphide	<15 mg/kg	TM180	1312.04	2141.77	86.33	
			#	#	#	
Easily Liberated Sulphide	<15 mg/kg	TM180	1720	2480	99.3	
			#	#	#	
Arsenic	<0.6 mg/kg	TM181	6.89	6.31	4.69	
			M	M	M	
Cadmium	<0.02 mg/kg	TM181	<0.0200	0.0776	<0.0200	
			M	M	M	
Chromium	<0.9 mg/kg	TM181	14.6	20.9	4.26	
			M	M	M	
Copper	<1.4 mg/kg	TM181	8.22	59.2	5.68	
			M	M	M	
Lead	<0.7 mg/kg	TM181	19.9	19.4	51.0	
			M	M	M	
Mercury	<0.14 mg/kg	TM181	0.226	<0.140	0.485	
			M	M	M	
Nickel	<0.2 mg/kg	TM181	17.0	45.0	3.19	
			M	M	M	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	
			#	#	#	
Zinc	<1.9 mg/kg	TM181	40.0	25.8	15.5	
			M	M	M	
Total Sulphate	<48 mg/kg	TM221	1980	7830	1910	
			M	M	M	

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SDG: 091118-92
Job: D_MOUCHEL_ELE-37
Client Reference: 15/11/09 (I5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66163

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	I5	I5	I5			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.50 - 4.00	5.90 - 6.00	7.00 - 7.20			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	15/11/2009	15/11/2009	15/11/2009			
			Date Received	17/11/2009	17/11/2009	17/11/2009			
			SDG Ref	091118-92	091118-92	091118-92			
			Lab Sample No.(s)	625006	625070	625129			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	444	1390	2950				
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00				
			#	#	#				
Benzene	<10 µg/kg	TM089	70.7	409	1090				
			M	M	M				
Toluene	<2 µg/kg	TM089	<5.00	60.3	88.6				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	<3.00	75.4	131				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	<8.00	108	339				
			M	M	M				
o Xylene	<3 µg/kg	TM089	<6.00	37.1	186				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	145	526				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	70.7	690	1840				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	25.2	21.1				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	50.8	81.0	188				
Aliphatics >C10-C12	<10 µg/kg	TM089	103	207	549				
Total Aliphatics C5-C12	<10 µg/kg	TM089	154	313	528				
Aromatics C6-C7	<10 µg/kg	TM089	70.7	409	1090				
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	60.3	88.6				
Aromatics >EC8-EC10	<10 µg/kg	TM089	76.2	342	894				
Aromatics >EC10-EC12	<10 µg/kg	TM089	154	310	524				
Total Aromatics C6-C12	<10 µg/kg	TM089	301	1120	2600				

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SDG: 091118-92
 Job: D_MOUCHEL_ELE-37
 Client Reference: 15/11/09 (I5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66163

PAH by GCMS

Results Legend		Sample Identity	I5	I5				
# ISO17025 accredited. m CERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.50 - 4.00 Soil/Solid 15/11/2009 17/11/2009 091118-92 625006	5.90 - 6.00 Soil/Solid 15/11/2009 17/11/2009 091118-92 625070				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	1060 M	3710 M				
Acenaphthylene (S)	<12 µg/kg	TM218	284 M	928 M				
Acenaphthene (S)	<8 µg/kg	TM218	1610 M	1030 M				
Fluorene (S)	<10 µg/kg	TM218	1050 M	1140 M				
Phenanthrene (S)	<15 µg/kg	TM218	1120 M	5080 M				
Anthracene (S)	<16 µg/kg	TM218	677 M	1840 M				
Fluoranthene (S)	<17 µg/kg	TM218	1570 M	10500 M				
Pyrene (S)	<15 µg/kg	TM218	1240 M	9720 M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	717 M	5150 M				
Chrysene (S)	<10 µg/kg	TM218	626 M	4290 M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	626 M	7780 M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	248 M	2950 M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	548 M	7880 M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	267 M	4930 M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	110 M	1380 M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	307 M	5660 M				
PAH 16 EPA Total	<118 µg/kg	TM218	12100 M	74100 M				

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SDG: 091118-92
Job: D_MOUCHEL_ELE-37
Client Reference: 15/11/09 (I5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66163

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I5	I5	I5
Depth (m)	3.50 - 4.00	5.90 - 6.00	7.00 - 7.20
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	15/11/2009	15/11/2009	15/11/2009
Date Received	17/11/2009	17/11/2009	17/11/2009
SDG Ref	091118-92	091118-92	091118-92
Lab Sample No.(s)	625006	625070	625129

Component	LOD/Units	Method	I5	I5	I5
Total Aliphatics >C5-C44	<100 µg/kg	TM173	8080	75100	19100
Total Aromatics >C6-C44	<100 µg/kg	TM173	95000	564000	92200
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	103000	639000	111000

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-38
Sample Delivery Group (SDG): 091118-99
Your Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks
Report No.: 66630

A total of 5 samples was received on Tuesday November 17, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66630

SOLID

Results Legend	Sample ID	C6						I12		Total		
		1.50 - 3.00		3.00 - 6.00		6.00 - 6.50		1.50 - 2.00			4.00 - 4.30	
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)			
Ammonium Soil by Titration	All									0		
		X		X		X		X		5		
Cyanides Complex/Free/Total/Thiocya	Total Cyanide									0		
		X		X		X		X		5		
Easily Liberated Sulphide	All									0		
		X		X		X		X		5		
EPH CWG (Aliphatic) GC (S)	All									0		
		X		X		X		X		5		
EPH CWG (Aromatic) GC (S)	All									0		
		X		X		X		X		5		
GRO BTEX MTBE GC (S)	All									0		
		X		X		X		X		5		
Hexavalent Chromium (s)	All									0		
		X		X		X		X		5		
Metals by iCap-OES (Soil)	Arsenic									0		
		X		X		X		X		5		
	Cadmium									0		
		X		X		X		X		5		
	Chromium									0		
		X		X		X		X		5		
	Copper									0		
		X		X		X		X		5		
	Lead									0		
		X		X		X		X		5		
	Mercury									0		
		X		X		X		X		5		
	Nickel									0		
		X		X		X		X		5		
	Selenium									0		
		X		X		X		X		5		
	Zinc									0		
		X		X		X		X		5		
PAH micro by GCMS	All									0		
		X		X		X		X		5		
pH	All									0		
		X		X		X		X		5		
Phenols by HPLC (S)	All									0		
		X		X		X		X		5		
Sample description	All									0		
		X		X		X		X		5		
Total Sulphate	All									0		
		X		X		X		X		5		
TPH CWG GC (S)	All									0		
		X		X		X		X		5		
VOC MS (S)	All									0		
		X		X		X		X		3		

SDG:	091118-99	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-38	Attention:	Verity Sankey
Client Reference:	16/11/09 (C6/12)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66630

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C6	1.50 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Oil/Petroleum
	3.00 - 6.00	Black	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	6.00 - 6.50	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
I12	1.50 - 2.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.00 - 4.30	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66630

Test Completion dates

SDG reference: 091118-99

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
C6	1.50 - 3.00	SOLID	01/12/2009	28/11/2009	23/11/2009	20/11/2009	26/11/2009	20/11/2009	23/11/2009	24/11/2009	23/11/2009	26/11/2009	28/11/2009	24/11/2009	20/11/2009	23/11/2009	26/11/2009
	3.00 - 6.00	SOLID	03/12/2009	28/11/2009	23/11/2009	20/11/2009	24/11/2009	20/11/2009	23/11/2009	23/11/2009	23/11/2009	26/11/2009	28/11/2009	24/11/2009	23/11/2009	23/11/2009	02/12/2009
	6.00 - 6.50	SOLID	01/12/2009	29/11/2009	23/11/2009	20/11/2009	24/11/2009	21/11/2009	23/11/2009	23/11/2009	23/11/2009	26/11/2009	28/11/2009	24/11/2009	23/11/2009	23/11/2009	02/12/2009
I12	1.50 - 2.00	SOLID	23/11/2009	23/11/2009	23/11/2009	20/11/2009	24/11/2009	21/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	24/11/2009	24/11/2009	26/11/2009	23/11/2009	23/11/2009
	4.00 - 4.30	SOLID	25/11/2009	25/11/2009	23/11/2009	20/11/2009	24/11/2009	21/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	24/11/2009	25/11/2009	26/11/2009	23/11/2009	23/11/2009

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SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66397

Results Legend			Sample Identity		C6	C6	C6	I12	I12
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 3.00	3.00 - 6.00	6.00 - 6.50	1.50 - 2.00	4.00 - 4.30	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	
			Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	
			SDG Ref	091118-99	091118-99	091118-99	091118-99	091118-99	
Lab Sample No.(s)	625363	625378	625404	625454	625477				
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	622	1360	2660	92.3	<15.0	M	M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	484	1060	2070	71.8	<15.0	M	M
Catechol	<0.01 mg/kg	TM062 (S)	<10.0	<0.100	<0.100	<0.0100	<0.0100	M	M
Phenol	<0.01 mg/kg	TM062 (S)	4650	10.7	96.6	<0.0100	<0.0100	M	M
Cresols	<0.01 mg/kg	TM062 (S)	11400	29.2	105	<0.0100	<0.0100	M	M
Resorcinol	<0.05 mg/kg	TM062 (S)	<50.0	<0.500	<0.500	<0.0500	<0.0500	M	M
Xylenols	<0.015 mg/kg	TM062 (S)	11500	38.5	44.1	<0.0150	<0.0150	M	M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<10.0	<0.100	<0.100	<0.0100	<0.0100	M	M
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<10.0	<0.100	<0.100	<0.0100	<0.0100	M	M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<15.0	<0.150	<0.150	<0.0150	<0.0150	M	M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	27500	78.3	246	<0.0200	0.00	M	M
pH value of soil	1 pH Units	TM133	9.92	9.34	9.18	8.96	8.81	M	M
Hexavalent Chromium	<0.6 mg/kg	TM151	<12.0	<3.00	<6.00	<0.600	<0.600	#	#
Total Cyanide	<1 mg/kg	TM153	570	9650	5.83	<1.00	<1.00	M	M
Easily Liberated Sulphide	<15 mg/kg	TM180	359	2910	64.6	<15.0	18.1	#	#
Arsenic	<0.6 mg/kg	TM181	27.0	9.34	7.44	2.48	4.95	M	M
Cadmium	<0.02 mg/kg	TM181	0.260	<0.0200	<0.0200	<0.0200	<0.0200	M	M
Chromium	<0.9 mg/kg	TM181	8.71	13.4	25.1	5.84	11.0	M	M
Copper	<1.4 mg/kg	TM181	24.3	16.5	9.00	3.72	4.29	M	M
Lead	<0.7 mg/kg	TM181	143	46.4	30.6	7.12	7.34	M	M
Mercury	<0.14 mg/kg	TM181	2.14	0.460	<0.140	<0.140	0.244	M	M
Nickel	<0.2 mg/kg	TM181	7.83	15.0	24.9	5.89	6.16	M	M
Selenium	<1 mg/kg	TM181	2.58	<1.00	<1.00	<1.00	<1.00	#	#
Zinc	<1.9 mg/kg	TM181	324	45.4	60.9	23.7	38.6	M	M
Total Sulphate	<48 mg/kg	TM221	13100	5370	3040	1170	636	M	M

SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66397

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C6	C6	C6	I12	I12
Depth (m)	1.50 - 3.00	3.00 - 6.00	6.00 - 6.50	1.50 - 2.00	4.00 - 4.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009
Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
SDG Ref	091118-99	091118-99	091118-99	091118-99	091118-99
Lab Sample No.(s)	625363	625378	625404	625454	625477

Component	LOD/Units	Method					
Aliphatics >C12-C16	<100 µg/kg	TM173	1190000	109000	103000	9820	3950
Aliphatics >C16-C21	<100 µg/kg	TM173	1180000	179000	84900	5130	1800
Aliphatics >C21-C35	<100 µg/kg	TM173	1620000	222000	84700	2340	<100
Aliphatics >C35-C44	<100 µg/kg	TM173	154000	18700	3870	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	4150000	529000	277000	17300	5750
Aliphatics >C16-C35	<100 µg/kg	TM173	2800000	401000	170000	7470	1800

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SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66397

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C6	C6	C6	I12	I12
Depth (m)	1.50 - 3.00	3.00 - 6.00	6.00 - 6.50	1.50 - 2.00	4.00 - 4.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009
Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
SDG Ref	091118-99	091118-99	091118-99	091118-99	091118-99
Lab Sample No.(s)	625363	625378	625404	625454	625477

Component	LOD/Units	Method					
Aromatics >EC12-EC16	<100 µg/kg	TM173	5330000	377000	269000	9900	2460
Aromatics >EC16-EC21	<100 µg/kg	TM173	9400000	864000	376000	10600	1140
Aromatics >EC21-EC35	<100 µg/kg	TM173	19200000	2060000	862000	22100	<100
Aromatics >EC35-EC44	<100 µg/kg	TM173	2420000	343000	162000	<100	<100
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	36300000	3640000	1670000	42600	3600
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	36300000	3640000	1670000	42600	3600

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SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66397

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	C6	C6	C6	I12	I12	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 3.00	3.00 - 6.00	6.00 - 6.50	1.50 - 2.00	4.00 - 4.30	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009	
			Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	
			SDG Ref	091118-99	091118-99	091118-99	091118-99	091118-99	
			Lab Sample No.(s)	625363	625378	625404	625454	625477	
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	918000	640000	91700	428	510		
			M	#	#	#	#	#	#
MTBE	<5 µg/kg	TM089	2110	1080	115	<5.00	<5.00		
			M	#	#	#	#	#	#
Benzene	<10 µg/kg	TM089	170000	40000	20300	27.8	53.8		
			M	M	M	M	M	M	M
Toluene	<2 µg/kg	TM089	182000	61100	14500	31.0	97.1		
			M	M	M	M	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	20600	11400	1390	<4.00	<9.00		
			M	M	M	M	M	M	M
m & p Xylene	<6 µg/kg	TM089	145000	77000	12200	22.5	59.7		
			M	M	M	M	M	M	M
o Xylene	<3 µg/kg	TM089	54500	32900	4170	<8.00	21.1		
			M	M	M	M	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	200000	110000	16400	22.5	80.7		
			M	M	M	M	M	M	M
Sum of BTEX	<10 µg/kg	TM089	572000	222000	52600	81.3	232		
			M	M	M	M	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	761	767	337	14.1	40.1		
			M						
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	11600	<10.0	13.4	52.0		
			M						
Aliphatics >C8-C10	<10 µg/kg	TM089	29500	47000	3830	21.4	33.8		
			M						
Aliphatics >C10-C12	<10 µg/kg	TM089	115000	115000	12200	106	40.8		
			M						
Total Aliphatics C5-C12	<10 µg/kg	TM089	145000	174000	16300	155	167		
			M						
Aromatics C6-C7	<10 µg/kg	TM089	170000	40000	20300	27.8	53.8		
			M						
Aromatics >C7-C8	<10 µg/kg	TM089	182000	61300	14500	31.0	97.1		
			M						
Aromatics >EC8-EC10	<10 µg/kg	TM089	264000	192000	23600	54.5	131		
			M						
Aromatics >EC10-EC12	<10 µg/kg	TM089	172000	172000	18300	159	61.1		
			M						
Total Aromatics C6-C12	<10 µg/kg	TM089	788000	465000	76600	273	344		
			M						

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SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66397

PAH micro by GCMS

Results Legend			Sample Identity	C6	C6	C6	I12	I12
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 3.00 Soil/Solid 16/11/2009 17/11/2009 091118-99 625363	3.00 - 6.00 Soil/Solid 16/11/2009 17/11/2009 091118-99 625378	6.00 - 6.50 Soil/Solid 16/11/2009 17/11/2009 091118-99 625404	1.50 - 2.00 Soil/Solid 16/11/2009 17/11/2009 091118-99 625454	4.00 - 4.30 Soil/Solid 17/11/2009 091118-99 625477
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	3680000	989000	177000	56.4	192	
Acenaphthylene (S)	<12 µg/kg	TM218	256000	167000	21000	46.9	59.6	
Acenaphthene (S)	<8 µg/kg	TM218	138000	29300	4200	11.8	12.5	
Fluorene (S)	<10 µg/kg	TM218	589000	145000	19900	19.0	37.9	
Phenanthrene (S)	<15 µg/kg	TM218	1920000	357000	47400	81.8	149	
Anthracene (S)	<16 µg/kg	TM218	591000	132000	14700	30.3	43.9	
Fluoranthene (S)	<17 µg/kg	TM218	1280000	228000	27500	122	106	
Pyrene (S)	<15 µg/kg	TM218	928000	147000	18200	90.1	74.3	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	328000	71700	7910	63.1	47.1	
Chrysene (S)	<10 µg/kg	TM218	255000	55200	7290	46.0	28.4	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	321000	61100	6090	85.9	43.6	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	129000	25100	3970	30.3	20.0	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	260000	47700	5290	59.2	33.6	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	131000	21700	2480	34.1	<18.0	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	34100	7170	762	<23.0	<23.0	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	172000	24000	3020	41.7	<24.0	
PAH 16 EPA Total	<118 µg/kg	TM218	11000000	2570000	366000	819	848	

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SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/I12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66397

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C6	C6	C6	I12	I12
Depth (m)	1.50 - 3.00	3.00 - 6.00	6.00 - 6.50	1.50 - 2.00	4.00 - 4.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	16/11/2009	16/11/2009	16/11/2009	16/11/2009	16/11/2009
Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
SDG Ref	091118-99	091118-99	091118-99	091118-99	091118-99
Lab Sample No.(s)	625363	625378	625404	625454	625477

Component	LOD/Units	Method	C6	C6	C6	I12	I12
Total Aliphatics >C5-C44	<100 µg/kg	TM173	4300000	703000	293000	17400	5920
Total Aromatics >C6-C44	<100 µg/kg	TM173	37100000	4110000	1750000	42800	3940
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	41400000	4810000	2040000	60300	9860

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SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/112)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66397

VOC MS (S)

Results Legend			Sample Identity	C6	C6	C6			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 3.00	3.00 - 6.00	6.00 - 6.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	16/11/2009	16/11/2009	16/11/2009			
			Date Received	17/11/2009	17/11/2009	17/11/2009			
			SDG Ref	091118-99	091118-99	091118-99			
			Lab Sample No.(s)	625363	625378	625404			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		123	171	160			
Toluene-d8**	%	TM116		42.7	65.9	112			
4-Bromofluorobenzene**	%	TM116		98.7	82.2	96.7			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
				M	M	M			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
				#	#	#			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
				M	M	M			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				M	M	M			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
				M	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
				M	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				#	#	#			
Carbon Disulphide	<9 µg/kg	TM116		61.4	30.8	<9.00			
				M	M	M			
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
				M	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				M	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
				M	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00			
				M	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				M	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
				M	M	M			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
				M	M	M			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
				M	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
				M	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
				M	M	M			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
				M	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
				M	M	M			
Benzene	<9 µg/kg	TM116		173000	3090				
				M	M				
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				#	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
				M	M	M			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
				M	M	M			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
				M	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0			
				M	M	M			
Toluene	<6 µg/kg	TM116		250000	8050				
				M	M				
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0			
				M	M	M			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				M	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
				M	M	M			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				M	M	M			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
				M	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0			
				M	M	M			
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
				M	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
				M	M	M			
Ethylbenzene	<9 µg/kg	TM116		45900	2760	576			
				M	M	M			

SDG: 091118-99
Job: D_MOUCHEL_ELE-38
Client Reference: 16/11/09 (C6/112)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66397

VOC MS (S)

Results Legend			Sample Identity	C6	C6	C6
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 3.00	3.00 - 6.00	6.00 - 6.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	16/11/2009	16/11/2009	16/11/2009
			Date Received	17/11/2009	17/11/2009	17/11/2009
			SDG Ref	091118-99	091118-99	091118-99
Lab Sample No.(s)	625363	625378	625404			
Component	LOD/Units	Method				
p/m-Xylene	<13 µg/kg	TM116	360000	20900	#	
o-Xylene	<11 µg/kg	TM116	137000	8840	M	1700 M
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	
Isopropylbenzene	<9 µg/kg	TM116	1630 M	560 M	46.0 M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	
Propylbenzene	<6 µg/kg	TM116	4950 M	910 M	80.6 M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	44700 M	4490 M	623 M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	99200 #	9960 #	1140 #	
sec-Butylbenzene	<8 µg/kg	TM116	235 #	80.5 #	<8.00 #	
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	
Naphthalene	<7 µg/kg	TM116	6780000	556000		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-86
Sample Delivery Group (SDG): 091119-100 **Report No.:** 66684
Your Reference: 14/11/09 (13)
Location: LIMERICK GASWORKS

A total of 3 samples was received on Wednesday November 18, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66684

SOLID

Results Legend	Sample ID							Total
		1.50 - 3.00		4.00 - 4.50		7.50 - 8.00		
	Depth (m)	Container		Container		Container		
		250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All			X			X	3
Hexavalent Chromium (s)	All		X				X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
	Cadmium		X		X		X	3
	Chromium		X		X		X	0
	Copper		X		X		X	3
	Lead		X		X		X	0
	Mercury		X		X		X	3
	Nickel		X		X		X	0
	Selenium		X		X		X	3
	Zinc		X		X		X	0
	PAH micro by GCMS	All		X		X		X
PCBs by GCMS	All		X					0
pH	All		X		X		X	3
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	3
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	3
			X		X		X	0
			X		X		X	3

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SDG:	091119-100	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-86	Attention:	Verity Sankey
Client Reference:	14/11/09 (I3)	Order No.:	
Location:	LIMERICK GASWORKS	Report No.:	66684

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
I3	1.50 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.00 - 4.50	Grey	Sandy Clay	0.1 - 2 mm	Stones
	7.50 - 8.00	Grey	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66684

Test Completion dates

SDG reference: 091119-100

Sample ID	Depth	Type	Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)
I3	1.50 - 3.00	SOLID	27/11/2009	23/11/2009	26/11/2009	23/11/2009	23/11/2009	26/11/2009	23/11/2009	20/11/2009	21/11/2009	22/11/2009	21/11/2009	24/11/2009	19/11/2009	20/11/2009	27/11/2009
	4.00 - 4.50	SOLID	27/11/2009	23/11/2009	26/11/2009	24/11/2009	24/11/2009	26/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	20/11/2009	23/11/2009	29/11/2009
	7.50 - 8.00	SOLID	27/11/2009	23/11/2009	27/11/2009	23/11/2009	23/11/2009	28/11/2009	20/11/2009	23/11/2009	20/11/2009	20/11/2009	23/11/2009	20/11/2009	18/11/2009	20/11/2009	27/11/2009

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SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66268

Results Legend			Sample Identity	I3	I3	I3			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 3.00	4.00 - 4.50	7.50 - 8.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	14/11/2009	14/11/2009			
			Date Received	18/11/2009	18/11/2009	18/11/2009			
			SDG Ref	091119-100	091119-100	091119-100			
			Lab Sample No.(s)	623454	623499	623586			
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	23.7 M	128 M	<15.0 M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	18.4	99.4	<15.0				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0200	0.00	<0.0100				
pH value of soil	1 pH Units	TM133	10.37 M	8.81 M	8.18 M				
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0840 #	<0.600 #	<0.600 #				
Total Cyanide	<1 mg/kg	TM153	3820 M	10.7 M	1.82 M				
PCB congener 28	<3 µg/kg	TM168	<3.00						
PCB congener 52	<3 µg/kg	TM168	<3.00						
PCB congener 101	<3 µg/kg	TM168	<3.00						
PCB congener 118	<3 µg/kg	TM168	<3.00						
PCB congener 138	<3 µg/kg	TM168	<3.00						
PCB congener 153	<3 µg/kg	TM168	<3.00						
PCB congener 180	<3 µg/kg	TM168	<3.00						
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00						
Easily Liberated Sulphide	<15 mg/kg	TM180	170 #	103 #	33.1 #				
Arsenic	<0.6 mg/kg	TM181	19.5 M	3.92 M	7.44 M				
Cadmium	<0.02 mg/kg	TM181	0.117 M	<0.0200 M	0.122 M				
Chromium	<0.9 mg/kg	TM181	13.2 M	6.94 M	11.5 M				
Copper	<1.4 mg/kg	TM181	33.3 M	4.88 M	7.40 M				
Lead	<0.7 mg/kg	TM181	186 M	7.82 M	17.1 M				
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M	<0.140 M				
Nickel	<0.2 mg/kg	TM181	14.3 M	8.24 M	15.6 M				
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #				
Zinc	<1.9 mg/kg	TM181	36.9 M	19.4 M	24.7 M				
Total Sulphate	<48 mg/kg	TM221	18200 M	1300 M	1250 M				

SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66268

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I3	I3	I3
Depth (m)	1.50 - 3.00	4.00 - 4.50	7.50 - 8.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-100	091119-100	091119-100
Lab Sample No.(s)	623454	623499	623586

Component	LOD/Units	Method	I3	I3	I3
Aliphatics >C12-C16	<100 µg/kg	TM173	4920	<100	3750
Aliphatics >C16-C21	<100 µg/kg	TM173	15600	<100	4360
Aliphatics >C21-C35	<100 µg/kg	TM173	380000	<100	19400
Aliphatics >C35-C44	<100 µg/kg	TM173	51000	<100	13500
Total Aliphatics >C12-C44	<100 µg/kg	TM173	452000	<100	41000
Aliphatics >C16-C35	<100 µg/kg	TM173	396000	<100	23800

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SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66268

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I3	I3	I3
Depth (m)	1.50 - 3.00	4.00 - 4.50	7.50 - 8.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-100	091119-100	091119-100
Lab Sample No.(s)	623454	623499	623586

Component	LOD/Units	Method	I3	I3	I3
Aromatics >EC12-EC16	<100 µg/kg	TM173	25400	2330	<5000
Aromatics >EC16-EC21	<100 µg/kg	TM173	61300	902	<5000
Aromatics >EC21-EC35	<100 µg/kg	TM173	471000	341	32200
Aromatics >EC35-EC44	<100 µg/kg	TM173	169000	<100	28000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	727000	3570	66700
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	727000	3570	66700

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SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66268

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I3	I3	I3
Depth (m)	1.50 - 3.00	4.00 - 4.50	7.50 - 8.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-100	091119-100	091119-100
Lab Sample No.(s)	623454	623499	623586

Component	LOD/Units	Method	I3	I3	I3
GRO C5-C12	<44 µg/kg	TM089	545	<44.0	329
			#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00
			#	#	#
Benzene	<10 µg/kg	TM089	65.3	<10.0	38.6
			M	M	M
Toluene	<2 µg/kg	TM089	29.0	<2.00	12.9
			M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<7.00	<3.00	18.7
			M	M	M
m & p Xylene	<6 µg/kg	TM089	26.6	<6.00	22.2
			M	M	M
o Xylene	<3 µg/kg	TM089	<9.00	<3.00	<8.00
			M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	26.6	<10.0	22.2
			M	M	M
Sum of BTEX	<10 µg/kg	TM089	121	<10.0	92.4
			M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	23.5	<10.0	12.8
Aliphatics >C6-C8	<10 µg/kg	TM089	17.0	<10.0	10.9
Aliphatics >C8-C10	<10 µg/kg	TM089	38.5	<10.0	24.9
Aliphatics >C10-C12	<10 µg/kg	TM089	115	<10.0	60.2
Total Aliphatics C5-C12	<10 µg/kg	TM089	194	<10.0	109
Aromatics C6-C7	<10 µg/kg	TM089	65.3	<10.0	38.6
Aromatics >C7-C8	<10 µg/kg	TM089	29.0	<10.0	12.9
Aromatics >EC8-EC10	<10 µg/kg	TM089	84.4	<10.0	78.2
Aromatics >EC10-EC12	<10 µg/kg	TM089	172	<10.0	90.3
Total Aromatics C6-C12	<10 µg/kg	TM089	351	<10.0	220

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SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66268

PAH micro by GCMS

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I3	I3	I3
Depth (m)	1.50 - 3.00	4.00 - 4.50	7.50 - 8.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-100	091119-100	091119-100
Lab Sample No.(s)	623454	623499	623586

Component	LOD/Units	Method	I3	I3	I3
Naphthalene (S)	<9 µg/kg	TM218	20000 M	28.0 M	120 M
Acenaphthylene (S)	<12 µg/kg	TM218	2520 M	18.4 M	20.0 M
Acenaphthene (S)	<8 µg/kg	TM218	1450 M	25.5 M	108 M
Fluorene (S)	<10 µg/kg	TM218	3450 M	18.7 M	59.4 M
Phenanthrene (S)	<15 µg/kg	TM218	34000 M	55.2 M	177 M
Anthracene (S)	<16 µg/kg	TM218	6290 M	24.6 M	66.1 M
Fluoranthene (S)	<17 µg/kg	TM218	33000 M	73.0 M	219 M
Pyrene (S)	<15 µg/kg	TM218	22800 M	70.5 M	180 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	12100 M	46.2 M	111 M
Chrysene (S)	<10 µg/kg	TM218	10500 M	31.6 M	91.9 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	17700 M	39.1 M	95.9 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	6480 M	16.9 M	40.7 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	13700 M	24.4 M	62.4 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	9440 M	<18.0 M	36.8 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	2880 M	<23.0 M	<23.0 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	10900 M	<24.0 M	46.5 M
PAH 16 EPA Total	<118 µg/kg	TM218	207000 M	472 M	1430 M

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SDG: 091119-100
Job: D_MOUCHEL_ELE-86
Client Reference: 14/11/09 (I3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66268

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I3	I3	I3
Depth (m)	1.50 - 3.00	4.00 - 4.50	7.50 - 8.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-100	091119-100	091119-100
Lab Sample No.(s)	623454	623499	623586

Component	LOD/Units	Method	I3	I3	I3
Total Aliphatics >C5-C44	<100 µg/kg	TM173	452000	<100	41100
Total Aromatics >C6-C44	<100 µg/kg	TM173	728000	3570	66900
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	1180000	3570	108000

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-87
Sample Delivery Group (SDG): 091119-101
Your Reference: 13/11/09 (G4)
Location: LIMERICK GASWORKS
Report No.: 66686

A total of 4 samples was received on Wednesday November 18, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-101
 Job: D_MOUCHEL_ELE-87
 Client Reference: 13/11/09 (G4)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66686

SOLID

Results Legend	Sample ID	G4								Total
		1.00 - 1.50		3.50 - 4.00		5.50 - 6.00		9.50 - 10.00		
		250g Amber Jar	400g Tub 60g VOC	250g Amber Jar	400g Tub 60g VOC	250g Amber Jar	400g Tub 60g VOC	250g Amber Jar	400g Tub 60g VOC	
X Test										
N No Determination Possible										
Ammonium Soil by Titration	All		X	X	X	X	X	X	X	0 4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X	X	X	X	X	X	X	0 4
Easily Liberated Sulphide	All		X	X	X	X	X	X	X	0 4
EPH CWG (Aliphatic) GC (S)	All		X	X	X	X	X	X	X	0 4
EPH CWG (Aromatic) GC (S)	All		X	X	X	X	X	X	X	0 4
GRO BTEX MTBE GC (S)	All			X	X	X	X	X	X	0 4
Hexavalent Chromium (s)	All		X	X	X	X	X	X	X	0 4
Metals by iCap-OES (Soil)	Arsenic		X	X	X	X	X	X	X	0 4
	Cadmium		X	X	X	X	X	X	X	0 4
	Chromium		X	X	X	X	X	X	X	0 4
	Copper		X	X	X	X	X	X	X	0 4
	Lead		X	X	X	X	X	X	X	0 4
	Mercury		X	X	X	X	X	X	X	0 4
	Nickel		X	X	X	X	X	X	X	0 4
	Selenium		X	X	X	X	X	X	X	0 4
	Zinc		X	X	X	X	X	X	X	0 4
PAH by GCMS	All		X					X		0 2
PAH micro by GCMS	All			X		X				0 2
PCBs by GCMS	All		X							0 1
pH	All		X	X	X	X	X	X	X	0 4
Phenols by HPLC (S)	All		X	X	X	X	X	X	X	0 4
Sample description	All		X	X	X	X	X	X	X	0 4
Total Sulphate	All		X	X	X	X	X	X	X	0 4
TPH CWG GC (S)	All		X	X	X	X	X	X	X	0 4
VOC MS (S)	All								X	0 1

SDG:	091119-101	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-87	Attention:	Verity Sankey
Client Reference:	13/11/09 (G4)	Order No.:	
Location:	LIMERICK GASWORKS	Report No.:	66686

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
G4	1.00 - 1.50	Black	Sand	0.1 - 2 mm	Stones
	3.50 - 4.00	Grey	Clay	<0.063 mm	Stones
	5.50 - 6.00	Grey	Silt	<0.063 mm	N/A
	9.50 - 10.00	Black	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-101
Job: D_MOUCHEL_ELE-87
Client Reference: 13/11/09 (G4)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66686

Test Completion dates

SDG reference: 091119-101

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
G4	1.00 - 1.50	SOLID	27/11/2009	20/11/2009	18/11/2009	27/11/2009	23/11/2009	21/11/2009	28/11/2009	23/11/2009	24/11/2009	26/11/2009	23/11/2009	28/11/2009	24/11/2009	24/11/2009	24/11/2009	27/11/2009
	3.50 - 4.00	SOLID	27/11/2009	20/11/2009	18/11/2009	23/11/2009	20/11/2009	20/11/2009	20/11/2009	23/11/2009	24/11/2009	26/11/2009	23/11/2009	28/11/2009	24/11/2009	24/11/2009	24/11/2009	04/12/2009
	5.50 - 6.00	SOLID	26/11/2009	24/11/2009	21/11/2009	25/11/2009	23/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	26/11/2009	28/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	27/11/2009
	9.50 - 10.00	SOLID	30/11/2009	20/11/2009	18/11/2009	20/11/2009	23/11/2009	23/11/2009	28/11/2009	23/11/2009	23/11/2009	24/11/2009	30/11/2009	29/11/2009	24/11/2009	24/11/2009	24/11/2009	19/11/2009

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SDG: 091119-101
Job: D_MOUCHEL_ELE-87
Client Reference: 13/11/09 (G4)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66686

Results Legend		Sample Identity	G4	G4	G4	G4		
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.00 - 1.50 Soil/Solid 21/11/2009 18/11/2009 091119-101 623140	3.50 - 4.00 Soil/Solid 13/11/2009 18/11/2009 091119-101 623251	5.50 - 6.00 Soil/Solid 13/11/2009 18/11/2009 091119-101 623345	9.50 - 10.00 Soil/Solid 13/11/2009 18/11/2009 091119-101 623403		
Component	LOD/Units	Method						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	<15.0 M	335 M	104 M		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	260	81.2		
Catechol	<0.01 mg/kg	TM062 (S)	<0.200	<0.0100	<0.0100	<0.0100		
Phenol	<0.01 mg/kg	TM062 (S)	<0.200 M	<0.0100 M	<0.0100 M	17.2 M		
Cresols	<0.01 mg/kg	TM062 (S)	<0.200 M	<0.0100 M	<0.0100 M	156 M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<1.00	<0.0500	<0.0500	<0.0500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.300 M	<0.0150 M	<0.0150 M	239 M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.200	<0.0100	<0.0100	38.9		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.200 M	<0.0100 M	<0.0100 M	<0.0100 M		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.300 M	<0.0150 M	<0.0150 M	<0.0150 M		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.0200	452		
pH value of soil	1 pH Units	TM133	7.24 M	8.30 M	8.18 M	8.84 M		
Hexavalent Chromium	<0.6 mg/kg	TM151	<6.00 #	<3.00 #	3.00 #	<6.00 #		
Total Cyanide	<1 mg/kg	TM153	180 M	<1.00 M	1.28 M	44.2 M		
PCB congener 28	<3 µg/kg	TM168	<3.00					
PCB congener 52	<3 µg/kg	TM168	<3.00					
PCB congener 101	<3 µg/kg	TM168	<3.00					
PCB congener 118	<3 µg/kg	TM168	<3.00					
PCB congener 138	<3 µg/kg	TM168	<3.00					
PCB congener 153	<3 µg/kg	TM168	<3.00					
PCB congener 180	<3 µg/kg	TM168	<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	31.7 #	36.2 #	144 #	694 #		
Arsenic	<0.6 mg/kg	TM181	44.6 M	13.1 M	6.38 M	10.0 M		
Cadmium	<0.02 mg/kg	TM181	1.03 M	0.532 M	<0.0200 M	0.153 M		
Chromium	<0.9 mg/kg	TM181	23.7 M	24.8 M	17.9 M	6.87 M		
Copper	<1.4 mg/kg	TM181	133 M	9.28 M	6.60 M	2.43 M		
Lead	<0.7 mg/kg	TM181	440 M	37.3 M	17.9 M	7.65 M		
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M	<0.140 M	<0.140 M		
Nickel	<0.2 mg/kg	TM181	114 M	28.0 M	17.8 M	6.69 M		
Selenium	<1 mg/kg	TM181	2.13 #	<1.00 #	<1.00 #	<1.00 #		
Zinc	<1.9 mg/kg	TM181	205 M	51.3 M	46.5 M	21.3 M		
Total Sulphate	<48 mg/kg	TM221	55200 M	522 M	1250 M	1850 M		

SDG: 091119-101
Job: D_MOUCHEL_ELE-87
Client Reference: 13/11/09 (G4)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66686

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	G4	G4	G4	G4		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	3.50 - 4.00	5.50 - 6.00	9.50 - 10.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	21/11/2009	13/11/2009	13/11/2009	13/11/2009		
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009		
			SDG Ref	091119-101	091119-101	091119-101	091119-101		
			Lab Sample No.(s)	623140	623251	623345	623403		
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	2350	2630	1800	193000			
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00			
			#	#	#				
Benzene	<10 µg/kg	TM089	106	<10.0	17.0	40400			
			M	M	M	M			
Toluene	<2 µg/kg	TM089	194	17.8	27.5	43100			
			M	M	M	M			
Ethyl Benzene	<3 µg/kg	TM089	32.0	<5.00	<5.00	5210			
			M	M	M	M			
m & p Xylene	<6 µg/kg	TM089	148	41.9	36.7	29300			
			M	M	M	M			
o Xylene	<3 µg/kg	TM089	54.1	22.9	19.7	10000			
			M	M	M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	202	64.8	56.3	39400			
			M	M	M	M			
Sum of BTEX	<10 µg/kg	TM089	534	82.6	101	128000			
			M	M	M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	87.3	<10.0	<10.0	2010			
Aliphatics >C6-C8	<10 µg/kg	TM089	63.9	<10.0	<10.0	4940			
Aliphatics >C8-C10	<10 µg/kg	TM089	151	110	74.1	11800			
Aliphatics >C10-C12	<10 µg/kg	TM089	516	896	603	11400			
Total Aliphatics C5-C12	<10 µg/kg	TM089	818	1010	677	30200			
Aromatics C6-C7	<10 µg/kg	TM089	106	<10.0	17.0	40400			
Aromatics >C7-C8	<10 µg/kg	TM089	194	17.8	27.5	43100			
Aromatics >EC8-EC10	<10 µg/kg	TM089	460	229	168	62300			
Aromatics >EC10-EC12	<10 µg/kg	TM089	775	1340	905	17100			
Total Aromatics C6-C12	<10 µg/kg	TM089	1530	1590	1120	163000			

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SDG: 091119-101
 Job: D_MOUCHEL_ELE-87
 Client Reference: 13/11/09 (G4)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66686

PAH by GCMS

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	G4	G4				
Depth (m)	1.00 - 1.50	9.50 - 10.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	21/11/2009	13/11/2009				
Date Received	18/11/2009	18/11/2009				
SDG Ref	091119-101	091119-101				
Lab Sample No.(s)	623140	623403				

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	13900	3980000		
Acenaphthylene (S)	<12 µg/kg	TM218	20400	430000		
Acenaphthene (S)	<8 µg/kg	TM218	2800	123000		
Fluorene (S)	<10 µg/kg	TM218	7120	383000		
Phenanthrene (S)	<15 µg/kg	TM218	79800	985000		
Anthracene (S)	<16 µg/kg	TM218	27100	303000		
Fluoranthene (S)	<17 µg/kg	TM218	291000	659000		
Pyrene (S)	<15 µg/kg	TM218	245000	438000		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	145000	192000		
Chrysene (S)	<10 µg/kg	TM218	102000	143000		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	182000	157000		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	69200	66700		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	154000	134000		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	88400	62000		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	22400	16100		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	94100	63800		
PAH 16 EPA Total	<118 µg/kg	TM218	1540000	8140000		

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SDG: 091119-101
 Job: D_MOUCHEL_ELE-87
 Client Reference: 13/11/09 (G4)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66686

PAH micro by GCMS

Results Legend			Sample Identity		G4		G4	
# ISO17025 accredited. m mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.50 - 4.00	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid			
			Date Sampled	13/11/2009	13/11/2009			
			Date Received	18/11/2009	18/11/2009			
			SDG Ref	091119-101	091119-101			
			Lab Sample No.(s)	623251	623345			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	320	545	M	M		
Acenaphthylene (S)	<12 µg/kg	TM218	21.0	23.7	M	M		
Acenaphthene (S)	<8 µg/kg	TM218	1100	802	M	M		
Fluorene (S)	<10 µg/kg	TM218	309	700	M	M		
Phenanthrene (S)	<15 µg/kg	TM218	697	1520	M	M		
Anthracene (S)	<16 µg/kg	TM218	151	370	M	M		
Fluoranthene (S)	<17 µg/kg	TM218	223	402	M	M		
Pyrene (S)	<15 µg/kg	TM218	187	347	M	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	66.7	98.5	M	M		
Chrysene (S)	<10 µg/kg	TM218	53.1	79.1	M	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	61.9	68.9	M	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	26.8	24.3	M	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	43.5	45.2	M	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	25.5	23.1	M	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0	<23.0	M	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	32.2	28.5	M	M		
PAH 16 EPA Total	<118 µg/kg	TM218	3320	5070	M	M		

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SDG: 091119-101
Job: D_MOUCHEL_ELE-87
Client Reference: 13/11/09 (G4)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66686

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	G4	G4	G4	G4		
Depth (m)	1.00 - 1.50	3.50 - 4.00	5.50 - 6.00	9.50 - 10.00		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	21/11/2009	13/11/2009	13/11/2009	13/11/2009		
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009		
SDG Ref	091119-101	091119-101	091119-101	091119-101		
Lab Sample No.(s)	623140	623251	623345	623403		

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	599000	3530	35300	5030000
Total Aromatics >C6-C44	<100 µg/kg	TM173	4250000	11400	90000	19800000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	4850000	14900	125000	24900000

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SDG: 091119-101
Job: D_MOUCHEL_ELE-87
Client Reference: 13/11/09 (G4)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66686

VOC MS (S)

Results Legend			Sample Identity	G4				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	9.50 - 10.00				
			Sample Type	Soil/Solid				
			Date Sampled	13/11/2009				
			Date Received	18/11/2009				
			SDG Ref	091119-101				
			Lab Sample No.(s)	623403				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	153					
Toluene-d8**	%	TM116	59.1					
4-Bromofluorobenzene**	%	TM116	90.6					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	M				
Chloromethane	<12 µg/kg	TM116	<12.0	#				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	M				
Bromoethane	<9 µg/kg	TM116	<9.00	M				
Chloroethane	<12 µg/kg	TM116	<12.0	M				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	M				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	#				
Carbon Disulphide	<9 µg/kg	TM116	160	M				
Dichloromethane	<10 µg/kg	TM116	<10.0	M				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	M				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	M				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Bromochloromethane	<10 µg/kg	TM116	<10.0	M				
Chloroform	<10 µg/kg	TM116	<10.0	M				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	M				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	M				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	M				
Benzene	<9 µg/kg	TM116	108000	M				
Trichloroethene	<9 µg/kg	TM116	<9.00	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Dibromomethane	<12 µg/kg	TM116	<12.0	M				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	M				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	M				
Toluene	<6 µg/kg	TM116	205000					
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	M				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	M				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	M				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	M				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	M				
Chlorobenzene	<7 µg/kg	TM116	<7.00	M				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	M				
Ethylbenzene	<9 µg/kg	TM116	64200	M				

SDG: 091119-101
 Job: D_MOUCHEL_ELE-87
 Client Reference: 13/11/09 (G4)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66686

VOC MS (S)

Results Legend		Sample Identity	G4				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	9.50 - 10.00				
		Sample Type	Soil/Solid				
		Date Sampled	13/11/2009				
		Date Received	18/11/2009				
		SDG Ref	091119-101				
		Lab Sample No.(s)	623403				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	412000				
o-Xylene	<11 µg/kg	TM116	152000				
Styrene	<11 µg/kg	TM116	<11.0				
Bromoform	<12 µg/kg	TM116	<12.0				
Isopropylbenzene	<9 µg/kg	TM116	7110				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0				
Bromobenzene	<14 µg/kg	TM116	<14.0				
Propylbenzene	<6 µg/kg	TM116	9720				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	54000				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	120000				
sec-Butylbenzene	<8 µg/kg	TM116	499				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0				
n-Butylbenzene	<7 µg/kg	TM116	<7.00				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0				
Naphthalene	<7 µg/kg	TM116	2630000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0				

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-88
Sample Delivery Group (SDG): 091119-102 **Report No.:** 66616
Your Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F
Location: LIMERICK GASWORKS

A total of 7 samples was received on Wednesday November 18, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-102
 Job: D_MOUCHEL_ELE-88
 Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66616

SOLID

Results Legend	Sample ID	F3							F5		F6		F7		Total	
		0.50 - 1.00		2.90 - 3.00		5.50 - 6.00		0.50 - 0.80		0.20 - 0.40		0.80 - 1.50		1.10 - 1.50		
		250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar		400g Tub
Ammonium Soil by Titration	All	X		X		X		X		X		X		X		0
Asbestos Presence Screen	All			X				X		X		X		X		7
Cyanides Complex/Free/Total/Thiocya	Total Cyanide			X		X		X		X		X		X		0
Easily Liberated Sulphide	All	X		X		X		X		X		X		X		7
EPH CWG (Aliphatic) GC (S)	All	X		X		X		X		X		X		X		7
EPH CWG (Aromatic) GC (S)	All	X		X		X		X		X		X		X		7
GRO BTEX MTBE GC (S)	All			X		X		X		X		X		X		7
Hexavalent Chromium (s)	All			X		X		X		X		X		X		0
Metals by iCap-OES (Soil)	Arsenic	X		X		X		X		X		X		X		7
	Cadmium	X		X		X		X		X		X		X		0
	Chromium	X		X		X		X		X		X		X		7
	Copper	X		X		X		X		X		X		X		7
	Lead	X		X		X		X		X		X		X		0
	Mercury	X		X		X		X		X		X		X		7
	Nickel	X		X		X		X		X		X		X		0
	Selenium	X		X		X		X		X		X		X		7
	Zinc	X		X		X		X		X		X		X		0
PAH by GCMS	All			X		X		X		X		X		X		3
PAH micro by GCMS	All	X		X		X		X		X		X		X		0
pH	All			X		X		X		X		N		X		1
Phenols by HPLC (S)	All			X		X		X		X		X		X		0
Sample description	All			X		X		X		X		X		X		7
Total Sulphate	All	X		X		X		X		X		X		X		0
TPH CWG GC (S)	All	X		X		X		X		X		X		X		7
VOC MS (S)	All					X				X		X		X		0
																4

SDG:	091119-102	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-88	Attention:	Verity Sankey
Client Reference:	13/11/09 (F6,F5,F7) 14/11/09 (F3)	Order No.:	
Location:	LIMERICK GASWORKS	Report No:	66616

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
F3	0.50 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.90 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	5.50 - 6.00	Black	Silty Clay	0.063 - 0.1 mm	Stones
F5	0.50 - 0.80	Brown	Sandy Clay	0.1 - 2 mm	Stones
F6	0.20 - 0.40	Black	Sand	0.063 - 0.1 mm	Coal fragments
	0.80 - 1.50	Black	Sand	0.1 - 2 mm	Oil/Petroleum
F7	1.10 - 1.50	Grey	Clay	<0.063 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-102
 Job: D_MOUCHEL_ELE-88
 Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66616

Test Completion dates

SDG reference: 091119-102

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GC/MS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
F3	0.50 - 1.00	SOLID	04/12/2009	19/11/2009	27/11/2009	23/11/2009	23/11/2009	26/11/2009	20/11/2009	23/11/2009	21/11/2009	24/11/2009	23/11/2009	23/11/2009	19/11/2009	20/11/2009	26/11/2009	26/11/2009
	2.90 - 3.00	SOLID	04/12/2009	18/11/2009	27/11/2009	23/11/2009	23/11/2009	26/11/2009	20/11/2009	23/11/2009	21/11/2009	24/11/2009	23/11/2009	23/11/2009	19/11/2009	20/11/2009	26/11/2009	01/12/2009
	5.50 - 6.00	SOLID	04/12/2009	20/11/2009	26/11/2009	23/11/2009	23/11/2009	26/11/2009	20/11/2009	23/11/2009	21/11/2009	24/11/2009	23/11/2009	23/11/2009	18/11/2009	20/11/2009	26/11/2009	26/11/2009
F5	0.50 - 0.80	SOLID	04/12/2009	19/11/2009	27/11/2009	23/11/2009	23/11/2009	26/11/2009	20/11/2009	23/11/2009	21/11/2009	24/11/2009	23/11/2009	23/11/2009	18/11/2009	20/11/2009	26/11/2009	26/11/2009
F6	0.20 - 0.40	SOLID	04/12/2009	18/11/2009	02/12/2009	27/11/2009	23/11/2009	30/11/2009	23/11/2009	23/11/2009	21/11/2009	24/11/2009	23/11/2009	23/11/2009	19/11/2009	20/11/2009	30/11/2009	02/12/2009
	0.80 - 1.50	SOLID	04/12/2009	23/11/2009	27/11/2009	23/11/2009	23/11/2009	30/11/2009	23/11/2009	23/11/2009	21/11/2009	24/11/2009	23/11/2009	23/11/2009	18/11/2009	20/11/2009	30/11/2009	03/12/2009
F7	1.10 - 1.50	SOLID	04/12/2009	23/11/2009	27/11/2009	23/11/2009	23/11/2009	30/11/2009	23/11/2009	23/11/2009	21/11/2009	24/11/2009	23/11/2009	23/11/2009	18/11/2009	20/11/2009	30/11/2009	01/12/2009

SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

Results Legend			Sample Identity	F3	F3	F3	F5	F6	F6
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 14/11/2009 18/11/2009 091119-102 622308	2.90 - 3.00 Soil/Solid 14/11/2009 18/11/2009 091119-102 622343	5.50 - 6.00 Soil/Solid 14/11/2009 18/11/2009 091119-102 622450	0.50 - 0.80 Soil/Solid 13/11/2009 18/11/2009 091119-102 622565	0.20 - 0.40 Soil/Solid 13/11/2009 18/11/2009 091119-102 622844	0.80 - 1.50 Soil/Solid 13/11/2009 18/11/2009 091119-102 622814
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001		No ACM Detected				No ACM Detected	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	29.3	<15.0	46.0	<15.0	529	15.5	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	41.3	<15.0	68.6	<15.0	755	25.3	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	32.1	<15.0	53.3	<15.0	588	19.7	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.0100	<0.100	<0.100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	1.80	<0.0100	<0.0200	14.7	<0.100	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	3.80	<0.0100	<0.0400	84.1	1.30	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.500	<0.0500	<0.0500	<0.500	<0.500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.150	<0.0150	<0.0150	99.9	<0.150	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.0100	<0.100	<0.100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.0100	<0.100	<0.100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.150	<0.0150	<0.0150	<0.150	<0.150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0200	5.59	6.00	<0.0600	199	1.42	
pH value of soil	1 pH Units	TM133	8.23	11.80	8.54	8.99	12.64		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<0.60	<3.0	<3.0	<3.0	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	<3.00	<3.00	<3.00	
Total Cyanide	<1 mg/kg	TM153	<1.00	964	17.1	8.97	604	5570	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	260.73	109.45	29.47	207.26	345.45	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	295	127	32.0	230	439	
Arsenic	<0.6 mg/kg	TM181	6.88	6.80	14.6	4.29	39.0	20.6	
Cadmium	<0.02 mg/kg	TM181	0.0697	0.0322	0.288	0.341	0.538	0.0521	
Chromium	<0.9 mg/kg	TM181	14.0	12.0	11.4	41.7	14.8	6.11	
Copper	<1.4 mg/kg	TM181	8.63	25.7	8.33	21.1	57.5	17.3	
Lead	<0.7 mg/kg	TM181	14.4	84.1	28.1	10.9	122	30.2	
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	
Nickel	<0.2 mg/kg	TM181	18.3	19.4	15.3	50.1	52.9	13.5	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	1.48	<1.00	
Zinc	<1.9 mg/kg	TM181	40.1	57.6	31.1	71.7	86.2	28.4	
Total Sulphate	<48 mg/kg	TM221	764	1750	1180	3490	10400	76100	

SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

EPH CWG (Aromatic) GC (S)

Results Legend	Sample Identity	F3	F3	F3	F5	F6	F6
<p>Results Legend</p> <p># ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.</p>	Depth (m)	0.50 - 1.00	2.90 - 3.00	5.50 - 6.00	0.50 - 0.80	0.20 - 0.40	0.80 - 1.50
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	14/11/2009	14/11/2009	14/11/2009	13/11/2009	13/11/2009	13/11/2009
	Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
	SDG Ref	091119-102	091119-102	091119-102	091119-102	091119-102	091119-102
	Lab Sample No.(s)	622308	622343	622450	622565	622844	622814

Component	LOD/Units	Method	F3	F3	F3	F5	F6	F6
Aromatics >EC12-EC16	<100 µg/kg	TM173	1040	464000	13100	49100	5660000	1480000
Aromatics >EC16-EC21	<100 µg/kg	TM173	<100	950000	29500	144000	8450000	1930000
Aromatics >EC21-EC35	<100 µg/kg	TM173	3820	1860000	30500	294000	16200000	3530000
Aromatics >EC35-EC44	<100 µg/kg	TM173	6050	318000	937	60600	2060000	694000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	11000	3590000	74000	548000	32400000	7640000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	11000	3590000	74000	548000	32400000	7640000

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

GRO BTEX MTBE GC (S)

Results Legend	Sample Identity	F3	F3	F3	F5	F6	F6
	Depth (m)	0.50 - 1.00	2.90 - 3.00	5.50 - 6.00	0.50 - 0.80	0.20 - 0.40	0.80 - 1.50
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	14/11/2009	14/11/2009	14/11/2009	13/11/2009	13/11/2009	13/11/2009
	Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
	SDG Ref	091119-102	091119-102	091119-102	091119-102	091119-102	091119-102
	Lab Sample No.(s)	622308	622343	622450	622565	622844	622814

Component	LOD/Units	Method	F3	F3	F3	F5	F6	F6
GRO C5-C12	<44 µg/kg	TM089	88.9 #	52300 #	5200 #	5340 #	69100 #	1410000 #
MTBE	<5 µg/kg	TM089	<5.00 #	<9.00 #	24.4 #	<8.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	<10.0 M	323 M	160 M	18.5 M	609 M	1580 M
Toluene	<2 µg/kg	TM089	16.5 M	2320 M	32.5 M	45.7 M	4660 M	21300 M
Ethyl Benzene	<3 µg/kg	TM089	<5.00 M	1620 M	242 M	38.0 M	1860 M	29900 M
m & p Xylene	<6 µg/kg	TM089	28.5 M	7970 M	125 M	264 M	13900 M	237000 M
o Xylene	<3 µg/kg	TM089	<8.00 M	3930 M	85.8 M	132 M	6620 M	112000 M
Sum m&p and o Xylene	<10 µg/kg	TM089	28.5 M	11900 M	211 M	396 M	20600 M	348000 M
Sum of BTEX	<10 µg/kg	TM089	45.0 M	16200 M	646 M	498 M	27700 M	401000 M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	35.4	<10.0	16.2	121	411
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	877	240	55.1	142	15900
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	6390	169	516	5770	151000
Aliphatics >C10-C12	<10 µg/kg	TM089	11.3	7680	1240	1390	10700	247000
Total Aliphatics C5-C12	<10 µg/kg	TM089	11.3	15000	1950	1980	16700	414000
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	323	160	18.5	609	1580
Aromatics >C7-C8	<10 µg/kg	TM089	16.5	2620	32.5	45.7	4660	21300
Aromatics >EC8-EC10	<10 µg/kg	TM089	40.3	29400	1160	1210	31100	605000
Aromatics >EC10-EC12	<10 µg/kg	TM089	16.9	11500	1870	2090	16000	370000
Total Aromatics C6-C12	<10 µg/kg	TM089	73.7	37300	3220	3360	52400	998000

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

PAH by GCMS

Results Legend		Sample Identity	F5	F6				
# ISO17025 accredited. m CERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 0.80 Soil/Solid 13/11/2009 18/11/2009 091119-102 622565	0.80 - 1.50 Soil/Solid 13/11/2009 18/11/2009 091119-102 622814				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	3820 M	4990000 M				
Acenaphthylene (S)	<12 µg/kg	TM218	846 M	249000 M				
Acenaphthene (S)	<8 µg/kg	TM218	869 M	259000 M				
Fluorene (S)	<10 µg/kg	TM218	1070 M	426000 M				
Phenanthrene (S)	<15 µg/kg	TM218	20800 M	1150000 M				
Anthracene (S)	<16 µg/kg	TM218	4470 M	448000 M				
Fluoranthene (S)	<17 µg/kg	TM218	20800 M	758000 M				
Pyrene (S)	<15 µg/kg	TM218	15500 M	565000 M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	9650 M	230000 M				
Chrysene (S)	<10 µg/kg	TM218	10200 M	234000 M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	8980 M	201000 M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3640 M	87700 M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	4900 M	191000 M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	3960 M	90500 M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1360 M	24200 M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	5120 M	108000 M				
PAH 16 EPA Total	<118 µg/kg	TM218	116000 M	1000000 M				

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

PAH micro by GCMS

Results Legend		Sample Identity	F3	F3	F3	F6		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 14/11/2009 18/11/2009 091119-102 622308	2.90 - 3.00 Soil/Solid 14/11/2009 18/11/2009 091119-102 622343	5.50 - 6.00 Soil/Solid 14/11/2009 18/11/2009 091119-102 622450	0.20 - 0.40 Soil/Solid 13/11/2009 18/11/2009 091119-102 622844		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	15.4 M	472000 M	5960 M	5530000 M		
Acenaphthylene (S)	<12 µg/kg	TM218	<12.0 M	66000 M	2860 M	435000 M		
Acenaphthene (S)	<8 µg/kg	TM218	<8.00 M	20100 M	3260 M	530000 M		
Fluorene (S)	<10 µg/kg	TM218	<10.0 M	64400 M	3380 M	975000 M		
Phenanthrene (S)	<15 µg/kg	TM218	<15.0 M	177000 M	6460 M	3620000 M		
Anthracene (S)	<16 µg/kg	TM218	<16.0 M	61600 M	1390 M	1100000 M		
Fluoranthene (S)	<17 µg/kg	TM218	<17.0 M	144000 M	2430 M	2640000 M		
Pyrene (S)	<15 µg/kg	TM218	15.3 M	96600 M	2570 M	1950000 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	<14.0 M	48100 M	734 M	931000 M		
Chrysene (S)	<10 µg/kg	TM218	<10.0 M	44700 M	587 M	680000 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	<15.0 M	48600 M	692 M	870000 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	<14.0 M	17100 M	322 M	375000 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	<15.0 M	42500 M	568 M	799000 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	<18.0 M	21300 M	267 M	403000 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0 M	6080 M	82.7 M	123000 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	<24.0 M	23700 M	306 M	442000 M		
PAH 16 EPA Total	<118 µg/kg	TM218	<118 M	1350000 M	31900 M	<23600 M		

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

TPH CWG GC (S)

Results Legend		Sample Identity	F3	F3	F3	F5	F6	F6
# ISO17025 accredited. m CERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.50 - 1.00	2.90 - 3.00	5.50 - 6.00	0.50 - 0.80	0.20 - 0.40	0.80 - 1.50
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
		Date Sampled	14/11/2009	14/11/2009	14/11/2009	13/11/2009	13/11/2009	13/11/2009
		Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
		SDG Ref	091119-102	091119-102	091119-102	091119-102	091119-102	091119-102
		Lab Sample No.(s)	622308	622343	622450	622565	622844	622814

Component	LOD/Units	Method	F3	F3	F3	F5	F6	F6
Total Aliphatics >C5-C44	<100 µg/kg	TM173	<100	2620000	172000	374000	5730000	1550000
Total Aromatics >C6-C44	<100 µg/kg	TM173	11100	3630000	77200	551000	3250000	8630000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	11100	6250000	249000	926000	3820000	1020000

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

VOC MS (S)

Results Legend			Sample Identity	F3	F6	F6			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.90 - 3.00	0.20 - 0.40	0.80 - 1.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	13/11/2009	13/11/2009			
			Date Received	18/11/2009	18/11/2009	18/11/2009			
			SDG Ref	091119-102	091119-102	091119-102			
			Lab Sample No.(s)	622343	622844	622814			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		31.9	126	101			
Toluene-d8**	%	TM116		60.4	53.3	93.7			
4-Bromofluorobenzene**	%	TM116		59.4	68.6	81.3			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<1300			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<1200			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<1000			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<900			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<1200			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<700			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<900			
Carbon Disulphide	<9 µg/kg	TM116		46.4	142	4860			
Dichloromethane	<10 µg/kg	TM116		<10.0	57.5	<1000			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<900			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<1200			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<800			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<900			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<1000			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<1000			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<1000			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<1200			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<1300			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<1100			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<1000			
Benzene	<9 µg/kg	TM116		311	1310	3480			
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<900			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<1000			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<1200			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<1100			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<2500			
Toluene	<6 µg/kg	TM116		1870	12900	37500			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<2700			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<900			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<700			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<900			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<900			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<1400			
Chlorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<700			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<1100			
Ethylbenzene	<9 µg/kg	TM116		5180	8820	44100			

SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

VOC MS (S)

Results Legend		Sample Identity	F3	F6	F6			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.90 - 3.00 Soil/Solid 14/11/2009 18/11/2009 091119-102 622343	0.20 - 0.40 Soil/Solid 13/11/2009 18/11/2009 091119-102 622844	0.80 - 1.50 Soil/Solid 13/11/2009 18/11/2009 091119-102 622814			
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	42800 #	79100 #	424000			
o-Xylene	<11 µg/kg	TM116	22700 M	41600 M	181000			
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<1100 M			
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<1200 M			
Isopropylbenzene	<9 µg/kg	TM116	754 M	3060 M	13100 M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<1500 #			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<1300 M			
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<1400 M			
Propylbenzene	<6 µg/kg	TM116	1300 M	3680 M	16400 M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<1400 #			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	7310 M	20500 M	100000 M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<900 #			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<1200 #			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	42800 #	46800 #	215000 #			
sec-Butylbenzene	<8 µg/kg	TM116	164 #	443 #	2360 #			
4-Isopropyltoluene	<8 µg/kg	TM116	623 #	3470 #	9950 #			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<800 #			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<1100 M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<700 #			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<800 M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<1100 M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<700 #			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<900 #			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<1500 #			
Naphthalene	<7 µg/kg	TM116	657000	1640000	4930000			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<1200 #			

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

Results Legend			Sample Identity	F7				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.10 - 1.50 Soil/Solid 13/11/2009 18/11/2009 091119-102 622658				
Component	LOD/Units	Method						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	15.5	M				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	21.5	M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	16.7					
Catechol	<0.01 mg/kg	TM062 (S)	<0.100					
Phenol	<0.01 mg/kg	TM062 (S)	<0.100	M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.100	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.500					
Xylenols	<0.015 mg/kg	TM062 (S)	<0.150	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.100					
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.100	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.150	M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00					
pH value of soil	1 pH Units	TM133	8.51	M				
Hexavalent Chromium	<0.6 mg/kg	TM151	<6.0	#				
Hexavalent Chromium	<0.6 mg/kg	TM151	<6.00	#				
Total Cyanide	<1 mg/kg	TM153	1820	M				
Easily Liberated Sulphide	<15 mg/kg	TM180	73.81	#				
Easily Liberated Sulphide	<15 mg/kg	TM180	79.6	#				
Arsenic	<0.6 mg/kg	TM181	3.55	M				
Cadmium	<0.02 mg/kg	TM181	<0.0200	M				
Chromium	<0.9 mg/kg	TM181	8.36	M				
Copper	<1.4 mg/kg	TM181	3.85	M				
Lead	<0.7 mg/kg	TM181	25.6	M				
Mercury	<0.14 mg/kg	TM181	0.975	M				
Nickel	<0.2 mg/kg	TM181	2.04	M				
Selenium	<1 mg/kg	TM181	<1.00	#				
Zinc	<1.9 mg/kg	TM181	19.6	M				
Total Sulphate	<48 mg/kg	TM221	2210	M				

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F7					
Depth (m)	1.10 - 1.50					
Sample Type	Soil/Solid					
Date Sampled	13/11/2009					
Date Received	18/11/2009					
SDG Ref	091119-102					
Lab Sample No.(s)	622658					

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	93900			
Aliphatics >C16-C21	<100 µg/kg	TM173	136000			
Aliphatics >C21-C35	<100 µg/kg	TM173	164000			
Aliphatics >C35-C44	<100 µg/kg	TM173	23300			
Total Aliphatics >C12-C44	<100 µg/kg	TM173	417000			
Aliphatics >C16-C35	<100 µg/kg	TM173	300000			

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

PAH by GCMS

Results Legend		Sample Identity	F7				
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.10 - 1.50 Soil/Solid 13/11/2009 18/11/2009 091119-102 622658				
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	256000	M			
Acenaphthylene (S)	<12 µg/kg	TM218	49700	M			
Acenaphthene (S)	<8 µg/kg	TM218	20300	M			
Fluorene (S)	<10 µg/kg	TM218	54800	M			
Phenanthrene (S)	<15 µg/kg	TM218	129000	M			
Anthracene (S)	<16 µg/kg	TM218	51300	M			
Fluoranthene (S)	<17 µg/kg	TM218	114000	M			
Pyrene (S)	<15 µg/kg	TM218	73100	M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	37500	M			
Chrysene (S)	<10 µg/kg	TM218	28600	M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	31300	M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	15300	M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	31300	M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	15100	M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	3990	M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	16400	M			
PAH 16 EPA Total	<118 µg/kg	TM218	928000	M			

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SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

VOC MS (S)

Results Legend		Sample Identity	F7				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.10 - 1.50				
		Sample Type	Soil/Solid				
		Date Sampled	13/11/2009				
		Date Received	18/11/2009				
		SDG Ref	091119-102				
		Lab Sample No.(s)	622658				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	163				
Toluene-d8**	%	TM116	96.1				
4-Bromofluorobenzene**	%	TM116	80.6				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	<9.00				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	24.3				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	161				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	360				

SDG: 091119-102
Job: D_MOUCHEL_ELE-88
Client Reference: 13/11/09 (F6,F5,F7) 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66272

VOC MS (S)

Results Legend		Sample Identity	F7				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.10 - 1.50 Soil/Solid 13/11/2009 18/11/2009 091119-102 622658				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	4320	#			
o-Xylene	<11 µg/kg	TM116	2060	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	99.1	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	141	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	1060	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	2190	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	117	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	360000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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Notification of NDPs (No determination possible)

SDG Number	091119-102	Location	LIMERICK GASWORKS
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	13/11/09 (F6.F5.F7) 14/11/09 (F3)	Report No.	27443-12
Attention	Dave Watts	Date Received	19/11/2009 15:32:51

Sample No	Sample Identity	Depth (m)	Test	Comment
630461	F6	0.80 - 1.50	pH	Sample contains oil / product
630461	F6	0.80 - 1.50	pH	Sample contains oil / product
630461	F6	0.80 - 1.50	pH	Sample contains oil / product
630461	F6	0.80 - 1.50	pH	Sample contains oil / product
630461	F6	0.80 - 1.50	pH	Sample contains oil / product
630461	F6	0.80 - 1.50	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-89
Sample Delivery Group (SDG): 091119-103 **Report No.:** 66689
Your Reference: 14/11/09 (F3)
Location: LIMERICK GASWORKS

A total of 3 samples was received on Wednesday November 18, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-103
Job: D_MOUCHEL_ELE-89
Client Reference: 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66689

SOLID

Results Legend	Sample ID	F3						Total
		1.50 - 2.00		4.50 - 5.00		7.00 - 7.50		
		250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All							0
		X		X		X		3
Asbestos Presence Screen	All							0
		X						1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide							0
		X		X		X		3
Easily Liberated Sulphide	All							0
		X		X		X		3
EPH CWG (Aliphatic) GC (S)	All							0
		X		X		X		3
EPH CWG (Aromatic) GC (S)	All							0
		X		X		X		3
GRO BTEX MTBE GC (S)	All							0
			X	X		X		3
Hexavalent Chromium (s)	All							0
		X				X		3
Metals by iCap-OES (Soil)	Arsenic							0
		X		X		X		3
	Cadmium							0
		X		X		X		3
	Chromium							0
		X		X		X		3
	Copper							0
		X		X		X		3
	Lead							0
		X		X		X		3
	Mercury							0
		X		X		X		3
	Nickel							0
		X		X		X		3
	Selenium							0
		X		X		X		3
	Zinc							0
		X		X		X		3
PAH micro by GCMS	All							0
		X		X		X		3
PCBs by GCMS	All							0
		X						1
pH	All						N	1
		X		X				2
Phenols by HPLC (S)	All							0
		X		X		X		3
Sample description	All							0
		X		X		X		3
Total Sulphate	All							0
		X		X		X		3
TPH CWG GC (S)	All							0
		X		X		X		3
VOC MS (S)	All							0
				X		X		2

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SDG:	091119-103	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-89	Attention:	Verity Sankey
Client Reference:	14/11/09 (F3)	Order No.:	
Location:	LIMERICK GASWORKS	Report No.:	66689

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
F3	1.50 - 2.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.50 - 5.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	7.00 - 7.50	Black	N/A	N/A	Tar

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-103
Job: D_MOUCHEL_ELE-89
Client Reference: 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66689

Test Completion dates

SDG reference: 091119-103

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)	
F3	1.50 - 2.00	SOLID	04/12/2009	18/11/2009	23/11/2009	27/11/2009	24/11/2009	23/11/2009	26/11/2009	23/11/2009	23/11/2009	21/11/2009	21/11/2009	20/11/2009	23/11/2009			26/11/2009	26/11/2009	26/11/2009
	4.50 - 5.00	SOLID	04/12/2009	23/11/2009	23/11/2009	27/11/2009	24/11/2009	23/11/2009	26/11/2009	23/11/2009	23/11/2009	21/11/2009	21/11/2009	20/11/2009	23/11/2009			26/11/2009	26/11/2009	01/12/2009
	7.00 - 7.50	SOLID	04/12/2009	26/11/2009	26/11/2009	30/11/2009	03/12/2009	03/12/2009	30/11/2009	30/11/2009	02/12/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009			03/12/2009	01/12/2009

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SDG: 091119-103
 Job: D_MOUCHEL_ELE-89
 Client Reference: 14/11/09 (F3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66689

Results Legend			Sample Identity	F3	F3	F3			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	4.50 - 5.00	7.00 - 7.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	14/11/2009	14/11/2009			
			Date Received	18/11/2009	18/11/2009	18/11/2009			
			SDG Ref	091119-103	091119-103	091119-103			
			Lab Sample No.(s)	622358	622428	622538			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	139	<15.0				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	108	<15.0				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.200				
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	0.189	4.40				
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	0.448	57.6				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<1.00				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0300	245				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.200				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.200				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.300				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0100	0.673	307				
pH value of soil	1 pH Units	TM133	11.07	9.34					
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<12.0				
Total Cyanide	<1 mg/kg	TM153	20.2	32.8	435				
PCB congener 28	<3 µg/kg	TM168	<3.00						
PCB congener 52	<3 µg/kg	TM168	<3.00						
PCB congener 101	<3 µg/kg	TM168	<3.00						
PCB congener 118	<3 µg/kg	TM168	<3.00						
PCB congener 138	<3 µg/kg	TM168	<3.00						
PCB congener 153	<3 µg/kg	TM168	<3.00						
PCB congener 180	<3 µg/kg	TM168	<3.00						
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00						
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	403	542				
Arsenic	<0.6 mg/kg	TM181	8.28	6.02	2.55				
Cadmium	<0.02 mg/kg	TM181	0.141	<0.0200	<0.0200				
Chromium	<0.9 mg/kg	TM181	19.0	7.34	2.48				
Copper	<1.4 mg/kg	TM181	17.7	9.60	2.12				
Lead	<0.7 mg/kg	TM181	238	66.3	5.91				
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140				
Nickel	<0.2 mg/kg	TM181	22.5	7.54	2.20				
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00				
Zinc	<1.9 mg/kg	TM181	56.6	36.1	8.43				
Total Sulphate	<48 mg/kg	TM221	4730	1050	5400				

SDG: 091119-103
Job: D_MOUCHEL_ELE-89
Client Reference: 14/11/09 (F3)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66689

GRO BTEX MTBE GC (S)

Results Legend		Sample Identity	F3	F3	F3			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.50 - 2.00	4.50 - 5.00	7.00 - 7.50			
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
		Date Sampled	14/11/2009	14/11/2009	14/11/2009			
		Date Received	18/11/2009	18/11/2009	18/11/2009			
		SDG Ref	091119-103	091119-103	091119-103			
		Lab Sample No.(s)	622358	622428	622538			
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	317	4720	2360000			
			#	#	#			
MTBE	<5 µg/kg	TM089	<5.00	18.9	<5.00			
			#	#	#			
Benzene	<10 µg/kg	TM089	13.8	530	200000			
			M	M	M			
Toluene	<2 µg/kg	TM089	35.7	218	407000			
			M	M	M			
Ethyl Benzene	<3 µg/kg	TM089	<7.00	109	80100			
			M	M	M			
m & p Xylene	<6 µg/kg	TM089	44.9	427	416000			
			M	M	M			
o Xylene	<3 µg/kg	TM089	21.9	260	177000			
			M	M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	66.7	687	593000			
			M	M	M			
Sum of BTEX	<10 µg/kg	TM089	116	1540	1280000			
			M	M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	17.2	11000			
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	106	153000			
Aliphatics >C8-C10	<10 µg/kg	TM089	33.2	491	186000			
Aliphatics >C10-C12	<10 µg/kg	TM089	43.6	721	184000			
Total Aliphatics C5-C12	<10 µg/kg	TM089	76.7	1340	531000			
Aromatics C6-C7	<10 µg/kg	TM089	13.8	530	200000			
Aromatics >C7-C8	<10 µg/kg	TM089	35.7	218	407000			
Aromatics >EC8-EC10	<10 µg/kg	TM089	116	530	952000			
Aromatics >EC10-EC12	<10 µg/kg	TM089	65.3	1080	271000			
Total Aromatics C6-C12	<10 µg/kg	TM089	231	3360	1830000			

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SDG: 091119-103
 Job: D_MOUCHEL_ELE-89
 Client Reference: 14/11/09 (F3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66689

PAH micro by GCMS

Results Legend		Sample Identity	F3	F3	F3			
# ISO17025 accredited. mCERES accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 14/11/2009 18/11/2009 091119-103 622358	4.50 - 5.00 Soil/Solid 14/11/2009 18/11/2009 091119-103 622428	7.00 - 7.50 Soil/Solid 14/11/2009 18/11/2009 091119-103 622538			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	5420 M	46100 M	13800000 M			
Acenaphthylene (S)	<12 µg/kg	TM218	6430 M	4220 M	1850000 M			
Acenaphthene (S)	<8 µg/kg	TM218	591 M	5680 M	481000 M			
Fluorene (S)	<10 µg/kg	TM218	1860 M	5280 M	1540000 M			
Phenanthrene (S)	<15 µg/kg	TM218	5360 M	12000 M	3860000 M			
Anthracene (S)	<16 µg/kg	TM218	2330 M	3390 M	1320000 M			
Fluoranthene (S)	<17 µg/kg	TM218	10200 M	6030 M	2640000 M			
Pyrene (S)	<15 µg/kg	TM218	8150 M	5050 M	1730000 M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	5930 M	2460 M	825000 M			
Chrysene (S)	<10 µg/kg	TM218	3830 M	1560 M	601000 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	6640 M	2260 M	811000 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	2760 M	836 M	309000 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6410 M	1940 M	620000 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	3460 M	988 M	295000 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	972 M	295 M	78100 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	3270 M	966 M	322000 M			
PAH 16 EPA Total	<118 µg/kg	TM218	73600 M	99000 M	31100000 M			

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SDG: 091119-103
 Job: D_MOUCHEL_ELE-89
 Client Reference: 14/11/09 (F3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66689

VOC MS (S)

Results Legend			Sample Identity	F3	F3			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	4.50 - 5.00	7.00 - 7.50			
			Sample Type	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	14/11/2009			
			Date Received	18/11/2009	18/11/2009			
			SDG Ref	091119-103	091119-103			
			Lab Sample No.(s)	622428	622538			
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116		79.7	147			
Toluene-d8**	%	TM116		79.6	66.5			
4-Bromofluorobenzene**	%	TM116		61.8	54.6			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<1300			
Chloromethane	<12 µg/kg	TM116		<12.0	<1200			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<1000			
Bromoethane	<9 µg/kg	TM116		<9.00	<900			
Chloroethane	<12 µg/kg	TM116		<12.0	<1200			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<700			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<900			
Carbon Disulphide	<9 µg/kg	TM116		11.6	<900			
Dichloromethane	<10 µg/kg	TM116		<10.0	<1000			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<900			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<1200			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<800			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<900			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<1000			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<1000			
Chloroform	<10 µg/kg	TM116		<10.0	<1000			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<1200			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<1300			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<1100			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<1000			
Benzene	<9 µg/kg	TM116		712	1100000			
Trichloroethene	<9 µg/kg	TM116		<9.00	<900			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<1000			
Dibromomethane	<12 µg/kg	TM116		<12.0	<1200			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<1100			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<2500			
Toluene	<6 µg/kg	TM116		434	913000			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<2700			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<900			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<700			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<900			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<900			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<1400			
Chorobenzene	<7 µg/kg	TM116		<7.00	<700			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<1100			
Ethylbenzene	<9 µg/kg	TM116		530	1050000			

SDG: 091119-103
 Job: D_MOUCHEL_ELE-89
 Client Reference: 14/11/09 (F3)
 Location: LIMERICK GASWORKS

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66689

VOC MS (S)

Results Legend			Sample Identity	F3	F3				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	4.50 - 5.00	7.00 - 7.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	14/11/2009	14/11/2009				
			Date Received	18/11/2009	18/11/2009				
			SDG Ref	091119-103	091119-103				
			Lab Sample No.(s)	622428	622538				
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	2200	#	4010000				
o-Xylene	<11 µg/kg	TM116	1300	M	2000000				
Styrene	<11 µg/kg	TM116	<11.0	M	<1100				
Bromoform	<12 µg/kg	TM116	<12.0	M	<1200				
Isopropylbenzene	<9 µg/kg	TM116	114	M	103000				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<1500				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<1300				
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<1400				
Propylbenzene	<6 µg/kg	TM116	157	M	142000				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<1400				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	685	M	555000				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<900				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<1200				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	1310	#	1060000				
sec-Butylbenzene	<8 µg/kg	TM116	36.7	#	13900				
4-Isopropyltoluene	<8 µg/kg	TM116	97.5	#	47300				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<800				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<1100				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<700				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<800				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<1100				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<700				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<900				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<1500				
Naphthalene	<7 µg/kg	TM116	4500	#	32100000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<1200				

Notification of NDPs (No determination possible)

SDG Number	091119-103	Location	LIMERICK GASWORKS
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	14/11/09 (F3)	Report No.	27523-0
Attention	Dave Watts	Date Received	19/11/2009 15:32:51

Sample No	Sample Identity	Depth (m)	Test	Comment
627124	F3	7.00 - 7.50	pH	Sample contains oil / product
627124	F3	7.00 - 7.50	pH	Sample contains oil / product
627124	F3	7.00 - 7.50	pH	Sample contains oil / product
627124	F3	7.00 - 7.50	pH	Sample contains oil / product
627124	F3	7.00 - 7.50	pH	Sample contains oil / product
627124	F3	7.00 - 7.50	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-39
Sample Delivery Group (SDG): 091119-50
Your Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks
Report No.: 66914

A total of 5 samples was received on Wednesday November 18, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-50
Job: D_MOUCHEL_ELE-39
Client Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66914

SOLID

Results Legend	Sample ID	B11		H11		H12		Total
		Depth (m)		Depth (m)		Depth (m)		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X	X	X	X	X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X	X	X	X	X	5
Easily Liberated Sulphide	All		X	X	X	X	X	0
EPH CWG (Aliphatic) GC (S)	All		X	X	X	X	X	5
EPH CWG (Aromatic) GC (S)	All		X	X	X	X	X	0
GRO BTEX MTBE GC (S)	All		X	X	X	X	X	5
Hexavalent Chromium (s)	All		X	X	X	X	X	0
Metals by iCap-OES (Soil)	Arsenic		X	X	X	X	X	5
	Cadmium		X	X	X	X	X	0
	Chromium		X	X	X	X	X	5
	Copper		X	X	X	X	X	0
	Lead		X	X	X	X	X	5
	Mercury		X	X	X	X	X	0
	Nickel		X	X	X	X	X	5
	Selenium		X	X	X	X	X	0
	Zinc		X	X	X	X	X	5
PAH micro by GCMS	All		X	X	X	X	X	0
PCBs by GCMS	All		X	X	X	X	X	5
pH	All		X	X	X	X	X	0
Phenols by HPLC (S)	All		X	X	X	X	X	5
Sample description	All		X	X	X	X	X	0
Total Sulphate	All		X	X	X	X	X	5
TPH CWG GC (S)	All		X	X	X	X	X	0
VOC MS (S)	All		X	X	X	X	X	5
				X	X	X	X	0
					X	X	X	4

SDG:	091119-50	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-39	Attention:	Verity Sankey
Client Reference:	17/11/09 (B11, H11 & H12)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66914

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
B11	0.40 - 0.55	Black	Clinker	0.063 - 0.1 mm	N/A
H11	0.50 - 1.00	Brown	Silty Sand	0.1 - 2 mm	Stones
	1.30 - 1.35	Grey	Silty Sand	0.063 - 0.1 mm	Stones
H12	0.20 - 0.40	Black	Sand	0.063 - 0.1 mm	Stones
	1.50 - 2.00	Brown	Dust	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-50
Job: D_MOUCHEL_ELE-39
Client Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66914

Test Completion dates

SDG reference: 091119-50

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
B11	0.40 - 0.55	SOLID	01/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	08/12/2009	25/11/2009	24/11/2009	24/11/2009	01/12/2009	28/11/2009	26/11/2009	23/11/2009	27/11/2009	
			03/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	25/11/2009	24/11/2009	24/11/2009	24/11/2009	01/12/2009	28/11/2009	26/11/2009	23/11/2009	27/11/2009	
H11	0.50 - 1.00	SOLID	03/12/2009	03/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	08/12/2009	25/11/2009	24/11/2009	24/11/2009	01/12/2009	28/11/2009	26/11/2009	23/11/2009	27/11/2009	
	1.30 - 1.35	SOLID	01/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	08/12/2009	25/11/2009	24/11/2009	24/11/2009	01/12/2009	28/11/2009	26/11/2009	23/11/2009	27/11/2009	
H12	0.20 - 0.40	SOLID	03/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	08/12/2009	25/11/2009	24/11/2009	24/11/2009	01/12/2009	28/11/2009	26/11/2009	23/11/2009	27/11/2009	
	1.50 - 2.00	SOLID	03/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	08/12/2009	25/11/2009	24/11/2009	24/11/2009	01/12/2009	28/11/2009	26/11/2009	23/11/2009	27/11/2009	

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SDG: 091119-50
Job: D_MOUCHEL_ELE-39
Client Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66458

Results Legend			Sample Identity		B11	H11	H11	H12	H12
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	0.40 - 0.55	0.50 - 1.00	1.30 - 1.35	0.20 - 0.40	1.50 - 2.00
Component	LOD/Units	Method	Date Sampled	Date Received	17/11/2009	17/11/2009	20/11/2009	17/11/2009	17/11/2009
			SDG Ref	Lab Sample No.(s)	091119-50	091119-50	091119-50	091119-50	091119-50
					627854	627932	628003	628038	628273
Exchangeable Ammonium as NH4	<15 mg/kg	TM024			<15.0	<15.0	<15.0	<15.0	<15.0
Ammoniacal Nitrogen as N	<15 mg/kg	TM024			<15.0	<15.0	<15.0	<15.0	<15.0
Catechol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.0100	<0.100	<0.100	<0.0100
Phenol	<0.01 mg/kg	TM062 (S)			<0.0100	0.0690	<0.280	3.53	<0.0300
Cresols	<0.01 mg/kg	TM062 (S)			<0.0100	0.161	0.693	17.5	<0.0300
Resorcinol	<0.05 mg/kg	TM062 (S)			<0.0500	<0.0500	<0.500	<0.500	<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)			<0.0150	0.437	<0.880	3.56	<0.0200
1-Naphthol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.0100	<0.100	<0.100	<0.0100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.0100	<0.100	<0.100	<0.0100
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)			<0.0150	<0.0150	<0.150	<0.150	<0.0150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)			0.00	0.667	1.97	24.5	<0.0800
pH value of soil	1 pH Units	TM133			8.42	8.27	8.18	7.75	8.58
Hexavalent Chromium	<0.6 mg/kg	TM151			<0.600	<0.600	<0.600	<12.0	<0.600
Total Cyanide	<1 mg/kg	TM153			<1.00	3.88	13.1	6.27	<1.00
PCB congener 28	<3 µg/kg	TM168				<3.00			
PCB congener 52	<3 µg/kg	TM168				<3.00			
PCB congener 101	<3 µg/kg	TM168				<3.00			
PCB congener 118	<3 µg/kg	TM168				<3.00			
PCB congener 138	<3 µg/kg	TM168				<3.00			
PCB congener 153	<3 µg/kg	TM168				<3.00			
PCB congener 180	<3 µg/kg	TM168				<3.00			
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00			
Easily Liberated Sulphide	<15 mg/kg	TM180			<15.0	19.3	102	21.2	31.6
Arsenic	<0.6 mg/kg	TM181			9.36	7.64	24.8	14.6	2.58
Cadmium	<0.02 mg/kg	TM181			<0.0200	<0.0200	<0.0200	<0.0200	<0.0200
Chromium	<0.9 mg/kg	TM181			5.00	24.7	6.99	3.43	4.01
Copper	<1.4 mg/kg	TM181			20.2	26.6	19.9	17.0	<1.40
Lead	<0.7 mg/kg	TM181			36.4	50.4	127	25.2	2.77
Mercury	<0.14 mg/kg	TM181			<0.140	<0.140	<0.140	<0.140	<0.140
Nickel	<0.2 mg/kg	TM181			10.3	21.8	15.1	7.13	2.99
Selenium	<1 mg/kg	TM181			<1.00	<1.00	<1.00	<1.00	<1.00
Zinc	<1.9 mg/kg	TM181			19.1	36.8	115	26.1	10.5
Total Sulphate	<48 mg/kg	TM221			1360	716	998	1600	980

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SDG: 091119-50
Job: D_MOUCHEL_ELE-39
Client Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66458

GRO BTEX MTBE GC (S)

Sample Identity	B11	H11	H11	H12	H12
	Depth (m)	0.40 - 0.55	0.50 - 1.00	1.30 - 1.35	0.20 - 0.40
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	20/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-50	091119-50	091119-50	091119-50	091119-50
Lab Sample No.(s)	627854	627932	628003	628038	628273

Component	LOD/Units	Method	B11	H11	H11	H12	H12
GRO C5-C12	<44 µg/kg	TM089	452 #	3630 #	97400 #	64100 #	813 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	70.8 M	137 M	79.2 M	1050 M	36.3 M
Toluene	<2 µg/kg	TM089	119 M	186 M	816 M	4010 M	107 M
Ethyl Benzene	<3 µg/kg	TM089	15.3 M	33.4 M	938 M	1190 M	30.1 M
m & p Xylene	<6 µg/kg	TM089	57.8 M	133 M	6300 M	7520 M	193 M
o Xylene	<3 µg/kg	TM089	21.2 M	56.4 M	2740 M	4270 M	49.8 M
Sum m&p and o Xylene	<10 µg/kg	TM089	79.1 M	190 M	9040 M	11800 M	243 M
Sum of BTEX	<10 µg/kg	TM089	284 M	546 M	10900 M	18000 M	416 M
Aliphatics C5-C6	<10 µg/kg	TM089	23.1	1090	12600	104	15.2
Aliphatics >C6-C8	<10 µg/kg	TM089	135	976	12100	2250	105
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	186	7780	6720	30.7
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	224	17000	10800	80.2
Total Aliphatics C5-C12	<10 µg/kg	TM089	158	2470	49500	19800	231
Aromatics C6-C7	<10 µg/kg	TM089	70.8	137	79.2	1050	36.3
Aromatics >C7-C8	<10 µg/kg	TM089	119	186	816	4010	107
Aromatics >EC8-EC10	<10 µg/kg	TM089	96.2	362	21700	23100	319
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	336	25400	16100	120
Total Aromatics C6-C12	<10 µg/kg	TM089	286	1160	48000	44300	582

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SDG: 091119-50
Job: D_MOUCHEL_ELE-39
Client Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66458

PAH micro by GCMS

Results Legend			Sample Identity	B11	H11	H11	H12	H12
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.40 - 0.55 Soil/Solid 17/11/2009 18/11/2009 091119-50 627854	0.50 - 1.00 Soil/Solid 17/11/2009 18/11/2009 091119-50 627932	1.30 - 1.35 Soil/Solid 20/11/2009 18/11/2009 091119-50 628003	0.20 - 0.40 Soil/Solid 17/11/2009 18/11/2009 091119-50 628038	1.50 - 2.00 Soil/Solid 17/11/2009 18/11/2009 091119-50 628273
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	33300	16600	891000	2810000	331	
Acenaphthylene (S)	<12 µg/kg	TM218	21100	7960	262000	937000	155	
Acenaphthene (S)	<8 µg/kg	TM218	1490	2490	68000	156000	72.2	
Fluorene (S)	<10 µg/kg	TM218	10700	7560	266000	675000	189	
Phenanthrene (S)	<15 µg/kg	TM218	158000	21500	735000	1630000	606	
Anthracene (S)	<16 µg/kg	TM218	45100	10800	270000	611000	204	
Fluoranthene (S)	<17 µg/kg	TM218	265000	32700	510000	1220000	404	
Pyrene (S)	<15 µg/kg	TM218	177000	24800	329000	776000	271	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	102000	12700	169000	339000	150	
Chrysene (S)	<10 µg/kg	TM218	84000	8550	128000	224000	101	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	172000	18300	168000	336000	124	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	162000	6370	61400	141000	45.3	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	93000	15400	130000	279000	103	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	52600	7530	60000	117000	36.0	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	14700	1970	17600	33300	<23.0	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	54500	8470	66300	130000	41.7	
PAH 16 EPA Total	<118 µg/kg	TM218	1450000	204000	4130000	10400000	2830	

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SDG: 091119-50
Job: D_MOUCHEL_ELE-39
Client Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66458

VOC MS (S)

Results Legend			Sample Identity		H11	H11	H12	H12
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	H11	H11	H12	H12	
			Sample Type	0.50 - 1.00	1.30 - 1.35	0.20 - 0.40	1.50 - 2.00	
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Received	17/11/2009	20/11/2009	17/11/2009	17/11/2009	
			SDG Ref	18/11/2009	18/11/2009	18/11/2009	18/11/2009	
			Lab Sample No.(s)	091119-50	091119-50	091119-50	091119-50	
				627932	628003	628038	628273	
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116		62.1	145	106	130	
Toluene-d8**	%	TM116		63.8	71.2	86.0	99.6	
4-Bromofluorobenzene**	%	TM116		48.4	64.0	74.8	84.8	
Dichlorodifluoromethane	<13 µg/kg	TM116		<130	<13.0	<1300	<13.0	
Chloromethane	<12 µg/kg	TM116		<120	<12.0	<1200	<12.0	
Vinyl Chloride	<10 µg/kg	TM116		<100	<10.0	<1000	<10.0	
Bromoethane	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
Chloroethane	<12 µg/kg	TM116		<120	<12.0	<1200	<12.0	
Trichlorofluoromethane	<7 µg/kg	TM116		<70.0	<7.00	<700	<7.00	
1,1-Dichloroethene	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
Carbon Disulphide	<9 µg/kg	TM116		<90.0	12.8	<900	<9.00	
Dichloromethane	<10 µg/kg	TM116		<100	<10.0	<1000	<10.0	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<120	<12.0	<1200	<12.0	
1,1-Dichloroethane	<8 µg/kg	TM116		<80.0	<8.00	<800	<8.00	
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
2,2-Dichloropropane	<10 µg/kg	TM116		<100	<10.0	<1000	<10.0	
Bromochloromethane	<10 µg/kg	TM116		<100	<10.0	<1000	<10.0	
Chloroform	<10 µg/kg	TM116		<100	<10.0	<1000	<10.0	
1,1,1-Trichloroethane	<12 µg/kg	TM116		<120	<12.0	<1200	<12.0	
1,1-Dichloropropene	<13 µg/kg	TM116		<130	<13.0	<1300	<13.0	
Carbontetrachloride	<11 µg/kg	TM116		<110	<11.0	<1100	<11.0	
1,2-Dichloroethane	<10 µg/kg	TM116		<100	<10.0	<1000	<10.0	
Benzene	<9 µg/kg	TM116		253	114	5470	52.6	
Trichloroethene	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
1,2-Dichloropropane	<10 µg/kg	TM116		<100	<10.0	<1000	<10.0	
Dibromomethane	<12 µg/kg	TM116		<120	<12.0	<1200	<12.0	
Bromodichloromethane	<11 µg/kg	TM116		<110	<11.0	<1100	<11.0	
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<250	<25.0	<2500	<25.0	
Toluene	<6 µg/kg	TM116		732	678	41100	132	
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<270	<27.0	<2700	<27.0	
1,1,2-Trichloroethane	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
1,3-Dichloropropane	<7 µg/kg	TM116		<70.0	<7.00	<700	<7.00	
Tetrachloroethene	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
Dibromochloromethane	<9 µg/kg	TM116		<90.0	<9.00	<900	<9.00	
1,2-Dibromoethane	<14 µg/kg	TM116		<140	<14.0	<1400	<14.0	
Chorobenzene	<7 µg/kg	TM116		<70.0	<7.00	<700	<7.00	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<110	<11.0	<1100	<11.0	
Ethylbenzene	<9 µg/kg	TM116		426	847	15700	32.2	

SDG: 091119-50
Job: D_MOUCHEL_ELE-39
Client Reference: 17/11/09 (B11, H11 & H12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66458

VOC MS (S)

Results Legend		Sample Identity	H11	H11	H12	H12		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 17/11/2009 18/11/2009 091119-50 627932	1.30 - 1.35 Soil/Solid 20/11/2009 18/11/2009 091119-50 628003	0.20 - 0.40 Soil/Solid 17/11/2009 18/11/2009 091119-50 628038	1.50 - 2.00 Soil/Solid 17/11/2009 18/11/2009 091119-50 628273		
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	1560 #	8130 #	130000 #	193 #		
o-Xylene	<11 µg/kg	TM116	708 M	2300 M	68300 M	51.5 M		
Styrene	<11 µg/kg	TM116	<110 M	<11.0 M	21900 M	18.1 M		
Bromoform	<12 µg/kg	TM116	<120 M	<12.0 M	<1200 M	<12.0 M		
Isopropylbenzene	<9 µg/kg	TM116	<90.0 M	156 M	2300 M	<9.00 M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<1500 #	<15.0 #		
1,2,3-Trichloropropane	<13 µg/kg	TM116	<130 M	<13.0 M	<1300 M	<13.0 M		
Bromobenzene	<14 µg/kg	TM116	<140 M	<14.0 M	<1400 M	<14.0 M		
Propylbenzene	<6 µg/kg	TM116	<60.0 M	267 M	4570 M	<6.00 M		
2-Chlorotoluene	<14 µg/kg	TM116	<140 #	<14.0 #	<1400 #	<14.0 #		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	156 M	1490 M	24800 M	15.4 M		
4-Chlorotoluene	<9 µg/kg	TM116	<90.0 #	<9.00 #	<900 #	<9.00 #		
tert-Butylbenzene	<12 µg/kg	TM116	<120 #	<12.0 #	<1200 #	<12.0 #		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	232 #	5550 #	64900 #	30.0 #		
sec-Butylbenzene	<8 µg/kg	TM116	<80.0 #	37.6 #	<800 #	<8.00 #		
4-Isopropyltoluene	<8 µg/kg	TM116	<80.0 #	<8.00 #	2660 #	<8.00 #		
1,3-Dichlorobenzene	<8 µg/kg	TM116	<80.0 #	<8.00 #	<800 #	<8.00 #		
1,4-Dichlorobenzene	<11 µg/kg	TM116	<110 M	<11.0 M	<1100 M	<11.0 M		
n-Butylbenzene	<7 µg/kg	TM116	<70.0 #	<7.00 #	<700 #	<7.00 #		
1,2-Dichlorobenzene	<8 µg/kg	TM116	<80.0 M	<8.00 M	<800 M	<8.00 M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<110 M	<11.0 M	<1100 M	<11.0 M		
Tert-amyl methyl ether	<7 µg/kg	TM116	<70.0 #	<7.00 #	<700 #	<7.00 #		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<90.0 #	<9.00 #	<900 #	<9.00 #		
Hexachlorobutadiene	<15 µg/kg	TM116	<150 #	<15.0 #	<1500 #	<15.0 #		
Naphthalene	<7 µg/kg	TM116	13200 #	421000 #	1710000 #	408 #		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<120 #	<12.0 #	<1200 #	<12.0 #		

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-40
Sample Delivery Group (SDG): 091119-64
Your Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks
Report No.: 66606

A total of 5 samples was received on Wednesday November 18, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-64
 Job: D_MOUCHEL_ELE-40
 Client Reference: 17/11/09 (E9/G11)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66606

SOLID

Results Legend	Sample ID	E9						G11		Total	
		1.00 - 1.50		4.70 - 5.00		5.30 - 5.50		0.00 - 0.50			1.00 - 1.60
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)		
Ammonium Soil by Titration	All									0	
		X		X		X		X	X	5	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide									0	
		X		X		X		X	X	5	
Easily Liberated Sulphide	All									0	
		X		X		X		X	X	5	
EPH CWG (Aliphatic) GC (S)	All									0	
		X		X		X		X	X	5	
EPH CWG (Aromatic) GC (S)	All									0	
		X		X		X		X	X	5	
GRO BTEX MTBE GC (S)	All									0	
		X		X		X		X	X	5	
Hexavalent Chromium (s)	All									0	
		X		X		X		X	X	5	
Metals by iCap-OES (Soil)	Arsenic									0	
		X		X		X		X	X	5	
	Cadmium									0	
		X		X		X		X	X	5	
	Chromium									0	
		X		X		X		X	X	5	
	Copper									0	
		X		X		X		X	X	5	
	Lead									0	
		X		X		X		X	X	5	
	Mercury									0	
		X		X		X		X	X	5	
	Nickel									0	
		X		X		X		X	X	5	
	Selenium									0	
		X		X		X		X	X	5	
	Zinc									0	
		X		X		X		X	X	5	
PAH by GCMS	All									0	
		X								1	
PAH micro by GCMS	All									0	
				X		X		X	X	4	
PCBs by GCMS	All									0	
		X								1	
pH	All									0	
		X		X		X		X	X	5	
Phenols by HPLC (S)	All									0	
		X		X		X		X	X	5	
Sample description	All									0	
		X		X		X		X	X	5	
Total Sulphate	All									0	
		X		X		X		X	X	5	
TPH CWG GC (S)	All									0	
		X		X		X		X	X	5	
VOC MS (S)	All									0	
		X		X		X		X	X	4	

SDG:	091119-64	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-40	Attention:	Verity Sankey
Client Reference:	17/11/09 (E9/G11)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66606

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E9	1.00 - 1.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.70 - 5.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	5.30 - 5.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
G11	0.00 - 0.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	1.00 - 1.60	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66606

Test Completion dates

SDG reference: 091119-64

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
E9	1.00 - 1.50	SOLID	03/12/2009	01/12/2009	01/12/2009	20/11/2009	24/11/2009	23/11/2009	02/12/2009	30/11/2009	24/11/2009	23/11/2009	01/12/2009	24/11/2009	28/11/2009	23/11/2009	23/11/2009	30/11/2009
	4.70 - 5.00	SOLID	03/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	23/11/2009	01/12/2009	24/11/2009	27/11/2009	23/11/2009	23/11/2009	30/11/2009
	5.30 - 5.50	SOLID	03/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	23/11/2009	01/12/2009	24/11/2009	27/11/2009	23/11/2009	23/11/2009	27/11/2009
G11	0.00 - 0.50	SOLID	01/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	23/11/2009	01/12/2009	24/11/2009	28/11/2009	23/11/2009	23/11/2009	27/11/2009
	1.00 - 1.60	SOLID	01/12/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009	23/11/2009	23/11/2009	24/11/2009	23/11/2009	01/12/2009	24/11/2009	28/11/2009	23/11/2009	23/11/2009	04/12/2009

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

Results Legend			Sample Identity		E9	E9	E9	G11	G11
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	1.00 - 1.50	4.70 - 5.00	5.30 - 5.50	0.00 - 0.50	1.00 - 1.60
Component	LOD/Units	Method	Date Sampled	Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
			SDG Ref	Lab Sample No.(s)	091119-64	091119-64	091119-64	091119-64	091119-64
					628215	628257	628286	628317	628371
Ammoniacal Nitrogen as N	<15 mg/kg	TM024			48.1	350	535	15.6	221
Catechol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.100	<0.100	<0.0100	<0.100
Phenol	<0.01 mg/kg	TM062 (S)			<0.0100	3.09	2.40	<0.0100	<0.100
Cresols	<0.01 mg/kg	TM062 (S)			<0.0100	25.3	5.35	<0.0100	<0.100
Resorcinol	<0.05 mg/kg	TM062 (S)			<0.0500	<0.500	<0.500	<0.0500	<0.500
Xylenols	<0.015 mg/kg	TM062 (S)			<0.0150	97.9	20.1	<0.0150	<0.150
1-Naphthol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.100	<0.100	<0.0100	<0.100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.100	<0.100	<0.0100	<0.100
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)			<0.0150	<0.150	<0.150	<0.0150	<0.150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)			<0.0200	126	27.9	0.00	0.00
pH value of soil	1 pH Units	TM133			9.05	9.52	9.08	8.11	8.67
Hexavalent Chromium	<0.6 mg/kg	TM151			<0.60	<6.0	<0.60	<0.60	<0.60
Hexavalent Chromium	<0.6 mg/kg	TM151			<0.600	<6.00	<0.600	<0.600	<0.600
Total Cyanide	<1 mg/kg	TM153			15.5	1800	130	<1.00	5.77
PCB congener 28	<3 µg/kg	TM168			<3.00				
PCB congener 52	<3 µg/kg	TM168			<3.00				
PCB congener 101	<3 µg/kg	TM168			<3.00				
PCB congener 118	<3 µg/kg	TM168			<3.00				
PCB congener 138	<3 µg/kg	TM168			<3.00				
PCB congener 153	<3 µg/kg	TM168			<3.00				
PCB congener 180	<3 µg/kg	TM168			<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168			<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180			78.03	277.58	168.95	21.44	23.15
Easily Liberated Sulphide	<15 mg/kg	TM180			94.4	389	223	22.9	26.9
Arsenic	<0.6 mg/kg	TM181			9.84	11.4	93.8	6.10	13.9
Cadmium	<0.02 mg/kg	TM181			<0.0200	<0.0200	<0.0200	<0.0200	<0.0200
Chromium	<0.9 mg/kg	TM181			14.3	14.7	29.9	13.8	11.2
Copper	<1.4 mg/kg	TM181			21.6	47.5	35.0	8.97	17.4
Lead	<0.7 mg/kg	TM181			185	59.4	65.8	17.7	80.1
Mercury	<0.14 mg/kg	TM181			0.373	<0.140	<0.140	<0.140	<0.140
Nickel	<0.2 mg/kg	TM181			17.2	14.5	42.7	22.5	14.7
Selenium	<1 mg/kg	TM181			<1.00	<1.00	<1.00	<1.00	<1.00
Zinc	<1.9 mg/kg	TM181			103	57.7	72.3	44.7	74.4
Total Sulphate	<48 mg/kg	TM221			2880	10700	1080	1360	1180

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E9	E9	E9	G11	G11
Depth (m)	1.00 - 1.50	4.70 - 5.00	5.30 - 5.50	0.00 - 0.50	1.00 - 1.60
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-64	091119-64	091119-64	091119-64	091119-64
Lab Sample No.(s)	628215	628257	628286	628317	628371

Component	LOD/Units	Method	E9	E9	E9	G11	G11
Aliphatics >C12-C16	<100 µg/kg	TM173	24000	127000	21400	57800	355000
Aliphatics >C16-C21	<100 µg/kg	TM173	9440	166000	42800	88500	346000
Aliphatics >C21-C35	<100 µg/kg	TM173	17600	274000	91400	83800	341000
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	31600	4840	12700	74700
Total Aliphatics >C12-C44	<100 µg/kg	TM173	51000	599000	160000	243000	1120000
Aliphatics >C16-C35	<100 µg/kg	TM173	27000	440000	134000	172000	686000

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
* This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E9	E9	E9	G11	G11
Depth (m)	1.00 - 1.50	4.70 - 5.00	5.30 - 5.50	0.00 - 0.50	1.00 - 1.60
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-64	091119-64	091119-64	091119-64	091119-64
Lab Sample No.(s)	628215	628257	628286	628317	628371

Component	LOD/Units	Method	E9	E9	E9	G11	G11
Aromatics >EC12-EC16	<100 µg/kg	TM173	31900	271000	56000	48100	553000
Aromatics >EC16-EC21	<100 µg/kg	TM173	17500	571000	106000	92500	829000
Aromatics >EC21-EC35	<100 µg/kg	TM173	21900	1220000	270000	353000	1860000
Aromatics >EC35-EC44	<100 µg/kg	TM173	<100	157000	39400	63600	306000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	71300	2220000	472000	557000	3550000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	71300	2220000	472000	557000	3550000

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	E9	E9	E9	G11	G11	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	4.70 - 5.00	5.30 - 5.50	0.00 - 0.50	1.00 - 1.60	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	
			SDG Ref	091119-64	091119-64	091119-64	091119-64	091119-64	
Lab Sample No.(s)	628215	628257	628286	628317	628371				
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	733	63800	28300	815	37700		
			#	#	#	#	#		#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00	<5.00		<5.00
			#	#	#	#	#		#
Benzene	<10 µg/kg	TM089	747	6830	4360	28.9	440		M
			M	M	M	M	M		M
Toluene	<2 µg/kg	TM089	18.1	4210	2570	41.7	1590		M
			M	M	M	M	M		M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	1220	742	12.8	521		M
			M	M	M	M	M		M
m & p Xylene	<6 µg/kg	TM089	<6.00	8180	3510	51.3	2930		M
			M	M	M	M	M		M
o Xylene	<3 µg/kg	TM089	<3.00	3790	1490	24.6	1370		M
			M	M	M	M	M		M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	12000	5000	75.9	4300		M
			M	M	M	M	M		M
Sum of BTEX	<10 µg/kg	TM089	765	24200	12700	159	6850		M
			M	M	M	M	M		M
Aliphatics C5-C6	<10 µg/kg	TM089	21.4	328	145	33.5	207		
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	1780	913	162	1630		
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	<10.0	<10.0	39.3	3470		
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	19600	8120	145	8130		
Total Aliphatics C5-C12	<10 µg/kg	TM089	21.4	21700	9180	379	13400		
Aromatics C6-C7	<10 µg/kg	TM089	747	6830	4360	28.9	440		
Aromatics >C7-C8	<10 µg/kg	TM089	18.1	4210	2570	41.7	1590		
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	6200	2300	148	10000		
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	29500	12200	217	12200		
Total Aromatics C6-C12	<10 µg/kg	TM089	765	46700	21400	435	24200		

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

PAH by GCMS

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E9
Depth (m)	1.00 - 1.50
Sample Type	Soil/Solid
Date Sampled	17/11/2009
Date Received	18/11/2009
SDG Ref	091119-64
Lab Sample No.(s)	628215

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	303	M		
Acenaphthylene (S)	<12 µg/kg	TM218	76.8	M		
Acenaphthene (S)	<8 µg/kg	TM218	82.3	M		
Fluorene (S)	<10 µg/kg	TM218	196	M		
Phenanthrene (S)	<15 µg/kg	TM218	1800	M		
Anthracene (S)	<16 µg/kg	TM218	314	M		
Fluoranthene (S)	<17 µg/kg	TM218	1890	M		
Pyrene (S)	<15 µg/kg	TM218	1460	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	813	M		
Chrysene (S)	<10 µg/kg	TM218	729	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	813	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	299	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	616	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	287	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	97.8	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	323	M		
PAH 16 EPA Total	<118 µg/kg	TM218	10100	M		

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SDG: 091119-64
 Job: D_MOUCHEL_ELE-40
 Client Reference: 17/11/09 (E9/G11)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66606

PAH micro by GCMS

Results Legend			Sample Identity	E9	E9	G11	G11		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	4.70 - 5.00	5.30 - 5.50	0.00 - 0.50	1.00 - 1.60		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009		
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009		
			SDG Ref	091119-64	091119-64	091119-64	091119-64		
			Lab Sample No.(s)	628257	628286	628317	628371		
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	201000	50400	20800	172			
Acenaphthylene (S)	<12 µg/kg	TM218	7840	2060	5980	<60.0			
Acenaphthene (S)	<8 µg/kg	TM218	7250	1320	2630	<40.0			
Fluorene (S)	<10 µg/kg	TM218	32400	5790	3520	50.2			
Phenanthrene (S)	<15 µg/kg	TM218	105000	15300	11700	113			
Anthracene (S)	<16 µg/kg	TM218	31100	4940	6450	<80.0			
Fluoranthene (S)	<17 µg/kg	TM218	72000	9720	24300	86.7			
Pyrene (S)	<15 µg/kg	TM218	45100	6220	16400	<75.0			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	25700	3200	10500	<70.0			
Chrysene (S)	<10 µg/kg	TM218	18700	2310	7580	<50.0			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	19800	2420	15600	<75.0			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	8680	1070	6470	<70.0			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	17000	1920	16300	<75.0			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	8250	892	8880	<90.0			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	2770	295	2460	<115			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	8880	955	9290	<120			
PAH 16 EPA Total	<118 µg/kg	TM218	612000	109000	168000	693			

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E9	E9	E9	G11	G11
Depth (m)	1.00 - 1.50	4.70 - 5.00	5.30 - 5.50	0.00 - 0.50	1.00 - 1.60
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-64	091119-64	091119-64	091119-64	091119-64
Lab Sample No.(s)	628215	628257	628286	628317	628371

Component	LOD/Units	Method	E9	E9	E9	G11	G11
Total Aliphatics >C5-C44	<100 µg/kg	TM173	51000	621000	170000	243000	1130000
Total Aromatics >C6-C44	<100 µg/kg	TM173	72000	2270000	494000	558000	3570000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	123000	2890000	663000	801000	4700000

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SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

VOC MS (S)

Results Legend			Sample Identity		E9	E9	E9	G11
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.00 - 1.50	4.70 - 5.00	5.30 - 5.50	1.00 - 1.60
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled		17/11/2009	17/11/2009	17/11/2009	17/11/2009
			Date Received		18/11/2009	18/11/2009	18/11/2009	18/11/2009
			SDG Ref		091119-64	091119-64	091119-64	091119-64
			Lab Sample No.(s)		628215	628257	628286	628371
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116			106	123	123	123
Toluene-d8**	%	TM116			69.9	74.3	82.5	73.2
4-Bromofluorobenzene**	%	TM116			45.8	71.2	69.4	63.0
Dichlorodifluoromethane	<13 µg/kg	TM116			<13.0	<13.0	<13.0	<13.0
Chloromethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Vinyl Chloride	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Bromoethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Chloroethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Trichlorofluoromethane	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
1,1-Dichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Carbon Disulphide	<9 µg/kg	TM116			27.1	135	32.7	15.3
Dichloromethane	<10 µg/kg	TM116			19.8	<10.0	<10.0	<10.0
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
trans-1,2-Dichloroethene	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
1,1-Dichloroethane	<8 µg/kg	TM116			<8.00	<8.00	<8.00	<8.00
cis-1,2-Dichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
2,2-Dichloropropane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Bromochloromethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Chloroform	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
1,1,1-Trichloroethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
1,1-Dichloropropene	<13 µg/kg	TM116			<13.0	<13.0	<13.0	<13.0
Carbontetrachloride	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
1,2-Dichloroethane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Benzene	<9 µg/kg	TM116			1610	4850	2440	593
Trichloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	212
1,2-Dichloropropane	<10 µg/kg	TM116			<10.0	<10.0	<10.0	<10.0
Dibromomethane	<12 µg/kg	TM116			<12.0	<12.0	<12.0	<12.0
Bromodichloromethane	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
cis-1,3-Dichloropropene	<25 µg/kg	TM116			<25.0	<25.0	<25.0	<25.0
Toluene	<6 µg/kg	TM116			104	4360	1380	1760
trans-1,3-Dichloropropene	<27 µg/kg	TM116			<27.0	<27.0	<27.0	<27.0
1,1,2-Trichloroethane	<9 µg/kg	TM116			<9.00	<9.00	27.5	<9.00
1,3-Dichloropropane	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
Tetrachloroethene	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
Dibromochloromethane	<9 µg/kg	TM116			<9.00	<9.00	<9.00	<9.00
1,2-Dibromoethane	<14 µg/kg	TM116			<14.0	<14.0	<14.0	<14.0
Chorobenzene	<7 µg/kg	TM116			<7.00	<7.00	<7.00	<7.00
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116			<11.0	<11.0	<11.0	<11.0
Ethylbenzene	<9 µg/kg	TM116			31.9	1830	556	982

SDG: 091119-64
Job: D_MOUCHEL_ELE-40
Client Reference: 17/11/09 (E9/G11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66606

VOC MS (S)

Results Legend			Sample Identity		E9	E9	E9	G11
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	4.70 - 5.00	5.30 - 5.50	1.00 - 1.60	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	
			SDG Ref	091119-64	091119-64	091119-64	091119-64	
Lab Sample No.(s)	628215	628257	628286	628371				
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	138	16500	2760	3850		
			#	#	#	#		
o-Xylene	<11 µg/kg	TM116	59.1	7670	1210	2450		
			M	M	M	M		
Styrene	<11 µg/kg	TM116	<11.0	<11.0	<11.0	514		
			M	M	M	M		
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0		
			M	M	M	M		
Isopropylbenzene	<9 µg/kg	TM116	<9.00	264	47.9	237		
			M	M	M	M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	<15.0	<15.0		
			#	#	#	#		
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	<13.0		
			M	M	M	M		
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	<14.0		
			M	M	M	M		
Propylbenzene	<6 µg/kg	TM116	<6.00	444	115	370		
			M	M	M	M		
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	<14.0		
			#	#	#	#		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	17.8	5460	589	3050		
			M	M	M	M		
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00		
			#	#	#	#		
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0		
			#	#	#	#		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	22.3	9800	1120	6050		
			#	#	#	#		
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	72.6	11.4	64.7		
			#	#	#	#		
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	<8.00	61.1	274		
			#	#	#	#		
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	<8.00		
			#	#	#	#		
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0		
			M	M	M	M		
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00		
			#	#	#	#		
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	<8.00		
			M	M	M	M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0		
			M	M	M	M		
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00		
			#	#	#	#		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00		
			#	#	#	#		
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	<15.0	<15.0		
			#	#	#	#		
Naphthalene	<7 µg/kg	TM116	1540	356000	101000	332000		
			#	#	#	#		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0		
			#	#	#	#		

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 03 December 2009
Job: D_MOUCHEL_ELE-41
Sample Delivery Group (SDG): 091119-78 **Report No.:** 66504
Your Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

A total of 5 samples was received on Wednesday November 18, 2009 and completed on Thursday December 03, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-78
 Job: D_MOUCHEL_ELE-41
 Client Reference: 17/11/09 (C9/C10)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66504

SOLID

Results Legend	Sample ID	C10				C9				Total
		0.75 - 1.00		2.50 - 2.90		2.00 - 2.50		4.50 - 5.00		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	
X Test										
N No Determination Possible										
Ammonium Soil by Titration	All		X		X			X		X
Asbestos Identification	All					X				
Asbestos Presence Screen	All									
Cyanides Complex/Free/Total/Thiocya	Total Cyanide					X				
Easily Liberated Sulphide	All		X		X			X		X
EPH CWG (Aliphatic) GC (S)	All		X		X			X		X
EPH CWG (Aromatic) GC (S)	All		X		X			X		X
GRO BTEX MTBE GC (S)	All		X		X			X		X
Hexavalent Chromium (s)	All					X				
Metals by iCap-OES (Soil)	Arsenic						X			X
	Cadmium		X		X			X		X
	Chromium		X		X			X		X
	Copper		X		X			X		X
	Lead		X		X			X		X
	Mercury		X		X			X		X
	Nickel		X		X			X		X
	Selenium		X		X			X		X
	Zinc		X		X			X		X
PAH micro by GCMS	All		X		X			X		X
pH	All		X		X			X		X
Phenols by HPLC (S)	All		X		X			X		X
Sample description	All		X		X			X		X
Total Sulphate	All		X		X			X		X
TPH CWG GC (S)	All		X		X			X		X
VOC MS (S)	All						X		X	

SDG:	091119-78	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-41	Attention:	Verity Sankey
Client Reference:	17/11/09 (C9/C10)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66504

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C10	0.75 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.50 - 2.90	Brown	Sandy Clay	0.1 - 2 mm	Stones
C9	2.00 - 2.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	4.50 - 5.00	Grey	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-78
Job: D_MOUCHEL_ELE-41
Client Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66504

Test Completion dates

SDG reference: 091119-78

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Identification	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GC/MS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOCS MS (S)
C10	0.75 - 1.00	SOLID	27/11/2009			23/11/2009	26/11/2009	24/11/2009	24/11/2009	01/12/2009	24/11/2009	24/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	24/11/2009	24/11/2009	01/12/2009
	2.50 - 2.90	SOLID	27/11/2009			23/11/2009	26/11/2009	24/11/2009	24/11/2009	01/12/2009	24/11/2009	24/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	24/11/2009	24/11/2009	01/12/2009
C9	0.25 - 0.75	SOLID		23/11/2009	20/11/2009														
	2.00 - 2.50	SOLID	27/11/2009			23/11/2009	26/11/2009	24/11/2009	24/11/2009	03/12/2009	24/11/2009	24/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	24/11/2009	24/11/2009	03/12/2009
	4.50 - 5.00	SOLID	27/11/2009			23/11/2009	26/11/2009	24/11/2009	24/11/2009	01/12/2009	24/11/2009	24/11/2009	23/11/2009	23/11/2009	24/11/2009	20/11/2009	24/11/2009	24/11/2009	03/12/2009

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SDG: 091119-78
Job: D_MOUCHEL_ELE-41
Client Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66504

Results Legend			Sample Identity	C10	C10	C9	C9	C9
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.75 - 1.00	2.50 - 2.90	0.25 - 0.75	2.00 - 2.50	4.50 - 5.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
			SDG Ref	091119-78	091119-78	091119-78	091119-78	091119-78
			Lab Sample No.(s)	628866	628919	628592	628679	628837
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001				Possible ACM Detect		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	52.8		464	84.4	
Date of Analysis	-	TM048			20/11/9			
Analysed By	-	TM048			Rhodri Williams			
Comments	-	TM048			Unable to identify sub			
Chrysotile (White) Asbestos	-	TM048			Detected			
Amosite (Brown) Asbestos	-	TM048			Not Detected			
Crocidolite (Blue) Asbestos	-	TM048			Not Detected			
Fibrous Anthophyllite	-	TM048			Not Detected			
Fibrous Tremolite	-	TM048			Not Detected			
Fibrous Actinolite	-	TM048			Not Detected			
Non-Asbestos Fibre	-	TM048			Not Detected			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100		<0.0100	<0.100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	0.0974		1.26	13.4	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0400		3.66	16.9	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500		<0.0500	<0.500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	0.179		6.86	10.2	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100		<0.0100	<0.100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100		<0.0100	<0.100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150		<0.0150	<0.150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.920		11.8	40.5	
pH value of soil	1 pH Units	TM133	8.70	8.91		9.33	9.06	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60		<3.0	<0.60	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600		<3.00	<0.600	
Total Cyanide	<1 mg/kg	TM153	6.65	7.07		4.79	1.74	
Easily Liberated Sulphide	<15 mg/kg	TM180	20.29	122.13		140.78	21.59	
Easily Liberated Sulphide	<15 mg/kg	TM180	22.7	132		182	23.5	
Arsenic	<0.6 mg/kg	TM181	13.1	5.57		18.4	9.22	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200		0.0224	<0.0200	
Chromium	<0.9 mg/kg	TM181	19.8	6.57		26.6	9.54	
Copper	<1.4 mg/kg	TM181	19.6	3.43		20.6	4.11	
Lead	<0.7 mg/kg	TM181	66.8	3.93		44.1	7.30	
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140		<0.140	<0.140	
Nickel	<0.2 mg/kg	TM181	23.7	7.56		35.6	6.87	
Selenium	<1 mg/kg	TM181	<1.00	<1.00		<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	49.9	16.0		58.9	17.9	
Total Sulphate	<48 mg/kg	TM221	1960	1230		626	837	

SDG: 091119-78
Job: D_MOUCHEL_ELE-41
Client Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66504

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C10	C10	C9	C9
Depth (m)	0.75 - 1.00	2.50 - 2.90	2.00 - 2.50	4.50 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-78	091119-78	091119-78	091119-78
Lab Sample No.(s)	628866	628919	628679	628837

Component	LOD/Units	Method	C10	C10	C9	C9
Aliphatics >C12-C16	<100 µg/kg	TM173	7280	35500	48700	27800
Aliphatics >C16-C21	<100 µg/kg	TM173	13100	53400	53900	38400
Aliphatics >C21-C35	<100 µg/kg	TM173	95600	62300	61800	54500
Aliphatics >C35-C44	<100 µg/kg	TM173	5350	6120	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	121000	157000	164000	121000
Aliphatics >C16-C35	<100 µg/kg	TM173	109000	116000	116000	92900

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SDG: 091119-78
Job: D_MOUCHEL_ELE-41
Client Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66504

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	C10	C10	C9	C9		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.75 - 1.00	2.50 - 2.90	2.00 - 2.50	4.50 - 5.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009		
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009		
			SDG Ref	091119-78	091119-78	091119-78	091119-78		
			Lab Sample No.(s)	628866	628919	628679	628837		
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	1050	37100	981000	33100	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00	#	#	#
Benzene	<10 µg/kg	TM089	45.9	17.3	16900	24.0	M	M	M
Toluene	<2 µg/kg	TM089	48.2	182	64200	129	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<6.00	209	22300	186	M	M	M
m & p Xylene	<6 µg/kg	TM089	45.9	1960	150000	2120	M	M	M
o Xylene	<3 µg/kg	TM089	19.0	1020	59500	938	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	65.0	2980	210000	3060	M	M	M
Sum of BTEX	<10 µg/kg	TM089	159	3390	313000	3400	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	22.8	40.9	4940	44.3			
Aliphatics >C6-C8	<10 µg/kg	TM089	170	2230	63600	1550			
Aliphatics >C8-C10	<10 µg/kg	TM089	79.5	5050	<10.0	4280			
Aliphatics >C10-C12	<10 µg/kg	TM089	198	7520	322000	6980			
Total Aliphatics C5-C12	<10 µg/kg	TM089	471	14800	390000	12900			
Aromatics C6-C7	<10 µg/kg	TM089	45.9	17.3	16900	24.0			
Aromatics >C7-C8	<10 µg/kg	TM089	48.2	182	64200	129			
Aromatics >EC8-EC10	<10 µg/kg	TM089	184	10800	109000	9670			
Aromatics >EC10-EC12	<10 µg/kg	TM089	297	11300	483000	10500			
Total Aromatics C6-C12	<10 µg/kg	TM089	575	22300	673000	20300			

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SDG: 091119-78
Job: D_MOUCHEL_ELE-41
Client Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66504

PAH micro by GCMS

Results Legend			Sample Identity	C10	C10	C9	C9		
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.75 - 1.00	2.50 - 2.90	2.00 - 2.50	4.50 - 5.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009		
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009		
			SDG Ref	091119-78	091119-78	091119-78	091119-78		
			Lab Sample No.(s)	628866	628919	628679	628837		
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	2020	102000	78500	83500			
Acenaphthylene (S)	<12 µg/kg	TM218	2220	29400	21700	17400			
Acenaphthene (S)	<8 µg/kg	TM218	313	7400	3830	3590			
Fluorene (S)	<10 µg/kg	TM218	912	22100	18300	16000			
Phenanthrene (S)	<15 µg/kg	TM218	8710	61100	46600	40300			
Anthracene (S)	<16 µg/kg	TM218	3590	20400	17300	14600			
Fluoranthene (S)	<17 µg/kg	TM218	17200	42200	32500	27300			
Pyrene (S)	<15 µg/kg	TM218	14000	26900	21200	17500			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	10600	14000	11200	8600			
Chrysene (S)	<10 µg/kg	TM218	7620	10200	7620	6290			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	12400	11500	9320	7080			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	5900	4560	3900	2990			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	12200	10200	8280	6330			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	7160	4430	3860	2840			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	2490	1390	1180	895			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	7520	4730	4150	3000			
PAH 16 EPA Total	<118 µg/kg	TM218	115000	373000	289000	258000			

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SDG: 091119-78
Job: D_MOUCHEL_ELE-41
Client Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66504

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C10	C10	C9	C9
Depth (m)	0.75 - 1.00	2.50 - 2.90	2.00 - 2.50	4.50 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-78	091119-78	091119-78	091119-78
Lab Sample No.(s)	628866	628919	628679	628837

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	122000	172000	555000	134000
Total Aromatics >C6-C44	<100 µg/kg	TM173	725000	762000	1780000	685000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	847000	934000	2340000	818000

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SDG: 091119-78
Job: D_MOUCHEL_ELE-41
Client Reference: 17/11/09 (C9/C10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66504

VOC MS (S)

Results Legend			Sample Identity		C9	C9				
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.00 - 2.50	4.50 - 5.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	17/11/2009	17/11/2009					
			Date Received	18/11/2009	18/11/2009					
			SDG Ref	091119-78	091119-78					
			Lab Sample No.(s)	628679	628837					
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM116		128	130					
Toluene-d8**	%	TM116		68.1	75.9					
4-Bromofluorobenzene**	%	TM116		60.3	61.9					
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0					
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0					
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0					
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00					
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
Carbon Disulphide	<9 µg/kg	TM116		89.7	59.6					
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0					
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0					
Chloroform	<10 µg/kg	TM116		<10.0	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0					
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0					
Benzene	<9 µg/kg	TM116		6200	56.7					
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	18.8					
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0					
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0					
Toluene	<6 µg/kg	TM116		59800	697					
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00					
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00					
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0					
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0					
Ethylbenzene	<9 µg/kg	TM116		13400	1170					

SDG: 091119-78
 Job: D_MOUCHEL_ELE-41
 Client Reference: 17/11/09 (C9/C10)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66504

VOC MS (S)

Results Legend			Sample Identity		C9	C9				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.00 - 2.50	4.50 - 5.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	17/11/2009	17/11/2009					
			Date Received	18/11/2009	18/11/2009					
			SDG Ref	091119-78	091119-78					
			Lab Sample No.(s)	628679	628837					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	165000		3470	#	#			
o-Xylene	<11 µg/kg	TM116	65100	M	1680	M	M			
Styrene	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0	M	M			
Isopropylbenzene	<9 µg/kg	TM116	897	M	239	M	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0	#	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0	M	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0	M	M			
Propylbenzene	<6 µg/kg	TM116	1530	M	435	M	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0	#	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	13000	M	1790	M	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00	#	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	73800	#	5790	#	#			
sec-Butylbenzene	<8 µg/kg	TM116	132	#	54.0	#	#			
4-Isopropyltoluene	<8 µg/kg	TM116	477	#	190	#	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<8.00	#	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00	#	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00	M	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<7.00	#	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00	#	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0	#	#			
Naphthalene	<7 µg/kg	TM116	1360000		193000					
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	#			

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-42
Sample Delivery Group (SDG): 091119-85
Your Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks
Report No.: 66890

A total of 5 samples was received on Wednesday November 18, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66890

SOLID

Results Legend	Sample ID	D10				G5				Total		
		0.10 - 0.50		1.50 - 2.00		1.00 - 1.50		4.00 - 4.50			8.00 - 8.50	
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)			
Ammonium Soil by Titration	All										0	
		X		X		X		X		X	5	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide										0	
		X		X		X		X		X	5	
Easily Liberated Sulphide	All										0	
		X		X		X		X		X	5	
EPH CWG (Aliphatic) GC (S)	All										0	
		X		X		X		X		X	5	
EPH CWG (Aromatic) GC (S)	All										0	
		X		X		X		X		X	5	
GRO BTEX MTBE GC (S)	All										0	
		X		X		X		X		X	5	
Hexavalent Chromium (s)	All										0	
		X		X		X		X		X	5	
Metals by iCap-OES (Soil)	Arsenic										0	
		X		X		X		X		X	5	
	Cadmium										0	
		X		X		X		X		X	5	
	Chromium										0	
		X		X		X		X		X	5	
	Copper										0	
		X		X		X		X		X	5	
	Lead										0	
		X		X		X		X		X	5	
	Mercury										0	
		X		X		X		X		X	5	
	Nickel										0	
		X		X		X		X		X	5	
	Selenium										0	
		X		X		X		X		X	5	
	Zinc										0	
		X		X		X		X		X	5	
PAH micro by GCMS	All										0	
		X		X		X		X		X	5	
PCBs by GCMS	All										0	
				X						X	2	
pH	All										0	
			X		X		X		X		5	
Phenols by HPLC (S)	All										0	
			X		X		X		X		5	
Sample description	All										0	
		X		X		X		X		X	5	
Total Sulphate	All										0	
		X		X		X		X		X	5	
TPH CWG GC (S)	All										0	
		X		X		X		X		X	5	
VOC MS (S)	All										0	
		X							X		2	

SDG:	091119-85	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-42	Attention:	Verity Sankey
Client Reference:	17/11/09 (G5 & D10)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66890

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D10	0.10 - 0.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	1.50 - 2.00	Brown	Clay	<0.063 mm	Stones
G5	1.00 - 1.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.00 - 4.50	Grey	Silty Clay	0.063 - 0.1 mm	Stones
	8.00 - 8.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66890

Test Completion dates

SDG reference: 091119-85

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
D10	0.10 - 0.50	SOLID	30/11/2009	01/12/2009	01/12/2009	24/11/2009	25/11/2009	24/11/2009	02/12/2009	23/11/2009	24/11/2009	25/11/2009	01/12/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	27/11/2009
	1.50 - 2.00	SOLID		01/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009		26/11/2009	25/11/2009	25/11/2009	01/12/2009	26/11/2009	26/11/2009	08/12/2009	24/11/2009	27/11/2009
G5	1.00 - 1.50	SOLID		01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009		23/11/2009	24/11/2009	24/11/2009	01/12/2009	24/11/2009	24/11/2009	26/11/2009	23/11/2009	27/11/2009
	4.00 - 4.50	SOLID		01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009		23/11/2009	24/11/2009	24/11/2009	01/12/2009	24/11/2009	24/11/2009	04/12/2009	23/11/2009	30/11/2009
	8.00 - 8.50	SOLID	30/11/2009	01/12/2009	24/11/2009	20/11/2009	24/11/2009	23/11/2009		23/11/2009	24/11/2009	24/11/2009	01/12/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	27/11/2009

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66249

Results Legend			Sample Identity		D10	D10	G5	G5	G5	
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	Sample Type	0.10 - 0.50	1.50 - 2.00	1.00 - 1.50	4.00 - 4.50	8.00 - 8.50	
			Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
			Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
			SDG Ref	091119-85	091119-85	091119-85	091119-85	091119-85	091119-85	091119-85
			Lab Sample No.(s)	629552	629624	628719	628745	629454		
			Component	LOD/Units	Method					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	67.0	<15.0	228	377			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	52.1	<15.0	177	293			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	0.463	<0.0100	<0.0100	<0.0300			
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	1.56	<0.0100	<0.0100	0.228			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	6.70	<0.0150	<0.0200	0.590			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	8.72	<0.0200	<0.0200	0.858			
pH value of soil	1 pH Units	TM133	10.97	8.54	7.70	8.89	8.60			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<3.00	<0.600	<0.600	<3.00			
Total Cyanide	<1 mg/kg	TM153	1.65	97.1	809	<1.00	<1.00			
PCB congener 28	<3 µg/kg	TM168		<3.00			<3.00			
PCB congener 52	<3 µg/kg	TM168		<3.00			<3.00			
PCB congener 101	<3 µg/kg	TM168		<3.00			<3.00			
PCB congener 118	<3 µg/kg	TM168		<3.00			<3.00			
PCB congener 138	<3 µg/kg	TM168		<3.00			<3.00			
PCB congener 153	<3 µg/kg	TM168		<3.00			<3.00			
PCB congener 180	<3 µg/kg	TM168		<3.00			<3.00			
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00			<3.00			
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	89.9	<15.0	44.6	442			
Arsenic	<0.6 mg/kg	TM181	7.83	3.70	35.0	3.60	11.2			
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200			
Chromium	<0.9 mg/kg	TM181	21.9	7.97	22.3	26.8	20.6			
Copper	<1.4 mg/kg	TM181	14.7	5.02	119	15.7	7.98			
Lead	<0.7 mg/kg	TM181	31.9	9.23	193	31.8	26.9			
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140	<0.140	<0.140			
Nickel	<0.2 mg/kg	TM181	23.6	7.32	44.8	28.0	21.3			
Selenium	<1 mg/kg	TM181	<1.00	<1.00	1.07	<1.00	<1.00			
Zinc	<1.9 mg/kg	TM181	57.3	16.8	128	37.5	48.5			
Total Sulphate	<48 mg/kg	TM221	4530	1430	22400	1080	1080			

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66249

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D10	D10	G5	G5	G5
Depth (m)	0.10 - 0.50	1.50 - 2.00	1.00 - 1.50	4.00 - 4.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-85	091119-85	091119-85	091119-85	091119-85
Lab Sample No.(s)	629552	629624	628719	628745	629454

Component	LOD/Units	Method	D10	D10	G5	G5	G5
Aliphatics >C12-C16	<100 µg/kg	TM173	17800	76500	61800	11900	8640
Aliphatics >C16-C21	<100 µg/kg	TM173	24300	67500	66800	15400	7340
Aliphatics >C21-C35	<100 µg/kg	TM173	57600	50500	114000	28000	8890
Aliphatics >C35-C44	<100 µg/kg	TM173	11500	<100	7370	4460	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	111000	195000	250000	59700	24900
Aliphatics >C16-C35	<100 µg/kg	TM173	81900	118000	180000	43400	16200

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66249

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D10	D10	G5	G5	G5
Depth (m)	0.10 - 0.50	1.50 - 2.00	1.00 - 1.50	4.00 - 4.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-85	091119-85	091119-85	091119-85	091119-85
Lab Sample No.(s)	629552	629624	628719	628745	629454

Component	LOD/Units	Method	D10	D10	G5	G5	G5
Aromatics >EC12-EC16	<100 µg/kg	TM173	20700	182000	74800	14000	18300
Aromatics >EC16-EC21	<100 µg/kg	TM173	27500	284000	104000	13800	27700
Aromatics >EC21-EC35	<100 µg/kg	TM173	250000	599000	846000	64600	82100
Aromatics >EC35-EC44	<100 µg/kg	TM173	64400	113000	273000	17100	25400
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	363000	1180000	1300000	109000	153000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	363000	1180000	1300000	109000	153000

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66249

GRO BTEX MTBE GC (S)

Sample Identity	D10	D10	G5	G5	G5
	Depth (m)	1.50 - 2.00	1.00 - 1.50	4.00 - 4.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-85	091119-85	091119-85	091119-85	091119-85
Lab Sample No.(s)	629552	629624	628719	628745	629454

Component	LOD/Units	Method	D10	D10	G5	G5	G5
GRO C5-C12	<44 µg/kg	TM089	450	77400	1930	2340	22400
MTBE	<5 µg/kg	TM089	16.8	168	21.1	12.8	33.5
Benzene	<10 µg/kg	TM089	25.2	690	259	1920	856
Toluene	<2 µg/kg	TM089	37.2	2080	139	17.4	1340
Ethyl Benzene	<3 µg/kg	TM089	<6.00	1620	23.8	39.4	391
m & p Xylene	<6 µg/kg	TM089	33.6	8030	162	52.2	2320
o Xylene	<3 µg/kg	TM089	16.8	4110	47.5	80.0	945
Sum m&p and o Xylene	<10 µg/kg	TM089	50.4	12100	210	132	3270
Sum of BTEX	<10 µg/kg	TM089	113	16500	631	2110	5860
Aliphatics C5-C6	<10 µg/kg	TM089	12.4	48.8	15.0	<10.0	17.0
Aliphatics >C6-C8	<10 µg/kg	TM089	165	3900	44.7	71.5	1050
Aliphatics >C8-C10	<10 µg/kg	TM089	17.2	9650	17.1	11.7	2560
Aliphatics >C10-C12	<10 µg/kg	TM089	39.8	13000	37.7	48.5	3610
Total Aliphatics C5-C12	<10 µg/kg	TM089	235	26600	547	132	7240
Aromatics C6-C7	<10 µg/kg	TM089	25.2	690	259	1920	856
Aromatics >C7-C8	<10 µg/kg	TM089	37.2	2080	139	17.4	1340
Aromatics >EC8-EC10	<10 µg/kg	TM089	76.2	26300	490	189	7490
Aromatics >EC10-EC12	<10 µg/kg	TM089	59.7	19600	476	72.7	5420
Total Aromatics C6-C12	<10 µg/kg	TM089	198	50600	1360	2200	15100

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66249

PAH micro by GCMS

Results Legend			Sample Identity	D10	D10	G5	G5	G5
# ISO17025 accredited. mCERES accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.10 - 0.50 Soil/Solid 17/11/2009 18/11/2009 091119-85 629552	1.50 - 2.00 Soil/Solid 17/11/2009 18/11/2009 091119-85 629624	1.00 - 1.50 Soil/Solid 17/11/2009 18/11/2009 091119-85 628719	4.00 - 4.50 Soil/Solid 17/11/2009 18/11/2009 091119-85 628745	8.00 - 8.50 Soil/Solid 17/11/2009 18/11/2009 091119-85 629454
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	1870	239000	17800	665	7000	
Acenaphthylene (S)	<12 µg/kg	TM218	2580	26700	9690	138	2180	
Acenaphthene (S)	<8 µg/kg	TM218	113	17600	624	80.5	717	
Fluorene (S)	<10 µg/kg	TM218	279	40900	1360	221	2560	
Phenanthrene (S)	<15 µg/kg	TM218	1490	92600	9090	1030	7240	
Anthracene (S)	<16 µg/kg	TM218	922	32400	3640	305	2430	
Fluoranthene (S)	<17 µg/kg	TM218	4680	59800	15800	964	5620	
Pyrene (S)	<15 µg/kg	TM218	4970	36900	13300	714	3830	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	4640	16700	10300	397	2120	
Chrysene (S)	<10 µg/kg	TM218	3650	11400	7760	317	1450	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	9000	15200	22100	383	1710	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3600	6430	7970	161	741	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	7530	12400	20300	371	1590	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4700	5590	18000	195	688	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1650	1430	4720	66.2	225	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	5090	5780	21400	261	729	
PAH 16 EPA Total	<118 µg/kg	TM218	56800	621000	184000	6270	40800	

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66249

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D10	D10	G5	G5	G5
Depth (m)	0.10 - 0.50	1.50 - 2.00	1.00 - 1.50	4.00 - 4.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-85	091119-85	091119-85	091119-85	091119-85
Lab Sample No.(s)	629552	629624	628719	628745	629454

Component	LOD/Units	Method	D10	D10	G5	G5	G5
Total Aliphatics >C5-C44	<100 µg/kg	TM173	111000	221000	250000	59900	32100
Total Aromatics >C6-C44	<100 µg/kg	TM173	363000	1230000	1300000	112000	169000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	475000	1450000	1550000	172000	201000

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SDG: 091119-85
Job: D_MOUCHEL_ELE-42
Client Reference: 17/11/09 (G5 & D10)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66249

VOC MS (S)

Results Legend			Sample Identity	D10	G5				
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.50	8.00 - 8.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	17/11/2009	17/11/2009				
			Date Received	18/11/2009	18/11/2009				
			SDG Ref	091119-85	091119-85				
			Lab Sample No.(s)	629552	629454				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	97.0	114					
Toluene-d8**	%	TM116	84.6	89.1					
4-Bromofluorobenzene**	%	TM116	56.7	80.6					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0					
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0					
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0					
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00					
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00					
Carbon Disulphide	<9 µg/kg	TM116	<9.00	<9.00					
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0					
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0					
Chloroform	<10 µg/kg	TM116	<10.0	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0					
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0					
Benzene	<9 µg/kg	TM116	23.4	1480					
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0					
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0					
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0					
Toluene	<6 µg/kg	TM116	30.9	2420					
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00					
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00					
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0					
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0					
Ethylbenzene	<9 µg/kg	TM116	<9.00	655					

SDG: 091119-85
 Job: D_MOUCHEL_ELE-42
 Client Reference: 17/11/09 (G5 & D10)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66249

VOC MS (S)

Results Legend			Sample Identity	D10	G5				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.50	8.00 - 8.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	17/11/2009	17/11/2009				
			Date Received	18/11/2009	18/11/2009				
			SDG Ref	091119-85	091119-85				
			Lab Sample No.(s)	629552	629454				
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116		33.0	4230	#	#		
o-Xylene	<11 µg/kg	TM116		13.6	1590	M	M		
Styrene	<11 µg/kg	TM116		<11.0	<11.0	M	M		
Bromoform	<12 µg/kg	TM116		<12.0	<12.0	M	M		
Isopropylbenzene	<9 µg/kg	TM116		<9.00	109	M	M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116		<15.0	<15.0	#	#		
1,2,3-Trichloropropane	<13 µg/kg	TM116		<13.0	<13.0	M	M		
Bromobenzene	<14 µg/kg	TM116		<14.0	<14.0	M	M		
Propylbenzene	<6 µg/kg	TM116		<6.00	176	M	M		
2-Chlorotoluene	<14 µg/kg	TM116		<14.0	<14.0	#	#		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		<8.00	780	M	M		
4-Chlorotoluene	<9 µg/kg	TM116		<9.00	<9.00	#	#		
tert-Butylbenzene	<12 µg/kg	TM116		<12.0	<12.0	#	#		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116		13.8	1690	#	#		
sec-Butylbenzene	<8 µg/kg	TM116		<8.00	26.0	#	#		
4-Isopropyltoluene	<8 µg/kg	TM116		<8.00	86.0	#	#		
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8.00	18.00	#	#		
1,4-Dichlorobenzene	<11 µg/kg	TM116		<11.0	<11.0	M	M		
n-Butylbenzene	<7 µg/kg	TM116		<7.00	<7.00	#	#		
1,2-Dichlorobenzene	<8 µg/kg	TM116		<8.00	<8.00	M	M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116		<11.0	<11.0	M	M		
Tert-amyl methyl ether	<7 µg/kg	TM116		<7.00	<7.00	#	#		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116		<9.00	<9.00	#	#		
Hexachlorobutadiene	<15 µg/kg	TM116		<15.0	<15.0	#	#		
Naphthalene	<7 µg/kg	TM116		303	39300	#	#		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116		<12.0	<12.0	#	#		

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-84
Sample Delivery Group (SDG): 091119-99 **Report No.:** 66681
Your Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

A total of 3 samples was received on Wednesday November 18, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091119-99
Job: D_MOUCHEL_ELE-84
Client Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66681

SOLID

Results Legend	Sample ID	12						Total
		0.55 - 0.70		2.00 - 2.50		8.50 - 9.00		
		250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All						0	
Asbestos Presence Screen	All	X		X		X	3	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X					1	
Easily Liberated Sulphide	All	X		X		X	3	
EPH CWG (Aliphatic) GC (S)	All	X		X		X	3	
EPH CWG (Aromatic) GC (S)	All	X		X		X	3	
GRO BTEX MTBE GC (S)	All			X		X	2	
Hexavalent Chromium (s)	All		X			X	2	
Metals by iCap-OES (Soil)	Arsenic	X		X		X	3	
	Cadmium	X		X		X	3	
	Chromium	X		X		X	3	
	Copper	X		X		X	3	
	Lead	X		X		X	3	
	Mercury	X		X		X	3	
	Nickel	X		X		X	3	
	Selenium	X		X		X	3	
	Zinc	X		X		X	3	
PAH micro by GCMS	All	X		X		X	3	
PCBs by GCMS	All	X					1	
pH	All		X		X	X	3	
Phenols by HPLC (S)	All		X		X	X	3	
Sample description	All	X		X		X	3	
Total Sulphate	All	X		X		X	3	
TPH CWG GC (S)	All	X		X		X	3	

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SDG:	091119-99	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-84	Attention:	Verity Sankey
Client Reference:	14/11/09 (I2)	Order No.:	
Location:	LIMERICK GASWORKS	Report No.:	66681

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
I2	0.55 - 0.70	Black	Silty Sand	0.063 - 0.1 mm	Stones
	2.00 - 2.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	8.50 - 9.00	Grey	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091119-99
Job: D_MOUCHEL_ELE-84
Client Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66681

Test Completion dates

SDG reference: 091119-99

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
I2	0.55 - 0.70	SOLID	29/11/2009	20/11/2009	18/11/2009	20/11/2009	24/11/2009	21/11/2009	20/11/2009	23/11/2009	20/11/2009	26/11/2009	28/11/2009	28/11/2009	27/11/2009	19/11/2009	18/11/2009	04/12/2009
	2.00 - 2.50	SOLID	27/11/2009	20/11/2009	18/11/2009	20/11/2009	24/11/2009	20/11/2009	20/11/2009	23/11/2009	20/11/2009	26/11/2009	28/11/2009	28/11/2009	27/11/2009	19/11/2009	18/11/2009	04/12/2009
	8.50 - 9.00	SOLID	29/11/2009	20/11/2009	18/11/2009	20/11/2009	24/11/2009	20/11/2009	20/11/2009	23/11/2009	20/11/2009	26/11/2009	28/11/2009	28/11/2009	28/11/2009	20/11/2009	18/11/2009	04/12/2009

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SDG: 091119-99
Job: D_MOUCHEL_ELE-84
Client Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66681

Results Legend			Sample Identity	I2	I2	I2			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 0.70	2.00 - 2.50	8.50 - 9.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	14/11/2009	14/11/2009			
			Date Received	18/11/2009	18/11/2009	18/11/2009			
			SDG Ref	091119-99	091119-99	091119-99			
			Lab Sample No.(s)	623683	623734	623873			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	34.5	172	310				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	26.8	134	241				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	<0.0300	<0.0100	<0.0100				
Cresols	<0.01 mg/kg	TM062 (S)	<0.0300	<0.0100	<0.0100				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0700	0.00	0.00				
pH value of soil	1 pH Units	TM133	9.64	7.88	7.91				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	0.0917	<3.00				
Total Cyanide	<1 mg/kg	TM153	629	<1.00	2.17				
PCB congener 28	<3 µg/kg	TM168	<3.00						
PCB congener 52	<3 µg/kg	TM168	<3.00						
PCB congener 101	<3 µg/kg	TM168	<3.00						
PCB congener 118	<3 µg/kg	TM168	<3.00						
PCB congener 138	<3 µg/kg	TM168	<3.00						
PCB congener 153	<3 µg/kg	TM168	<3.00						
PCB congener 180	<3 µg/kg	TM168	<3.00						
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00						
Easily Liberated Sulphide	<15 mg/kg	TM180	37.5	118	109				
Arsenic	<0.6 mg/kg	TM181	20.3	7.37	8.18				
Cadmium	<0.02 mg/kg	TM181	0.469	0.124	0.128				
Chromium	<0.9 mg/kg	TM181	13.8	10.9	10.1				
Copper	<1.4 mg/kg	TM181	115	11.2	12.2				
Lead	<0.7 mg/kg	TM181	1370	30.9	44.2				
Mercury	<0.14 mg/kg	TM181	2.57	<0.140	<0.140				
Nickel	<0.2 mg/kg	TM181	29.9	14.1	13.3				
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00				
Zinc	<1.9 mg/kg	TM181	188	29.7	44.1				
Total Sulphate	<48 mg/kg	TM221	37500	531	1970				

SDG: 091119-99
Job: D_MOUCHEL_ELE-84
Client Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66681

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I2	I2	I2
Depth (m)	0.55 - 0.70	2.00 - 2.50	8.50 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-99	091119-99	091119-99
Lab Sample No.(s)	623683	623734	623873

Component	LOD/Units	Method	I2	I2	I2
Aliphatics >C12-C16	<100 µg/kg	TM173	30700	608	<100
Aliphatics >C16-C21	<100 µg/kg	TM173	177000	<100	<100
Aliphatics >C21-C35	<100 µg/kg	TM173	1310000	883	4680
Aliphatics >C35-C44	<100 µg/kg	TM173	331000	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	1850000	1570	4680
Aliphatics >C16-C35	<100 µg/kg	TM173	1490000	962	4680

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SDG: 091119-99
Job: D_MOUCHEL_ELE-84
Client Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: David Megson
Order No.:
Report No.: 66681

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	I2	I2	I2			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 0.70	2.00 - 2.50	8.50 - 9.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	14/11/2009	14/11/2009			
			Date Received	18/11/2009	18/11/2009	18/11/2009			
			SDG Ref	091119-99	091119-99	091119-99			
			Lab Sample No.(s)	623683	623734	623873			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	1750	<44.0	845				
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00				
			#	#	#				
Benzene	<10 µg/kg	TM089	302	<10.0	171				
			M	M	M				
Toluene	<2 µg/kg	TM089	53.1	<9.00	33.9				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	140	<3.00	62.9				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	104	11.6	54.5				
			M	M	M				
o Xylene	<3 µg/kg	TM089	45.2	<4.00	25.4				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	149	11.6	79.9				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	644	11.6	347				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	30.1	<10.0	22.5				
Aliphatics >C6-C8	<10 µg/kg	TM089	71.9	<10.0	<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	136	<10.0	61.7				
Aliphatics >C10-C12	<10 µg/kg	TM089	266	<10.0	126				
Total Aliphatics C5-C12	<10 µg/kg	TM089	504	<10.0	210				
Aromatics C6-C7	<10 µg/kg	TM089	302	<10.0	171				
Aromatics >C7-C8	<10 µg/kg	TM089	53.1	<10.0	33.9				
Aromatics >EC8-EC10	<10 µg/kg	TM089	493	<10.0	235				
Aromatics >EC10-EC12	<10 µg/kg	TM089	399	<10.0	189				
Total Aromatics C6-C12	<10 µg/kg	TM089	1250	<10.0	628				

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SDG: 091119-99
Job: D_MOUCHEL_ELE-84
Client Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66681

PAH micro by GCMS

Results Legend			Sample Identity	I2	I2	I2			
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 0.70	2.00 - 2.50	8.50 - 9.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	14/11/2009	14/11/2009	14/11/2009			
			Date Received	18/11/2009	18/11/2009	18/11/2009			
			SDG Ref	091119-99	091119-99	091119-99			
			Lab Sample No.(s)	623683	623734	623873			
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	16400	26.4	687	M	M	M	
Acenaphthylene (S)	<12 µg/kg	TM218	5460	25.9	112	M	M	M	
Acenaphthene (S)	<8 µg/kg	TM218	2690	<8.00	269	M	M	M	
Fluorene (S)	<10 µg/kg	TM218	3800	14.6	427	M	M	M	
Phenanthrene (S)	<15 µg/kg	TM218	28000	96.9	1130	M	M	M	
Anthracene (S)	<16 µg/kg	TM218	16600	35.3	389	M	M	M	
Fluoranthene (S)	<17 µg/kg	TM218	73200	176	941	M	M	M	
Pyrene (S)	<15 µg/kg	TM218	82100	142	703	M	M	M	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	43800	96.6	465	M	M	M	
Chrysene (S)	<10 µg/kg	TM218	34100	79.3	374	M	M	M	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	39900	125	458	M	M	M	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	12500	54.1	191	M	M	M	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	33700	77.3	361	M	M	M	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	15800	61.8	167	M	M	M	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	4890	<23.0	61.9	M	M	M	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	20500	83.4	186	M	M	M	
PAH 16 EPA Total	<118 µg/kg	TM218	434000	1700	6920	M	M	M	

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SDG: 091119-99
Job: D_MOUCHEL_ELE-84
Client Reference: 14/11/09 (I2)
Location: LIMERICK GASWORKS

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66681

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	I2	I2	I2
Depth (m)	0.55 - 0.70	2.00 - 2.50	8.50 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	14/11/2009	14/11/2009	14/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091119-99	091119-99	091119-99
Lab Sample No.(s)	623683	623734	623873

Component	LOD/Units	Method	I2	I2	I2
Total Aliphatics >C5-C44	<100 µg/kg	TM173	1850000	1570	4890
Total Aromatics >C6-C44	<100 µg/kg	TM173	1660000	10100	106000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	3510000	11700	111000

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-50
Sample Delivery Group (SDG): 091120-100
Your Reference: 19/11/09 (F12/E12/J5)
Location: Limerick Gasworks
Report No.: 66693

A total of 2 samples was received on Thursday November 19, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-100
Job: D_MOUCHEL_ELE-50
Client Reference: 19/11/09 (F12/E12/J5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66693

SOLID

Results Legend	Sample ID					Total
		Depth (m)				
		1.50 - 2.50	5.30 - 6.00	60g VOC Dublin	JAR (D)	
	Container	60g VOC Dublin	JAR (D)	JAR (D)	TUB (D)	
Ammonium Soil by Titration	All					0
			X		X	2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide					0
			X		X	2
Easily Liberated Sulphide	All					0
			X		X	2
EPH CWG (Aliphatic) GC (S)	All					0
		X			X	2
EPH CWG (Aromatic) GC (S)	All					0
		X			X	2
GRO BTEX MTBE GC (S)	All					0
		X		X		2
Hexavalent Chromium (s)	All					0
			X		X	2
Metals by iCap-OES (Soil)	Arsenic					0
		X			X	2
	Cadmium					0
		X			X	2
	Chromium					0
		X			X	2
	Copper					0
		X			X	2
	Lead					0
		X			X	2
	Mercury					0
		X			X	2
	Nickel					0
		X			X	2
	Selenium					0
		X			X	2
	Zinc					0
		X			X	2
PAH micro by GCMS	All					0
		X			X	2
pH	All					0
			X		X	2
Phenols by HPLC (S)	All					0
			X		X	2
Sample description	All					0
		X			X	2
Total Sulphate	All					0
		X			X	2
TPH CWG GC (S)	All					0
		X			X	2

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SDG:	091120-100	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-50	Attention:	Verity Sankey
Client Reference:	19/11/09 (F12/E12/J5)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66693

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
J5	1.50 - 2.50	Grey	Sandy Clay	0.1 - 2 mm	Stones
	5.30 - 6.00	Black	Silty Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-100
Job: D_MOUCHEL_ELE-50
Client Reference: 19/11/09 (F12/E12/J5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66693

Test Completion dates

SDG reference: 091120-100

Sample ID	Depth	Type	SDG reference: 091120-100													
			Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)
J5	1.50 - 2.50	SOLID	30/11/2009	24/11/2009	24/11/2009	26/11/2009	26/11/2009	01/12/2009	25/11/2009	25/11/2009	26/11/2009	24/11/2009	25/11/2009	23/11/2009	25/11/2009	01/12/2009
	5.30 - 6.00	SOLID	30/11/2009	24/11/2009	24/11/2009	26/11/2009	26/11/2009	01/12/2009	25/11/2009	25/11/2009	26/11/2009	24/11/2009	25/11/2009	23/11/2009	25/11/2009	01/12/2009

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SDG: 091120-100
Job: D_MOUCHEL_ELE-50
Client Reference: 19/11/09 (F12/E12/J5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66220

Results Legend		Sample Identity	J5	J5			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.50 Soil/Solid 19/11/2009 19/11/2009 091120-100 635008	5.30 - 6.00 Soil/Solid 19/11/2009 19/11/2009 091120-100 635089			
Component	LOD/Units	Method					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	60.5 M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	47.0			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	0.297 M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	0.392 M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.140 M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.878			
pH value of soil	1 pH Units	TM133	7.51 M	8.85 M			
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00 #	<0.600 #			
Total Cyanide	<1 mg/kg	TM153	647 M	243 M			
Easily Liberated Sulphide	<15 mg/kg	TM180	66.0 #	2970 #			
Arsenic	<0.6 mg/kg	TM181	6.76 M	5.81 M			
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M			
Chromium	<0.9 mg/kg	TM181	29.2 M	14.2 M			
Copper	<1.4 mg/kg	TM181	55.4 M	47.8 M			
Lead	<0.7 mg/kg	TM181	28.6 M	81.6 M			
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M			
Nickel	<0.2 mg/kg	TM181	48.6 M	21.2 M			
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #			
Zinc	<1.9 mg/kg	TM181	24.8 M	98.2 M			
Total Sulphate	<48 mg/kg	TM221	15400 M	2740 M			

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SDG: 091120-100
Job: D_MOUCHEL_ELE-50
Client Reference: 19/11/09 (F12/E12/J5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66220

GRO BTEX MTBE GC (S)

Sample Identity	J5	J5				
	Depth (m)	1.50 - 2.50	5.30 - 6.00			
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	19/11/2009	19/11/2009				
Date Received	19/11/2009	19/11/2009				
SDG Ref	091120-100	091120-100				
Lab Sample No.(s)	635008	635089				

Component	LOD/Units	Method				
GRO C5-C12	<44 µg/kg	TM089	2700	12200		
			#	#		
MTBE	<5 µg/kg	TM089	<5.00	<5.00		
			#	#		
Benzene	<10 µg/kg	TM089	40.9	2630		
			M	M		
Toluene	<2 µg/kg	TM089	35.6	347		
			M	M		
Ethyl Benzene	<3 µg/kg	TM089	<4.00	143		
			M	M		
m & p Xylene	<6 µg/kg	TM089	31.7	525		
			M	M		
o Xylene	<3 µg/kg	TM089	15.8	228		
			M	M		
Sum m&p and o Xylene	<10 µg/kg	TM089	47.5	753		
			M	M		
Sum of BTEX	<10 µg/kg	TM089	124	3880		
			M	M		
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	125		
Aliphatics >C6-C8	<10 µg/kg	TM089	30.0	432		
Aliphatics >C8-C10	<10 µg/kg	TM089	310	1220		
Aliphatics >C10-C12	<10 µg/kg	TM089	706	1890		
Total Aliphatics C5-C12	<10 µg/kg	TM089	1050	3670		
Aromatics C6-C7	<10 µg/kg	TM089	40.9	2630		
Aromatics >C7-C8	<10 µg/kg	TM089	35.6	327		
Aromatics >EC8-EC10	<10 µg/kg	TM089	513	2730		
Aromatics >EC10-EC12	<10 µg/kg	TM089	1060	2830		
Total Aromatics C6-C12	<10 µg/kg	TM089	1650	8550		

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SDG: 091120-100
Job: D_MOUCHEL_ELE-50
Client Reference: 19/11/09 (F12/E12/J5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66220

PAH micro by GCMS

Results Legend		Sample Identity	J5	J5				
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.50 Soil/Solid 19/11/2009 19/11/2009 091120-100 635008	5.30 - 6.00 Soil/Solid 19/11/2009 19/11/2009 091120-100 635089				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	1850 M	133000 M				
Acenaphthylene (S)	<12 µg/kg	TM218	2320 M	2990 M				
Acenaphthene (S)	<8 µg/kg	TM218	714 M	22200 M				
Fluorene (S)	<10 µg/kg	TM218	410 M	12700 M				
Phenanthrene (S)	<15 µg/kg	TM218	1380 M	246000 M				
Anthracene (S)	<16 µg/kg	TM218	1070 M	69500 M				
Fluoranthene (S)	<17 µg/kg	TM218	6910 M	440000 M				
Pyrene (S)	<15 µg/kg	TM218	7350 M	347000 M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	4530 M	208000 M				
Chrysene (S)	<10 µg/kg	TM218	3300 M	156000 M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	13000 M	201000 M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3260 M	69100 M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	10200 M	197000 M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	10100 M	91700 M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	2270 M	22500 M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	10800 M	87700 M				
PAH 16 EPA Total	<118 µg/kg	TM218	79400 M	2370000 M				

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SDG: 091120-100
Job: D_MOUCHEL_ELE-50
Client Reference: 19/11/09 (F12/E12/J5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66220

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	J5	J5				
Depth (m)	1.50 - 2.50	5.30 - 6.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	19/11/2009	19/11/2009				
Date Received	19/11/2009	19/11/2009				
SDG Ref	091120-100	091120-100				
Lab Sample No.(s)	635008	635089				

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	194000	70600		
Total Aromatics >C6-C44	<100 µg/kg	TM173	512000	861000		
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	706000	931000		

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-51
Sample Delivery Group (SDG): 091120-101
Your Reference: Limerick Gasworks
Location: Limerick Gasworks
Report No.: 66631

A total of 5 samples was received on Thursday November 19, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66631

SOLID

Results Legend	Sample ID	C12		D12		G10		G8		G9		Total
		Depth (m)		Depth (m)		Depth (m)		Depth (m)		Depth (m)		
		Container		Container		Container		Container		Container		
X Test												
N No Determination Possible												
Ammonium Soil by Titration	All		X		X		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X		X	5
Easily Liberated Sulphide	All		X		X		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X		X	5
EPH CWG (Aromatic) GC (S)	All		X		X		X		X		X	0
GRO BTEX MTBE GC (S)	All		X		X		X		X		X	5
Hexavalent Chromium (s)	All	X		X		X		X		X		0
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X		X	5
	Cadmium		X		X		X		X		X	0
	Chromium		X		X		X		X		X	5
	Copper		X		X		X		X		X	0
	Lead		X		X		X		X		X	5
	Mercury		X		X		X		X		X	0
	Nickel		X		X		X		X		X	5
	Selenium		X		X		X		X		X	0
	Zinc		X		X		X		X		X	5
PAH micro by GCMS	All		X		X		X		X		X	0
pH	All		X		X		X		X		X	5
Phenols by HPLC (S)	All		X		X		X		X		X	0
Sample description	All		X		X		X		X		X	5
Total Sulphate	All		X		X		X		X		X	0
TPH CWG GC (S)	All		X		X		X		X		X	5
VOC MS (S)	All		X		X		X		X		X	0
					X		X		X		X	3

SDG:	091120-101	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-51	Attention:	Verity Sankey
Client Reference:	Limerick Gasworks	Order No.:	
Location:	Limerick Gasworks	Report No.:	66631

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C12	0.55 - 1.00	Brown	Silty Clay	0.063 - 0.1 mm	N/A
D12	0.00 - 0.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
G10	0.00 - 0.50	Brown	Sand	0.1 - 2 mm	Stones
G8	0.00 - 0.40	Grey	Silty Clay	0.063 - 0.1 mm	Stones
G9	0.00 - 0.30	Brown	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66631

Test Completion dates

SDG reference: 091120-101

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
C12	0.55 - 1.00	SOLID	02/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	25/11/2009	01/12/2009	26/11/2009	24/11/2009	24/11/2009	24/11/2009	30/11/2009
D12	0.00 - 0.50	SOLID	04/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	24/11/2009	04/12/2009	26/11/2009	01/12/2009	01/12/2009	24/11/2009	01/12/2009
G10	0.00 - 0.50	SOLID	30/11/2009	04/12/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	24/11/2009	04/12/2009	26/11/2009	01/12/2009	01/12/2009	24/11/2009	30/11/2009
G8	0.00 - 0.40	SOLID	03/12/2009	02/12/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	24/11/2009	04/12/2009	26/11/2009	01/12/2009	01/12/2009	24/11/2009	30/11/2009
G9	0.00 - 0.30	SOLID	30/11/2009	04/12/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	24/11/2009	04/12/2009	26/11/2009	01/12/2009	01/12/2009	24/11/2009	30/11/2009

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SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66631

Results Legend			Sample Identity	C12	D12	G10	G8	G9
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.55 - 1.00 Soil/Solid 23/11/2009 19/11/2009 091120-101 634855	0.00 - 0.50 Soil/Solid 18/11/2009 19/11/2009 091120-101 635005	0.00 - 0.50 Soil/Solid 18/11/2009 19/11/2009 091120-101 635031	0.00 - 0.40 Soil/Solid 18/11/2009 19/11/2009 091120-101 634913	0.00 - 0.30 Soil/Solid 18/11/2009 19/11/2009 091120-101 634957
Component	LOD/Units	Method						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	28.4	<15.0	<15.0	15.3	18.0	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	46.7	<15.0	<15.0	21.2	25.9	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	36.3	<15.0	<15.0	16.5	20.1	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.200	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0200	<0.200	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0200	<0.600	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	<1.00	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	<0.300	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.200	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.200	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	<0.300	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.0200	<0.0400	0.672	
pH value of soil	1 pH Units	TM133	8.50	7.85	8.36	8.45	8.34	
Hexavalent Chromium	<0.6 mg/kg	TM151	0.071	<3.0	<0.60	<3.0	<6.0	
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0911	<3.00	<0.600	<3.00	<6.00	
Total Cyanide	<1 mg/kg	TM153	<1.00	<1.00	2.57	6.92	35.5	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	<15.00	<15.00	18.23	128.36	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	<15.0	<15.0	19.6	144	
Arsenic	<0.6 mg/kg	TM181	16.0	6.66	5.01	6.36	16.6	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	
Chromium	<0.9 mg/kg	TM181	33.5	17.5	14.5	9.03	12.4	
Copper	<1.4 mg/kg	TM181	30.3	17.2	29.5	6.22	33.6	
Lead	<0.7 mg/kg	TM181	57.2	34.0	15.9	20.5	200	
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140	<0.140	<0.140	
Nickel	<0.2 mg/kg	TM181	45.3	18.3	18.8	9.91	18.9	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	65.1	73.1	36.5	25.5	90.3	
Total Sulphate	<48 mg/kg	TM221	290	677	345	323	1480	

SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66631

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C12	D12	G10	G8	G9
Depth (m)	0.55 - 1.00	0.00 - 0.50	0.00 - 0.50	0.00 - 0.40	0.00 - 0.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	23/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-101	091120-101	091120-101	091120-101	091120-101
Lab Sample No.(s)	634855	635005	635031	634913	634957

Component	LOD/Units	Method	C12	D12	G10	G8	G9
Aliphatics >C12-C16	<100 µg/kg	TM173	26700	20200	9230	25700	403000
Aliphatics >C16-C21	<100 µg/kg	TM173	8180	35200	20100	46500	563000
Aliphatics >C21-C35	<100 µg/kg	TM173	<100	69900	26000	112000	1100000
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	15100	<100	56800	188000
Total Aliphatics >C12-C44	<100 µg/kg	TM173	34900	140000	55400	241000	2250000
Aliphatics >C16-C35	<100 µg/kg	TM173	8180	105000	46200	158000	1660000

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SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66631

EPH CWG (Aromatic) GC (S)

Results Legend			Sample Identity	C12	D12	G10	G8	G9
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 1.00	0.00 - 0.50	0.00 - 0.50	0.00 - 0.40	0.00 - 0.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	23/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
			Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009
			SDG Ref	091120-101	091120-101	091120-101	091120-101	091120-101
			Lab Sample No.(s)	634855	635005	635031	634913	634957
Component	LOD/Units	Method						
Aromatics >EC12-EC16	<100 µg/kg	TM173	21200	20800	16300	23200	486000	
Aromatics >EC16-EC21	<100 µg/kg	TM173	5910	62400	17500	57900	1810000	
Aromatics >EC21-EC35	<100 µg/kg	TM173	1040	360000	101000	323000	8460000	
Aromatics >EC35-EC44	<100 µg/kg	TM173	<100	124000	23300	167000	1270000	
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	28200	567000	158000	572000	12000000	
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	28200	567000	158000	572000	12000000	

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SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66631

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	C12	D12	G10	G8	G9	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 1.00	0.00 - 0.50	0.00 - 0.50	0.00 - 0.40	0.00 - 0.30	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	23/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009	
			Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009	
			SDG Ref	091120-101	091120-101	091120-101	091120-101	091120-101	
			Lab Sample No.(s)	634855	635005	635031	634913	634957	
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	<44.0	<44.0	<44.0	2140	2240		
			#	#	#	#	#	#	
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
			#	#	#	#	#	#	
Benzene	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
			M	M	M	M	M	M	
Toluene	<2 µg/kg	TM089	<2.00	<2.00	<2.00	<9.00	<8.00	<8.00	
			M	M	M	M	M	M	
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	<3.00	<5.00	<3.00	<3.00	
			M	M	M	M	M	M	
m & p Xylene	<6 µg/kg	TM089	<6.00	<6.00	<6.00	30.1	20.2	20.2	
			M	M	M	M	M	M	
o Xylene	<3 µg/kg	TM089	<3.00	<3.00	<3.00	17.2	22.4	22.4	
			M	M	M	M	M	M	
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	<10.0	<10.0	47.3	42.6	42.6	
			M	M	M	M	M	M	
Sum of BTEX	<10 µg/kg	TM089	<10.0	<10.0	<10.0	47.3	42.6	42.6	
			M	M	M	M	M	M	
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	<10.0	20.0	<10.0	<10.0	
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0	42.9	<10.0	<10.0	
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	<10.0	<10.0	200	149	149	
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	<10.0	<10.0	610	729	729	
Total Aliphatics C5-C12	<10 µg/kg	TM089	<10.0	<10.0	<10.0	873	879	879	
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	<10.0	<10.0	347	267	267	
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	<10.0	<10.0	916	1090	1090	
Total Aromatics C6-C12	<10 µg/kg	TM089	<10.0	<10.0	<10.0	1260	1360	1360	

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SDG: 091120-101
 Job: D_MOUCHEL_ELE-51
 Client Reference: Limerick Gasworks
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66631

PAH micro by GCMS

Results Legend			Sample Identity	C12	D12	G10	G8	G9
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 1.00	0.00 - 0.50	0.00 - 0.50	0.00 - 0.40	0.00 - 0.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	23/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
			Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009
			SDG Ref	091120-101	091120-101	091120-101	091120-101	091120-101
			Lab Sample No.(s)	634855	635005	635031	634913	634957
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	30.0	410	637	1700	15900	
			M	M	M	M	M	
Acenaphthylene (S)	<12 µg/kg	TM218	49.0	210	1520	1400	53400	
			M	M	M	M	M	
Acenaphthene (S)	<8 µg/kg	TM218	<8.00	114	483	1610	21800	
			M	M	M	M	M	
Fluorene (S)	<10 µg/kg	TM218	<10.0	91.4	879	2270	42500	
			M	M	M	M	M	
Phenanthrene (S)	<15 µg/kg	TM218	<15.0	270	3710	7770	152000	
			M	M	M	M	M	
Anthracene (S)	<16 µg/kg	TM218	<16.0	117	2020	3200	66600	
			M	M	M	M	M	
Fluoranthene (S)	<17 µg/kg	TM218	19.7	557	8480	9200	241000	
			M	M	M	M	M	
Pyrene (S)	<15 µg/kg	TM218	21.2	482	6560	6530	180000	
			M	M	M	M	M	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	17.6	275	3660	4280	110000	
			M	M	M	M	M	
Chrysene (S)	<10 µg/kg	TM218	17.5	304	2800	2540	81400	
			M	M	M	M	M	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	33.4	601	5240	5500	166000	
			M	M	M	M	M	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	<14.0	235	1830	1760	56800	
			M	M	M	M	M	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	20.6	355	3960	4660	126000	
			M	M	M	M	M	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	24.5	253	2350	2480	66900	
			M	M	M	M	M	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0	65.3	634	612	18000	
			M	M	M	M	M	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	43.1	320	2510	2280	66400	
			M	M	M	M	M	
PAH 16 EPA Total	<118 µg/kg	TM218	277	1660	47300	57800	1470000	
			M	M	M	M	M	

SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66631

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C12	D12	G10	G8	G9
Depth (m)	0.55 - 1.00	0.00 - 0.50	0.00 - 0.50	0.00 - 0.40	0.00 - 0.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	23/11/2009	18/11/2009	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-101	091120-101	091120-101	091120-101	091120-101
Lab Sample No.(s)	634855	635005	635031	634913	634957

Component	LOD/Units	Method	C12	D12	G10	G8	G9
Total Aliphatics >C5-C44	<100 µg/kg	TM173	34900	140000	55400	242000	2250000
Total Aromatics >C6-C44	<100 µg/kg	TM173	28200	567000	158000	573000	12000000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	63100	708000	214000	815000	14300000

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SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66631

VOC MS (S)

Results Legend			Sample Identity	G10	G8	G9			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	0.00 - 0.40	0.00 - 0.30			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	18/11/2009	18/11/2009	18/11/2009			
			Date Received	19/11/2009	19/11/2009	19/11/2009			
			SDG Ref	091120-101	091120-101	091120-101			
			Lab Sample No.(s)	635031	634913	634957			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		133	131	131			
Toluene-d8**	%	TM116		95.6	86.3	59.3			
4-Bromofluorobenzene**	%	TM116		97.0	71.0	53.7			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Carbon Disulphide	<9 µg/kg	TM116		<9.00	9.90	<9.00			
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Benzene	<9 µg/kg	TM116		<9.00	12.2	31.8			
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0			
Toluene	<6 µg/kg	TM116		<6.00	21.3	44.9			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0			
Chlorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
Ethylbenzene	<9 µg/kg	TM116		<9.00	12.2	53.8			

SDG: 091120-101
Job: D_MOUCHEL_ELE-51
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66631

VOC MS (S)

Results Legend		Sample Identity	G10	G8	G9
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 18/11/2009 19/11/2009 091120-101 635031	0.00 - 0.40 Soil/Solid 18/11/2009 19/11/2009 091120-101 634913	0.00 - 0.30 Soil/Solid 18/11/2009 19/11/2009 091120-101 634957
Component	LOD/Units	Method			
p/m-Xylene	<13 µg/kg	TM116	<13.0 #	63.1 #	406 #
o-Xylene	<11 µg/kg	TM116	<11.0 M	33.5 M	391 M
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	45.4 M
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M
Isopropylbenzene	<9 µg/kg	TM116	<9.00 M	<9.00 M	11.1 M
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M
Propylbenzene	<6 µg/kg	TM116	<6.00 M	7.60 M	16.4 M
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8.00 M	42.3 M	649 M
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	<10.0 #	74.2 #	455 #
sec-Butylbenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	8.63 #	80.3 #
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
Naphthalene	<7 µg/kg	TM116	<7.00 #	1670 #	19300 #
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 16 December 2009
Job: D_MOUCHEL_ELE-43
Sample Delivery Group (SDG): 091120-59
Your Reference: 18/11/09 (B8)
Location: Limerick Gasworks
Report No.: 67620

A total of 3 samples was received on Thursday, November 19, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67620

SOLID

Results Legend	Sample ID	B8						Total
		3.00 - 3.40		3.50 - 4.00		4.00 - 4.50		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
			X		X		X	3
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0
			X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
			X		X		X	3
EPH CWG (Aliphatic) GC (S)	All		X		X		X	0
			X		X		X	3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
			X		X		X	3
GRO BTEX MTBE GC (S)	All		X		X		X	0
		X		X		X		3
Hexavalent Chromium (s)	All		X		X		X	0
			X		X		X	3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
			X		X		X	3
	Cadmium		X		X		X	0
			X		X		X	3
	Chromium		X		X		X	0
			X		X		X	3
	Copper		X		X		X	0
			X		X		X	3
	Lead		X		X		X	0
			X		X		X	3
	Mercury		X		X		X	0
			X		X		X	3
	Nickel		X		X		X	0
			X		X		X	3
	Selenium		X		X		X	0
			X		X		X	3
	Zinc		X		X		X	0
			X		X		X	3
PAH micro by GCMS	All		X		X		X	0
			X		X		X	3
pH	All		X		X		X	0
			X		X		X	3
Phenols by HPLC (S)	All		X		X		X	0
			X		X		X	3
Sample description	All		X		X		X	0
			X		X		X	3
Total Sulphate	All		X		X		X	0
			X		X		X	3
TPH CWG GC (S)	All		X		X		X	0
			X		X		X	3
VOC MS (S)	All			X				0
				X				1

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SDG:	091120-59	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-43	Attention:	Verity Sankey
Client Reference:	18/11/09 (B8)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67620

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
B8	3.00 - 3.40	Grey	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	3.50 - 4.00	Grey	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	4.00 - 4.50	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67620

Test Completion dates

SDG reference: 091120-59

Sample ID	Depth	Type	SDG reference: 091120-59															
			VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Pherads by HPLC (S)	pH	PAH by GCMS	Metals by Cap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyanate	Ammonium Soil by Titration	
B8	3.00 - 3.40	SOLID	03/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	01/12/2009	24/11/2009	02/12/2009		
	3.50 - 4.00	SOLID	02/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	01/12/2009	24/11/2009	03/12/2009		
	4.00 - 4.50	SOLID	03/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	01/12/2009	24/11/2009	03/12/2009		

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SDG 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 67620

Results Legend			Sample Identity	B8	B8	B8			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.40	3.50 - 4.00	4.00 - 4.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	18/11/2009	18/11/2009	18/11/2009			
			Date Received	19/11/2009	19/11/2009	19/11/2009			
			SDG Ref	091120-59	091120-59	091120-59			
			Lab Sample No.(s)	632847	632874	632898			
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	922	3430	470	M	M	M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	717	2670	366				
Catechol	<0.01 mg/kg	TM062 (S)	<0.200	<0.200	<0.200				
Phenol	<0.01 mg/kg	TM062 (S)	21.8	37.7	16.5	M	M	M	
Cresols	<0.01 mg/kg	TM062 (S)	52.0	99.6	44.4	M	M	M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<1.00	<1.00	<1.00				
Xylenols	<0.015 mg/kg	TM062 (S)	74.8	117	56.8	M	M	M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.200	<0.200	<0.200				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.200	<0.200	<0.200	M	M	M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.300	<0.300	<0.300	M	M	M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	149	254	118				
pH value of soil	1 pH Units	TM133	9.94	9.09	8.78	M	M	M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	<3.00	<3.00	#	#	#	
Total Cyanide	<1 mg/kg	TM153	3.05	13.4	3.03	M	M	M	
Easily Liberated Sulphide	<15 mg/kg	TM180			36.96			#	
Easily Liberated Sulphide	<15 mg/kg	TM180	54.7	87.4	41.0	#	#	#	
Arsenic	<0.6 mg/kg	TM181	6.62	20.3	12.6	M	M	M	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	M	M	M	
Chromium	<0.9 mg/kg	TM181	22.6	23.8	12.1	M	M	M	
Copper	<1.4 mg/kg	TM181	42.0	46.1	4.48	M	M	M	
Lead	<0.7 mg/kg	TM181	17.7	34.5	10.6	M	M	M	
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140	M	M	M	
Nickel	<0.2 mg/kg	TM181	29.6	36.5	12.8	M	M	M	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	#	#	#	
Zinc	<1.9 mg/kg	TM181	44.9	33.8	28.2	M	M	M	
Total Sulphate	<48 mg/kg	TM221	4350	3910	964	M	M	M	

SDG 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 67620

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B8	B8	B8
Depth (m)	3.00 - 3.40	3.50 - 4.00	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-59	091120-59	091120-59
Lab Sample No.(s)	632847	632874	632898

Component	LOD/Units	Method	B8	B8	B8
Aromatics >EC12-EC16	<100 µg/kg	TM173	378000	360000	91000
Aromatics >EC16-EC21	<100 µg/kg	TM173	747000	659000	168000
Aromatics >EC21-EC35	<100 µg/kg	TM173	1820000	1610000	411000
Aromatics >EC35-EC44	<100 µg/kg	TM173	335000	283000	110000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	3280000	2910000	780000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	3280000	2910000	780000

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SDG: 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No.: 67620

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B8	B8	B8
Depth (m)	3.00 - 3.40	3.50 - 4.00	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-59	091120-59	091120-59
Lab Sample No.(s)	632847	632874	632898

Component	LOD/Units	Method	B8	B8	B8
GRO C5-C12	<44 µg/kg	TM089	1170000 #	446000 #	480000 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	30700 M	16700 M	17200 M
Toluene	<2 µg/kg	TM089	109000 M	42800 M	49700 M
Ethyl Benzene	<3 µg/kg	TM089	24800 M	8870 M	10000 M
m & p Xylene	<6 µg/kg	TM089	183000 M	68500 M	71500 M
o Xylene	<3 µg/kg	TM089	74500 M	26200 M	27100 M
Sum m&p and o Xylene	<10 µg/kg	TM089	257000 M	94600 M	98600 M
Sum of BTEX	<10 µg/kg	TM089	422000 M	163000 M	175000 M
Aliphatics C5-C6	<10 µg/kg	TM089	1710	27400	1940
Aliphatics >C6-C8	<10 µg/kg	TM089	45800	15600	21700
Aliphatics >C8-C10	<10 µg/kg	TM089	106000	33800	<10.0
Aliphatics >C10-C12	<10 µg/kg	TM089	173000	62300	152000
Total Aliphatics C5-C12	<10 µg/kg	TM089	326000	139000	176000
Aromatics C6-C7	<10 µg/kg	TM089	30700	16700	17200
Aromatics >C7-C8	<10 µg/kg	TM089	109000	42800	49700
Aromatics >EC8-EC10	<10 µg/kg	TM089	440000	154000	49400
Aromatics >EC10-EC12	<10 µg/kg	TM089	259000	93400	228000
Total Aromatics C6-C12	<10 µg/kg	TM089	840000	307000	344000

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SDG: 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No.: 67620

PAH micro by GCMS

Results Legend		Sample Identity	B8	B8	B8
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 3.40 Soil/Solid 18/11/2009 19/11/2009 091120-59 632847	3.50 - 4.00 Soil/Solid 18/11/2009 19/11/2009 091120-59 632874	4.00 - 4.50 Soil/Solid 18/11/2009 19/11/2009 091120-59 632898
Component	LOD/Units	Method			
Naphthalene (S)	<9 µg/kg	TM218	561000 M	469000 M	430000 M
Acenaphthylene (S)	<12 µg/kg	TM218	90300 M	57000 M	54100 M
Acenaphthene (S)	<8 µg/kg	TM218	18500 M	12500 M	11700 M
Fluorene (S)	<10 µg/kg	TM218	79700 M	53100 M	52000 M
Phenanthrene (S)	<15 µg/kg	TM218	216000 M	162000 M	131000 M
Anthracene (S)	<16 µg/kg	TM218	76200 M	50700 M	49000 M
Fluoranthene (S)	<17 µg/kg	TM218	148000 M	113000 M	89400 M
Pyrene (S)	<15 µg/kg	TM218	103000 M	78000 M	62400 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	47400 M	36200 M	27600 M
Chrysene (S)	<10 µg/kg	TM218	34600 M	27700 M	21700 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	45700 M	37400 M	24900 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	17200 M	13500 M	9420 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	37500 M	30900 M	19300 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	17600 M	15000 M	8800 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	4260 M	4200 M	2380 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	17900 M	16700 M	10100 M
PAH 16 EPA Total	<118 µg/kg	TM218	1510000 M	1180000 M	1000000 M

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SDG 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 67620

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B8	B8	B8
Depth (m)	3.00 - 3.40	3.50 - 4.00	4.00 - 4.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-59	091120-59	091120-59
Lab Sample No.(s)	632847	632874	632898

Component	LOD/Units	Method			
Total Aliphatics >C5-C44	<100 µg/kg	TM173	865000	592000	243000
Total Aromatics >C6-C44	<100 µg/kg	TM173	4120000	3220000	1120000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	4980000	3810000	1370000

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SDG 091120-59
 Job: D_MOUCHEL_ELE-43
 Client Reference: 18/11/09 (B8)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: David Megson
 Order No.:
 Report No: 67620

VOC MS (S)

Results Legend		Sample Identity	B8				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	3.50 - 4.00				
		Sample Type	Soil/Solid				
		Date Sampled	18/11/2009				
		Date Received	19/11/2009				
		SDG Ref	091120-59				
		Lab Sample No.(s)	632874				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	116				
Toluene-d8**	%	TM116	72.8				
4-Bromofluorobenzene**	%	TM116	58.2				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	14.1				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	44900				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	75700				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	6200				

SDG: 091120-59
Job: D_MOUCHEL_ELE-43
Client Reference: 18/11/09 (B8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 67620

VOC MS (S)

Results Legend		Sample Identity	B8				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.50 - 4.00 Soil/Solid 18/11/2009 19/11/2009 091120-59 632874				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	94100	#			
o-Xylene	<11 µg/kg	TM116	35700	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	335	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	581	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	5930	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	38400	#			
sec-Butylbenzene	<8 µg/kg	TM116	54.5	#			
4-Isopropyltoluene	<8 µg/kg	TM116	242	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	1200000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	16.5	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-44
Sample Delivery Group (SDG): 091120-71 **Report No.:** 66898
Your Reference: 18/11/09 (E8)
Location: Limerick Gasworks

A total of 3 samples was received on Thursday November 19, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-71
Job: D_MOUCHEL_ELE-44
Client Reference: 18/11/09 (E8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66898

SOLID

Results Legend	Sample ID	E8						Total
		0.40 - 0.80		2.50 - 3.00		5.50 - 6.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0 3
Asbestos Presence Screen	All				X			0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0 3
Easily Liberated Sulphide	All		X		X		X	0 3
EPH CWG (Aliphatic) GC (S)	All		X		X			0 3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0 3
GRO BTEX MTBE GC (S)	All		X		X		X	0 3
Hexavalent Chromium (s)	All	X		X		X		0 3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0 3
	Cadmium		X		X		X	0 3
	Chromium		X		X		X	0 3
	Copper		X		X		X	0 3
	Lead		X		X		X	0 3
	Mercury		X		X		X	0 3
	Nickel		X		X		X	0 3
	Selenium		X		X		X	0 3
	Zinc		X		X		X	0 3
PAH micro by GCMS	All		X		X		X	0 3
pH	All		X		X		X	0 3
Phenols by HPLC (S)	All		X		X		X	0 3
Sample description	All		X		X		X	0 3
Total Sulphate	All		X		X		X	0 3
TPH CWG GC (S)	All		X		X		X	0 3
VOC MS (S)	All						X	0 1

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Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E8	0.40 - 0.80	Grey	Silt	0.063 - 0.1 mm	Stones
	2.50 - 3.00	Brown	Clay	<0.063 mm	N/A
	5.50 - 6.00	Brown	Silt	<0.063 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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Test Completion dates

SDG reference: 091120-71

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
E8	0.40 - 0.80	SOLID	01/12/2009	01/12/2009	01/12/2009	23/11/2009	25/11/2009	24/11/2009	25/11/2009	25/11/2009	25/11/2009	01/12/2009	26/11/2009	26/11/2009	08/12/2009	24/11/2009	23/11/2009	30/11/2009
	2.50 - 3.00	SOLID	01/12/2009	01/12/2009	01/12/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	01/12/2009	26/11/2009	26/11/2009	24/11/2009	24/11/2009	23/11/2009	30/11/2009
	5.50 - 6.00	SOLID	01/12/2009	01/12/2009	01/12/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	01/12/2009	26/11/2009	26/11/2009	24/11/2009	24/11/2009	23/11/2009	30/11/2009

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Results Legend			Sample Identity			E8			E8			E8		
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.80	2.50 - 3.00	5.50 - 6.00								
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid								
			Date Sampled	18/11/2009	18/11/2009	18/11/2009								
			Date Received	19/11/2009	19/11/2009	19/11/2009								
			SDG Ref	091120-71	091120-71	091120-71								
			Lab Sample No.(s)	633137	633173	633225								
Component	LOD/Units	Method												
Asbestos Presence Screen	-	TM001	No ACM Detected											
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	M	112	M	226	M						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		86.7		176							
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.100		<0.100							
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	38.5	M	41.1	M						
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M	53.6	M	62.5	M						
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.500		<0.500							
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	27.8	M	43.0	M						
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.100		<0.100							
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.100	M	<0.100	M						
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.150	M	<0.150	M						
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00		120		147							
pH value of soil	1 pH Units	TM133	8.20	M	10.48	M	9.40	M						
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#	<0.600	#	<0.600	#						
Total Cyanide	<1 mg/kg	TM153	4.47	M	1.86	M	5.04	M						
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	#	42.5	#	43.0	#						
Arsenic	<0.6 mg/kg	TM181	2.11	M	7.9	M	17.6	M						
Cadmium	<0.02 mg/kg	TM181	<0.0200	M	<0.0200	M	<0.0200	M						
Chromium	<0.9 mg/kg	TM181	1.23	M	30.4	M	35.7	M						
Copper	<1.4 mg/kg	TM181	2.29	M	23.1	M	27.0	M						
Lead	<0.7 mg/kg	TM181	5.00	M	55.4	M	63.4	M						
Mercury	<0.14 mg/kg	TM181	<0.140	M	<0.140	M	<0.140	M						
Nickel	<0.2 mg/kg	TM181	3.82	M	44.9	M	52.4	M						
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	<1.00	#						
Zinc	<1.9 mg/kg	TM181	19.2	M	72.3	M	76.1	M						
Total Sulphate	<48 mg/kg	TM221	57.5	M	591	M	886	M						

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EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E8	E8	E8
Depth (m)	0.40 - 0.80	2.50 - 3.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-71	091120-71	091120-71
Lab Sample No.(s)	633137	633173	633225

Component	LOD/Units	Method	E8	E8	E8
Aliphatics >C12-C16	<100 µg/kg	TM173	10700	5150	20400
Aliphatics >C16-C21	<100 µg/kg	TM173	52300	1570	13700
Aliphatics >C21-C35	<100 µg/kg	TM173	116000	562	20100
Aliphatics >C35-C44	<100 µg/kg	TM173	13700	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	192000	7270	54200
Aliphatics >C16-C35	<100 µg/kg	TM173	168000	2130	33800

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GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E8	E8	E8
Depth (m)	0.40 - 0.80	2.50 - 3.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-71	091120-71	091120-71
Lab Sample No.(s)	633137	633173	633225

Component	LOD/Units	Method	E8	E8	E8
GRO C5-C12	<44 µg/kg	TM089	161	5410	7440
			#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00
			#	#	#
Benzene	<10 µg/kg	TM089	10.2	1350	1280
			M	M	M
Toluene	<2 µg/kg	TM089	11.2	612	552
			M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	60.3	64.4
			M	M	M
m & p Xylene	<6 µg/kg	TM089	13.3	418	585
			M	M	M
o Xylene	<3 µg/kg	TM089	<3.00	193	249
			M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	13.3	611	834
			M	M	M
Sum of BTEX	<10 µg/kg	TM089	34.7	2630	2730
			M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	52.0	48.9
Aliphatics >C6-C8	<10 µg/kg	TM089	61.9	160	210
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	209	342
Aliphatics >C10-C12	<10 µg/kg	TM089	18.8	818	1440
Total Aliphatics C5-C12	<10 µg/kg	TM089	80.8	1240	2040
Aromatics C6-C7	<10 µg/kg	TM089	10.2	1350	1280
Aromatics >C7-C8	<10 µg/kg	TM089	11.2	612	552
Aromatics >EC8-EC10	<10 µg/kg	TM089	19.0	966	1410
Aromatics >EC10-EC12	<10 µg/kg	TM089	28.2	1230	2160
Total Aromatics C6-C12	<10 µg/kg	TM089	68.7	4180	5410

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PAH micro by GCMS

Results Legend			Sample Identity	E8	E8	E8			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.80	2.50 - 3.00	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	18/11/2009	18/11/2009	18/11/2009			
			Date Received	19/11/2009	19/11/2009	19/11/2009			
			SDG Ref	091120-71	091120-71	091120-71			
			Lab Sample No.(s)	633137	633173	633225			
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	851	1070	3890				
			M	M	M				
Acenaphthylene (S)	<12 µg/kg	TM218	2830	273	224				
			M	M	M				
Acenaphthene (S)	<8 µg/kg	TM218	89.1	99.1	151				
			M	M	M				
Fluorene (S)	<10 µg/kg	TM218	273	336	527				
			M	M	M				
Phenanthrene (S)	<15 µg/kg	TM218	1290	1030	2290				
			M	M	M				
Anthracene (S)	<16 µg/kg	TM218	948	214	617				
			M	M	M				
Fluoranthene (S)	<17 µg/kg	TM218	2690	279	1640				
			M	M	M				
Pyrene (S)	<15 µg/kg	TM218	2640	183	1130				
			M	M	M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1770	122	749				
			M	M	M				
Chrysene (S)	<10 µg/kg	TM218	1430	63.2	519				
			M	M	M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	6700	87.0	598				
			M	M	M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	1890	30.0	348				
			M	M	M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6710	67.3	634				
			M	M	M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4370	34.4	267				
			M	M	M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1050	<23.0	110				
			M	M	M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	4930	34.0	263				
			M	M	M				
PAH 16 EPA Total	<118 µg/kg	TM218	40500	3930	13900				
			M	M	M				

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TPH CWG GC (S)

Results Legend
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subcontracted test.
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The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E8	E8	E8
Depth (m)	0.40 - 0.80	2.50 - 3.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	18/11/2009	18/11/2009	18/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-71	091120-71	091120-71
Lab Sample No.(s)	633137	633173	633225

Component	LOD/Units	Method	E8	E8	E8
Total Aliphatics >C5-C44	<100 µg/kg	TM173	192000	8510	56200
Total Aromatics >C6-C44	<100 µg/kg	TM173	342000	25500	120000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	535000	34000	176000

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VOC MS (S)

Results Legend		Sample Identity	E8				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	5.50 - 6.00 Soil/Solid 18/11/2009 19/11/2009 091120-71 633225				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	109				
Toluene-d8**	%	TM116	93.8				
4-Bromofluorobenzene**	%	TM116	91.7				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	M			
Chloromethane	<12 µg/kg	TM116	<12.0	#			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	M			
Bromoethane	<9 µg/kg	TM116	<9.00	M			
Chloroethane	<12 µg/kg	TM116	<12.0	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	#			
Carbon Disulphide	<9 µg/kg	TM116	<9.00	M			
Dichloromethane	<10 µg/kg	TM116	<10.0	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M			
Bromochloromethane	<10 µg/kg	TM116	<10.0	M			
Chloroform	<10 µg/kg	TM116	<10.0	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	M			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	M			
1,2-Dichloroethane	<10 µg/kg	TM116	104	M			
Benzene	<9 µg/kg	TM116	2110	M			
Trichloroethene	<9 µg/kg	TM116	<9.00	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M			
Dibromomethane	<12 µg/kg	TM116	<12.0	M			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	M			
Toluene	<6 µg/kg	TM116	685	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	M			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	M			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	M			
Chorobenzene	<7 µg/kg	TM116	<7.00	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	M			
Ethylbenzene	<9 µg/kg	TM116	53.3	M			

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VOC MS (S)

Results Legend		Sample Identity	E8				
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		Sample Type	Soil/Solid				
		Date Sampled	18/11/2009				
		Date Received	19/11/2009				
		SDG Ref	091120-71				
		Lab Sample No.(s)	633225				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	518	#			
o-Xylene	<11 µg/kg	TM116	218	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	<9.00	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	8.81	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	83.1	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	181	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	6170	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 03 December 2009
Job: D_MOUCHEL_ELE-46
Sample Delivery Group (SDG): 091120-75
Your Reference: Limerick Gasworks
Location: Limerick Gasworks
Report No.: 66469

A total of 3 samples was received on Thursday November 19, 2009 and completed on Thursday December 03, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-75
Job: D_MOUCHEL_ELE-46
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66469

SOLID

Results Legend	Sample ID							Total
		K1		L2				
		1.00 - 1.50	3.50 - 4.00	4.50 - 5.00				
Container	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)				
Ammonium Soil by Titration	All						0	
		X		X		X	3	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide						0	
		X		X		X	3	
Easily Liberated Sulphide	All						0	
		X		X		X	3	
EPH CWG (Aliphatic) GC (S)	All						0	
		X		X		X	3	
EPH CWG (Aromatic) GC (S)	All						0	
		X		X		X	3	
GRO BTEX MTBE GC (S)	All						0	
		X		X		X	3	
Hexavalent Chromium (s)	All						0	
		X		X		X	3	
Metals by iCap-OES (Soil)	Arsenic						0	
		X		X		X	3	
	Cadmium						0	
		X		X		X	3	
	Chromium						0	
		X		X		X	3	
	Copper						0	
		X		X		X	3	
	Lead						0	
		X		X		X	3	
	Mercury						0	
		X		X		X	3	
	Nickel						0	
		X		X		X	3	
	Selenium						0	
		X		X		X	3	
	Zinc						0	
		X		X		X	3	
PAH micro by GCMS	All						0	
		X		X		X	3	
PCBs by GCMS	All						0	
		X					1	
pH	All						0	
		X		X		X	3	
Phenols by HPLC (S)	All						0	
		X		X		X	3	
Sample description	All						0	
		X		X		X	3	
Total Sulphate	All						0	
		X		X		X	3	
TPH CWG GC (S)	All						0	
		X		X		X	3	

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SDG:	091120-75	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-46	Attention:	Verity Sankey
Client Reference:	Limerick Gasworks	Order No.:	
Location:	Limerick Gasworks	Report No.:	66469

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
K1	1.00 - 1.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	3.50 - 4.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
L2	4.50 - 5.00	Brown	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-75
Job: D_MOUCHEL_ELE-46
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66469

Test Completion dates

SDG reference: 091120-75

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
K1	1.00 - 1.50	SOLID	01/12/2009	01/12/2009	02/12/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	24/11/2009	01/12/2009
	3.50 - 4.00	SOLID	23/11/2009	23/11/2009	23/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	25/11/2009	24/11/2009	01/12/2009	26/11/2009	26/11/2009	26/11/2009	24/11/2009	01/12/2009
L2	4.50 - 5.00	SOLID	26/11/2009	26/11/2009	26/11/2009	24/11/2009	24/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	24/11/2009	01/12/2009

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SDG: 091120-75
Job: D_MOUCHEL_ELE-46
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66242

Results Legend			Sample Identity	K1	K1	L2			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50	3.50 - 4.00	4.50 - 5.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	19/11/2009	19/11/2009	19/11/2009			
			Date Received	19/11/2009	19/11/2009	19/11/2009			
			SDG Ref	091120-75	091120-75	091120-75			
			Lab Sample No.(s)	633723	633829	634104			
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	53.7	54.6	111				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	41.8	42.5	86.7				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.0100				
pH value of soil	1 pH Units	TM133	8.26	8.01	8.18				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600				
Total Cyanide	<1 mg/kg	TM153	<1.00	<1.00	44.6				
PCB congener 28	<3 µg/kg	TM168	<3.00						
PCB congener 52	<3 µg/kg	TM168	<3.00						
PCB congener 101	<3 µg/kg	TM168	<3.00						
PCB congener 118	<3 µg/kg	TM168	<3.00						
PCB congener 138	<3 µg/kg	TM168	<3.00						
PCB congener 153	<3 µg/kg	TM168	<3.00						
PCB congener 180	<3 µg/kg	TM168	<3.00						
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00						
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	120	1320				
Arsenic	<0.6 mg/kg	TM181	4.21	4.86	7.67				
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200				
Chromium	<0.9 mg/kg	TM181	8.25	11.7	35.4				
Copper	<1.4 mg/kg	TM181	6.15	5.77	19.1				
Lead	<0.7 mg/kg	TM181	21.0	12.2	87.3				
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140				
Nickel	<0.2 mg/kg	TM181	7.46	11.5	36.9				
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00				
Zinc	<1.9 mg/kg	TM181	22.0	28.6	64.4				
Total Sulphate	<48 mg/kg	TM221	2500	921	2100				

SDG: 091120-75
Job: D_MOUCHEL_ELE-46
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66242

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K1	K1	L2			
Depth (m)	1.00 - 1.50	3.50 - 4.00	4.50 - 5.00			
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
Date Sampled	19/11/2009	19/11/2009	19/11/2009			
Date Received	19/11/2009	19/11/2009	19/11/2009			
SDG Ref	091120-75	091120-75	091120-75			
Lab Sample No.(s)	633723	633829	634104			

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	11900	15600	19600	
Aromatics >EC16-EC21	<100 µg/kg	TM173	5690	5790	32800	
Aromatics >EC21-EC35	<100 µg/kg	TM173	35600	8600	105000	
Aromatics >EC35-EC44	<100 µg/kg	TM173	5050	1940	21900	
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	58200	31900	180000	
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	58200	31900	180000	

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SDG: 091120-75
Job: D_MOUCHEL_ELE-46
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66242

GRO BTEX MTBE GC (S)

Component	LOD/Units	Method	Sample Identity			K1	K1	L2									
			Depth (m)	Sample Type	Date Sampled							Date Received	SDG Ref	Lab Sample No.(s)			
GRO C5-C12	<44 µg/kg	TM089	1.00 - 1.50	Soil/Solid	19/11/2009	19/11/2009	091120-75	633723	<44.0	#	<44.0	#	70.1	#			
MTBE	<5 µg/kg	TM089	3.50 - 4.00	Soil/Solid	19/11/2009	19/11/2009	091120-75	633829	<5.00	#	<5.00	#	<7.00	#			
Benzene	<10 µg/kg	TM089	4.50 - 5.00	Soil/Solid	19/11/2009	19/11/2009	091120-75	634104	<10.0	M	<10.0	M	40.6	M			
Toluene	<2 µg/kg	TM089							<2.00	M	<3.00	M	16.0	M			
Ethyl Benzene	<3 µg/kg	TM089							<3.00	M	<3.00	M	<3.00	M			
m & p Xylene	<6 µg/kg	TM089							<6.00	M	<6.00	M	<8.00	M			
o Xylene	<3 µg/kg	TM089							<3.00	M	<3.00	M	<3.00	M			
Sum m&p and o Xylene	<10 µg/kg	TM089							<10.0	M	<10.0	M	<10.0	M			
Sum of BTEX	<10 µg/kg	TM089							<10.0	M	<10.0	M	56.6	M			
Aliphatics C5-C6	<10 µg/kg	TM089							<10.0		<10.0		<10.0				
Aliphatics >C6-C8	<10 µg/kg	TM089							<10.0		<10.0		<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089							<10.0		<10.0		<10.0				
Aliphatics >C10-C12	<10 µg/kg	TM089							<10.0		<10.0		<10.0				
Total Aliphatics C5-C12	<10 µg/kg	TM089							<10.0		<10.0		<10.0				
Aromatics C6-C7	<10 µg/kg	TM089							<10.0		<10.0		40.6				
Aromatics >C7-C8	<10 µg/kg	TM089							<10.0		<10.0		16.0				
Aromatics >EC8-EC10	<10 µg/kg	TM089							<10.0		<10.0		<10.0				
Aromatics >EC10-EC12	<10 µg/kg	TM089							<10.0		<10.0		<10.0				
Total Aromatics C6-C12	<10 µg/kg	TM089							<10.0		<10.0		56.6				

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SDG: 091120-75
Job: D_MOUCHEL_ELE-46
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66242

PAH micro by GCMS

Results Legend		Sample Identity	K1	K1	L2			
# ISO17025 accredited. # mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.00 - 1.50 Soil/Solid 19/11/2009 19/11/2009 091120-75 633723	3.50 - 4.00 Soil/Solid 19/11/2009 19/11/2009 091120-75 633829	4.50 - 5.00 Soil/Solid 19/11/2009 19/11/2009 091120-75 634104			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	156 M	71.4 M	508 M			
Acenaphthylene (S)	<12 µg/kg	TM218	70.2 M	12.6 M	128 M			
Acenaphthene (S)	<8 µg/kg	TM218	41.6 M	241 M	181 M			
Fluorene (S)	<10 µg/kg	TM218	95.6 M	68.9 M	239 M			
Phenanthrene (S)	<15 µg/kg	TM218	672 M	79.6 M	731 M			
Anthracene (S)	<16 µg/kg	TM218	154 M	85.4 M	310 M			
Fluoranthene (S)	<17 µg/kg	TM218	1120 M	210 M	952 M			
Pyrene (S)	<15 µg/kg	TM218	874 M	167 M	804 M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	412 M	98.9 M	479 M			
Chrysene (S)	<10 µg/kg	TM218	477 M	83.3 M	440 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	663 M	94.1 M	604 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	256 M	40.7 M	239 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	406 M	52.5 M	471 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	265 M	29.3 M	244 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	81.4 M	<23.0 M	83.2 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	315 M	36.8 M	349 M			
PAH 16 EPA Total	<118 µg/kg	TM218	6060 M	1370 M	6700 M			

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SDG: 091120-75
Job: D_MOUCHEL_ELE-46
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66242

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K1	K1	L2
Depth (m)	1.00 - 1.50	3.50 - 4.00	4.50 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-75	091120-75	091120-75
Lab Sample No.(s)	633723	633829	634104

Component	LOD/Units	Method			
Total Aliphatics >C5-C44	<100 µg/kg	TM173	28100	29700	23400
Total Aromatics >C6-C44	<100 µg/kg	TM173	58200	31900	180000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	86200	61600	203000

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 16 December 2009
Job: D_MOUCHEL_ELE-45
Sample Delivery Group (SDG): 091120-81
Your Reference: 19/11/09 (B6)
Location: Limerick Gasworks
Report No.: 67612

One sample was received on Thursday November 19, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-81
Job: D_MOUCHEL_ELE-45
Client Reference: 19/11/09 (B6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67612

SOLID

Results Legend	Sample ID	B6		Total
	Depth (m)	3.50 - 4.00		
	Container	60g VOC Dublin	TUB (D) JAR (D)	
Ammonium Soil by Titration	All		X	0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X	0 1
Easily Liberated Sulphide	All		X	0 1
EPH CWG (Aliphatic) GC (S)	All	X		0 1
EPH CWG (Aromatic) GC (S)	All	X		0 1
GRO BTEX MTBE GC (S)	All	X		0 1
Hexavalent Chromium (s)	All		X	0 1
Metals by iCap-OES (Soil)	Arsenic	X		0 1
	Cadmium	X		0 1
	Chromium	X		0 1
	Copper	X		0 1
	Lead	X		0 1
	Mercury	X		0 1
	Nickel	X		0 1
	Selenium	X		0 1
	Zinc	X		0 1
PAH by GCMS	All	X		0 1
PCBs by GCMS	All	X		0 1
pH	All		X	0 1
Phenols by HPLC (S)	All		X	0 1
Sample description	All	X		0 1
Total Sulphate	All	X		0 1
TPH CWG GC (S)	All	X		0 1
VOC MS (S)	All	X		0 1

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SDG:	091120-81	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-45	Attention:	Verity Sankey
Client Reference:	19/11/09 (B6)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67612

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
B6	3.50 - 4.00	Black	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-81
Job: D_MOUCHEL_ELE-45
Client Reference: 19/11/09 (B6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67612

Test Completion dates

SDG reference: 091120-81

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Cap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyanate	Ammonium Soil by Titration
B6	3.50 - 4.00	SOLID	30/11/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	07/12/2009	28/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	29/11/2009	01/12/2009	24/11/2009	01/12/2009

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SDG 091120-81
Job: D_MOUCHEL_ELE-45
Client Reference: 19/11/09 (B6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67612

Results Legend		Sample Identity	B6				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.50 - 4.00 Soil/Solid 19/11/2009 19/11/2009 091120-81 633533				
Component	LOD/Units	Method					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	358	M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	278				
Catechol	<0.01 mg/kg	TM062 (S)	<0.200				
Phenol	<0.01 mg/kg	TM062 (S)	1.74	M			
Cresols	<0.01 mg/kg	TM062 (S)	10.6	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<1.00				
Xylenols	<0.015 mg/kg	TM062 (S)	41.7	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.200				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.200	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.300	M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	54.1				
pH value of soil	1 pH Units	TM133	8.13	M			
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	#			
Total Cyanide	<1 mg/kg	TM153	207	M			
PCB congener 28	<3 µg/kg	TM168	<3.00				
PCB congener 52	<3 µg/kg	TM168	<3.00				
PCB congener 101	<3 µg/kg	TM168	<3.00				
PCB congener 118	<3 µg/kg	TM168	<3.00				
PCB congener 138	<3 µg/kg	TM168	<3.00				
PCB congener 153	<3 µg/kg	TM168	<3.00				
PCB congener 180	<3 µg/kg	TM168	<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	105	#			
Arsenic	<0.6 mg/kg	TM181	22.5	M			
Cadmium	<0.02 mg/kg	TM181	<0.0200	M			
Chromium	<0.9 mg/kg	TM181	9.29	M			
Copper	<1.4 mg/kg	TM181	7.63	M			
Lead	<0.7 mg/kg	TM181	11.6	M			
Mercury	<0.14 mg/kg	TM181	<0.140	M			
Nickel	<0.2 mg/kg	TM181	12.1	M			
Selenium	<1 mg/kg	TM181	8.20	#			
Zinc	<1.9 mg/kg	TM181	25.7	M			
Total Sulphate	<48 mg/kg	TM221	4990	M			

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SDG 091120-81
Job: D_MOUCHEL_ELE-45
Client Reference: 19/11/09 (B6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67612

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B6					
Depth (m)	3.50 - 4.00					
Sample Type	Soil/Solid					
Date Sampled	19/11/2009					
Date Received	19/11/2009					
SDG Ref	091120-81					
Lab Sample No.(s)	633533					

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	1200000			
Aromatics >EC16-EC21	<100 µg/kg	TM173	2270000			
Aromatics >EC21-EC35	<100 µg/kg	TM173	5230000			
Aromatics >EC35-EC44	<100 µg/kg	TM173	774000			
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	9470000			
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	9470000			

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SDG 091120-81
Job: D_MOUCHEL_ELE-45
Client Reference: 19/11/09 (B6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67612

GRO BTEX MTBE GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B6
Depth (m)	3.50 - 4.00
Sample Type	Soil/Solid
Date Sampled	19/11/2009
Date Received	19/11/2009
SDG Ref	091120-81
Lab Sample No.(s)	633533

Component	LOD/Units	Method					
GRO C5-C12	<44 µg/kg	TM089	748000	#			
MTBE	<5 µg/kg	TM089	<5.00	#			
Benzene	<10 µg/kg	TM089	24200	M			
Toluene	<2 µg/kg	TM089	90400	M			
Ethyl Benzene	<3 µg/kg	TM089	18800	M			
m & p Xylene	<6 µg/kg	TM089	131000	M			
o Xylene	<3 µg/kg	TM089	47900	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	179000	M			
Sum of BTEX	<10 µg/kg	TM089	312000	M			
Aliphatics C5-C6	<10 µg/kg	TM089	2860				
Aliphatics >C6-C8	<10 µg/kg	TM089	34700				
Aliphatics >C8-C10	<10 µg/kg	TM089	55400				
Aliphatics >C10-C12	<10 µg/kg	TM089	104000				
Total Aliphatics C5-C12	<10 µg/kg	TM089	197000				
Aromatics C6-C7	<10 µg/kg	TM089	24200				
Aromatics >C7-C8	<10 µg/kg	TM089	90400				
Aromatics >EC8-EC10	<10 µg/kg	TM089	281000				
Aromatics >EC10-EC12	<10 µg/kg	TM089	156000				
Total Aromatics C6-C12	<10 µg/kg	TM089	551000				

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SDG 091120-81
 Job: D_MOUCHEL_ELE-45
 Client Reference: 19/11/09 (B6)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67612

VOC MS (S)

Results Legend		Sample Identity	B6				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	3.50 - 4.00				
		Sample Type	Soil/Solid				
		Date Sampled	19/11/2009				
		Date Received	19/11/2009				
		SDG Ref	091120-81				
		Lab Sample No.(s)	633533				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	166				
Toluene-d8**	%	TM116	53.6				
4-Bromofluorobenzene**	%	TM116	88.0				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	34.4				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	27200				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	65700				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	19100				

SDG: 091120-81
Job: D_MOUCHEL_ELE-45
Client Reference: 19/11/09 (B6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67612

VOC MS (S)

Results Legend		Sample Identity	B6				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.50 - 4.00 Soil/Solid 19/11/2009 19/11/2009 091120-81 633533				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	128000	#			
o-Xylene	<11 µg/kg	TM116	46700	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	1860	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	2970	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	14100	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	28900	#			
sec-Butylbenzene	<8 µg/kg	TM116	268	#			
4-Isopropyltoluene	<8 µg/kg	TM116	1330	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	1450000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	106	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-57
Sample Delivery Group (SDG): 091120-86 **Report No.:** 66581
Your Reference: 17/11/09 (D9)
Location: Limerick Gasworks

A total of 4 samples was received on Wednesday November 18, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-86
 Job: D_MOUCHEL_ELE-57
 Client Reference: 17/11/09 (D9)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66581

SOLID

Results Legend	Sample ID	D9								Total
		1.50 - 2.00		3.00 - 3.50		4.50 - 5.00		5.50 - 6.00		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
Ammonium Soil by Titration	All		X		X		X		X	0 4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	0 4
Easily Liberated Sulphide	All		X		X		X		X	0 4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0 4
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	0 4
GRO BTEX MTBE GC (S)	All		X		X		X		X	0 4
Hexavalent Chromium (s)	All		X		X		X		X	0 4
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0 4
	Cadmium		X		X		X		X	0 4
	Chromium		X		X		X		X	0 4
	Copper		X		X		X		X	0 4
	Lead		X		X		X		X	0 4
	Mercury		X		X		X		X	0 4
	Nickel		X		X		X		X	0 4
	Selenium		X		X		X		X	0 4
	Zinc		X		X		X		X	0 4
PAH micro by GCMS	All		X		X		X		X	0 4
pH	All		X		X		X		X	0 4
Phenols by HPLC (S)	All		X		X		X		X	0 4
Sample description	All		X		X		X		X	0 4
Total Sulphate	All		X		X		X		X	0 4
TPH CWG GC (S)	All		X		X		X		X	0 4
VOC MS (S)	All			X		X		X		0 3

SDG:	091120-86	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-57	Attention:	Verity Sankey
Client Reference:	17/11/09 (D9)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66581

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D9	1.50 - 2.00	Brown	Sand	0.1 - 2 mm	Stones
	3.00 - 3.50	Brown	Sand	0.1 - 2 mm	Stones
	4.50 - 5.00	Brown	Sand	0.1 - 2 mm	Stones
	5.50 - 6.00	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-86
Job: D_MOUCHEL_ELE-57
Client Reference: 17/11/09 (D9)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66581

Test Completion dates

SDG reference: 091120-86

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
D9	1.50 - 2.00	SOLID	02/12/2009	02/12/2009	02/12/2009	23/11/2009	25/11/2009	23/11/2009	26/11/2009	25/11/2009	24/11/2009	01/12/2009	29/11/2009	29/11/2009	26/11/2009	24/11/2009	27/11/2009
	3.00 - 3.50	SOLID	30/11/2009	02/12/2009	25/11/2009	23/11/2009	25/11/2009	23/11/2009	26/11/2009	25/11/2009	24/11/2009	01/12/2009	29/11/2009	29/11/2009	26/11/2009	24/11/2009	27/11/2009
	4.50 - 5.00	SOLID	03/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	23/11/2009	26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	29/11/2009	26/11/2009	24/11/2009	27/11/2009
	5.50 - 6.00	SOLID	04/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	23/11/2009	26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	29/11/2009	26/11/2009	24/11/2009	27/11/2009

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SDG: 091120-86
Job: D_MOUCHEL_ELE-57
Client Reference: 17/11/09 (D9)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66581

Results Legend			Sample Identity				
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	D9	D9	D9	D9
			Sample Type	1.50 - 2.00	3.00 - 3.50	4.50 - 5.00	5.50 - 6.00
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Received	17/11/2009	17/11/2009	17/11/2009	17/11/2009
			SDG Ref	18/11/2009	18/11/2009	18/11/2009	18/11/2009
Lab Sample No.(s)	091120-86	091120-86	091120-86	091120-86			
Component	LOD/Units	Method	D9	D9	D9	D9	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	29.3 M	70.7 M	180 M	115 M	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	47.0 M	133 M	299 M	183 M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	36.6	103	232	142	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.200	<0.200	
Phenol	<0.01 mg/kg	TM062 (S)	0.0625 M	0.248 M	10.5 M	16.0 M	
Cresols	<0.01 mg/kg	TM062 (S)	0.300 M	1.17 M	106 M	50.5 M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<1.00	<1.00	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0700 M	3.30 M	294 M	127 M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.200	<0.200	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.200 M	<0.200 M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.300 M	<0.300 M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.450	4.76	111	194	
pH value of soil	1 pH Units	TM133	7.70 M	9.74 M	9.97 M	10.45 M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.0 #	<3.0 #	<6.0 #	<6.0 #	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00 #	<3.00 #	<6.00 #	<6.00 #	
Total Cyanide	<1 mg/kg	TM153	78.2 M	322 M	115 M	13.9 M	
Easily Liberated Sulphide	<15 mg/kg	TM180	50.21 #	1117.30 #	965.29 #	202.94 #	
Easily Liberated Sulphide	<15 mg/kg	TM180	62.8 #	1630 #	1250 #	252 #	
Arsenic	<0.6 mg/kg	TM181	13.4 M	30.8 M	155 M	8.29 M	
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M	<0.0200 M	<0.0200 M	
Chromium	<0.9 mg/kg	TM181	22.3 M	16.2 M	19.9 M	19.1 M	
Copper	<1.4 mg/kg	TM181	44.0 M	34.9 M	27.0 M	5.62 M	
Lead	<0.7 mg/kg	TM181	25.7 M	285 M	2070 M	14.0 M	
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M	<0.140 M	<0.140 M	
Nickel	<0.2 mg/kg	TM181	23.8 M	13.0 M	23.7 M	11.6 M	
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	<1.00 #	
Zinc	<1.9 mg/kg	TM181	38.9 M	94.9 M	111 M	19.3 M	
Total Sulphate	<48 mg/kg	TM221	6970 M	6080 M	9440 M	5370 M	

SDG: 091120-86
Job: D_MOUCHEL_ELE-57
Client Reference: 17/11/09 (D9)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66581

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D9	D9	D9	D9
Depth (m)	1.50 - 2.00	3.00 - 3.50	4.50 - 5.00	5.50 - 6.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009
Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009
SDG Ref	091120-86	091120-86	091120-86	091120-86
Lab Sample No.(s)	634411	634718	634824	634886

Component	LOD/Units	Method	D9	D9	D9	D9
Aliphatics >C12-C16	<100 µg/kg	TM173	318000	170000	773000	198000
Aliphatics >C16-C21	<100 µg/kg	TM173	533000	335000	2370000	310000
Aliphatics >C21-C35	<100 µg/kg	TM173	923000	690000	5080000	376000
Aliphatics >C35-C44	<100 µg/kg	TM173	89400	97800	325000	36600
Total Aliphatics >C12-C44	<100 µg/kg	TM173	1860000	1290000	8550000	920000
Aliphatics >C16-C35	<100 µg/kg	TM173	1460000	1020000	7450000	686000

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SDG: 091120-86
Job: D_MOUCHEL_ELE-57
Client Reference: 17/11/09 (D9)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66581

GRO BTEX MTBE GC (S)

Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Sample Identity	D9	D9	D9	D9
	Depth (m)	1.50 - 2.00	3.00 - 3.50	4.50 - 5.00	5.50 - 6.00
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	17/11/2009	17/11/2009	17/11/2009	17/11/2009
	Date Received	18/11/2009	18/11/2009	18/11/2009	18/11/2009
	SDG Ref	091120-86	091120-86	091120-86	091120-86
Lab Sample No.(s)	634411	634718	634824	634886	

Component	LOD/Units	Method	D9	D9	D9	D9
GRO C5-C12	<44 µg/kg	TM089	3640	30400	1830000	1350000
MTBE	<5 µg/kg	TM089	37.5	112	<5.00	248
Benzene	<10 µg/kg	TM089	218	2040	209000	10700
Toluene	<2 µg/kg	TM089	46.3	758	248000	77300
Ethyl Benzene	<3 µg/kg	TM089	<7.00	479	42800	26200
m & p Xylene	<6 µg/kg	TM089	45.0	1590	251000	180000
o Xylene	<3 µg/kg	TM089	43.8	1090	114000	83100
Sum m&p and o Xylene	<10 µg/kg	TM089	88.8	2690	366000	263000
Sum of BTEX	<10 µg/kg	TM089	353	5960	865000	378000
Aliphatics C5-C6	<10 µg/kg	TM089	32.0	65.7	6550	62.1
Aliphatics >C6-C8	<10 µg/kg	TM089	237	1480	62900	21700
Aliphatics >C8-C10	<10 µg/kg	TM089	248	3400	129000	125000
Aliphatics >C10-C12	<10 µg/kg	TM089	943	5720	239000	254000
Total Aliphatics C5-C12	<10 µg/kg	TM089	1460	10700	427000	401000
Aromatics C6-C7	<10 µg/kg	TM089	218	2040	209000	10700
Aromatics >C7-C8	<10 µg/kg	TM089	46.3	758	248000	77300
Aromatics >EC8-EC10	<10 µg/kg	TM089	460	8270	601000	478000
Aromatics >EC10-EC12	<10 µg/kg	TM089	1420	8570	344000	381000
Total Aromatics C6-C12	<10 µg/kg	TM089	2140	19600	1400000	947000

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SDG: 091120-86
 Job: D_MOUCHEL_ELE-57
 Client Reference: 17/11/09 (D9)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66581

PAH micro by GCMS

Results Legend		Sample Identity	D9	D9	D9	D9
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 17/11/2009 18/11/2009 091120-86 634411	3.00 - 3.50 Soil/Solid 17/11/2009 18/11/2009 091120-86 634718	4.50 - 5.00 Soil/Solid 17/11/2009 18/11/2009 091120-86 634824	5.50 - 6.00 Soil/Solid 17/11/2009 18/11/2009 091120-86 634886
Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	46800 M	265000 M	4130000 M	1940000 M
Acenaphthylene (S)	<12 µg/kg	TM218	34200 M	45200 M	531000 M	296000 M
Acenaphthene (S)	<8 µg/kg	TM218	42600 M	28800 M	143000 M	57900 M
Fluorene (S)	<10 µg/kg	TM218	187000 M	107000 M	578000 M	237000 M
Phenanthrene (S)	<15 µg/kg	TM218	429000 M	362000 M	1460000 M	519000 M
Anthracene (S)	<16 µg/kg	TM218	165000 M	117000 M	568000 M	208000 M
Fluoranthene (S)	<17 µg/kg	TM218	257000 M	300000 M	1110000 M	360000 M
Pyrene (S)	<15 µg/kg	TM218	167000 M	203000 M	725000 M	235000 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	89500 M	113000 M	350000 M	112000 M
Chrysene (S)	<10 µg/kg	TM218	66600 M	83400 M	247000 M	83200 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	64500 M	104000 M	341000 M	103000 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	24900 M	39600 M	132000 M	43500 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	43000 M	75700 M	260000 M	76200 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	18300 M	37200 M	125000 M	36200 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	6990 M	10500 M	30900 M	10100 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	19100 M	39500 M	133000 M	40700 M
PAH 16 EPA Total	<118 µg/kg	TM218	1660000 M	1930000 M	10900000 M	4360000 M

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SDG: 091120-86
Job: D_MOUCHEL_ELE-57
Client Reference: 17/11/09 (D9)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66581

VOC MS (S)

Results Legend			Sample Identity	D9	D9	D9			
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.50 - 5.00	5.50 - 6.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	17/11/2009	17/11/2009	17/11/2009			
			Date Received	18/11/2009	18/11/2009	18/11/2009			
			SDG Ref	091120-86	091120-86	091120-86			
			Lab Sample No.(s)	634718	634824	634886			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	120	109	111				
Toluene-d8**	%	TM116	67.9	84.6	93.0				
4-Bromofluorobenzene**	%	TM116	59.9	72.0	82.9				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<1300	<1300				
Chloromethane	<12 µg/kg	TM116	<12.0	<1200	<1200				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<1000	<1000				
Bromoethane	<9 µg/kg	TM116	<9.00	<900	<900				
Chloroethane	<12 µg/kg	TM116	<12.0	<1200	<1200				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<700	<700				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<900	<900				
Carbon Disulphide	<9 µg/kg	TM116	462	<900	<900				
Dichloromethane	<10 µg/kg	TM116	<10.0	<1000	<1000				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<900	<900				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<1200	<1200				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<800	<800				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<900	<900				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<1000	<1000				
Bromochloromethane	<10 µg/kg	TM116	<10.0	<1000	<1000				
Chloroform	<10 µg/kg	TM116	<10.0	<1000	<1000				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<1200	<1200				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<1300	<1300				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<1100	<1100				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<1000	<1000				
Benzene	<9 µg/kg	TM116	1960	358000	10500				
Trichloroethene	<9 µg/kg	TM116	<9.00	<900	<900				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<1000	<1000				
Dibromomethane	<12 µg/kg	TM116	<12.0	<1200	<1200				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<1100	<1100				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<2500	<2500				
Toluene	<6 µg/kg	TM116	618	278000	62800				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<2700	<2700				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<900	<900				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<700	<700				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<900	<900				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<900	<900				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<1400	<1400				
Chorobenzene	<7 µg/kg	TM116	<7.00	<700	<700				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<1100	<1100				
Ethylbenzene	<9 µg/kg	TM116	557	42500	17400				

SDG: 091120-86
Job: D_MOUCHEL_ELE-57
Client Reference: 17/11/09 (D9)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66581

VOC MS (S)

Results Legend			Sample Identity	D9	D9	D9
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.50 - 5.00	5.50 - 6.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	17/11/2009	17/11/2009	17/11/2009
			Date Received	18/11/2009	18/11/2009	18/11/2009
			SDG Ref	091120-86	091120-86	091120-86
			Lab Sample No.(s)	634718	634824	634886
Component	LOD/Units	Method				
p/m-Xylene	<13 µg/kg	TM116	1970	258000	137000	
			#			
o-Xylene	<11 µg/kg	TM116	1100	103000	55100	
			M			
Styrene	<11 µg/kg	TM116	<11.0	<1100	<1100	
			M			
Bromoform	<12 µg/kg	TM116	<12.0	<1200	<1200	
			M			
Isopropylbenzene	<9 µg/kg	TM116	133	3870	2750	
			M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<1500	<1500	
			#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<1300	<1300	
			M			
Bromobenzene	<14 µg/kg	TM116	<14.0	<1400	<1400	
			M			
Propylbenzene	<6 µg/kg	TM116	213	6800	5990	
			M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<1400	<1400	
			#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	919	30300	24700	
			M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<900	<900	
			#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<1200	<1200	
			#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	2310	69200	60900	
			#			
sec-Butylbenzene	<8 µg/kg	TM116	45.6	<800	<800	
			#			
4-Isopropyltoluene	<8 µg/kg	TM116	159	3450	2500	
			#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<800	<800	
			#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<1100	<1100	
			M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<700	<700	
			#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<800	<800	
			M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<1100	<1100	
			M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<700	<700	
			#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<900	<900	
			#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<1500	<1500	
			#			
Naphthalene	<7 µg/kg	TM116	106000	3280000	1740000	
			#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<1200	<1200	
			#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 09 December 2009
Job: D_MOUCHEL_ELE-47
Sample Delivery Group (SDG): 091120-91 **Report No.:** 67034
Your Reference: 18/11/09 (J4)
Location: Limerick Gasworks

A total of 3 samples was received on Thursday November 19, 2009 and completed on Wednesday December 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-91
Job: D_MOUCHEL_ELE-47
Client Reference: 18/11/09 (J4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67034

SOLID

Results Legend	Sample ID	J4						Total
		0.55 - 1.00		2.50 - 3.00		4.30 - 4.80		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X	3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
GRO BTEX MTBE GC (S)	All	X		X		X		3
Hexavalent Chromium (s)	All		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic		X		X		X	3
	Cadmium		X		X		X	0
	Chromium		X		X		X	3
	Copper		X		X		X	0
	Lead		X		X		X	3
	Mercury		X		X		X	0
	Nickel		X		X		X	3
	Selenium		X		X		X	0
	Zinc		X		X		X	3
PAH micro by GCMS	All		X		X		X	0
pH	All		X		X		X	3
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All		X		X		X	3
Total Sulphate	All		X		X		X	0
TPH CWG GC (S)	All		X		X		X	3
			X		X		X	0
			X		X		X	3

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SDG:	091120-91	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-47	Attention:	Verity Sankey
Client Reference:	18/11/09 (J4)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67034

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
J4	0.55 - 1.00	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	2.50 - 3.00	Grey	Silty Sand	0.063 - 0.1 mm	Stones
	4.30 - 4.80	Black	Sludge / Sediment	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-91
Job: D_MOUCHEL_ELE-47
Client Reference: 18/11/09 (J4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67034

Test Completion dates

SDG reference: 091120-91

Sample ID	Depth	Type	SDG reference: 091120-91													
			Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)
J4	0.55 - 1.00	SOLID	30/11/2009	24/11/2009	08/12/2009	29/11/2009	29/11/2009	01/12/2009	09/12/2009	24/11/2009	25/11/2009	26/11/2009	25/11/2009	23/11/2009	25/11/2009	02/12/2009
	2.50 - 3.00	SOLID	30/11/2009	24/11/2009	01/12/2009	26/11/2009	26/11/2009	09/12/2009	24/11/2009	25/11/2009	26/11/2009	25/11/2009	23/11/2009	25/11/2009	09/12/2009	02/12/2009
	4.30 - 4.80	SOLID	30/11/2009	24/11/2009	01/12/2009	29/11/2009	29/11/2009	01/12/2009	09/12/2009	24/11/2009	25/11/2009	26/11/2009	25/11/2009	23/11/2009	25/11/2009	02/12/2009

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SDG: 091120-91
Job: D_MOUCHEL_ELE-47
Client Reference: 18/11/09 (J4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67034

Results Legend			Sample Identity	J4	J4	J4
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 1.00	2.50 - 3.00	4.30 - 4.80
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	18/11/2009	18/11/2009	18/11/2009
			Date Received	19/11/2009	19/11/2009	19/11/2009
			SDG Ref	091120-91	091120-91	091120-91
Lab Sample No.(s)	634137	634198	634272			
Component	LOD/Units	Method				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	24.0 M	<15.0 M	37.0 M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	18.7	<15.0	28.8	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	0.0960 M	0.108 M	0.143 M	
Cresols	<0.01 mg/kg	TM062 (S)	0.228 M	0.156 M	0.221 M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	0.338 M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.336	<0.220	0.702	
pH value of soil	1 pH Units	TM133	7.59 M	7.60 M	8.82 M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<3.00 #	<0.600 #	
Total Cyanide	<1 mg/kg	TM153	201 M	452 M	106 M	
Easily Liberated Sulphide	<15 mg/kg	TM180	200 #	38.0 #	347 #	
Arsenic	<0.6 mg/kg	TM181	10.4 M	2.30 M	6.73 M	
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M	<0.0200 M	
Chromium	<0.9 mg/kg	TM181	16.7 M	11.9 M	7.57 M	
Copper	<1.4 mg/kg	TM181	31.0 M	18.0 M	9.42 M	
Lead	<0.7 mg/kg	TM181	90.4 M	66.8 M	17.4 M	
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M	<0.140 M	
Nickel	<0.2 mg/kg	TM181	20.6 M	10.4 M	5.79 M	
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	
Zinc	<1.9 mg/kg	TM181	72.5 M	45.8 M	16.5 M	
Total Sulphate	<48 mg/kg	TM221	94600 M	2190 M	6030 M	

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SDG: 091120-91
Job: D_MOUCHEL_ELE-47
Client Reference: 18/11/09 (J4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67034

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	J4	J4	J4			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 1.00	2.50 - 3.00	4.30 - 4.80			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	18/11/2009	18/11/2009	18/11/2009			
			Date Received	19/11/2009	19/11/2009	19/11/2009			
			SDG Ref	091120-91	091120-91	091120-91			
			Lab Sample No.(s)	634137	634198	634272			
			Method						
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	508	3910	2230				
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00				
			#	#	#				
Benzene	<10 µg/kg	TM089	33.6	342	1380				
			M	M	M				
Toluene	<2 µg/kg	TM089	30.0	42.0	36.4				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	<3.00	60.0	24.7				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	22.8	113	32.5				
			M	M	M				
o Xylene	<3 µg/kg	TM089	<8.00	43.2	13.0				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	22.8	156	45.5				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	86.4	600	1480				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	26.0	43.9	55.6				
Aliphatics >C6-C8	<10 µg/kg	TM089	26.2	374	46.2				
Aliphatics >C8-C10	<10 µg/kg	TM089	41.7	488	86.7				
Aliphatics >C10-C12	<10 µg/kg	TM089	106	668	132				
Total Aliphatics C5-C12	<10 µg/kg	TM089	200	1570	360				
Aromatics C6-C7	<10 µg/kg	TM089	33.6	342	1380				
Aromatics >C7-C8	<10 µg/kg	TM089	30.0	420	36.4				
Aromatics >EC8-EC10	<10 µg/kg	TM089	85.4	948	200				
Aromatics >EC10-EC12	<10 µg/kg	TM089	159	1000	257				
Total Aromatics C6-C12	<10 µg/kg	TM089	308	2330	1870				

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SDG: 091120-91
Job: D_MOUCHEL_ELE-47
Client Reference: 18/11/09 (J4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67034

PAH micro by GCMS

Results Legend			Sample Identity	J4	J4	J4			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.55 - 1.00	2.50 - 3.00	4.30 - 4.80			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	18/11/2009	18/11/2009	18/11/2009			
			Date Received	19/11/2009	19/11/2009	19/11/2009			
			SDG Ref	091120-91	091120-91	091120-91			
			Lab Sample No.(s)	634137	634198	634272			
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	4290	28500	33700	M	M	M	
Acenaphthylene (S)	<12 µg/kg	TM218	5380	575	2620	M	M	M	
Acenaphthene (S)	<8 µg/kg	TM218	1870	22100	18300	M	M	M	
Fluorene (S)	<10 µg/kg	TM218	6660	3480	17900	M	M	M	
Phenanthrene (S)	<15 µg/kg	TM218	58500	2620	37100	M	M	M	
Anthracene (S)	<16 µg/kg	TM218	15800	1150	13000	M	M	M	
Fluoranthene (S)	<17 µg/kg	TM218	62800	3930	66400	M	M	M	
Pyrene (S)	<15 µg/kg	TM218	44000	3130	57100	M	M	M	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	29100	1690	50100	M	M	M	
Chrysene (S)	<10 µg/kg	TM218	25900	1540	38900	M	M	M	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	35700	1870	75300	M	M	M	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	16800	842	30600	M	M	M	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	22300	1700	77700	M	M	M	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	16400	1010	45700	M	M	M	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	5490	349	14700	M	M	M	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	17500	1160	50100	M	M	M	
PAH 16 EPA Total	<118 µg/kg	TM218	369000	75800	629000	M	M	M	

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 29 December 2009
Job: D_MOUCHEL_ELE-49
Sample Delivery Group (SDG): 091120-96
Your Reference: 18/11/09 (C8)
Location: Limerick Gasworks
Report No.: 68348

A total of 5 samples was received on Thursday November 19, 2009 and completed on Tuesday December 29, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 68348

SOLID

Results Legend	Sample ID	C8										Total
		0.40 - 1.00		1.00 - 1.50		2.00 - 2.50		2.50 - 3.00		3.00 - 3.30		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test												
N No Determination Possible												
Ammonium Soil by Titration	All		X		X		X		X		X	0
Cyanide Comp/Free/Total/Thiocyanate	All		X		X		X		X		X	5
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X		X	0
Easily Liberated Sulphide	All		X		X		X		X		X	4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X		X	5
GRO BTEX MTBE GC (S)	All		X		X		X		X		X	0
Hexavalent Chromium (s)	All	X	X		X		X		X		X	5
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X		X	0
	Cadmium		X		X		X		X		X	5
	Chromium		X		X		X		X		X	0
	Copper		X		X		X		X		X	5
	Lead		X		X		X		X		X	0
	Mercury		X		X		X		X		X	5
	Nickel		X		X		X		X		X	0
	Selenium		X		X		X		X		X	5
	Zinc		X		X		X		X		X	0
PAH by GCMS	All		X		X		X		X		X	2
PAH micro by GCMS	All		X		X		X		X		X	0
PCBs by GCMS	All		X		X		X		X		X	3
pH	All		X		N		N		N		X	1
Phenols by HPLC (S)	All		X		X		X		X		X	3
Sample description	All		X		X		X		X		X	0
Total Sulphate	All		X		X		X		X		X	5
TPH CWG GC (S)	All		X		X		X		X		X	0
VOC MS (S)	All	X			X		X		X		X	5
												0
												3

SDG:	091120-96	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-49	Attention:	Verity Sankey
Client Reference:	18/11/09 (C8)	Order No.:	
Location:	Limerick Gasworks	Report No.:	68348

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C8	0.40 - 1.00	Brown	Sand	0.1 - 2 mm	Stones
	1.00 - 1.50	Grey	Sand	0.063 - 0.1 mm	Tar
	2.00 - 2.50	Black	Sand	0.1 - 2 mm	Oil/Petroleum
	2.50 - 3.00	Grey	Silty Sand	0.063 - 0.1 mm	Oil/Petroleum
	3.00 - 3.30	Black	Sludge / Sediment	0.063 - 0.1 mm	Oil/Petroleum

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 68348

Test Completion dates

SDG reference: 091120-96

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
C8	0.40 - 1.00	SOLID	03/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009			26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	24/11/2009	27/11/2009	01/12/2009
	1.00 - 1.50	SOLID	03/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009	09/12/2009			26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	24/11/2009	24/11/2009	01/12/2009
	2.00 - 2.50	SOLID	30/11/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009				26/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	24/11/2009	24/11/2009	01/12/2009
	2.50 - 3.00	SOLID	03/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009				28/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	24/11/2009	24/11/2009	01/12/2009
	3.00 - 3.30	SOLID	03/12/2009	03/12/2009	25/11/2009	23/11/2009	25/11/2009				28/11/2009	25/11/2009	24/11/2009	03/12/2009	29/11/2009	24/11/2009	24/11/2009	04/12/2009

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SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66524

Results Legend			Sample Identity	C8	C8	C8	C8	C8
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.40 - 1.00 Soil/Solid 18/11/2009 19/11/2009 091120-96 634372	1.00 - 1.50 Soil/Solid 23/11/2009 19/11/2009 091120-96 634395	2.00 - 2.50 Soil/Solid 18/11/2009 19/11/2009 091120-96 634453	2.50 - 3.00 Soil/Solid 18/11/2009 19/11/2009 091120-96 634492	3.00 - 3.30 Soil/Solid 23/11/2009 19/11/2009 091120-96 634573
Component	LOD/Units	Method						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	278	424	168	111	5200	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	216	330	130	86.2	4050	
Catechol	<0.01 mg/kg	TM062 (S)	<1.00	<0.200	<0.200	<0.200	<0.200	
Phenol	<0.01 mg/kg	TM062 (S)	350	17.6	14.0	2.93	8.28	
Cresols	<0.01 mg/kg	TM062 (S)	941	51.4	32.4	7.42	45.5	
Resorcinol	<0.05 mg/kg	TM062 (S)	<5.00	<1.00	<1.00	<1.00	<1.00	
Xylenols	<0.015 mg/kg	TM062 (S)	710	93.1	30.0	12.3	93.4	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<1.00	<0.200	<0.200	<0.200	<0.200	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<1.00	<0.200	<0.200	<0.200	<0.200	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<1.50	<0.300	<0.300	<0.300	<0.300	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	2000	162	76.4	22.6	147	
pH value of soil	1 pH Units	TM133	11.18				9.63	
Hexavalent Chromium	<0.6 mg/kg	TM151	<12.0	<12.0	<6.00	<6.00	<6.00	
Total Cyanide	<1 mg/kg	TM153	73.3	704	325	276	147	
PCB congener 28	<3 µg/kg	TM168		<3.00				
PCB congener 52	<3 µg/kg	TM168		<3.00				
PCB congener 101	<3 µg/kg	TM168		<3.00				
PCB congener 118	<3 µg/kg	TM168		<3.00				
PCB congener 138	<3 µg/kg	TM168		<3.00				
PCB congener 153	<3 µg/kg	TM168		<3.00				
PCB congener 180	<3 µg/kg	TM168		<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	90.0	4220	310	367	2360	
Arsenic	<0.6 mg/kg	TM181	13.2	17.6	9.39	13.5	7.70	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	
Chromium	<0.9 mg/kg	TM181	23.3	14.3	11.7	14.0	9.12	
Copper	<1.4 mg/kg	TM181	37.7	73.1	29.1	158	7.48	
Lead	<0.7 mg/kg	TM181	79.5	234	111	51.5	13.1	
Mercury	<0.14 mg/kg	TM181	<0.140	0.688	<0.140	<0.140	<0.140	
Nickel	<0.2 mg/kg	TM181	28.5	27.1	14.7	27.3	6.81	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	56.9	117	35.7	68.6	20.7	
Total Sulphate	<48 mg/kg	TM221	7190	4420	3620	21300	3430	

SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66524

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C8	C8	C8	C8	C8
Depth (m)	0.40 - 1.00	1.00 - 1.50	2.00 - 2.50	2.50 - 3.00	3.00 - 3.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	18/11/2009	23/11/2009	18/11/2009	18/11/2009	23/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091120-96	091120-96	091120-96	091120-96	091120-96
Lab Sample No.(s)	634372	634395	634453	634492	634573

Component	LOD/Units	Method	C8	C8	C8	C8	C8
Aliphatics >C12-C16	<100 µg/kg	TM173	397000	810000	159000	746000	452000
Aliphatics >C16-C21	<100 µg/kg	TM173	563000	1080000	201000	709000	392000
Aliphatics >C21-C35	<100 µg/kg	TM173	724000	1170000	300000	844000	440000
Aliphatics >C35-C44	<100 µg/kg	TM173	68200	73100	35300	53600	26400
Total Aliphatics >C12-C44	<100 µg/kg	TM173	1750000	3130000	696000	2350000	1310000
Aliphatics >C16-C35	<100 µg/kg	TM173	1290000	2250000	502000	1550000	832000

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SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66524

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	C8	C8	C8	C8	C8
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 1.00	1.00 - 1.50	2.00 - 2.50	2.50 - 3.00	3.00 - 3.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	18/11/2009	23/11/2009	18/11/2009	18/11/2009	23/11/2009
			Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009	19/11/2009
			SDG Ref	091120-96	091120-96	091120-96	091120-96	091120-96
			Lab Sample No.(s)	634372	634395	634453	634492	634573
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	2490000	521000	1140000	1240000	1520000	
MTBE	<5 µg/kg	TM089	<5.00	303	<5.00	<5.00	<5.00	
Benzene	<10 µg/kg	TM089	171000	30700	54900	46000	67900	
Toluene	<2 µg/kg	TM089	371000	45700	94100	134000	189000	
Ethyl Benzene	<3 µg/kg	TM089	69800	17700	31500	30600	39500	
m & p Xylene	<6 µg/kg	TM089	467000	96800	182000	202000	259000	
o Xylene	<3 µg/kg	TM089	202000	39200	76200	84400	106000	
Sum m&p and o Xylene	<10 µg/kg	TM089	669000	136000	258000	287000	365000	
Sum of BTEX	<10 µg/kg	TM089	1280000	230000	439000	497000	661000	
Aliphatics C5-C6	<10 µg/kg	TM089	4380	393	3170	5740	96700	
Aliphatics >C6-C8	<10 µg/kg	TM089	85600	21100	53400	66500	1240	
Aliphatics >C8-C10	<10 µg/kg	TM089	189000	42300	91600	<10.0	<10.0	
Aliphatics >C10-C12	<10 µg/kg	TM089	261000	65400	167000	384000	456000	
Total Aliphatics C5-C12	<10 µg/kg	TM089	539000	129000	315000	457000	554000	
Aromatics C6-C7	<10 µg/kg	TM089	171000	30700	54900	46000	67900	
Aromatics >C7-C8	<10 µg/kg	TM089	371000	45700	94100	134000	189000	
Aromatics >EC8-EC10	<10 µg/kg	TM089	1020000	217000	427000	142000	181000	
Aromatics >EC10-EC12	<10 µg/kg	TM089	391000	98100	251000	576000	683000	
Total Aromatics C6-C12	<10 µg/kg	TM089	1950000	392000	827000	898000	1120000	

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SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66524

PAH by GCMS

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C8	C8				
Depth (m)	2.50 - 3.00	3.00 - 3.30				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	18/11/2009	23/11/2009				
Date Received	19/11/2009	19/11/2009				
SDG Ref	091120-96	091120-96				
Lab Sample No.(s)	634492	634573				

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	1560000	885000		
			M	M		
Acenaphthylene (S)	<12 µg/kg	TM218	201000	106000		
			M	M		
Acenaphthene (S)	<8 µg/kg	TM218	35800	19300		
			M	M		
Fluorene (S)	<10 µg/kg	TM218	167000	88000		
			M	M		
Phenanthrene (S)	<15 µg/kg	TM218	429000	231000		
			M	M		
Anthracene (S)	<16 µg/kg	TM218	148000	75600		
			M	M		
Fluoranthene (S)	<17 µg/kg	TM218	299000	152000		
			M	M		
Pyrene (S)	<15 µg/kg	TM218	202000	104000		
			M	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	94500	44500		
			M	M		
Chrysene (S)	<10 µg/kg	TM218	68100	32200		
			M	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	76600	38200		
			M	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	32200	15300		
			M	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	70400	31400		
			M	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	30800	13200		
			M	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	8710	3880		
			M	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	31800	14200		
			M	M		
PAH 16 EPA Total	<118 µg/kg	TM218	3460000	1860000		
			M	M		

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SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66524

PAH micro by GCMS

Results Legend		Sample Identity	C8	C8	C8
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.40 - 1.00 Soil/Solid 18/11/2009 19/11/2009 091120-96 634372	1.00 - 1.50 Soil/Solid 23/11/2009 19/11/2009 091120-96 634395	2.00 - 2.50 Soil/Solid 18/11/2009 19/11/2009 091120-96 634453
Component	LOD/Units	Method			
Naphthalene (S)	<9 µg/kg	TM218	1870000 M	3760000 M	1330000 M
Acenaphthylene (S)	<12 µg/kg	TM218	250000 M	421000 M	168000 M
Acenaphthene (S)	<8 µg/kg	TM218	63400 M	121000 M	40300 M
Fluorene (S)	<10 µg/kg	TM218	265000 M	419000 M	159000 M
Phenanthrene (S)	<15 µg/kg	TM218	602000 M	1050000 M	359000 M
Anthracene (S)	<16 µg/kg	TM218	255000 M	384000 M	145000 M
Fluoranthene (S)	<17 µg/kg	TM218	448000 M	778000 M	263000 M
Pyrene (S)	<15 µg/kg	TM218	297000 M	531000 M	181000 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	151000 M	255000 M	85100 M
Chrysene (S)	<10 µg/kg	TM218	113000 M	190000 M	69200 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	142000 M	264000 M	81400 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	58100 M	99700 M	34900 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	106000 M	225000 M	66600 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	51400 M	118000 M	32500 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	14100 M	32500 M	8300 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	55400 M	130000 M	36700 M
PAH 16 EPA Total	<118 µg/kg	TM218	4740000 M	8780000 M	3060000 M

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SDG: 091120-96
Job: D_MOUCHEL_ELE-49
Client Reference: 18/11/09 (C8)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66524

VOC MS (S)

Results Legend			Sample Identity	C8	C8	C8
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 1.00	2.00 - 2.50	3.00 - 3.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	18/11/2009	18/11/2009	23/11/2009
			Date Received	19/11/2009	19/11/2009	19/11/2009
			SDG Ref	091120-96	091120-96	091120-96
			Lab Sample No.(s)	634372	634453	634573
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM116	118	127	143	
Toluene-d8**	%	TM116	72.3	59.0	59.2	
4-Bromofluorobenzene**	%	TM116	60.6	98.1	86.9	
Dichlorodifluoromethane	<13 µg/kg	TM116	<130 M	<13.0 M	<13.0 M	
Chloromethane	<12 µg/kg	TM116	<120 #	<12.0 #	<12.0 #	
Vinyl Chloride	<10 µg/kg	TM116	<100 M	<10.0 M	<10.0 M	
Bromoethane	<9 µg/kg	TM116	<90.0 M	<9.00 M	<9.00 M	
Chloroethane	<12 µg/kg	TM116	<120 M	<12.0 M	<12.0 M	
Trichlorofluoromethane	<7 µg/kg	TM116	<70.0 M	<7.00 M	<7.00 M	
1,1-Dichloroethene	<9 µg/kg	TM116	<90.0 #	<9.00 #	<9.00 #	
Carbon Disulphide	<9 µg/kg	TM116	<90.0 M	28.7 M	17.5 M	
Dichloromethane	<10 µg/kg	TM116	<100 M	<10.0 M	<10.0 M	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<90.0 M	<9.00 M	<9.00 M	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<120 M	<12.0 M	<12.0 M	
1,1-Dichloroethane	<8 µg/kg	TM116	<80.0 M	<8.00 M	<8.00 M	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<90.0 M	<9.00 M	<9.00 M	
2,2-Dichloropropane	<10 µg/kg	TM116	<100 M	<10.0 M	<10.0 M	
Bromochloromethane	<10 µg/kg	TM116	<100 M	<10.0 M	<10.0 M	
Chloroform	<10 µg/kg	TM116	<100 M	<10.0 M	<10.0 M	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<120 M	<12.0 M	<12.0 M	
1,1-Dichloropropene	<13 µg/kg	TM116	<130 M	<13.0 M	<13.0 M	
Carbontetrachloride	<11 µg/kg	TM116	<110 M	<11.0 M	<11.0 M	
1,2-Dichloroethane	<10 µg/kg	TM116	<100 M	<10.0 M	<10.0 M	
Benzene	<9 µg/kg	TM116	138000 M	13700 M	123000 M	
Trichloroethene	<9 µg/kg	TM116	<90.0 #	<9.00 #	<9.00 #	
1,2-Dichloropropane	<10 µg/kg	TM116	<100 M	<10.0 M	<10.0 M	
Dibromomethane	<12 µg/kg	TM116	<120 M	<12.0 M	<12.0 M	
Bromodichloromethane	<11 µg/kg	TM116	<110 M	<11.0 M	<11.0 M	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<250 M	<25.0 M	<25.0 M	
Toluene	<6 µg/kg	TM116	295000 M	38000 M	174000 M	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<270 M	<27.0 M	<27.0 M	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<90.0 M	<9.00 M	<9.00 M	
1,3-Dichloropropane	<7 µg/kg	TM116	<70.0 M	<7.00 M	<7.00 M	
Tetrachloroethene	<9 µg/kg	TM116	<90.0 M	<9.00 M	<9.00 M	
Dibromochloromethane	<9 µg/kg	TM116	<90.0 M	<9.00 M	<9.00 M	
1,2-Dibromoethane	<14 µg/kg	TM116	<140 M	<14.0 M	<14.0 M	
Chorobenzene	<7 µg/kg	TM116	<70.0 M	<7.00 M	<7.00 M	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<110 M	<11.0 M	<11.0 M	
Ethylbenzene	<9 µg/kg	TM116	45500 M	17200 M	29900 M	

SDG: 091120-96
 Job: D_MOUCHEL_ELE-49
 Client Reference: 18/11/09 (C8)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66524

VOC MS (S)

Results Legend			Sample Identity	C8	C8	C8			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 1.00	2.00 - 2.50	3.00 - 3.30			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	18/11/2009	18/11/2009	23/11/2009			
			Date Received	19/11/2009	19/11/2009	19/11/2009			
			SDG Ref	091120-96	091120-96	091120-96			
			Lab Sample No.(s)	634372	634453	634573			
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	364000	118000	218000	#	#		
o-Xylene	<11 µg/kg	TM116	151000	52300	87000	M	M		
Styrene	<11 µg/kg	TM116	<110	<11.0	<11.0	M	M		
Bromoform	<12 µg/kg	TM116	<120	<12.0	<12.0	M	M		
Isopropylbenzene	<9 µg/kg	TM116	3260	2000	1350	M	M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	<15.0	#	#		
1,2,3-Trichloropropane	<13 µg/kg	TM116	<130	<13.0	<13.0	M	M		
Bromobenzene	<14 µg/kg	TM116	<140	<14.0	<14.0	M	M		
Propylbenzene	<6 µg/kg	TM116	5840	5070	2160	M	M		
2-Chlorotoluene	<14 µg/kg	TM116	<140	<14.0	<14.0	#	#		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	44700	22800	35900	M	M		
4-Chlorotoluene	<9 µg/kg	TM116	<90.0	<9.00	<9.00	#	#		
tert-Butylbenzene	<12 µg/kg	TM116	<120	<12.0	<12.0	#	#		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	108000	56200	81300	#	#		
sec-Butylbenzene	<8 µg/kg	TM116	446	248	164	#	#		
4-Isopropyltoluene	<8 µg/kg	TM116	<80.0	10.80	<8.00	#	#		
1,3-Dichlorobenzene	<8 µg/kg	TM116	<80.0	8.00	<8.00	#	#		
1,4-Dichlorobenzene	<11 µg/kg	TM116	<110	<11.0	<11.0	M	M		
n-Butylbenzene	<7 µg/kg	TM116	<70.0	<7.00	<7.00	#	#		
1,2-Dichlorobenzene	<8 µg/kg	TM116	<80.0	<8.00	<8.00	M	M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<110	<11.0	<11.0	M	M		
Tert-amyl methyl ether	<7 µg/kg	TM116	<70.0	<7.00	<7.00	#	#		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<90.0	<9.00	<9.00	#	#		
Hexachlorobutadiene	<15 µg/kg	TM116	<150	<15.0	<15.0	#	#		
Naphthalene	<7 µg/kg	TM116	1460000	1180000	1850000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<120	<12.0	<12.0	#	#		

Table of Results - Appendix

SDG Number : 091120-96

Client : Mouchel

Client Ref : 18/11/09 (C8)

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹
PM001		Preparation of Samples for Metals Analysis	Dry
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material	Wet
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids	Wet
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC	Wet
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter	Wet
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser	Wet
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS System" Segmented Flow Analyser	Wet
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and ECP Polychlorinated Biphenyl Congeners by GC-MS in Soils	Dry
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID	Dry
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique	Wet
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES	Dry
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546	Wet
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer	Dry

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Notification of NDPs (No determination possible)

SDG Number	091120-96	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	18/11/09 (C8)	Report No.	31038-0
Attention	Dave Watts	Date Received	20/11/2009 14:29:04

Sample No	Sample Identity	Depth (m)	Test	Comment
641275	C8	1.00 - 1.50	pH	Sample contains oil / product
641275	C8	1.00 - 1.50	pH	Sample contains oil / product
641275	C8	1.00 - 1.50	pH	Sample contains oil / product
641318	C8	2.00 - 2.50	pH	Sample contains oil / product
641318	C8	2.00 - 2.50	pH	Sample contains oil / product
641318	C8	2.00 - 2.50	pH	Sample contains oil / product
641473	C8	2.50 - 3.00	pH	Sample contains oil / product
641473	C8	2.50 - 3.00	pH	Sample contains oil / product
641473	C8	2.50 - 3.00	pH	Sample contains oil / product

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-48
Sample Delivery Group (SDG): 091120-97
Your Reference: Limerick Gasworks
Location: Limerick Gasworks
Report No.: 66695

A total of 2 samples was received on Thursday November 19, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66695

SOLID

Results Legend	Sample ID	D8				Total
		0.60 - 1.10		1.50 - 2.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test						
N No Determination Possible						
Ammonium Soil by Titration	All		X		X	0 2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X	0 2
Easily Liberated Sulphide	All		X		X	0 2
EPH CWG (Aliphatic) GC (S)	All		X		X	0 2
EPH CWG (Aromatic) GC (S)	All		X		X	0 2
GRO BTEX MTBE GC (S)	All	X		X		0 2
Hexavalent Chromium (s)	All		X		X	0 2
Metals by iCap-OES (Soil)	Arsenic		X		X	0 2
	Cadmium		X		X	0 2
	Chromium		X		X	0 2
	Copper		X		X	0 2
	Lead		X		X	0 2
	Mercury		X		X	0 2
	Nickel		X		X	0 2
	Selenium		X		X	0 2
	Zinc		X		X	0 2
PAH micro by GCMS	All		X		X	0 2
pH	All		X		X	0 2
Phenols by HPLC (S)	All		X		X	0 2
Sample description	All		X		X	0 2
Total Sulphate	All		X		X	0 2
TPH CWG GC (S)	All		X		X	0 2
VOC MS (S)	All	X		X		0 2

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SDG:	091120-97	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-48	Attention:	Verity Sankey
Client Reference:	Limerick Gasworks	Order No.:	
Location:	Limerick Gasworks	Report No.:	66695

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D8	0.60 - 1.10	Brown	Sandy Clay	0.1 - 2 mm	Stones
	1.50 - 2.00	Black	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66695

Test Completion dates

SDG reference: 091120-97

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
D8	0.60 - 1.10	SOLID	30/11/2009	02/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	25/11/2009	01/12/2009	29/11/2009	29/11/2009	24/11/2009	24/11/2009	30/11/2009
	1.50 - 2.00	SOLID	30/11/2009	02/12/2009	25/11/2009	23/11/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	24/11/2009	01/12/2009	29/11/2009	29/11/2009	01/12/2009	24/11/2009	30/11/2009

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SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66695

Results Legend			Sample Identity		D8	D8						
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.60 - 1.10	1.50 - 2.00							
			Sample Type	Soil/Solid	Soil/Solid							
			Date Sampled		18/11/2009							
			Date Received		19/11/2009							
			SDG Ref		091120-97							
			Lab Sample No.(s)		634438							
			Method		634530							
Component	LOD/Units	Method										
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	21.7	M	33.5	M						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		26.1							
Catechol	<0.01 mg/kg	TM062 (S)	<0.200		<0.200							
Phenol	<0.01 mg/kg	TM062 (S)	3.70	M	12.1	M						
Cresols	<0.01 mg/kg	TM062 (S)	12.2	M	14.2	M						
Resorcinol	<0.05 mg/kg	TM062 (S)	<1.00		<1.00							
Xylenols	<0.015 mg/kg	TM062 (S)	11.0	M	4.70	M						
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.200		<0.200							
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.200	M	<0.200	M						
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.300	M	<0.300	M						
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	26.9		31.0							
pH value of soil	1 pH Units	TM133	7.83	M	9.30	M						
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	#	<3.00	#						
Total Cyanide	<1 mg/kg	TM153	38.2	M	78.6	M						
Easily Liberated Sulphide	<15 mg/kg	TM180	238	#	63.2	#						
Arsenic	<0.6 mg/kg	TM181	28.4	M	10.3	M						
Cadmium	<0.02 mg/kg	TM181	<0.0200	M	<0.0200	M						
Chromium	<0.9 mg/kg	TM181	16.4	M	19.6	M						
Copper	<1.4 mg/kg	TM181	87.7	M	17.2	M						
Lead	<0.7 mg/kg	TM181	934	M	80.2	M						
Mercury	<0.14 mg/kg	TM181	<0.140	M	<0.140	M						
Nickel	<0.2 mg/kg	TM181	30.0	M	26.8	M						
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#						
Zinc	<1.9 mg/kg	TM181	69.4	M	51.1	M						
Total Sulphate	<48 mg/kg	TM221	3460	M	1920	M						

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SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66695

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D8	D8				
Depth (m)	0.60 - 1.10	1.50 - 2.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled						
Date Received	19/11/2009	19/11/2009				
SDG Ref	091120-97	091120-97				
Lab Sample No.(s)	634438	634530				

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	144000	57100		
Aliphatics >C16-C21	<100 µg/kg	TM173	161000	66600		
Aliphatics >C21-C35	<100 µg/kg	TM173	184000	111000		
Aliphatics >C35-C44	<100 µg/kg	TM173	16600	18900		
Total Aliphatics >C12-C44	<100 µg/kg	TM173	506000	254000		
Aliphatics >C16-C35	<100 µg/kg	TM173	345000	178000		

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SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66695

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D8	D8				
Depth (m)	0.60 - 1.10	1.50 - 2.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled						
Date Received	19/11/2009	19/11/2009				
SDG Ref	091120-97	091120-97				
Lab Sample No.(s)	634438	634530				

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	994000	450000		
Aromatics >EC16-EC21	<100 µg/kg	TM173	3070000	1150000		
Aromatics >EC21-EC35	<100 µg/kg	TM173	8480000	2880000		
Aromatics >EC35-EC44	<100 µg/kg	TM173	956000	423000		
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	13500000	4910000		
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	13500000	4910000		

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SDG: 091120-97
 Job: D_MOUCHEL_ELE-48
 Client Reference: Limerick Gasworks
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66695

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D8	D8				
Depth (m)	0.60 - 1.10	1.50 - 2.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled						
Date Received	19/11/2009	19/11/2009				
SDG Ref	091120-97	091120-97				
Lab Sample No.(s)	634438	634530				

Component	LOD/Units	Method				
GRO C5-C12	<44 µg/kg	TM089	63000	50900		
			#	#		
MTBE	<5 µg/kg	TM089	159	73.8		
			#	#		
Benzene	<10 µg/kg	TM089	4830	1150		
			M	M		
Toluene	<2 µg/kg	TM089	5350	1440		
			M	M		
Ethyl Benzene	<3 µg/kg	TM089	694	339		
			M	M		
m & p Xylene	<6 µg/kg	TM089	9380	2980		
			M	M		
o Xylene	<3 µg/kg	TM089	4110	1300		
			M	M		
Sum m&p and o Xylene	<10 µg/kg	TM089	13500	4280		
			M	M		
Sum of BTEX	<10 µg/kg	TM089	24400	7200		
			M	M		
Aliphatics C5-C6	<10 µg/kg	TM089	178	29.1		
Aliphatics >C6-C8	<10 µg/kg	TM089	1480	3130		
Aliphatics >C8-C10	<10 µg/kg	TM089	4440	6780		
Aliphatics >C10-C12	<10 µg/kg	TM089	10300	9410		
Total Aliphatics C5-C12	<10 µg/kg	TM089	16400	19400		
Aromatics C6-C7	<10 µg/kg	TM089	4830	1150		
Aromatics >C7-C8	<10 µg/kg	TM089	5350	1440		
Aromatics >EC8-EC10	<10 µg/kg	TM089	20800	14800		
Aromatics >EC10-EC12	<10 µg/kg	TM089	15400	14100		
Total Aromatics C6-C12	<10 µg/kg	TM089	46400	31500		

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SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66695

PAH micro by GCMS

Results Legend			Sample Identity	D8	D8				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.60 - 1.10 Soil/Solid 19/11/2009 091120-97 634438	1.50 - 2.00 Soil/Solid 18/11/2009 19/11/2009 091120-97 634530				
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	142000	407000	M	M			
Acenaphthylene (S)	<12 µg/kg	TM218	53200	245000	M	M			
Acenaphthene (S)	<8 µg/kg	TM218	12300	54700	M	M			
Fluorene (S)	<10 µg/kg	TM218	75200	283000	M	M			
Phenanthrene (S)	<15 µg/kg	TM218	276000	1070000	M	M			
Anthracene (S)	<16 µg/kg	TM218	101000	376000	M	M			
Fluoranthene (S)	<17 µg/kg	TM218	263000	860000	M	M			
Pyrene (S)	<15 µg/kg	TM218	200000	655000	M	M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	101000	302000	M	M			
Chrysene (S)	<10 µg/kg	TM218	78400	244000	M	M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	100000	270000	M	M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	41000	108000	M	M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	86300	237000	M	M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	40900	108000	M	M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	11800	26100	M	M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	46200	118000	M	M			
PAH 16 EPA Total	<118 µg/kg	TM218	1630000	5380000	M	M			

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SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66695

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D8	D8				
Depth (m)	0.60 - 1.10	1.50 - 2.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled		18/11/2009				
Date Received	19/11/2009	19/11/2009				
SDG Ref	091120-97	091120-97				
Lab Sample No.(s)	634438	634530				

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	523000	273000		
Total Aromatics >C6-C44	<100 µg/kg	TM173	13500000	4940000		
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	14100000	5210000		

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SDG: 091120-97
Job: D_MOUCHEL_ELE-48
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66695

VOC MS (S)

Results Legend			Sample Identity	D8	D8				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.60 - 1.10	1.50 - 2.00				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	18/11/2009	18/11/2009				
			Date Received	19/11/2009	19/11/2009				
			SDG Ref	091120-97	091120-97				
			Lab Sample No.(s)	634438	634530				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	136	120					
Toluene-d8**	%	TM116	59.4	74.1					
4-Bromofluorobenzene**	%	TM116	65.4	68.5					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	#	#			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
Carbon Disulphide	<9 µg/kg	TM116	40.0	20.8	M	M			
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Benzene	<9 µg/kg	TM116	2280	1050	M	M			
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	M	M			
Toluene	<6 µg/kg	TM116	2810	787	M	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	M	M			
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	M	M			
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
Ethylbenzene	<9 µg/kg	TM116	1250	198	M	M			

SDG: 091120-97
 Job: D_MOUCHEL_ELE-48
 Client Reference: Limerick Gasworks
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66695

VOC MS (S)

Results Legend			Sample Identity		D8	D8				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.60 - 1.10	1.50 - 2.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	19/11/2009	18/11/2009					
			Date Received	19/11/2009	19/11/2009					
			SDG Ref	091120-97	091120-97					
			Lab Sample No.(s)	634438	634530					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	7960		1550	#	#			
o-Xylene	<11 µg/kg	TM116	3620	M	656	M	M			
Styrene	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0	M	M			
Isopropylbenzene	<9 µg/kg	TM116	221	M	88.9	M	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0	#	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0	M	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0	M	M			
Propylbenzene	<6 µg/kg	TM116	271	M	205	M	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0	#	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	2850	M	734	M	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00	#	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	3600	#	1220	#	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#	49.6	#	#			
4-Isopropyltoluene	<8 µg/kg	TM116	212	#	130	#	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	8.00	#	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00	#	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00	M	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<7.00	#	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00	#	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0	#	#			
Naphthalene	<7 µg/kg	TM116	399000		87800		#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	#			

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-52
Sample Delivery Group (SDG): 091123-15
Your Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks
Report No.: 66881

A total of 5 samples was received on Friday November 20, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091123-15
 Job: D_MOUCHEL_ELE-52
 Client Reference: 19/11/09 (L6/D11)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66881

SOLID

Results Legend	Sample ID	D11.		L6.					Total	
		Depth (m)		Depth (m)		Depth (m)		Depth (m)		
		0.40 - 0.70	0.50 - 0.80	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50	Container			
		250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	
Ammonium Soil by Titration	All		X		X		X		X	0
Asbestos Presence Screen	All		X		X		X		X	5
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	0
Easily Liberated Sulphide	All		X		X		X		X	5
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	5
GRO BTEX MTBE GC (S)	All		X		X		X		X	0
Hexavalent Chromium (s)	All		X		X		X		X	5
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0
	Cadmium		X		X		X		X	5
	Chromium		X		X		X		X	0
	Copper		X		X		X		X	5
	Lead		X		X		X		X	0
	Mercury		X		X		X		X	5
	Nickel		X		X		X		X	0
	Selenium		X		X		X		X	5
	Zinc		X		X		X		X	0
PAH micro by GCMS	All		X		X		X		X	5
PCBs by GCMS	All						X			0
pH	All		X		X		X		X	1
Phenols by HPLC (S)	All		X		X		X		X	0
Sample description	All		X		X		X		X	5
Total Sulphate	All		X		X		X		X	0
TPH CWG GC (S)	All		X		X		X		X	5
VOC MS (S)	All						X		X	0
										3

SDG:	091123-15	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-52	Attention:	Verity Sankey
Client Reference:	19/11/09 (L6/D11)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66881

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D11.	0.40 - 0.70	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
L6.	0.50 - 0.80	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.50 - 3.00	Brown	Sludge / Sediment	0.1 - 2 mm	Stones
	6.00 - 6.50	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	7.00 - 7.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66881

Test Completion dates

SDG reference: 091123-15

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOCS MS (S)
D11.	0.40 - 0.70	SOLID	01/12/2009	24/11/2009	25/11/2009	01/12/2009	27/11/2009	02/12/2009	02/12/2009	25/11/2009	26/11/2009	27/11/2009	27/11/2009	24/11/2009	26/11/2009	24/11/2009	26/11/2009	26/11/2009	04/12/2009
L6.	0.50 - 0.80	SOLID	01/12/2009	25/11/2009	25/11/2009	01/12/2009	30/11/2009	30/11/2009	04/12/2009	25/11/2009	26/11/2009	27/11/2009	27/11/2009	24/11/2009	26/11/2009	24/11/2009	26/11/2009	26/11/2009	04/12/2009
	2.50 - 3.00	SOLID	01/12/2009	25/11/2009	25/11/2009	01/12/2009	30/11/2009	30/11/2009	07/12/2009	25/11/2009	26/11/2009	27/11/2009	27/11/2009	24/11/2009	26/11/2009	24/11/2009	26/11/2009	26/11/2009	03/12/2009
	6.00 - 6.50	SOLID	01/12/2009	25/11/2009	25/11/2009	01/12/2009	30/11/2009	30/11/2009	04/12/2009	25/11/2009	26/11/2009	27/11/2009	27/11/2009	24/11/2009	26/11/2009	24/11/2009	26/11/2009	26/11/2009	07/12/2009
	7.00 - 7.50	SOLID	01/12/2009	25/11/2009	25/11/2009	01/12/2009	27/11/2009	04/12/2009	04/12/2009	25/11/2009	26/11/2009	27/11/2009	27/11/2009	24/11/2009	26/11/2009	24/11/2009	26/11/2009	26/11/2009	07/12/2009

Consent of copyright owner required for inspection of copyright owner's records

SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66881

Results Legend			Sample Identity	D11.	L6.	L6.	L6.	L6.
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.70	0.50 - 0.80	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	19/11/2009	19/11/2009	19/11/2009	24/11/2009	19/11/2009
			Date Received	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
			SDG Ref	091123-15	091123-15	091123-15	091123-15	091123-15
Lab Sample No.(s)	642341	642342	642344	642347	642348			
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001	No ACM Detected					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	24.0	311	794	<15.0	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	18.6	242	618	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.500	<0.500	<0.100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	14.7	140	93.1	20.8	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0200	85.2	396	281	51.9	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.500	<2.50	<2.50	<0.500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	133	361	328	37.6	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.500	<0.500	<0.100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.500	<0.500	<0.100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.150	<0.750	<0.750	<0.150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0300	233	897	702	110	
pH value of soil	1 pH Units	TM133	7.75	8.76	8.99	9.62	12.11	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<3.00	<6.00	<6.00	<0.600	
Total Cyanide	<1 mg/kg	TM153	<1.00	22.8	126	2350	4.29	
PCB congener 28	<3 µg/kg	TM168				<3.00		
PCB congener 52	<3 µg/kg	TM168				<3.00		
PCB congener 101	<3 µg/kg	TM168				<3.00		
PCB congener 118	<3 µg/kg	TM168				<3.00		
PCB congener 138	<3 µg/kg	TM168				<3.00		
PCB congener 153	<3 µg/kg	TM168				<3.00		
PCB congener 180	<3 µg/kg	TM168				<3.00		
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	119	69.9	6380	19.9	
Arsenic	<0.6 mg/kg	TM181	15.4	4.48	13.1	15.3	5.13	
Cadmium	<0.02 mg/kg	TM181	0.198	<0.0200	<0.0200	0.542	0.149	
Chromium	<0.9 mg/kg	TM181	12.5	10.2	11.7	16.0	9.22	
Copper	<1.4 mg/kg	TM181	15.6	11.2	16.5	19.5	4.08	
Lead	<0.7 mg/kg	TM181	44.6	24.0	128	266	12.4	
Mercury	<0.14 mg/kg	TM181	0.262	<0.140	<0.140	0.433	0.251	
Nickel	<0.2 mg/kg	TM181	19.0	13.8	13.8	11.5	6.81	
Selenium	<1 mg/kg	TM181	1.08	<1.00	<1.00	1.29	<1.00	
Zinc	<1.9 mg/kg	TM181	52.3	54.2	54.7	39.9	15.4	
Total Sulphate	<48 mg/kg	TM221	3940	571	1610	1260	1370	

SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66881

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D11.	L6.	L6.	L6.	L6.
Depth (m)	0.40 - 0.70	0.50 - 0.80	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	24/11/2009	19/11/2009
Date Received	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
SDG Ref	091123-15	091123-15	091123-15	091123-15	091123-15
Lab Sample No.(s)	642341	642342	642344	642347	642348

Component	LOD/Units	Method	D11.	L6.	L6.	L6.	L6.
Aliphatics >C12-C16	<100 µg/kg	TM173	19900	143000	568000	512000	8830
Aliphatics >C16-C21	<100 µg/kg	TM173	18000	325000	769000	676000	28500
Aliphatics >C21-C35	<100 µg/kg	TM173	36700	636000	1230000	1290000	75600
Aliphatics >C35-C44	<100 µg/kg	TM173	11400	442000	177000	68300	7320
Total Aliphatics >C12-C44	<100 µg/kg	TM173	86100	1550000	2740000	2550000	120000
Aliphatics >C16-C35	<100 µg/kg	TM173	54700	961000	2000000	1970000	104000

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SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66881

GRO BTEX MTBE GC (S)

Results Legend # ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Sample Identity	D11.	L6.	L6.	L6.	L6.
	Depth (m)	0.40 - 0.70	0.50 - 0.80	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	19/11/2009	19/11/2009	19/11/2009	24/11/2009	19/11/2009
	Date Received	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
	SDG Ref	091123-15	091123-15	091123-15	091123-15	091123-15
Lab Sample No.(s)	642341	642342	642344	642347	642348	

Component	LOD/Units	Method	D11.	L6.	L6.	L6.	L6.
GRO C5-C12	<44 µg/kg	TM089	955	90400	1440000	330000	81900
MTBE	<5 µg/kg	TM089	<5.00	<5.00	4040	<5.00	<5.00
Benzene	<10 µg/kg	TM089	201	2260	155000	2900	1300
Toluene	<2 µg/kg	TM089	180	7500	202000	11600	3510
Ethyl Benzene	<3 µg/kg	TM089	28.9	2070	36100	5450	2110
m & p Xylene	<6 µg/kg	TM089	86.6	15000	197000	29800	8880
o Xylene	<3 µg/kg	TM089	52.2	6480	90800	16500	4310
Sum m&p and o Xylene	<10 µg/kg	TM089	139	21500	288000	46200	13200
Sum of BTEX	<10 µg/kg	TM089	548	33300	681000	66200	20100
Aliphatics C5-C6	<10 µg/kg	TM089	13.6	125	1170	367	556
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	519	10800	7880	6250
Aliphatics >C8-C10	<10 µg/kg	TM089	63.9	6260	104000	33200	8190
Aliphatics >C10-C12	<10 µg/kg	TM089	115	16300	192000	69200	13800
Total Aliphatics C5-C12	<10 µg/kg	TM089	193	23200	308000	111000	28800
Aromatics C6-C7	<10 µg/kg	TM089	201	2260	155000	2900	1300
Aromatics >C7-C8	<10 µg/kg	TM089	180	7500	202000	11600	3510
Aromatics >EC8-EC10	<10 µg/kg	TM089	263	32800	480000	101000	27600
Aromatics >EC10-EC12	<10 µg/kg	TM089	173	24500	288000	104000	20700
Total Aromatics C6-C12	<10 µg/kg	TM089	817	67200	1130000	220000	53100

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SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66881

PAH micro by GCMS

Results Legend			Sample Identity	D11.	L6.	L6.	L6.	L6.
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.70	0.50 - 0.80	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	19/11/2009	19/11/2009	19/11/2009	24/11/2009	19/11/2009
			Date Received	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
			SDG Ref	091123-15	091123-15	091123-15	091123-15	091123-15
Lab Sample No.(s)	642341	642342	642344	642347	642348			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	4870	<180	2410000	871000	9490	
Acenaphthylene (S)	<12 µg/kg	TM218	1240	<240	483000	165000	2050	
Acenaphthene (S)	<8 µg/kg	TM218	393	<160	94000	31900	466	
Fluorene (S)	<10 µg/kg	TM218	502	<200	357000	117000	1720	
Phenanthrene (S)	<15 µg/kg	TM218	1770	<300	892000	289000	4850	
Anthracene (S)	<16 µg/kg	TM218	1220	<320	309000	101000	1750	
Fluoranthene (S)	<17 µg/kg	TM218	2460	<340	613000	205000	3740	
Pyrene (S)	<15 µg/kg	TM218	2080	<300	409000	138000	2690	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1440	<280	208000	70000	1450	
Chrysene (S)	<10 µg/kg	TM218	1270	<200	149000	47900	1060	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	2410	<300	153000	60400	1060	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	917	<280	66000	23300	486	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	2200	<300	149000	51800	1130	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	1610	<360	67000	22600	524	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	431	<460	15500	6040	163	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1810	<480	64300	22400	557	
PAH 16 EPA Total	<118 µg/kg	TM218	26600	<2360	6430000	2220000	33200	

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SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66881

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D11.	L6.	L6.	L6.	L6.
Depth (m)	0.40 - 0.70	0.50 - 0.80	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	24/11/2009	19/11/2009
Date Received	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
SDG Ref	091123-15	091123-15	091123-15	091123-15	091123-15
Lab Sample No.(s)	642341	642342	642344	642347	642348

Component	LOD/Units	Method	D11.	L6.	L6.	L6.	L6.
Total Aliphatics >C5-C44	<100 µg/kg	TM173	86300	1570000	3050000	2660000	149000
Total Aromatics >C6-C44	<100 µg/kg	TM173	174000	4590000	17400000	8060000	345000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	261000	6160000	20500000	10700000	494000

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SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66881

VOC MS (S)

Results Legend			Sample Identity	L6.	L6.	L6.			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	19/11/2009	24/11/2009	19/11/2009			
			Date Received	20/11/2009	20/11/2009	20/11/2009			
			SDG Ref	091123-15	091123-15	091123-15			
			Lab Sample No.(s)	642344	642347	642348			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		157	124	86.5			
Toluene-d8**	%	TM116		54.7	62.9	75.1			
4-Bromofluorobenzene**	%	TM116		124	59.2	66.8			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Carbon Disulphide	<9 µg/kg	TM116		<9.00	<9.00	49.9			
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Benzene	<9 µg/kg	TM116		133000	15200	5770			
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0			
Toluene	<6 µg/kg	TM116		194000	37100	10800			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
Tetrachloroethene	<9 µg/kg	TM116		106	<9.00	23.0			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0			
Chlorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
Ethylbenzene	<9 µg/kg	TM116		32400	16000	383			

SDG: 091123-15
Job: D_MOUCHEL_ELE-52
Client Reference: 19/11/09 (L6/D11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66881

VOC MS (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	L6.	L6.	L6.
Depth (m)	2.50 - 3.00	6.00 - 6.50	7.00 - 7.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	24/11/2009	19/11/2009
Date Received	20/11/2009	20/11/2009	20/11/2009
SDG Ref	091123-15	091123-15	091123-15
Lab Sample No.(s)	642344	642347	642348

Component	LOD/Units	Method	L6.	L6.	L6.
p/m-Xylene	<13 µg/kg	TM116	230000 #	80200 #	15000 #
o-Xylene	<11 µg/kg	TM116	89600 M	33600 M	5620 M
Styrene	<11 µg/kg	TM116	41100 M	9900 M	<11.0 M
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M
Isopropylbenzene	<9 µg/kg	TM116	2450 M	683 M	300 M
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M
Propylbenzene	<6 µg/kg	TM116	8450 M	1150 M	550 M
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	33900 M	9180 M	1840 M
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	80700 #	44000 #	5620 #
sec-Butylbenzene	<8 µg/kg	TM116	364 #	107 #	60.6 #
4-Isopropyltoluene	<8 µg/kg	TM116	1540 #	450 #	219 #
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #
Naphthalene	<7 µg/kg	TM116	2200000	1280000	139000
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-53
Sample Delivery Group (SDG): 091123-19 **Report No.:** 67193
Your Reference: 19/11/09 (L5)
Location: Limerick Gasworks

A total of 4 samples was received on Thursday November 19, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67193

SOLID

Results Legend	Sample ID											Total	
		L5.											
		0.50 - 1.00		3.00 - 3.50		5.00 - 5.50		6.50 - 7.00					
X Test	N No Determination Possible	Container											
		250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)		
Ammonium Soil by Titration	All												0
			X		X		X		X		X		4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X		X		0
			X		X		X		X		X		4
Easily Liberated Sulphide	All		X		X		X		X		X		0
			X		X		X		X		X		4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X		X		0
			X		X		X		X		X		4
EPH CWG (Aromatic) GC (S)	All		X		X		X		X		X		0
			X		X		X		X		X		4
GRO BTEX MTBE GC (S)	All		X		X		X		X		X		0
			X		X		X		X		X		4
Hexavalent Chromium (s)	All		X		X		X		X		X		0
			X		X		X		X		X		4
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X		X		0
			X		X		X		X		X		4
	Cadmium		X		X		X		X		X		0
			X		X		X		X		X		4
	Chromium		X		X		X		X		X		0
			X		X		X		X		X		4
	Copper		X		X		X		X		X		0
			X		X		X		X		X		4
	Lead		X		X		X		X		X		0
			X		X		X		X		X		4
	Mercury		X		X		X		X		X		0
			X		X		X		X		X		4
	Nickel		X		X		X		X		X		0
			X		X		X		X		X		4
	Selenium		X		X		X		X		X		0
			X		X		X		X		X		4
	Zinc		X		X		X		X		X		0
			X		X		X		X		X		4
PAH micro by GCMS	All		X		X		X		X		X		0
			X		X		X		X		X		4
pH	All			X		X		X		X		X	0
				X		X		X		X		X	4
Phenols by HPLC (S)	All			X		X		X		X		X	0
				X		X		X		X		X	4
Sample description	All		X		X		X		X		X		0
			X		X		X		X		X		4
Total Sulphate	All		X		X		X		X		X		0
			X		X		X		X		X		4
TPH CWG GC (S)	All		X		X		X		X		X		0
			X		X		X		X		X		4
VOC MS (S)	All				X		X						0
					X		X						2

SDG:	091123-19	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-53	Attention:	Verity Sankey
Client Reference:	19/11/09 (L5)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67193

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
L5.	0.50 - 1.00	Brown	Sand	0.1 - 2 mm	Stones
	3.00 - 3.50	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	5.00 - 5.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	6.50 - 7.00	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67193

Test Completion dates

SDG reference: 091123-19

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
L5.	0.50 - 1.00	SOLID	08/12/2009	26/11/2009	24/11/2009	26/11/2009	24/11/2009	24/11/2009	27/11/2009	26/11/2009	25/11/2009	07/12/2009	30/11/2009	01/12/2009	25/11/2009	01/12/2009	01/12/2009
	3.00 - 3.50	SOLID	03/12/2009	08/12/2009	26/11/2009	24/11/2009	26/11/2009	24/11/2009	27/11/2009	02/12/2009	27/11/2009	04/12/2009	30/11/2009	01/12/2009	26/11/2009	25/11/2009	01/12/2009
	5.00 - 5.50	SOLID	07/12/2009	11/12/2009	26/11/2009	24/11/2009	26/11/2009	24/11/2009	27/11/2009	26/11/2009	25/11/2009	04/12/2009	30/11/2009	01/12/2009	26/11/2009	25/11/2009	01/12/2009
	6.50 - 7.00	SOLID	04/12/2009	25/11/2009	24/11/2009	26/11/2009	24/11/2009	24/11/2009	27/11/2009	26/11/2009	25/11/2009	04/12/2009	26/11/2009	01/12/2009	26/11/2009	25/11/2009	01/12/2009

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SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67193

Results Legend			Sample Identity	L5.	L5.	L5.	L5.
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	3.00 - 3.50	5.00 - 5.50	6.50 - 7.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
			Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
			SDG Ref	091123-19	091123-19	091123-19	091123-19
Lab Sample No.(s)	642532	642539	642533	642535			
Component	LOD/Units	Method					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	230	360	19.4	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	179	280	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.100	<0.500	<0.200	<0.100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.100	232	70.2	27.6	
Cresols	<0.01 mg/kg	TM062 (S)	<0.100	715	172	66.5	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.500	<2.50	<1.00	<0.500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.150	706	175	50.5	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.100	<0.500	<0.200	<0.100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.100	<0.500	<0.200	<0.100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.150	<0.750	<0.300	<0.150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	1650	417	145	
pH value of soil	1 pH Units	TM133	9.87	8.26	8.51	11.90	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	<3.00	<3.00	<0.600	
Total Cyanide	<1 mg/kg	TM153	3.54	50.4	306	7.83	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	433	1920	22.4	
Arsenic	<0.6 mg/kg	TM181	6.69	8.22	13.1	4.23	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	<0.0200	
Chromium	<0.9 mg/kg	TM181	15.2	10.5	11.3	6.87	
Copper	<1.4 mg/kg	TM181	14.0	21.2	17.6	3.36	
Lead	<0.7 mg/kg	TM181	31.4	51.4	160	9.49	
Mercury	<0.14 mg/kg	TM181	<0.140	0.626	<0.140	<0.140	
Nickel	<0.2 mg/kg	TM181	20.3	11.3	11.0	5.22	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	38.2	45.0	23.5	12.2	
Total Sulphate	<48 mg/kg	TM221	568	3590	1290	1770	

SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67193

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	L5.	L5.	L5.	L5.		
Depth (m)	0.50 - 1.00	3.00 - 3.50	5.00 - 5.50	6.50 - 7.00		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
SDG Ref	091123-19	091123-19	091123-19	091123-19		
Lab Sample No.(s)	642532	642539	642533	642535		

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	122000	569000	283000	2110
Aliphatics >C16-C21	<100 µg/kg	TM173	229000	847000	476000	854
Aliphatics >C21-C35	<100 µg/kg	TM173	425000	1320000	1040000	<100
Aliphatics >C35-C44	<100 µg/kg	TM173	120000	159000	86100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	896000	2890000	1880000	2970
Aliphatics >C16-C35	<100 µg/kg	TM173	654000	2170000	1520000	854

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SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67193

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	L5.	L5.	L5.	L5.
Depth (m)	0.50 - 1.00	3.00 - 3.50	5.00 - 5.50	6.50 - 7.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091123-19	091123-19	091123-19	091123-19
Lab Sample No.(s)	642532	642539	642533	642535

Component	LOD/Units	Method	L5.	L5.	L5.	L5.
GRO C5-C12	<44 µg/kg	TM089	309000 #	611000 #	600000 #	3630 #
MTBE	<5 µg/kg	TM089	545 #	1480 #	1950 #	<5.00 #
Benzene	<10 µg/kg	TM089	8680 M	44000 M	10200 M	473 M
Toluene	<2 µg/kg	TM089	27200 M	73300 M	34600 M	645 M
Ethyl Benzene	<3 µg/kg	TM089	6910 M	13900 M	16900 M	110 M
m & p Xylene	<6 µg/kg	TM089	38500 M	82700 M	67900 M	554 M
o Xylene	<3 µg/kg	TM089	15600 M	36800 M	27600 M	187 M
Sum m&p and o Xylene	<10 µg/kg	TM089	54100 M	120000 M	95500 M	741 M
Sum of BTEX	<10 µg/kg	TM089	96900 M	251000 M	157000 M	1970 M
Aliphatics C5-C6	<10 µg/kg	TM089	212	856	679	51.1
Aliphatics >C6-C8	<10 µg/kg	TM089	15000	26500	33300	35.5
Aliphatics >C8-C10	<10 µg/kg	TM089	30700	50000	59900	183
Aliphatics >C10-C12	<10 µg/kg	TM089	47700	82700	103000	447
Total Aliphatics C5-C12	<10 µg/kg	TM089	93700	160000	197000	716
Aromatics C6-C7	<10 µg/kg	TM089	8680	44000	10200	473
Aromatics >C7-C8	<10 µg/kg	TM089	27200	73300	34600	645
Aromatics >EC8-EC10	<10 µg/kg	TM089	107000	208000	202000	1130
Aromatics >EC10-EC12	<10 µg/kg	TM089	71600	124000	154000	670
Total Aromatics C6-C12	<10 µg/kg	TM089	215000	450000	401000	2910

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SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67193

PAH micro by GCMS

Results Legend		Sample Identity	L5.	L5.	L5.	L5.		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 19/11/2009 19/11/2009 091123-19 642532	3.00 - 3.50 Soil/Solid 19/11/2009 19/11/2009 091123-19 642539	5.00 - 5.50 Soil/Solid 19/11/2009 19/11/2009 091123-19 642533	6.50 - 7.00 Soil/Solid 19/11/2009 19/11/2009 091123-19 642535		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	50300 M	3540000 M	852000 M	2110 M		
Acenaphthylene (S)	<12 µg/kg	TM218	16300 M	694000 M	148000 M	204 M		
Acenaphthene (S)	<8 µg/kg	TM218	3530 M	127000 M	26700 M	34.7 M		
Fluorene (S)	<10 µg/kg	TM218	12500 M	478000 M	101000 M	123 M		
Phenanthrene (S)	<15 µg/kg	TM218	33100 M	1200000 M	254000 M	350 M		
Anthracene (S)	<16 µg/kg	TM218	11900 M	416000 M	86100 M	115 M		
Fluoranthene (S)	<17 µg/kg	TM218	25200 M	804000 M	171000 M	215 M		
Pyrene (S)	<15 µg/kg	TM218	18300 M	556000 M	117000 M	172 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	8420 M	257000 M	53200 M	96.2 M		
Chrysene (S)	<10 µg/kg	TM218	6920 M	185000 M	38400 M	65.1 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	7720 M	196000 M	43100 M	72.1 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3260 M	85000 M	20400 M	28.0 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6960 M	184000 M	37300 M	56.9 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	3480 M	85700 M	17200 M	24.5 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	926 M	17700 M	4310 M	<23.0 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	3610 M	83200 M	16600 M	28.7 M		
PAH 16 EPA Total	<118 µg/kg	TM218	212000 M	8970000 M	1990000 M	3700 M		

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SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67193

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	L5.	L5.	L5.	L5.
Depth (m)	0.50 - 1.00	3.00 - 3.50	5.00 - 5.50	6.50 - 7.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091123-19	091123-19	091123-19	091123-19
Lab Sample No.(s)	642532	642539	642533	642535

Component	LOD/Units	Method	L5.	L5.	L5.	L5.
Total Aliphatics >C5-C44	<100 µg/kg	TM173	990000	3050000	2080000	3680
Total Aromatics >C6-C44	<100 µg/kg	TM173	4360000	16100000	6910000	13500
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	5350000	19100000	8990000	17200

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SDG: 091123-19
Job: D_MOUCHEL_ELE-53
Client Reference: 19/11/09 (L5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67193

VOC MS (S)

Results Legend			Sample Identity	L5.	L5.				
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	5.00 - 5.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	19/11/2009	19/11/2009				
			Date Received	19/11/2009	19/11/2009				
			SDG Ref	091123-19	091123-19				
			Lab Sample No.(s)	642539	642533				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		113	138				
Toluene-d8**	%	TM116		91.0	56.8				
4-Bromofluorobenzene**	%	TM116		75.7	97.3				
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0				
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0				
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0				
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00				
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	185				
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
Carbon Disulphide	<9 µg/kg	TM116		147	87.6				
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0				
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0				
Chloroform	<10 µg/kg	TM116		<10.0	61.8				
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	267				
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0				
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0				
Benzene	<9 µg/kg	TM116		229000	42400				
Trichloroethene	<9 µg/kg	TM116		41700000	1090				
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0				
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0				
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0				
Toluene	<6 µg/kg	TM116		<6.00	66100				
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00				
Tetrachloroethene	<9 µg/kg	TM116		352	1310				
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0				
Chorobenzene	<7 µg/kg	TM116		<7.00	473				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0				
Ethylbenzene	<9 µg/kg	TM116		52200	20100				

SDG: 091123-19
 Job: D_MOUCHEL_ELE-53
 Client Reference: 19/11/09 (L5)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67193

VOC MS (S)

Results Legend			Sample Identity	L5.	L5.				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 3.50 Soil/Solid 19/11/2009 19/11/2009 091123-19 642539	5.00 - 5.50 Soil/Solid 19/11/2009 19/11/2009 091123-19 642533				
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	334000	81600	#				
o-Xylene	<11 µg/kg	TM116	132000	31500	M				
Styrene	<11 µg/kg	TM116	<11.0	9920	M				
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	M				
Isopropylbenzene	<9 µg/kg	TM116	2370	1290	M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	M				
Propylbenzene	<6 µg/kg	TM116	5850	2220	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	39700	9770	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	95000	36200	#				
sec-Butylbenzene	<8 µg/kg	TM116	428	230	#				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	8.73	#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	8.00	#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	#				
Naphthalene	<7 µg/kg	TM116	3810000	678000					
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	#				

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-55
Sample Delivery Group (SDG): 091123-27
Your Reference: 19/11/09 (L3)
Location: Limerick Gasworks
Report No.: 66592

A total of 3 samples was received on Friday November 20, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091123-27
Job: D_MOUCHEL_ELE-55
Client Reference: 19/11/09 (L3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66592

SOLID

Results Legend	Sample ID	L3.						Total
		0.00 - 0.50		1.00 - 1.50		4.50 - 5.00		
		250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	3
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All	X						0
EPH CWG (Aromatic) GC (S)	All	X		X		X		0
GRO BTEX MTBE GC (S)	All		X		X		X	0
Hexavalent Chromium (s)	All		X		X		X	3
Metals by iCap-OES (Soil)	Arsenic	X		X		X		0
	Cadmium	X		X		X		3
	Chromium	X		X		X		0
	Copper	X		X		X		3
	Lead	X		X		X		0
	Mercury	X		X		X		3
	Nickel	X		X		X		0
	Selenium	X		X		X		3
	Zinc	X		X		X		0
PAH micro by GCMS	All	X		X		X		3
PCBs by GCMS	All			X				0
pH	All		X		X		X	1
Phenols by HPLC (S)	All		X		X		X	3
Sample description	All	X		X		X		0
Total Sulphate	All	X		X		X		3
TPH CWG GC (S)	All	X		X		X		0
VOC MS (S)	All						X	3
								0
								1

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SDG:	091123-27	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-55	Attention:	Verity Sankey
Client Reference:	19/11/09 (L3)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66592

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
L3.	0.00 - 0.50	Brown	Sand	0.1 - 2 mm	Stones
	1.00 - 1.50	Brown	Sand	0.1 - 2 mm	Stones
	4.50 - 5.00	Brown	Sandy Clay	0.1 - 2 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091123-27
 Job: D_MOUCHEL_ELE-55
 Client Reference: 19/11/09 (L3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66592

Test Completion dates

SDG reference: 091123-27

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
L3.	0.00 - 0.50	SOLID	04/12/2009	25/11/2009	24/11/2009	26/11/2009	25/11/2009	27/11/2009	27/11/2009	27/11/2009	25/11/2009	25/11/2009	04/12/2009	26/11/2009	26/11/2009	02/12/2009	25/11/2009	01/12/2009
	1.00 - 1.50	SOLID	04/12/2009	26/11/2009	24/11/2009	26/11/2009	25/11/2009	27/11/2009	27/11/2009	27/11/2009	25/11/2009	25/11/2009	04/12/2009	26/11/2009	26/11/2009	02/12/2009	25/11/2009	01/12/2009
	4.50 - 5.00	SOLID	03/12/2009	04/12/2009	26/11/2009	24/11/2009	26/11/2009	25/11/2009	27/11/2009	27/11/2009	27/11/2009	25/11/2009	04/12/2009	26/11/2009	26/11/2009	01/12/2009	25/11/2009	01/12/2009

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SDG: 091123-27
 Job: D_MOUCHEL_ELE-55
 Client Reference: 19/11/09 (L3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66592

Results Legend			Sample Identity	L3.	L3.	L3.			
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 19/11/2009 20/11/2009 091123-27 642867	1.00 - 1.50 Soil/Solid 19/11/2009 20/11/2009 091123-27 642870	4.50 - 5.00 Soil/Solid 19/11/2009 20/11/2009 091123-27 642864			
Component	LOD/Units	Method							
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	31.7				
			M	M	M				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0	48.9				
			M	M	M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	38.0				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	0.274	<0.0100	<0.0300				
			M	M	M				
Cresols	<0.01 mg/kg	TM062 (S)	0.467	<0.0100	0.120				
			M	M	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	0.336				
			M	M	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.0360				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100				
			M	M	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150				
			M	M	M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.741	<0.0100	0.528				
			M	M	M				
pH value of soil	1 pH Units	TM133	8.08	8.32	8.8				
			M	M	M				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<0.60				
			#	#	#				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600				
			#	#	#				
Total Cyanide	<1 mg/kg	TM153	24.9	20.2	70.0				
			M	M	M				
PCB congener 28	<3 µg/kg	TM168		<3.00					
PCB congener 52	<3 µg/kg	TM168		<3.00					
PCB congener 101	<3 µg/kg	TM168		<3.00					
PCB congener 118	<3 µg/kg	TM168		<3.00					
PCB congener 138	<3 µg/kg	TM168		<3.00					
PCB congener 153	<3 µg/kg	TM168		<3.00					
PCB congener 180	<3 µg/kg	TM168		<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	55.81	56.50	124.13				
			#	#	#				
Easily Liberated Sulphide	<15 mg/kg	TM180	63.6	74.0	149				
			#	#	#				
Arsenic	<0.6 mg/kg	TM181	16.0	23.9	2.57				
			M	M	M				
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200				
			M	M	M				
Chromium	<0.9 mg/kg	TM181	14.2	27.9	20.3				
			M	M	M				
Copper	<1.4 mg/kg	TM181	89.6	65.2	17.2				
			M	M	M				
Lead	<0.7 mg/kg	TM181	398	359	46.7				
			M	M	M				
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140				
			M	M	M				
Nickel	<0.2 mg/kg	TM181	30.2	42.5	23.2				
			M	M	M				
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00				
			#	#	#				
Zinc	<1.9 mg/kg	TM181	137	54.6	56.8				
			M	M	M				
Total Sulphate	<48 mg/kg	TM221	2280	5220	803				
			M	M	M				

SDG: 091123-27
Job: D_MOUCHEL_ELE-55
Client Reference: 19/11/09 (L3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66592

EPH CWG (Aliphatic) GC (S)

Results Legend		Sample Identity			L3.	L3.	L3.													
		Depth (m)	Sample Type	Date Sampled							Date Received	SDG Ref	Lab Sample No.(s)							
# ISO17025 accredited. m CERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		0.00 - 0.50	Soil/Solid	19/11/2009	20/11/2009	091123-27	642867	1.00 - 1.50	Soil/Solid	19/11/2009	20/11/2009	091123-27	642870	4.50 - 5.00	Soil/Solid	19/11/2009	20/11/2009	091123-27	642864	
		Component	LOD/Units	Method																
		Aliphatics >C12-C16	<100 µg/kg	TM173	116000	5350	7090													
		Aliphatics >C16-C21	<100 µg/kg	TM173	204000	4470	11800													
		Aliphatics >C21-C35	<100 µg/kg	TM173	285000	6850	19800													
		Aliphatics >C35-C44	<100 µg/kg	TM173	41500	<100	<100													
		Total Aliphatics >C12-C44	<100 µg/kg	TM173	646000	16700	38700													
		Total Aliphatics & Aromatics >C12-C44	<100 µg/kg	TM173		602000	180000													
		Aliphatics >C16-C35	<100 µg/kg	TM173	488000	11300	31600													
		Aliphatics >C35-C40	<100 µg/kg	TM173		<100	<100													
Aliphatics >C40-C44	<100 µg/kg	TM173		<100	<100															
Total Aliphatics >C12-C35	<100 µg/kg	TM173		16700	38700															
Total Aliphatics >C12-C40	<100 µg/kg	TM173		16700	38700															

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SDG: 091123-27
Job: D_MOUCHEL_ELE-55
Client Reference: 19/11/09 (L3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66592

EPH CWG (Aromatic) GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	L3.	L3.	L3.
Depth (m)	0.00 - 0.50	1.00 - 1.50	4.50 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009
Date Received	20/11/2009	20/11/2009	20/11/2009
SDG Ref	091123-27	091123-27	091123-27
Lab Sample No.(s)	642867	642870	642864

Component	LOD/Units	Method			
Aromatics >EC12-EC16	<100 µg/kg	TM173	62000	11200	48700
Aromatics >EC16-EC21	<100 µg/kg	TM173	134000	29900	25100
Aromatics >EC21-EC35	<100 µg/kg	TM173	470000	395000	60900
Aromatics >EC35-EC44	<100 µg/kg	TM173	83900	149000	6810
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	750000	585000	142000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	750000	585000	142000

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SDG: 091123-27
Job: D_MOUCHEL_ELE-55
Client Reference: 19/11/09 (L3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66592

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	L3.	L3.	L3.			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	1.00 - 1.50	4.50 - 5.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	19/11/2009	19/11/2009	19/11/2009			
			Date Received	20/11/2009	20/11/2009	20/11/2009			
			SDG Ref	091123-27	091123-27	091123-27			
			Lab Sample No.(s)	642867	642870	642864			
			Method						
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	11500	206	2360	#	#	#	
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	#	#	#	
Benzene	<10 µg/kg	TM089	86.6	<10.0	356	M	M	M	
Toluene	<2 µg/kg	TM089	221	<6.00	44.4	M	M	M	
Ethyl Benzene	<3 µg/kg	TM089	114	<3.00	34.8	M	M	M	
m & p Xylene	<6 µg/kg	TM089	710	<8.00	26.4	M	M	M	
o Xylene	<3 µg/kg	TM089	360	<4.00	12.0	M	M	M	
Sum m&p and o Xylene	<10 µg/kg	TM089	1070	<10.0	38.4	M	M	M	
Sum of BTEX	<10 µg/kg	TM089	1490	<10.0	474	M	M	M	
Aliphatics C5-C6	<10 µg/kg	TM089	22.7	<10.0	32.0				
Aliphatics >C6-C8	<10 µg/kg	TM089	327	10.2	94.2				
Aliphatics >C8-C10	<10 µg/kg	TM089	1230	23.1	<10.0				
Aliphatics >C10-C12	<10 µg/kg	TM089	2630	52.3	735				
Total Aliphatics C5-C12	<10 µg/kg	TM089	4210	85.6	851				
Aromatics C6-C7	<10 µg/kg	TM089	86.6	<10.0	356				
Aromatics >C7-C8	<10 µg/kg	TM089	221	<10.0	44.4				
Aromatics >EC8-EC10	<10 µg/kg	TM089	3020	84.7	43.1				
Aromatics >EC10-EC12	<10 µg/kg	TM089	3950	78.4	1090				
Total Aromatics C6-C12	<10 µg/kg	TM089	7280	113	1530				

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SDG: 091123-27
Job: D_MOUCHEL_ELE-55
Client Reference: 19/11/09 (L3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66592

PAH micro by GCMS

Results Legend		Sample Identity	L3.	L3.	L3.
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 19/11/2009 20/11/2009 091123-27 642867	1.00 - 1.50 Soil/Solid 19/11/2009 20/11/2009 091123-27 642870	4.50 - 5.00 Soil/Solid 19/11/2009 20/11/2009 091123-27 642864
Component	LOD/Units	Method			
Naphthalene (S)	<9 µg/kg	TM218	17800 M	7400 M	79500 M
Acenaphthylene (S)	<12 µg/kg	TM218	4590 M	1410 M	513 M
Acenaphthene (S)	<8 µg/kg	TM218	982 M	227 M	9880 M
Fluorene (S)	<10 µg/kg	TM218	2680 M	261 M	3230 M
Phenanthrene (S)	<15 µg/kg	TM218	10200 M	12500 M	4960 M
Anthracene (S)	<16 µg/kg	TM218	3280 M	2540 M	684 M
Fluoranthene (S)	<17 µg/kg	TM218	12400 M	24300 M	2090 M
Pyrene (S)	<15 µg/kg	TM218	10200 M	21300 M	1540 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	6190 M	21000 M	632 M
Chrysene (S)	<10 µg/kg	TM218	5220 M	16800 M	540 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	8780 M	37700 M	476 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3490 M	12300 M	204 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6760 M	28300 M	446 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4950 M	21300 M	221 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1360 M	6160 M	72.1 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	5820 M	22800 M	280 M
PAH 16 EPA Total	<118 µg/kg	TM218	105000 M	236000 M	105000 M

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SDG: 091123-27
Job: D_MOUCHEL_ELE-55
Client Reference: 19/11/09 (L3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66592

VOC MS (S)

Results Legend			Sample Identity	L3.				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	4.50 - 5.00				
			Sample Type	Soil/Solid				
			Date Sampled	19/11/2009				
			Date Received	20/11/2009				
			SDG Ref	091123-27				
			Lab Sample No.(s)	642864				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	105					
Toluene-d8**	%	TM116	89.8					
4-Bromofluorobenzene**	%	TM116	68.7					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	M				
Chloromethane	<12 µg/kg	TM116	<12.0	#				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	M				
Bromoethane	<9 µg/kg	TM116	<9.00	M				
Chloroethane	<12 µg/kg	TM116	<12.0	M				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	M				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	#				
Carbon Disulphide	<9 µg/kg	TM116	26.9	M				
Dichloromethane	<10 µg/kg	TM116	<10.0	M				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	M				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	M				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Bromochloromethane	<10 µg/kg	TM116	<10.0	M				
Chloroform	<10 µg/kg	TM116	<10.0	M				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	M				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	M				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	M				
Benzene	<9 µg/kg	TM116	435	M				
Trichloroethene	<9 µg/kg	TM116	<9.00	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Dibromomethane	<12 µg/kg	TM116	<12.0	M				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	M				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	M				
Toluene	<6 µg/kg	TM116	40.4	M				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	M				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	M				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	M				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	M				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	M				
Chorobenzene	<7 µg/kg	TM116	<7.00	M				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	M				
Ethylbenzene	<9 µg/kg	TM116	43.9	M				

SDG: 091123-27
 Job: D_MOUCHEL_ELE-55
 Client Reference: 19/11/09 (L3)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 66592

VOC MS (S)

Results Legend		Sample Identity	L3.				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	4.50 - 5.00				
		Sample Type	Soil/Solid				
		Date Sampled	19/11/2009				
		Date Received	20/11/2009				
		SDG Ref	091123-27				
		Lab Sample No.(s)	642864				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	37.4	#			
o-Xylene	<11 µg/kg	TM116	16.7	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	12.9	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	<6.00	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8.00	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	79.7	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	13.9	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	8150	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 16 December 2009
Job: D_MOUCHEL_ELE-54
Sample Delivery Group (SDG): 091123-34
Your Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks
Report No.: 67616

A total of 4 samples was received on Thursday November 19, 2009 and completed on Wednesday December 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67616

SOLID

Results Legend	Sample ID	B7		K3				Total
		Depth (m)		Depth (m)		Depth (m)		
		3.00 - 3.50	0.50 - 1.00	2.50 - 3.00	4.50 - 5.00	250g Amber Jar	60g VOC Dublin TUB (D)	
Test	No Determination Possible	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	250g Amber Jar	60g VOC Dublin TUB (D)	
Ammonium Soil by Titration	All		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	4
Easily Liberated Sulphide	All		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All	X	X		X		X	0
EPH CWG (Aromatic) GC (S)	All	X	X		X		X	0
GRO BTEX MTBE GC (S)	All		X		X		X	0
Hexavalent Chromium (s)	All		X		X		X	0
Metals by iCap-OES (Soil)	Arsenic	X	X		X		X	0
	Cadmium	X	X		X		X	0
	Chromium	X	X		X		X	0
	Copper	X	X		X		X	0
	Lead	X	X		X		X	0
	Mercury	X	X		X		X	0
	Nickel	X	X		X		X	0
	Selenium	X	X		X		X	0
	Zinc	X	X		X		X	0
PAH by GCMS	All	X					X	0
PAH micro by GCMS	All		X		X			0
PCBs by GCMS	All		X					0
pH	All		X		X		X	0
Phenols by HPLC (S)	All		X		X		X	0
Sample description	All	X	X		X		X	0
Total Sulphate	All	X	X		X		X	0
TPH CWG GC (S)	All	X	X		X		X	0
VOC MS (S)	All		X					0
		X						1

SDG:	091123-34	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-54	Attention:	Verity Sankey
Client Reference:	19/11/09 (K3/B7)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67616

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
B7	3.00 - 3.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
K3	0.50 - 1.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	2.50 - 3.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	4.50 - 5.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67616

Test Completion dates

SDG reference: 091123-34

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Cap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyanate	Ammonium Sulf by Titration
B7	3.00 - 3.50	SOLID	09/12/2009	02/12/2009	26/11/2009	24/11/2009	26/11/2009	25/11/2009	26/11/2009	07/12/2009	26/11/2009	25/11/2009	02/12/2009	27/11/2009	01/12/2009	01/12/2009	25/11/2009	01/12/2009
K3	0.50 - 1.00	SOLID	02/12/2009	26/11/2009	24/11/2009	26/11/2009	25/11/2009	26/11/2009	27/11/2009	26/11/2009	26/11/2009	25/11/2009	02/12/2009	27/11/2009	02/12/2009	02/12/2009	25/11/2009	01/12/2009
	2.50 - 3.00	SOLID	02/12/2009	26/11/2009	24/11/2009	26/11/2009	25/11/2009	26/11/2009	27/11/2009	26/11/2009	26/11/2009	25/11/2009	02/12/2009	27/11/2009	02/12/2009	01/12/2009	25/11/2009	01/12/2009
	4.50 - 5.00	SOLID	02/12/2009	26/11/2009	24/11/2009	26/11/2009	25/11/2009	26/11/2009	27/11/2009	07/12/2009	26/11/2009	25/11/2009	02/12/2009	27/11/2009	02/12/2009	01/12/2009	25/11/2009	01/12/2009

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SDG 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

Results Legend			Sample Identity	B7	K3	K3	K3		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 3.50 Soil/Solid 19/11/2009 19/11/2009 091123-34 642401	0.50 - 1.00 Soil/Solid 19/11/2009 19/11/2009 091123-34 642261	2.50 - 3.00 Soil/Solid 19/11/2009 19/11/2009 091123-34 642325	4.50 - 5.00 Soil/Solid 19/11/2009 19/11/2009 091123-34 642372		
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	1020	<15.0	<15.0	25.8			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	794	<15.0	<15.0	20.1			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0500	<0.0100	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	16.3	<0.0100	<0.0100	<0.0100			
Cresols	<0.01 mg/kg	TM062 (S)	17.1	<0.0100	<0.0100	<0.0100			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.250	<0.0500	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	12.2	<0.0150	<0.0150	<0.0150			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0500	<0.0100	<0.0100	<0.0100			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0500	<0.0100	<0.0100	<0.0100			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0750	<0.0150	<0.0150	<0.0150			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	45.6	0.00	0.00	0.00			
pH value of soil	1 pH Units	TM133	10.11	7.78	7.72	9.64			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	<0.600			
Total Cyanide	<1 mg/kg	TM153	32.5	46.7	78.5	2.94			
PCB congener 28	<3 µg/kg	TM168		<3.00					
PCB congener 52	<3 µg/kg	TM168		<3.00					
PCB congener 101	<3 µg/kg	TM168		<3.00					
PCB congener 118	<3 µg/kg	TM168		<3.00					
PCB congener 138	<3 µg/kg	TM168		<3.00					
PCB congener 153	<3 µg/kg	TM168		<3.00					
PCB congener 180	<3 µg/kg	TM168		<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	91.0	70.9	51.5	693			
Arsenic	<0.6 mg/kg	TM181	5.71	10.2	14.4	8.91			
Cadmium	<0.02 mg/kg	TM181	0.370	0.391	0.560	0.492			
Chromium	<0.9 mg/kg	TM181	9.98	17.7	17.2	12.5			
Copper	<1.4 mg/kg	TM181	11.8	51.5	81.9	11.4			
Lead	<0.7 mg/kg	TM181	25.5	315	438	28.4			
Mercury	<0.14 mg/kg	TM181	0.276	0.947	1.51	0.339			
Nickel	<0.2 mg/kg	TM181	9.36	24.4	30.5	13.1			
Selenium	<1 mg/kg	TM181	<1.00	<1.00	1.26	<1.00			
Zinc	<1.9 mg/kg	TM181	24.4	98.2	187	35.1			
Total Sulphate	<48 mg/kg	TM221	4090	5230	4950	2530			

SDG 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B7	K3	K3	K3		
Depth (m)	3.00 - 3.50	0.50 - 1.00	2.50 - 3.00	4.50 - 5.00		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
SDG Ref	091123-34	091123-34	091123-34	091123-34		
Lab Sample No.(s)	642401	642261	642325	642372		

Component	LOD/Units	Method	B7	K3	K3	K3		
Aliphatics >C12-C16	<100 µg/kg	TM173	27300	24000	39200	<100		
Aliphatics >C16-C21	<100 µg/kg	TM173	35800	47300	89200	<100		
Aliphatics >C21-C35	<100 µg/kg	TM173	69900	107000	233000	1720		
Aliphatics >C35-C44	<100 µg/kg	TM173	12000	33600	50900	<100		
Total Aliphatics >C12-C44	<100 µg/kg	TM173	145000	212000	413000	1720		
Aliphatics >C16-C35	<100 µg/kg	TM173	106000	154000	323000	1720		

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SDG: 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

EPH CWG (Aromatic) GC (S)

Results Legend		Sample Identity	B7	K3	K3	K3		
<p># ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.</p>		Depth (m)	3.00 - 3.50	0.50 - 1.00	2.50 - 3.00	4.50 - 5.00		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
		Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
		SDG Ref	091123-34	091123-34	091123-34	091123-34		
		Lab Sample No.(s)	642401	642261	642325	642372		
Component	LOD/Units	Method						
Aromatics >EC12-EC16	<100 µg/kg	TM173	77500	18300	19500	6300		
Aromatics >EC16-EC21	<100 µg/kg	TM173	118000	44300	69500	8160		
Aromatics >EC21-EC35	<100 µg/kg	TM173	283000	291000	489000	23300		
Aromatics >EC35-EC44	<100 µg/kg	TM173	64000	111000	133000	4520		
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	543000	464000	711000	42300		
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	543000	464000	711000	42300		

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SDG: 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B7	K3	K3	K3
Depth (m)	3.00 - 3.50	0.50 - 1.00	2.50 - 3.00	4.50 - 5.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091123-34	091123-34	091123-34	091123-34
Lab Sample No.(s)	642401	642261	642325	642372

Component	LOD/Units	Method	B7	K3	K3	K3
GRO C5-C12	<44 µg/kg	TM089	35100 #	110 #	<44.0 #	342 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	489 M	<10.0 M	<10.0 M	97.6 M
Toluene	<2 µg/kg	TM089	1250 M	<2.00 M	<2.00 M	17.1 M
Ethyl Benzene	<3 µg/kg	TM089	276 M	<3.00 M	<3.00 M	<3.00 M
m & p Xylene	<6 µg/kg	TM089	2340 M	<6.00 M	<6.00 M	<6.00 M
o Xylene	<3 µg/kg	TM089	669 M	<3.00 M	<3.00 M	<3.00 M
Sum m&p and o Xylene	<10 µg/kg	TM089	3010 M	<10.0 M	<10.0 M	<10.0 M
Sum of BTEX	<10 µg/kg	TM089	5030 M	<10.0 M	<10.0 M	115 M
Aliphatics C5-C6	<10 µg/kg	TM089	67.8	14.3	<10.0	24.5
Aliphatics >C6-C8	<10 µg/kg	TM089	2390	43.5	<10.0	25.0
Aliphatics >C8-C10	<10 µg/kg	TM089	6230	13.1	<10.0	29.4
Aliphatics >C10-C12	<10 µg/kg	TM089	4820	<10.0	<10.0	41.6
Total Aliphatics C5-C12	<10 µg/kg	TM089	13500	70.9	<10.0	120
Aromatics C6-C7	<10 µg/kg	TM089	489	<10.0	<10.0	97.6
Aromatics >C7-C8	<10 µg/kg	TM089	1250	<10.0	<10.0	17.1
Aromatics >EC8-EC10	<10 µg/kg	TM089	12600	19.6	<10.0	44.1
Aromatics >EC10-EC12	<10 µg/kg	TM089	7230	11.7	<10.0	62.4
Total Aromatics C6-C12	<10 µg/kg	TM089	21600	31.3	<10.0	221

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SDG: 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

PAH by GCMS

Results Legend			Sample Identity		B7	K3				
# ISO17025 accredited. m CERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.00 - 3.50	4.50 - 5.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	19/11/2009	19/11/2009					
			Date Received	19/11/2009	19/11/2009					
			SDG Ref	091123-34	091123-34					
			Lab Sample No.(s)	642401	642372					
Component	LOD/Units	Method								
Naphthalene (S)	<9 µg/kg	TM218	615	1420	M	M				
Acenaphthylene (S)	<12 µg/kg	TM218	103	382	M	M				
Acenaphthene (S)	<8 µg/kg	TM218	960	985	M	M				
Fluorene (S)	<10 µg/kg	TM218	1560	1080	M	M				
Phenanthrene (S)	<15 µg/kg	TM218	2310	3300	M	M				
Anthracene (S)	<16 µg/kg	TM218	435	535	M	M				
Fluoranthene (S)	<17 µg/kg	TM218	2390	1660	M	M				
Pyrene (S)	<15 µg/kg	TM218	1600	1080	M	M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	191	128	M	M				
Chrysene (S)	<10 µg/kg	TM218	149	107	M	M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	145	82.1	M	M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	66.2	48.3	M	M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	117	76.9	M	M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	55.8	46.9	M	M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0	<23.0	M	M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	68.4	52.6	M	M				
PAH 16 EPA Total	<118 µg/kg	TM218	10800	10000	M	M				

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SDG 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

PAH micro by GCMS

Results Legend			Sample Identity	K3	K3				
<p>ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.</p>			Depth (m)	0.50 - 1.00	2.50 - 3.00				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	19/11/2009	19/11/2009				
			Date Received	19/11/2009	19/11/2009				
			SDG Ref	091123-34	091123-34				
			Lab Sample No.(s)	642261	642325				
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	9250	2730	M	M			
Acenaphthylene (S)	<12 µg/kg	TM218	2320	1650	M	M			
Acenaphthene (S)	<8 µg/kg	TM218	1250	606	M	M			
Fluorene (S)	<10 µg/kg	TM218	1750	706	M	M			
Phenanthrene (S)	<15 µg/kg	TM218	7790	5530	M	M			
Anthracene (S)	<16 µg/kg	TM218	2650	2290	M	M			
Fluoranthene (S)	<17 µg/kg	TM218	8060	13900	M	M			
Pyrene (S)	<15 µg/kg	TM218	8200	12600	M	M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	5050	9280	M	M			
Chrysene (S)	<10 µg/kg	TM218	3940	7390	M	M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	7550	13400	M	M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	2620	4510	M	M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6780	11400	M	M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4740	7980	M	M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1240	2260	M	M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	5680	9050	M	M			
PAH 16 EPA Total	<118 µg/kg	TM218	78900	105000	M	M			

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SDG 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	B7	K3	K3	K3		
Depth (m)	3.00 - 3.50	0.50 - 1.00	2.50 - 3.00	4.50 - 5.00		
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009		
SDG Ref	091123-34	091123-34	091123-34	091123-34		
Lab Sample No.(s)	642401	642261	642325	642372		

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	159000	212000	413000	1840
Total Aromatics >C6-C44	<100 µg/kg	TM173	564000	464000	711000	42500
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	723000	676000	1120000	44300

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SDG 091123-34
Job: D_MOUCHEL_ELE-54
Client Reference: 19/11/09 (K3/B7)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67616

VOC MS (S)

Results Legend		Sample Identity	B7				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 3.50 Soil/Solid 19/11/2009 19/11/2009 091123-34 642401				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	119				
Toluene-d8**	%	TM116	92.8				
4-Bromofluorobenzene**	%	TM116	76.9				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	104				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	1790				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	3520				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	868				

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SDG 091123-34
 Job: D_MOUCHEL_ELE-54
 Client Reference: 19/11/09 (K3/B7)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67616

VOC MS (S)

Results Legend		Sample Identity	B7				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.00 - 3.50 Soil/Solid 19/11/2009 19/11/2009 091123-34 642401				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	6670				
o-Xylene	<11 µg/kg	TM116	2300	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	110	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	223	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	1100	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	2270	#			
sec-Butylbenzene	<8 µg/kg	TM116	23.1	#			
4-Isopropyltoluene	<8 µg/kg	TM116	95.9	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	103000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-56
Sample Delivery Group (SDG): 091123-38 **Report No.:** 66549
Your Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

A total of 4 samples was received on Thursday November 19, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66549

SOLID

Results Legend	Sample ID									Total
		K2				L7				
		0.00 - 0.50		1.00 - 1.50		3.00 - 3.50		0.50 - 0.80		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)		
Ammonium Soil by Titration	All									0
		X	X	X	X	X	X	X	X	4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide									0
		X	X	X	X	X	X	X	X	4
Easily Liberated Sulphide	All									0
		X	X	X	X	X	X	X	X	4
EPH CWG (Aliphatic) GC (S)	All									0
		X								1
EPH CWG (Aromatic) GC (S)	All									0
		X	X	X	X	X	X	X	X	4
GRO BTEX MTBE GC (S)	All									0
		X	X	X	X	X	X	X	X	4
Hexavalent Chromium (s)	All									0
		X	X	X	X	X	X	X	X	4
Metals by iCap-OES (Soil)	Arsenic									0
		X	X	X	X	X	X	X	X	4
	Cadmium									0
		X	X	X	X	X	X	X	X	4
	Chromium									0
		X	X	X	X	X	X	X	X	4
	Copper									0
		X	X	X	X	X	X	X	X	4
	Lead									0
		X	X	X	X	X	X	X	X	4
	Mercury									0
		X	X	X	X	X	X	X	X	4
	Nickel									0
		X	X	X	X	X	X	X	X	4
	Selenium									0
		X	X	X	X	X	X	X	X	4
	Zinc									0
		X	X	X	X	X	X	X	X	4
PAH micro by GCMS	All									0
		X	X	X	X	X	X	X	X	4
PCBs by GCMS	All									0
			X					X		2
pH	All									0
		X	X	X	X	X	X	X	X	4
Phenols by HPLC (S)	All									0
		X	X	X	X	X	X	X	X	4
Sample description	All									0
		X	X	X	X	X	X	X	X	4
Total Sulphate	All									0
		X	X	X	X	X	X	X	X	4
TPH CWG GC (S)	All									0
		X	X	X	X	X	X	X	X	4

SDG:	091123-38	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-56	Attention:	Verity Sankey
Client Reference:	19/11/09 (C11/L7/K2)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66549

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
K2	0.00 - 0.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	1.00 - 1.50	Brown	Sand	0.1 - 2 mm	Stones
	3.00 - 3.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
L7	0.50 - 0.80	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66549

Test Completion dates

SDG reference: 091123-38

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
K2	0.00 - 0.50	SOLID	02/12/2009	26/11/2009	24/11/2009	27/11/2009	03/12/2009	27/11/2009	26/11/2009	02/12/2009	26/11/2009	02/12/2009	27/11/2009	02/12/2009	02/12/2009	25/11/2009	01/12/2009
	1.00 - 1.50	SOLID	02/12/2009	26/11/2009	24/11/2009	25/11/2009	03/12/2009	27/11/2009	26/11/2009	27/11/2009	26/11/2009	02/12/2009	01/12/2009	01/12/2009	02/12/2009	25/11/2009	01/12/2009
	3.00 - 3.50	SOLID	02/12/2009	26/11/2009	24/11/2009	25/11/2009	03/12/2009	27/11/2009	26/11/2009	27/11/2009	26/11/2009	02/12/2009	01/12/2009	01/12/2009	02/12/2009	25/11/2009	01/12/2009
L7	0.50 - 0.80	SOLID	02/12/2009	26/11/2009	24/11/2009	27/11/2009	03/12/2009	27/11/2009	26/11/2009	27/11/2009	26/11/2009	02/12/2009	01/12/2009	01/12/2009	02/12/2009	25/11/2009	01/12/2009

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SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66547

Results Legend			Sample Identity				
# ISO17025 accredited. # mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	K2	K2	K2	L7
			Sample Type	0.00 - 0.50	1.00 - 1.50	3.00 - 3.50	0.50 - 0.80
			Date Sampled	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
			SDG Ref	19/11/2009	19/11/2009	19/11/2009	19/11/2009
Lab Sample No.(s)	091123-38	091123-38	091123-38	091123-38			
Component	LOD/Units	Method	642650	642672	642725	642611	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0 M	<15.0 M	43.4 M	<15.0 M	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	<15.0 M	69.8 M	<15.0 M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	54.3	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	0.00	0.00	
pH value of soil	1 pH Units	TM133	10.26 M	7.84 M	8.26 M	11.06 M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60 #	<0.60 #	<0.60 #	0.0099 #	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<0.600 #	<0.600 #	<0.600 #	
Total Cyanide	<1 mg/kg	TM153	17.3 M	20.3 M	2.63 M	<1.00 M	
PCB congener 28	<3 µg/kg	TM168		<3.00		<3.00	
PCB congener 52	<3 µg/kg	TM168		<3.00		<3.00	
PCB congener 101	<3 µg/kg	TM168		<3.00		<3.00	
PCB congener 118	<3 µg/kg	TM168		<3.00		<3.00	
PCB congener 138	<3 µg/kg	TM168		<3.00		<3.00	
PCB congener 153	<3 µg/kg	TM168		<3.00		<3.00	
PCB congener 180	<3 µg/kg	TM168		<3.00		<3.00	
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00		<3.00	
Easily Liberated Sulphide	<15 mg/kg	TM180	115.06 #	127.62 #	<15.00 #	<15.00 #	
Easily Liberated Sulphide	<15 mg/kg	TM180	136 #	185 #	<15.0 #	<15.0 #	
Arsenic	<0.6 mg/kg	TM181	6.81 M	7.55 M	5.36 M	3.67 M	
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M	<0.0200 M	<0.0200 M	
Chromium	<0.9 mg/kg	TM181	31.3 M	13.9 M	14.2 M	10.9 M	
Copper	<1.4 mg/kg	TM181	37.9 M	26.8 M	8.42 M	8.67 M	
Lead	<0.7 mg/kg	TM181	108 M	18.8 M	36.2 M	14.8 M	
Mercury	<0.14 mg/kg	TM181	0.319 M	<0.140 M	<0.140 M	<0.140 M	
Nickel	<0.2 mg/kg	TM181	38.1 M	14.8 M	13.8 M	13.3 M	
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	<1.00 #	
Zinc	<1.9 mg/kg	TM181	46.0 M	18.5 M	39.4 M	25.8 M	
Total Sulphate	<48 mg/kg	TM221	11500 M	7720 M	941 M	822 M	

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SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66547

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
* This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K2	K2	K2	L7
Depth (m)	0.00 - 0.50	1.00 - 1.50	3.00 - 3.50	0.50 - 0.80
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091123-38	091123-38	091123-38	091123-38
Lab Sample No.(s)	642650	642672	642725	642611

Component	LOD/Units	Method	K2	K2	K2	L7
Aliphatics >C12-C16	<100 µg/kg	TM173	4870	<100	675	4240
Aliphatics >C16-C21	<100 µg/kg	TM173	1340	<100	958	6720
Aliphatics >C21-C35	<100 µg/kg	TM173	10100	<100	1620	157000
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	<100	<100	172000
Total Aliphatics >C12-C44	<100 µg/kg	TM173	16300	<100	3250	340000
Total Aliphatics & Aromatics >C12-C44	<100 µg/kg	TM173	250000	127000	25500	931000
Aliphatics >C16-C35	<100 µg/kg	TM173	11400	<100	2580	164000
Aliphatics >C35-C40	<100 µg/kg	TM173	<100	<100	<100	95400
Aliphatics >C40-C44	<100 µg/kg	TM173	<100	<100	<100	76600
Total Aliphatics >C12-C35	<100 µg/kg	TM173	16300	<100	3250	168000
Total Aliphatics >C12-C40	<100 µg/kg	TM173	16300	<100	3250	264000

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SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66547

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K2	K2	K2	L7
Depth (m)	0.00 - 0.50	1.00 - 1.50	3.00 - 3.50	0.50 - 0.80
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091123-38	091123-38	091123-38	091123-38
Lab Sample No.(s)	642650	642672	642725	642611

Component	LOD/Units	Method				
Aromatics >EC12-EC16	<100 µg/kg	TM173	5700	2220	2770	4160
Aromatics >EC16-EC21	<100 µg/kg	TM173	6170	2620	3180	13300
Aromatics >EC21-EC35	<100 µg/kg	TM173	161000	85500	14200	279000
Aromatics >EC35-EC44	<100 µg/kg	TM173	61200	36300	2150	295000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	234000	127000	22300	591000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	234000	127000	22300	591000

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SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66547

GRO BTEX MTBE GC (S)

Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Sample Identity	K2	K2	K2	L7
	Depth (m)	0.00 - 0.50	1.00 - 1.50	3.00 - 3.50	0.50 - 0.80
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
	Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
	SDG Ref	091123-38	091123-38	091123-38	091123-38
Lab Sample No.(s)	642650	642672	642725	642611	

Component	LOD/Units	Method	K2	K2	K2	L7
GRO C5-C12	<44 µg/kg	TM089	1630	283	193	113
			#	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00
			#	#	#	#
Benzene	<10 µg/kg	TM089	97.9	<10.0	<10.0	<10.0
			M	M	M	M
Toluene	<2 µg/kg	TM089	133	<2.00	<2.00	<2.00
			M	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	20.1	<3.00	<3.00	<3.00
			M	M	M	M
m & p Xylene	<6 µg/kg	TM089	169	<6.00	<6.00	<6.00
			M	M	M	M
o Xylene	<3 µg/kg	TM089	89.7	<3.00	<3.00	<3.00
			M	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	258	<10.0	<10.0	<10.0
			M	M	M	M
Sum of BTEX	<10 µg/kg	TM089	510	<10.0	<10.0	<10.0
			M	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	29.2	12.7	13.0	18.5
Aliphatics >C6-C8	<10 µg/kg	TM089	53.4	36.8	<10.0	32.3
Aliphatics >C8-C10	<10 µg/kg	TM089	194	42.0	35.3	13.4
Aliphatics >C10-C12	<10 µg/kg	TM089	220	51.3	29.2	11.4
Total Aliphatics C5-C12	<10 µg/kg	TM089	496	143	77.4	75.7
Aromatics C6-C7	<10 µg/kg	TM089	97.9	<10.0	<10.0	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	133	<10.0	<10.0	<10.0
Aromatics >EC8-EC10	<10 µg/kg	TM089	569	62.9	52.9	20.1
Aromatics >EC10-EC12	<10 µg/kg	TM089	330	77.0	43.8	17.2
Total Aromatics C6-C12	<10 µg/kg	TM089	1130	140	96.7	37.3

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SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66547

PAH micro by GCMS

Results Legend			Sample Identity	K2	K2	K2	L7
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 19/11/2009 19/11/2009 091123-38 642650	1.00 - 1.50 Soil/Solid 19/11/2009 19/11/2009 091123-38 642672	3.00 - 3.50 Soil/Solid 19/11/2009 19/11/2009 091123-38 642725	0.50 - 0.80 Soil/Solid 19/11/2009 19/11/2009 091123-38 642611
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	1690	589	93.7	372	
Acenaphthylene (S)	<12 µg/kg	TM218	199	336	34.1	1790	
Acenaphthene (S)	<8 µg/kg	TM218	15.5	31.8	70.0	223	
Fluorene (S)	<10 µg/kg	TM218	23.1	54.6	66.2	826	
Phenanthrene (S)	<15 µg/kg	TM218	706	1850	457	3520	
Anthracene (S)	<16 µg/kg	TM218	233	307	132	2000	
Fluoranthene (S)	<17 µg/kg	TM218	2090	6890	615	12600	
Pyrene (S)	<15 µg/kg	TM218	1960	6540	570	10700	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	2220	4850	333	5280	
Chrysene (S)	<10 µg/kg	TM218	2170	3180	322	4600	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	4960	10600	559	5810	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	2180	3510	189	2640	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	3790	6950	390	4770	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	3190	6670	237	2400	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	817	1510	60.9	646	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	3830	8260	272	2940	
PAH 16 EPA Total	<118 µg/kg	TM218	30100	62400	4400	61100	

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 For inspection purposes only

SDG: 091123-38
Job: D_MOUCHEL_ELE-56
Client Reference: 19/11/09 (C11/L7/K2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66547

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	K2	K2	K2	L7
Depth (m)	0.00 - 0.50	1.00 - 1.50	3.00 - 3.50	0.50 - 0.80
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	19/11/2009	19/11/2009	19/11/2009	19/11/2009
Date Received	19/11/2009	19/11/2009	19/11/2009	19/11/2009
SDG Ref	091123-38	091123-38	091123-38	091123-38
Lab Sample No.(s)	642650	642672	642725	642611

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	16800	143	3330	340000
Total Aromatics >C6-C44	<100 µg/kg	TM173	235000	127000	22400	591000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	252000	127000	25700	932000

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 09 December 2009
Job: D_MOUCHEL_ELE-58
Sample Delivery Group (SDG): 091124-30
Your Reference: 20-11-09 (E1)
Location: Limerick Gasworks
Report No.: 67084

A total of 4 samples was received on Monday November 23, 2009 and completed on Wednesday December 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG:	091124-30	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-58	Attention:	Verity Sankey
Client Reference:	20-11-09 (E1)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67084

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E1	0.40 - 0.60	Brown	Sandy Clay	0.1 - 2 mm	Stones
	0.90 - 1.00	Brown	Sand	0.1 - 2 mm	Stones
	5.20 - 5.50	Grey	Silty Sand	0.063 - 0.1 mm	Stones
	5.70 - 6.00	Black	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67084

Test Completion dates

SDG reference: 091124-30

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
E1	0.40 - 0.60	SOLID	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009	09/12/2009
	0.90 - 1.00	SOLID	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009
	5.20 - 5.50	SOLID	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009	03/11/2009
	5.70 - 6.00	SOLID	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

Results Legend			Sample Identity	E1	E1	E1			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.60	0.90 - 1.00	5.20 - 5.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009	23/11/2009			
			SDG Ref	091124-30	091124-30	091124-30			
			Lab Sample No.(s)	644967	645000	645118			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0	22.0				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0				
Catechol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)		<0.0100					
Cresols	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100				
Resorcinol	<0.05 mg/kg	TM062 (S)		<0.0500	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)		<0.0150	<0.0150				
1-Naphthol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)		<0.0100	<0.0100				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)		<0.0150	<0.0150				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)		<0.0200	0.00				
pH value of soil	1 pH Units	TM133	7.64	8.37	8.67				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<3.0				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<3.00				
Total Cyanide	<1 mg/kg	TM153	165	0.84	2.96				
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	415.99	144.42				
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	528	172				
Arsenic	<0.6 mg/kg	TM181	11.8	7.19	4.88				
Cadmium	<0.02 mg/kg	TM181	0.224	<0.0200	<0.0200				
Chromium	<0.9 mg/kg	TM181	11.3	8.72	5.74				
Copper	<1.4 mg/kg	TM181	67.6	21.8	7.05				
Lead	<0.7 mg/kg	TM181	1690	22.2	86.7				
Mercury	<0.14 mg/kg	TM181	8.76	<0.140	<0.140				
Nickel	<0.2 mg/kg	TM181	14.9	11.9	5.27				
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00				
Zinc	<1.9 mg/kg	TM181	176	10.8	30.5				
Total Sulphate	<48 mg/kg	TM221	9070	144000	2250				

SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E1	E1	E1
Depth (m)	0.40 - 0.60	0.90 - 1.00	5.20 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-30	091124-30	091124-30
Lab Sample No.(s)	644967	645000	645118

Component	LOD/Units	Method	E1	E1	E1
Aliphatics >C12-C16	<100 µg/kg	TM173	109000	3930	5550
Aliphatics >C16-C21	<100 µg/kg	TM173	98600	629	5530
Aliphatics >C21-C35	<100 µg/kg	TM173	134000	464	9980
Aliphatics >C35-C44	<100 µg/kg	TM173	12200	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	354000	5020	21100
Aliphatics >C16-C35	<100 µg/kg	TM173	233000	1090	15500

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E1	E1	E1
Depth (m)	0.40 - 0.60	0.90 - 1.00	5.20 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-30	091124-30	091124-30
Lab Sample No.(s)	644967	645000	645118

Component	LOD/Units	Method	E1	E1	E1
Aromatics >EC12-EC16	<100 µg/kg	TM173	3280000	9380	4920
Aromatics >EC16-EC21	<100 µg/kg	TM173	7890000	21500	8200
Aromatics >EC21-EC35	<100 µg/kg	TM173	14200000	230000	30100
Aromatics >EC35-EC44	<100 µg/kg	TM173	2080000	72100	3490
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	27400000	333000	46700
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	27400000	333000	46700

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E1	E1	E1
Depth (m)	0.40 - 0.60	0.90 - 1.00	5.20 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-30	091124-30	091124-30
Lab Sample No.(s)	644967	645000	645118

Component	LOD/Units	Method	E1	E1	E1
GRO C5-C12	<44 µg/kg	TM089	29200	695	<44.0
			#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00
			#	#	#
Benzene	<10 µg/kg	TM089	1650	<10.0	<10.0
			M	M	M
Toluene	<2 µg/kg	TM089	4400	14.0	<3.00
			M	M	M
Ethyl Benzene	<3 µg/kg	TM089	406	<3.00	<3.00
			M	M	M
m & p Xylene	<6 µg/kg	TM089	5990	19.1	<6.00
			M	M	M
o Xylene	<3 µg/kg	TM089	1920	<3.00	<3.00
			M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	7910	19.1	<10.0
			M	M	M
Sum of BTEX	<10 µg/kg	TM089	14400	33.0	<10.0
			M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	202	<10.0	<10.0
Aliphatics >C8-C10	<10 µg/kg	TM089	1750	<10.0	<10.0
Aliphatics >C10-C12	<10 µg/kg	TM089	4090	255	<10.0
Total Aliphatics C5-C12	<10 µg/kg	TM089	6050	255	<10.0
Aromatics C6-C7	<10 µg/kg	TM089	1650	<10.0	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	4400	14.0	<10.0
Aromatics >EC8-EC10	<10 µg/kg	TM089	11000	26.6	<10.0
Aromatics >EC10-EC12	<10 µg/kg	TM089	6140	382	14.3
Total Aromatics C6-C12	<10 µg/kg	TM089	23100	424	14.3

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

PAH by GCMS

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E1
Depth (m)	5.20 - 5.50
Sample Type	Soil/Solid
Date Sampled	20/11/2009
Date Received	23/11/2009
SDG Ref	091124-30
Lab Sample No.(s)	645118

Component	LOD/Units	Method				
Naphthalene (S)	<9 µg/kg	TM218	143	M		
Acenaphthylene (S)	<12 µg/kg	TM218	40.0	M		
Acenaphthene (S)	<8 µg/kg	TM218	82.9	M		
Fluorene (S)	<10 µg/kg	TM218	160	M		
Phenanthrene (S)	<15 µg/kg	TM218	557	M		
Anthracene (S)	<16 µg/kg	TM218	270	M		
Fluoranthene (S)	<17 µg/kg	TM218	720	M		
Pyrene (S)	<15 µg/kg	TM218	536	M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	306	M		
Chrysene (S)	<10 µg/kg	TM218	269	M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	275	M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	123	M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	224	M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	134	M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	54.4	M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	167	M		
PAH 16 EPA Total	<118 µg/kg	TM218	4060	M		

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

PAH micro by GCMS

Results Legend			Sample Identity		E1		E1	
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.60	0.90 - 1.00			
			Sample Type	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009			
			SDG Ref	091124-30	091124-30			
			Lab Sample No.(s)	644967	645000			
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	2170000	6480				
Acenaphthylene (S)	<12 µg/kg	TM218	120000	37500				
Acenaphthene (S)	<8 µg/kg	TM218	41300	11000				
Fluorene (S)	<10 µg/kg	TM218	243000	73700				
Phenanthrene (S)	<15 µg/kg	TM218	1120000	309000				
Anthracene (S)	<16 µg/kg	TM218	488000	101000				
Fluoranthene (S)	<17 µg/kg	TM218	816000	259000				
Pyrene (S)	<15 µg/kg	TM218	616000	186000				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	250000	91600				
Chrysene (S)	<10 µg/kg	TM218	223000	66000				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	218000	78000				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	109000	31700				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	205000	73300				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	112000	33900				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	31100	9660				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	132000	34200				
PAH 16 EPA Total	<118 µg/kg	TM218	6900000	1400000				

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	E1	E1	E1
Depth (m)	0.40 - 0.60	0.90 - 1.00	5.20 - 5.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-30	091124-30	091124-30
Lab Sample No.(s)	644967	645000	645118

Component	LOD/Units	Method	E1	E1	E1
Total Aliphatics >C5-C44	<100 µg/kg	TM173	360000	5270	21100
Total Aromatics >C6-C44	<100 µg/kg	TM173	27400000	334000	46700
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	27800000	339000	67700

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SDG: 091124-30
Job: D_MOUCHEL_ELE-58
Client Reference: 20-11-09 (E1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67084

VOC MS (S)

Results Legend			Sample Identity		E1	E1				
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.60	5.20 - 5.50					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	20/11/2009	20/11/2009					
			Date Received	23/11/2009	23/11/2009					
			SDG Ref	091124-30	091124-30					
			Lab Sample No.(s)	644967	645118					
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM116		133	77.2					
Toluene-d8**	%	TM116		50.6	75.4					
4-Bromofluorobenzene**	%	TM116		68.5	50.6					
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0					
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0					
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0					
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00					
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
Carbon Disulphide	<9 µg/kg	TM116		372	11.1					
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0					
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0					
Chloroform	<10 µg/kg	TM116		<10.0	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0					
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0					
Benzene	<9 µg/kg	TM116		6760	<9.00					
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0					
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0					
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0					
Toluene	<6 µg/kg	TM116		12000	<6.00					
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00					
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00					
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0					
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0					
Ethylbenzene	<9 µg/kg	TM116		2870	<9.00					

SDG: 091124-30
 Job: D_MOUCHEL_ELE-58
 Client Reference: 20-11-09 (E1)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67084

VOC MS (S)

Results Legend			Sample Identity		E1	E1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.40 - 0.60	5.20 - 5.50					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	20/11/2009	20/11/2009					
			Date Received	23/11/2009	23/11/2009					
			SDG Ref	091124-30	091124-30					
			Lab Sample No.(s)	644967	645118					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	39300	<13.0	#	#				
o-Xylene	<11 µg/kg	TM116	13800	<11.0	M	M				
Styrene	<11 µg/kg	TM116	<11.0	<11.0	M	M				
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	M	M				
Isopropylbenzene	<9 µg/kg	TM116	456	<9.00	M	M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	#	#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	M	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	M	M				
Propylbenzene	<6 µg/kg	TM116	505	<6.00	M	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	#	#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	8990	<8.00	M	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	#	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	18700	<10.0	#	#				
sec-Butylbenzene	<8 µg/kg	TM116	129	<8.00	#	#				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	<8.00	#	#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	#	#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	M	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	#	#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	M	M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	M	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	#	#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	#	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	#	#				
Naphthalene	<7 µg/kg	TM116	1180000	4910						
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	#	#				

APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-59
Sample Delivery Group (SDG): 091124-39
Your Reference: 20-11-09 (F1)
Location: Limerick Gasworks
Report No.: 66960

A total of 2 samples was received on Monday November 23, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091124-39
Job: D_MOUCHEL_ELE-59
Client Reference: 20-11-09 (F1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66960

SOLID

Results Legend	Sample ID	F1		Total			
		Depth (m)					
		0.50 - 1.00	4.50 - 5.00				
	Container	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	JAR (D)	TUB (D)		
X Test							
N No Determination Possible							
Ammonium Soil by Titration	All		X		X		0 2
Asbestos Presence Screen	All		X				0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		0 2
Easily Liberated Sulphide	All		X		X		0 2
EPH CWG (Aliphatic) GC (S)	All		X		X		0 2
EPH CWG (Aromatic) GC (S)	All		X		X		0 2
GRO BTEX MTBE GC (S)	All	X		X			0 2
Hexavalent Chromium (s)	All		X		X		0 2
Metals by iCap-OES (Soil)	Arsenic		X		X		0 2
	Cadmium		X		X		0 2
	Chromium		X		X		0 2
	Copper		X		X		0 2
	Lead		X		X		0 2
	Mercury		X		X		0 2
	Nickel		X		X		0 2
	Selenium		X		X		0 2
	Zinc		X		X		0 2
PAH by GCMS	All		X		X		0 2
PCBs by GCMS	All		X				0 1
pH	All		X		X		0 2
Phenols by HPLC (S)	All		X		X		0 2
Sample description	All		X		X		0 2
Total Sulphate	All		X		X		0 2
TPH CWG GC (S)	All		X		X		0 2

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SDG:	091124-39	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-59	Attention:	Verity Sankey
Client Reference:	20-11-09 (F1)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66960

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
F1	0.50 - 1.00	Brown	Sandy Clay	0.063 - 0.1 mm	Stones
	4.50 - 5.00	Grey	Silty Sand	0.063 - 0.1 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091124-39
Job: D_MOUCHEL_ELE-59
Client Reference: 20-11-09 (F1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66960

Test Completion dates

SDG reference: 091124-39

Sample ID	Depth	Type	TPH CWG GC (S)		Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration	
			04/12/2009	08/12/2009	26/11/2009	26/11/2009	28/11/2009	28/11/2009	25/11/2009	01/12/2009	02/12/2009	30/11/2009	27/11/2009	04/12/2009	07/12/2009	30/11/2009	29/11/2009	02/12/2009	26/11/2009	25/11/2009
F1	0.50 - 1.00	SOLID																		
	4.50 - 5.00	SOLID																		

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SDG: 091124-39
Job: D_MOUCHEL_ELE-59
Client Reference: 20-11-09 (F1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66185

Results Legend			Sample Identity		F1	F1				
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	4.50 - 5.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	20/11/2009	20/11/2009					
			Date Received	23/11/2009	23/11/2009					
			SDG Ref	091124-39	091124-39					
			Lab Sample No.(s)	645493	645597					
Component	LOD/Units	Method								
Asbestos Presence Screen	-	TM001	No ACM Detected							
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	60.9	25.7						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	88.5	39.6	M	M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	68.8	30.8						
Catechol	<0.01 mg/kg	TM062 (S)	<0.200	<0.0100						
Phenol	<0.01 mg/kg	TM062 (S)	<0.200	<0.0100	M	M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.200	<0.0100	M	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<1.00	<0.0500						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.300	<0.0150	M	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.200	<0.0100						
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.200	<0.0100	M	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.300	<0.0150	M	M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.110	0.00						
pH value of soil	1 pH Units	TM133	10.88	8.02	M					
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<3.0	#	#				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<3.00	#	#				
Total Cyanide	<1 mg/kg	TM153	1410	1700	M	M				
PCB congener 28	<3 µg/kg	TM168	<3.00							
PCB congener 52	<3 µg/kg	TM168	<3.00							
PCB congener 101	<3 µg/kg	TM168	<3.00							
PCB congener 118	<3 µg/kg	TM168	<3.00							
PCB congener 138	<3 µg/kg	TM168	<3.00							
PCB congener 153	<3 µg/kg	TM168	<3.00							
PCB congener 180	<3 µg/kg	TM168	<3.00							
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00							
Easily Liberated Sulphide	<15 mg/kg	TM180	76.22	41.45	#	#				
Easily Liberated Sulphide	<15 mg/kg	TM180	86.1	49.7	#	#				
Arsenic	<0.6 mg/kg	TM181	14.7	5.03	M	M				
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	M	M				
Chromium	<0.9 mg/kg	TM181	10.9	6.75	M	M				
Copper	<1.4 mg/kg	TM181	30.7	6.02	M	M				
Lead	<0.7 mg/kg	TM181	194	40.7	M	M				
Mercury	<0.14 mg/kg	TM181	0.410	<0.140	M	M				
Nickel	<0.2 mg/kg	TM181	7.01	4.48	M	M				
Selenium	<1 mg/kg	TM181	<1.00	<1.00	#	#				
Zinc	<1.9 mg/kg	TM181	140	24.6	M	M				
Total Sulphate	<48 mg/kg	TM221	28900	1690	M	M				

SDG: 091124-39
Job: D_MOUCHEL_ELE-59
Client Reference: 20-11-09 (F1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66185

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F1	F1				
Depth (m)	0.50 - 1.00	4.50 - 5.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	20/11/2009	20/11/2009				
Date Received	23/11/2009	23/11/2009				
SDG Ref	091124-39	091124-39				
Lab Sample No.(s)	645493	645597				

Component	LOD/Units	Method	F1	F1			
GRO C5-C12	<44 µg/kg	TM089	148	857			
			#	#			
MTBE	<5 µg/kg	TM089	<5.00	<6.00			
			#	#			
Benzene	<10 µg/kg	TM089	<10.0	14.4			
			M	M			
Toluene	<2 µg/kg	TM089	<9.00	27.6			
			M	M			
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<9.00			
			M	M			
m & p Xylene	<6 µg/kg	TM089	14.7	33.6			
			M	M			
o Xylene	<3 µg/kg	TM089	<4.00	16.8			
			M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	14.7	50.4			
			M	M			
Sum of BTEX	<10 µg/kg	TM089	14.7	92.4			
			M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	20.7			
Aliphatics >C6-C8	<10 µg/kg	TM089	29.5	51.4			
Aliphatics >C8-C10	<10 µg/kg	TM089	13.3	57.8			
Aliphatics >C10-C12	<10 µg/kg	TM089	28.3	219			
Total Aliphatics C5-C12	<10 µg/kg	TM089	71.0	349			
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	14.4			
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	27.6			
Aromatics >EC8-EC10	<10 µg/kg	TM089	34.6	78.9			
Aromatics >EC10-EC12	<10 µg/kg	TM089	42.4	329			
Total Aromatics C6-C12	<10 µg/kg	TM089	77.0	508			

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SDG: 091124-39
Job: D_MOUCHEL_ELE-59
Client Reference: 20-11-09 (F1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66185

PAH by GCMS

Results Legend			Sample Identity		F1	F1				
# ISO17025 accredited. m mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	4.50 - 5.00					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	20/11/2009	20/11/2009					
			Date Received	23/11/2009	23/11/2009					
			SDG Ref	091124-39	091124-39					
			Lab Sample No.(s)	645493	645597					
Component	LOD/Units	Method								
Naphthalene (S)	<9 µg/kg	TM218	5330	330	M	M				
Acenaphthylene (S)	<12 µg/kg	TM218	2110	55.7	M	M				
Acenaphthene (S)	<8 µg/kg	TM218	351	966	M	M				
Fluorene (S)	<10 µg/kg	TM218	872	166	M	M				
Phenanthrene (S)	<15 µg/kg	TM218	14500	1320	M	M				
Anthracene (S)	<16 µg/kg	TM218	5000	493	M	M				
Fluoranthene (S)	<17 µg/kg	TM218	18600	1100	M	M				
Pyrene (S)	<15 µg/kg	TM218	15200	945	M	M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	6610	564	M	M				
Chrysene (S)	<10 µg/kg	TM218	6440	477	M	M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	4150	702	M	M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3500	289	M	M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6490	535	M	M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4840	307	M	M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1150	116	M	M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	5360	328	M	M				
PAH 16 EPA Total	<118 µg/kg	TM218	101000	8710	M	M				

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SDG: 091124-39
Job: D_MOUCHEL_ELE-59
Client Reference: 20-11-09 (F1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66185

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F1	F1				
Depth (m)	0.50 - 1.00	4.50 - 5.00				
Sample Type	Soil/Solid	Soil/Solid				
Date Sampled	20/11/2009	20/11/2009				
Date Received	23/11/2009	23/11/2009				
SDG Ref	091124-39	091124-39				
Lab Sample No.(s)	645493	645597				

Component	LOD/Units	Method				
Total Aliphatics >C5-C44	<100 µg/kg	TM173	2720000	11200		
Total Aromatics >C6-C44	<100 µg/kg	TM173	2390000	75100		
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	5110000	86300		

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 04 December 2009
Job: D_MOUCHEL_ELE-60
Sample Delivery Group (SDG): 091124-60
Your Reference: 20/11/09
Location: Limerick Gasworks (G1)
Report No.: 66623

A total of 3 samples was received on Monday November 23, 2009 and completed on Friday December 04, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66623

SOLID

Results Legend	Sample ID	G1						Total
		0.00 - 0.50		4.50 - 5.00		8.50 - 9.00		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	
Asbestos Presence Screen	All		X					
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	
Easily Liberated Sulphide	All		X		X		X	
EPH CWG (Aliphatic) GC (S)	All		X		X		X	
EPH CWG (Aromatic) GC (S)	All		X		X		X	
GRO BTEX MTBE GC (S)	All		X		X		X	
Hexavalent Chromium (s)	All	X		X		X		
Metals by iCap-OES (Soil)	Arsenic		X		X		X	
	Cadmium		X		X		X	
	Chromium		X		X		X	
	Copper		X		X		X	
	Lead		X		X		X	
	Mercury		X		X		X	
	Nickel		X		X		X	
	Selenium		X		X		X	
	Zinc		X		X		X	
PAH by GCMS	All		X		X		X	
PAH micro by GCMS	All		X		X		X	
PCBs by GCMS	All		X		X		X	
pH	All		X		X		X	
Phenols by HPLC (S)	All		X		X		X	
Sample description	All		X		X		X	
Total Sulphate	All		X		X		X	
TPH CWG GC (S)	All		X		X		X	
VOC MS (S)	All		X		X		X	

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SDG:	091124-60	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-60	Attention:	Verity Sankey
Client Reference:	20/11/09	Order No.:	
Location:	Limerick Gasworks (G1)	Report No:	66623

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
G1	0.00 - 0.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.50 - 5.00	Grey	Silty Sand	0.063 - 0.1 mm	Stones
	8.50 - 9.00	Brown	Sludge / Sediment	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66623

Test Completion dates

SDG reference: 091124-60

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
G1	0.00 - 0.50	SOLID	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009
	4.50 - 5.00	SOLID	27/11/2009	26/11/2009	26/11/2009	25/11/2009	28/11/2009	25/11/2009	30/11/2009	02/12/2009	27/11/2009	27/11/2009	04/12/2009	29/11/2009	30/11/2009	02/12/2009	26/11/2009	01/12/2009	01/12/2009
	8.50 - 9.00	SOLID	03/12/2009	04/12/2009	04/12/2009	25/11/2009	28/11/2009	25/11/2009	02/12/2009	02/12/2009	27/11/2009	27/11/2009	04/12/2009	30/11/2009	30/11/2009	02/12/2009	26/11/2009	01/12/2009	01/12/2009

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SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66623

Results Legend		Sample Identity	G1	G1	G1			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 20/11/2009 23/11/2009 091124-60 646373	4.50 - 5.00 Soil/Solid 20/11/2009 23/11/2009 091124-60 646462	8.50 - 9.00 Soil/Solid 20/11/2009 23/11/2009 091124-60 646542			
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001	No ACM Detected					
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	25.9	23.5	287			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	38.7	36.0	490			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	30.1	28.0	381			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100			
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.133			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	0.10			
pH value of soil	1 pH Units	TM133	8.73	8.25	8.36			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<0.60			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600			
Total Cyanide	<1 mg/kg	TM153	8.08	7.90	62.6			
PCB congener 28	<3 µg/kg	TM168	<3.00	<3.00				
PCB congener 52	<3 µg/kg	TM168	<3.00	<3.00				
PCB congener 101	<3 µg/kg	TM168	<3.00	<3.00				
PCB congener 118	<3 µg/kg	TM168	<3.00	<3.00				
PCB congener 138	<3 µg/kg	TM168	<3.00	<3.00				
PCB congener 153	<3 µg/kg	TM168	<3.00	<3.00				
PCB congener 180	<3 µg/kg	TM168	<3.00	<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00	<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	35.55	52.33			
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	42.3	69.6			
Arsenic	<0.6 mg/kg	TM181	31.9	<0.600	12.3			
Cadmium	<0.02 mg/kg	TM181	1.35	<0.0200	<0.0200			
Chromium	<0.9 mg/kg	TM181	16.4	79.8	16.2			
Copper	<1.4 mg/kg	TM181	65.8	36.1	19.1			
Lead	<0.7 mg/kg	TM181	4850	<0.700	569			
Mercury	<0.14 mg/kg	TM181	1.02	<0.140	<0.140			
Nickel	<0.2 mg/kg	TM181	36.7	75.1	18.9			
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00			
Zinc	<1.9 mg/kg	TM181	228	40.1	33.4			
Total Sulphate	<48 mg/kg	TM221	1440	1570	3330			

SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66623

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	G1	G1	G1
Depth (m)	0.00 - 0.50	4.50 - 5.00	8.50 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-60	091124-60	091124-60
Lab Sample No.(s)	646373	646462	646542

Component	LOD/Units	Method	G1	G1	G1
Aromatics >EC12-EC16	<100 µg/kg	TM173	180000	23700	85700
Aromatics >EC16-EC21	<100 µg/kg	TM173	502000	38500	314000
Aromatics >EC21-EC35	<100 µg/kg	TM173	2190000	43900	1130000
Aromatics >EC35-EC44	<100 µg/kg	TM173	528000	18200	243000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	3400000	124000	1770000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	3400000	124000	1770000

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SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66623

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	G1	G1	G1
Depth (m)	0.00 - 0.50	4.50 - 5.00	8.50 - 9.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-60	091124-60	091124-60
Lab Sample No.(s)	646373	646462	646542

Component	LOD/Units	Method	G1	G1	G1
GRO C5-C12	<44 µg/kg	TM089	270 #	346 #	1810 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	<10.0 M	<10.0 M	61.2 M
Toluene	<2 µg/kg	TM089	<6.00 M	<4.00 M	33.3 M
Ethyl Benzene	<3 µg/kg	TM089	<3.00 M	<3.00 M	17.3 M
m & p Xylene	<6 µg/kg	TM089	<6.00 M	<6.00 M	78.5 M
o Xylene	<3 µg/kg	TM089	<3.00 M	<3.00 M	55.9 M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0 M	<10.0 M	134 M
Sum of BTEX	<10 µg/kg	TM089	<10.0 M	<10.0 M	246 M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	23.6
Aliphatics >C6-C8	<10 µg/kg	TM089	37.4	29.7	71.0
Aliphatics >C8-C10	<10 µg/kg	TM089	25.7	23.9	182
Aliphatics >C10-C12	<10 µg/kg	TM089	67.5	99.5	405
Total Aliphatics C5-C12	<10 µg/kg	TM089	131	153	681
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	61.2
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	33.3
Aromatics >EC8-EC10	<10 µg/kg	TM089	38.5	33.9	424
Aromatics >EC10-EC12	<10 µg/kg	TM089	101	149	607
Total Aromatics C6-C12	<10 µg/kg	TM089	140	185	1130

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SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66623

PAH micro by GCMS

Results Legend		Sample Identity	G1	G1				
# ISO17025 accredited. m mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 20/11/2009 23/11/2009 091124-60 646373	8.50 - 9.00 Soil/Solid 20/11/2009 23/11/2009 091124-60 646542				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	23100 M	25100 M				
Acenaphthylene (S)	<12 µg/kg	TM218	20700 M	4830 M				
Acenaphthene (S)	<8 µg/kg	TM218	5390 M	9060 M				
Fluorene (S)	<10 µg/kg	TM218	30900 M	26800 M				
Phenanthrene (S)	<15 µg/kg	TM218	188000 M	79000 M				
Anthracene (S)	<16 µg/kg	TM218	90000 M	25600 M				
Fluoranthene (S)	<17 µg/kg	TM218	196000 M	67900 M				
Pyrene (S)	<15 µg/kg	TM218	145000 M	49000 M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	78100 M	35500 M				
Chrysene (S)	<10 µg/kg	TM218	61800 M	28600 M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	66700 M	32500 M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	30400 M	15600 M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	60300 M	30100 M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	31400 M	13600 M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	9100 M	5420 M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	32100 M	13300 M				
PAH 16 EPA Total	<118 µg/kg	TM218	1070000 M	462000 M				

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SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66623

VOC MS (S)

Results Legend			Sample Identity	G1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	8.50 - 9.00				
			Sample Type	Soil/Solid				
			Date Sampled	20/11/2009				
			Date Received	23/11/2009				
			SDG Ref	091124-60				
			Lab Sample No.(s)	646542				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	111					
Toluene-d8**	%	TM116	90.1					
4-Bromofluorobenzene**	%	TM116	73.8					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	M				
Chloromethane	<12 µg/kg	TM116	<12.0	#				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	M				
Bromoethane	<9 µg/kg	TM116	<9.00	M				
Chloroethane	<12 µg/kg	TM116	<12.0	M				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	M				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	#				
Carbon Disulphide	<9 µg/kg	TM116	19.9	M				
Dichloromethane	<10 µg/kg	TM116	<10.0	M				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	M				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	M				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Bromochloromethane	<10 µg/kg	TM116	<10.0	M				
Chloroform	<10 µg/kg	TM116	<10.0	M				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	M				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	M				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	M				
Benzene	<9 µg/kg	TM116	36.9	M				
Trichloroethene	<9 µg/kg	TM116	<9.00	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Dibromomethane	<12 µg/kg	TM116	<12.0	M				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	M				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	M				
Toluene	<6 µg/kg	TM116	17.3	M				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	M				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	M				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	M				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	M				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	M				
Chorobenzene	<7 µg/kg	TM116	<7.00	M				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	M				
Ethylbenzene	<9 µg/kg	TM116	<9.00	M				

SDG: 091124-60
Job: D_MOUCHEL_ELE-60
Client Reference: 20/11/09
Location: Limerick Gasworks (G1)

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66623

VOC MS (S)

Results Legend		Sample Identity									
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		G1 Depth (m) 8.50 - 9.00 Sample Type Soil/Solid Date Sampled 20/11/2009 Date Received 23/11/2009 SDG Ref 091124-60 Lab Sample No.(s) 646542									
Component	LOD/Units	Method									
p/m-Xylene	<13 µg/kg	TM116	52.4								
				#							
o-Xylene	<11 µg/kg	TM116	45.7								
				M							
Styrene	<11 µg/kg	TM116	<11.0								
				M							
Bromoform	<12 µg/kg	TM116	<12.0								
				M							
Isopropylbenzene	<9 µg/kg	TM116	<9.00								
				M							
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0								
				#							
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0								
				M							
Bromobenzene	<14 µg/kg	TM116	<14.0								
				M							
Propylbenzene	<6 µg/kg	TM116	<6.00								
				M							
2-Chlorotoluene	<14 µg/kg	TM116	<14.0								
				#							
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	50.7								
				M							
4-Chlorotoluene	<9 µg/kg	TM116	<9.00								
				#							
tert-Butylbenzene	<12 µg/kg	TM116	<12.0								
				#							
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	112								
				#							
sec-Butylbenzene	<8 µg/kg	TM116	<8.00								
				#							
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00								
				#							
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00								
				#							
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0								
				M							
n-Butylbenzene	<7 µg/kg	TM116	<7.00								
				#							
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00								
				M							
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0								
				M							
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00								
				#							
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00								
				#							
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0								
				#							
Naphthalene	<7 µg/kg	TM116	1300								
				#							
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0								
				#							

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-91
Sample Delivery Group (SDG): 091124-63
Your Reference: Limerick Gasworks
Location: Limerick Gasworks
Report No.: 66961

A total of 4 samples was received on Monday November 23, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091124-63
Job: D_MOUCHEL_ELE-91
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66961

SOLID

Results Legend	Sample ID	G2								Total
		0.00 - 0.50		1.00 - 1.50		5.00 - 5.50		8.00 - 8.50		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
Ammonium Soil by Titration	All									0
		X		X		X		X		4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide									0
		X		X		X		X		4
Easily Liberated Sulphide	All									0
		X		X		X		X		4
EPH CWG (Aliphatic) GC (S)	All									0
		X		X		X		X		4
EPH CWG (Aromatic) GC (S)	All									0
		X		X		X		X		4
GRO BTEX MTBE GC (S)	All									0
		X		X		X		X		4
Hexavalent Chromium (s)	All									0
		X		X		X		X		4
Metals by iCap-OES (Soil)	Arsenic									0
		X		X		X		X		4
	Cadmium									0
		X		X		X		X		4
	Chromium									0
		X		X		X		X		4
	Copper									0
		X		X		X		X		4
	Lead									0
		X		X		X		X		4
	Mercury									0
		X		X		X		X		4
	Nickel									0
		X		X		X		X		4
	Selenium									0
		X		X		X		X		4
	Zinc									0
		X		X		X		X		4
PAH by GCMS	All									0
		X		X		X		X		4
PCBs by GCMS	All									0
		X								1
pH	All									0
		X		X		X		X		4
Phenols by HPLC (S)	All									0
		X		X		X		X		4
Sample description	All									0
		X		X		X		X		4
Total Sulphate	All									0
		X		X		X		X		4
TPH CWG GC (S)	All									0
		X		X		X		X		4

SDG:	091124-63	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-91	Attention:	Verity Sankey
Client Reference:	Limerick Gasworks	Order No.:	
Location:	Limerick Gasworks	Report No.:	66961

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
G2	0.00 - 0.50	Black	Sand	0.063 - 0.1 mm	Stones
	1.00 - 1.50	Brown	Sand	0.063 - 0.1 mm	Stones
	5.00 - 5.50	Grey	Silty Sand	0.063 - 0.1 mm	N/A
	8.00 - 8.50	Brown	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091124-63
Job: D_MOUCHEL_ELE-91
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66961

Test Completion dates

SDG reference: 091124-63

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (S)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
G2	0.00 - 0.50	SOLID	08/12/2009	26/11/2009	25/11/2009	28/11/2009	25/11/2009	30/11/2009	05/12/2009	27/11/2009	27/11/2009	07/12/2009	29/11/2009	29/11/2009	02/12/2009	26/11/2009	03/12/2009
	1.00 - 1.50	SOLID	08/12/2009	26/11/2009	25/11/2009	28/11/2009	25/11/2009	02/12/2009	27/11/2009	27/11/2009	27/11/2009	07/12/2009	30/11/2009	30/11/2009	02/12/2009	26/11/2009	03/12/2009
	5.00 - 5.50	SOLID	08/12/2009	26/11/2009	25/11/2009	28/11/2009	25/11/2009	02/12/2009	27/11/2009	27/11/2009	27/11/2009	07/12/2009	29/11/2009	29/11/2009	02/12/2009	26/11/2009	03/12/2009
	8.00 - 8.50	SOLID	08/12/2009	26/11/2009	25/11/2009	28/11/2009	25/11/2009	02/12/2009	27/11/2009	27/11/2009	27/11/2009	07/12/2009	29/11/2009	29/11/2009	02/12/2009	26/11/2009	03/12/2009

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SDG: 091124-63
Job: D_MOUCHEL_ELE-91
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66961

Results Legend		Sample Identity	G2	G2	G2	G2		
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646581	1.00 - 1.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646640	5.00 - 5.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646821	8.00 - 8.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646995		
Component	LOD/Units	Method						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0 M	<15.0 M	41.1 M	60.3 M		
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	<15.0 M	60.8 M	93.8 M		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	47.3	73.0		
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100		
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	0.124 M	<0.0100 M	<0.0100 M		
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0300 M	<0.0300 M	<0.0100 M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0300 M	<0.0150 M	<0.0150 M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	<0.170	<0.0300	0.00		
pH value of soil	1 pH Units	TM133	7.39 M	7.77 M	8.39 M	8.12 M		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60 #	<0.60 #	<3.0 #	<0.60 #		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<0.600 #	<3.00 #	<0.600 #		
Total Cyanide	<1 mg/kg	TM153	145 M	50.4 M	<1.00 M	3.00 M		
PCB congener 28	<3 µg/kg	TM168	<3.00					
PCB congener 52	<3 µg/kg	TM168	<3.00					
PCB congener 101	<3 µg/kg	TM168	<3.00					
PCB congener 118	<3 µg/kg	TM168	<3.00					
PCB congener 138	<3 µg/kg	TM168	<3.00					
PCB congener 153	<3 µg/kg	TM168	<3.00					
PCB congener 180	<3 µg/kg	TM168	<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00 #	95.76 #	71.85 #	27.95 #		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0 #	108 #	82.6 #	33.8 #		
Arsenic	<0.6 mg/kg	TM181	22.5 M	13.6 M	4.04 M	7.31 M		
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M	<0.0200 M	<0.0200 M		
Chromium	<0.9 mg/kg	TM181	15.2 M	10.7 M	5.37 M	14.1 M		
Copper	<1.4 mg/kg	TM181	156 M	57.5 M	5.26 M	7.95 M		
Lead	<0.7 mg/kg	TM181	111 M	277 M	32.3 M	22.1 M		
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M	<0.140 M	<0.140 M		
Nickel	<0.2 mg/kg	TM181	29.3 M	23.1 M	2.85 M	15.2 M		
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	<1.00 #		
Zinc	<1.9 mg/kg	TM181	45.0 M	83.3 M	29.1 M	37.1 M		
Total Sulphate	<48 mg/kg	TM221	22600 M	31100 M	1980 M	1020 M		

SDG: 091124-63
Job: D_MOUCHEL_ELE-91
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66961

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	G2	G2	G2	G2
Depth (m)	0.00 - 0.50	1.00 - 1.50	5.00 - 5.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-63	091124-63	091124-63	091124-63
Lab Sample No.(s)	646581	646640	646821	646995

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	35200	36900	5590	11300
Aliphatics >C16-C21	<100 µg/kg	TM173	49000	47300	3630	5960
Aliphatics >C21-C35	<100 µg/kg	TM173	226000	112000	11700	6400
Aliphatics >C35-C44	<100 µg/kg	TM173	60100	14200	2020	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	370000	210000	22900	23700
Aliphatics >C16-C35	<100 µg/kg	TM173	275000	159000	15300	12400

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SDG: 091124-63
Job: D_MOUCHEL_ELE-91
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66961

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	G2	G2	G2	G2		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	1.00 - 1.50	5.00 - 5.50	8.00 - 8.50		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009		
			Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
			SDG Ref	091124-63	091124-63	091124-63	091124-63		
			Lab Sample No.(s)	646581	646640	646821	646995		
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	111	328	56.4	401			
			#	#	#	#			
MTBE	<5 µg/kg	TM089	27.1	13.6	<5.00	<5.00			
			#	#	#	#			
Benzene	<10 µg/kg	TM089	<10.0	63.3	<10.0	<10.0			
			M	M	M	M			
Toluene	<2 µg/kg	TM089	11.3	54.2	<2.00	<3.00			
			M	M	M	M			
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<4.00	<3.00	<3.00			
			M	M	M	M			
m & p Xylene	<6 µg/kg	TM089	<6.00	41.8	<9.00	<6.00			
			M	M	M	M			
o Xylene	<3 µg/kg	TM089	<3.00	<9.00	<6.00	<4.00			
			M	M	M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	41.8	<10.0	<10.0			
			M	M	M	M			
Sum of BTEX	<10 µg/kg	TM089	11.3	159	<10.0	<10.0			
			M	M	M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	12.1	<10.0	<10.0	<10.0			
Aliphatics >C6-C8	<10 µg/kg	TM089	60.2	<10.0	<10.0	<10.0			
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	16.2	<10.0	29.3			
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	48.3	<10.0	128			
Total Aliphatics C5-C12	<10 µg/kg	TM089	72.3	64.5	<10.0	158			
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	63.3	<10.0	<10.0			
Aromatics >C7-C8	<10 µg/kg	TM089	11.3	54.2	<10.0	<10.0			
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	66.2	11.8	43.9			
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	72.4	12.6	193			
Total Aromatics C6-C12	<10 µg/kg	TM089	11.3	256	24.4	236			

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SDG: 091124-63
Job: D_MOUCHEL_ELE-91
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66961

PAH by GCMS

Component	LOD/Units	Method	Sample Identity				
			G2	G2	G2	G2	
Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.00 - 0.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646581	1.00 - 1.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646640	5.00 - 5.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646821	8.00 - 8.50 Soil/Solid 20/11/2009 23/11/2009 091124-63 646995
Naphthalene (S)	<9 µg/kg	TM218	6240 M	27600 M	156 M	638 M	
Acenaphthylene (S)	<12 µg/kg	TM218	503 M	31000 M	46.9 M	148 M	
Acenaphthene (S)	<8 µg/kg	TM218	<8.00 M	3890 M	42.6 M	769 M	
Fluorene (S)	<10 µg/kg	TM218	142 M	21800 M	142 M	926 M	
Phenanthrene (S)	<15 µg/kg	TM218	3060 M	257000 M	676 M	1660 M	
Anthracene (S)	<16 µg/kg	TM218	3170 M	136000 M	210 M	676 M	
Fluoranthene (S)	<17 µg/kg	TM218	2560 M	370000 M	635 M	2070 M	
Pyrene (S)	<15 µg/kg	TM218	1710 M	293000 M	465 M	1810 M	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	564 M	167000 M	240 M	935 M	
Chrysene (S)	<10 µg/kg	TM218	684 M	135000 M	218 M	717 M	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1030 M	173000 M	213 M	740 M	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	984 M	69300 M	181 M	396 M	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	485 M	130000 M	193 M	631 M	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	134 M	75700 M	107 M	257 M	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0 M	22300 M	38.1 M	108 M	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	183 M	74700 M	129 M	270 M	
PAH 16 EPA Total	<118 µg/kg	TM218	21500 M	199000 M	3630 M	12800 M	

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SDG: 091124-63
Job: D_MOUCHEL_ELE-91
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66961

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	G2	G2	G2	G2
Depth (m)	0.00 - 0.50	1.00 - 1.50	5.00 - 5.50	8.00 - 8.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-63	091124-63	091124-63	091124-63
Lab Sample No.(s)	646581	646640	646821	646995

Component	LOD/Units	Method	G2	G2	G2	G2
Total Aliphatics >C5-C44	<100 µg/kg	TM173	370000	211000	22900	23900
Total Aromatics >C6-C44	<100 µg/kg	TM173	210000	910000	266000	123000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	580000	9310000	289000	147000

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-62
Sample Delivery Group (SDG): 091124-65
Your Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks
Report No.: 66672

A total of 7 samples was received on Monday November 23, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66672

SOLID

Results Legend	Sample ID	A3			D12			E12			F11		Total
		Depth (m)			Depth (m)			Depth (m)			Depth (m)		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)		
X Test													
N No Determination Possible													
Ammonium Soil by Titration	All	X	X	X	X	X	X	X	X	X	X	0	
Asbestos Presence Screen	All	X										7	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide	X	X	X	X	X	X	X	X	X	X	0	
Easily Liberated Sulphide	All	X	X	X	X	X	X	X	X	X	X	7	
EPH CWG (Aliphatic) GC (S)	All	X	X	X	X	X	X	X	X	X	X	0	
EPH CWG (Aromatic) GC (S)	All	X	X	X	X	X	X	X	X	X	X	7	
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	X	X	X	X	X	0	
Hexavalent Chromium (s)	All	X	X	X	X	X	X	X	X	X	X	7	
Metals by iCap-OES (Soil)	Arsenic	X	X	X	X	X	X	X	X	X	X	0	
	Cadmium	X	X	X	X	X	X	X	X	X	X	7	
	Chromium	X	X	X	X	X	X	X	X	X	X	0	
	Copper	X	X	X	X	X	X	X	X	X	X	7	
	Lead	X	X	X	X	X	X	X	X	X	X	0	
	Mercury	X	X	X	X	X	X	X	X	X	X	7	
	Nickel	X	X	X	X	X	X	X	X	X	X	0	
	Selenium	X	X	X	X	X	X	X	X	X	X	7	
	Zinc	X	X	X	X	X	X	X	X	X	X	0	
PAH micro by GCMS	All	X	X	X	X	X	X	X	X	X	X	0	
PCBs by GCMS	All							X			X	0	
pH	All	X	X	X	X	X	X	X	X	X	X	2	
Phenols by HPLC (S)	All	X	X	X	X	X	X	X	X	X	X	0	
Sample description	All	X	X	X	X	X	X	X	X	X	X	7	
Total Sulphate	All	X	X	X	X	X	X	X	X	X	X	0	
TPH CWG GC (S)	All	X	X	X	X	X	X	X	X	X	X	7	
VOC MS (S)	All							X		X		0	
												2	

SDG:	091124-65	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-62	Attention:	Verity Sankey
Client Reference:	20/11/09 (f11, A3,D12 & E12)	Order No.:	
Location:	Limerick Gasworks	Report No:	66672

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
A3	0.50 - 1.00	Brown	Sand	0.1 - 2 mm	Stones
D12	1.20 - 1.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.80 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
E12	1.50 - 2.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.00 - 2.40	Brown	Sandy Clay	0.1 - 2 mm	Stones
F11	0.00 - 0.50	Brown	Sand	0.1 - 2 mm	Stones
	2.50 - 3.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091124-65
 Job: D_MOUCHEL_ELE-62
 Client Reference: 20/11/09 (f11, A3,D12 & E12)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66672

Test Completion dates

SDG reference: 091124-65

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
A3	0.50 - 1.00	SOLID	02/12/2009	25/11/2009	30/11/2009	02/12/2009	02/12/2009	02/12/2009	04/12/2009	01/12/2009	03/12/2009	01/12/2009	27/11/2009	01/12/2009	02/12/2009	02/12/2009	04/12/2009	04/12/2009
	1.20 - 1.50	SOLID	02/12/2009	29/11/2009	29/11/2009	02/12/2009	02/12/2009	03/11/2009	04/12/2009	01/12/2009	03/12/2009	27/11/2009	27/11/2009	01/12/2009	25/11/2009	27/11/2009	04/12/2009	04/12/2009
D12	2.80 - 3.00	SOLID	03/12/2009	28/11/2009	28/11/2009	03/12/2009	03/12/2009	30/11/2009	04/12/2009	01/12/2009	27/11/2009	27/11/2009	27/11/2009	25/11/2009	28/11/2009	04/12/2009	04/12/2009	04/12/2009
	1.50 - 2.00	SOLID	02/12/2009	30/11/2009	30/11/2009	02/12/2009	02/12/2009	29/11/2009	04/12/2009	01/12/2009	27/11/2009	27/11/2009	30/11/2009	01/12/2009	01/12/2009	04/12/2009	04/12/2009	04/12/2009
E12	2.00 - 2.40	SOLID	01/12/2009	30/11/2009	30/11/2009	02/12/2009	02/12/2009	29/11/2009	04/12/2009	01/12/2009	27/11/2009	27/11/2009	30/11/2009	01/12/2009	01/12/2009	04/12/2009	04/12/2009	04/12/2009
	0.00 - 0.50	SOLID	02/12/2009	25/11/2009	30/11/2009	02/12/2009	02/12/2009	29/11/2009	04/12/2009	01/12/2009	03/12/2009	01/12/2009	27/11/2009	01/12/2009	01/12/2009	04/12/2009	04/12/2009	04/12/2009
F11	2.50 - 3.00	SOLID	02/12/2009	29/11/2009	29/11/2009	02/12/2009	02/12/2009	29/11/2009	04/12/2009	01/12/2009	27/11/2009	27/11/2009	30/11/2009	01/12/2009	01/12/2009	04/12/2009	04/12/2009	07/12/2009

SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

Results Legend			Sample Identity	A3	D12	D12	E12	E12	F11
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 647101	1.20 - 1.50 Soil/Solid 20/11/2009 23/11/2009 091124-65 647187	2.80 - 3.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 647230	1.50 - 2.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 647259	2.00 - 2.40 Soil/Solid 20/11/2009 23/11/2009 091124-65 647290	0.00 - 0.50 Soil/Solid 20/11/2009 23/11/2009 091124-65 646834
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						No ACM Detected
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	35.2	29.3	<15.0	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0	<15.0	49.7	41.4	<15.0	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	38.7	32.2	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.106
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0200	<0.0100	<0.0100	<0.0100	0.531
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0400	<0.0200	<0.0150	<0.0150	4.43
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.0700	<0.0200	0.00	5.07	
pH value of soil	1 pH Units	TM133	8.67	8.70	8.77	8.57	8.64	9.77	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	0.0099	<0.60	<0.60	0.076	<0.60	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	<0.600	0.0834	<0.600	
Total Cyanide	<1 mg/kg	TM153	1.58	1.90	<1.00	<1.00	<1.00	<1.00	
PCB congener 28	<3 µg/kg	TM168					<3.00		
PCB congener 52	<3 µg/kg	TM168					<3.00		
PCB congener 101	<3 µg/kg	TM168					<3.00		
PCB congener 118	<3 µg/kg	TM168					<3.00		
PCB congener 138	<3 µg/kg	TM168					<3.00		
PCB congener 153	<3 µg/kg	TM168					<3.00		
PCB congener 180	<3 µg/kg	TM168					<3.00		
Total of 7 Congener PCBs	<3 µg/kg	TM168					<3.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	<15.00	<15.00	<15.00	<15.00	<15.00	37.64
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	39.9
Arsenic	<0.6 mg/kg	TM181	11.6	4.63	4.14	2.94	4.68	4.53	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200
Chromium	<0.9 mg/kg	TM181	12.1	6.64	6.09	5.78	6.30	13.5	
Copper	<1.4 mg/kg	TM181	24.0	4.02	3.28	3.01	3.73	11.2	
Lead	<0.7 mg/kg	TM181	79.1	5.59	5.51	5.39	6.48	11.9	
Mercury	<0.14 mg/kg	TM181	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	0.192
Nickel	<0.2 mg/kg	TM181	17.5	6.56	5.11	4.52	5.91	17.6	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Zinc	<1.9 mg/kg	TM181	59.5	13.5	10.9	12.1	13.1	31.4	
Total Sulphate	<48 mg/kg	TM221	6870	136	278	204	1330	3560	

SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
* This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A3	D12	D12	E12	E12	F11
Depth (m)	0.50 - 1.00	1.20 - 1.50	2.80 - 3.00	1.50 - 2.00	2.00 - 2.40	0.00 - 0.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-65	091124-65	091124-65	091124-65	091124-65	091124-65
Lab Sample No.(s)	647101	647187	647230	647259	647290	646834

Component	LOD/Units	Method	A3	D12	D12	E12	E12	F11
Aliphatics >C12-C16	<100 µg/kg	TM173	9260	2510	1180	2000	2330	9150
Aliphatics >C16-C21	<100 µg/kg	TM173	18900	<100	<100	443	430	21000
Aliphatics >C21-C35	<100 µg/kg	TM173	78200	<100	<100	<100	<100	56000
Aliphatics >C35-C44	<100 µg/kg	TM173	26000	<100	<100	<100	<100	12500
Total Aliphatics >C12-C44	<100 µg/kg	TM173	132000	2510	1180	2440	2760	98600
Aliphatics >C16-C35	<100 µg/kg	TM173	97100	<100	<100	443	430	77000

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A3	D12	D12	E12	E12	F11
Depth (m)	0.50 - 1.00	1.20 - 1.50	2.80 - 3.00	1.50 - 2.00	2.00 - 2.40	0.00 - 0.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-65	091124-65	091124-65	091124-65	091124-65	091124-65
Lab Sample No.(s)	647101	647187	647230	647259	647290	646834

Component	LOD/Units	Method	A3	D12	D12	E12	E12	F11
GRO C5-C12	<44 µg/kg	TM089	199 #	<44.0 #	18400 #	334 #	235 #	<44.0 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	<5.00 #	<5.00 #	<5.00 #	<5.00 #
Benzene	<10 µg/kg	TM089	<10.0 M	<10.0 M	64.4 M	14.3 M	11.0 M	<10.0 M
Toluene	<2 µg/kg	TM089	<9.00 M	<3.00 M	179 M	<5.00 M	<5.00 M	<2.00 M
Ethyl Benzene	<3 µg/kg	TM089	<3.00 M	<3.00 M	187 M	13.2 M	12.1 M	<3.00 M
m & p Xylene	<6 µg/kg	TM089	<9.00 M	<6.00 M	981 M	23.1 M	13.2 M	<6.00 M
o Xylene	<3 µg/kg	TM089	<4.00 M	<3.00 M	491 M	<7.00 M	<4.00 M	<3.00 M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0 M	<10.0 M	1470 M	23.1 M	13.2 M	<10.0 M
Sum of BTEX	<10 µg/kg	TM089	<10.0 M	<10.0 M	1900 M	50.6 M	36.3 M	<10.0 M
Aliphatics C5-C6	<10 µg/kg	TM089	47.7	<10.0	125	<10.0	10.7	<10.0
Aliphatics >C6-C8	<10 µg/kg	TM089	32.6	<10.0	464	16.2	16.5	<10.0
Aliphatics >C8-C10	<10 µg/kg	TM089	15.5	<10.0	<10.0	20.1	16.8	<10.0
Aliphatics >C10-C12	<10 µg/kg	TM089	30.6	<10.0	7040	82.3	50.7	<10.0
Total Aliphatics C5-C12	<10 µg/kg	TM089	126	<10.0	7630	119	94.8	<10.0
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	64.4	14.3	11.0	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	179	<10.0	<10.0	<10.0
Aromatics >EC8-EC10	<10 µg/kg	TM089	23.2	<10.0	663	66.5	50.4	<10.0
Aromatics >EC10-EC12	<10 µg/kg	TM089	45.8	<10.0	10600	123	76.1	<10.0
Total Aromatics C6-C12	<10 µg/kg	TM089	69.0	<10.0	11500	204	138	<10.0

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

PAH micro by GCMS

Results Legend		Sample Identity	A3	D12	D12	E12	E12	F11
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 1.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 647101	1.20 - 1.50 Soil/Solid 20/11/2009 23/11/2009 091124-65 647187	2.80 - 3.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 647230	1.50 - 2.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 647259	2.00 - 2.40 Soil/Solid 20/11/2009 23/11/2009 091124-65 647290	0.00 - 0.50 Soil/Solid 20/11/2009 23/11/2009 091124-65 646834

Component	LOD/Units	Method	A3	D12	D12	E12	E12	F11
Naphthalene (S)	<9 µg/kg	TM218	5140 M	20.4 M	262 M	343 M	66.1 M	1220 M
Acenaphthylene (S)	<12 µg/kg	TM218	1420 M	<12.0 M	87.1 M	<12.0 M	<12.0 M	5820 M
Acenaphthene (S)	<8 µg/kg	TM218	1810 M	<8.00 M	54.3 M	35.1 M	27.2 M	292 M
Fluorene (S)	<10 µg/kg	TM218	1800 M	10.3 M	116 M	<10.0 M	<10.0 M	1010 M
Phenanthrene (S)	<15 µg/kg	TM218	18600 M	<15.0 M	329 M	<15.0 M	21.5 M	11600 M
Anthracene (S)	<16 µg/kg	TM218	3930 M	18.1 M	85.3 M	<16.0 M	<16.0 M	4490 M
Fluoranthene (S)	<17 µg/kg	TM218	20900 M	<17.0 M	176 M	<17.0 M	<17.0 M	18500 M
Pyrene (S)	<15 µg/kg	TM218	20100 M	<15.0 M	122 M	<15.0 M	<15.0 M	14900 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	9180 M	<14.0 M	67.8 M	<14.0 M	<14.0 M	8590 M
Chrysene (S)	<10 µg/kg	TM218	7820 M	<10.0 M	48.8 M	13.6 M	<10.0 M	6880 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	9630 M	<15.0 M	51.7 M	<15.0 M	<15.0 M	11100 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3750 M	<14.0 M	21.7 M	<14.0 M	<14.0 M	4970 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	8600 M	<15.0 M	24.1 M	<15.0 M	<15.0 M	11100 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4950 M	<18.0 M	<18.0 M	<18.0 M	<18.0 M	6970 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1500 M	<23.0 M	<23.0 M	<23.0 M	<23.0 M	1850 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	5780 M	<24.0 M	<24.0 M	<24.0 M	<24.0 M	8270 M
PAH 16 EPA Total	<118 µg/kg	TM218	125000 M	<118 M	1450 M	392 M	<118 M	118000 M

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

TPH CWG GC (S)

Results Legend	Sample Identity	A3	D12	D12	E12	E12	F11
	Depth (m)	0.50 - 1.00	1.20 - 1.50	2.80 - 3.00	1.50 - 2.00	2.00 - 2.40	0.00 - 0.50
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
	Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-65	091124-65	091124-65	091124-65	091124-65	091124-65	091124-65
Lab Sample No.(s)	647101	647187	647230	647259	647290	646834	

Component	LOD/Units	Method	A3	D12	D12	E12	E12	F11
Total Aliphatics >C5-C44	<100 µg/kg	TM173	132000	2510	8800	2560	2860	98600
Total Aromatics >C6-C44	<100 µg/kg	TM173	332000	<100	11500	204	4270	654000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	464000	2510	20300	2770	7120	752000

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66672

VOC MS (S)

Results Legend		Sample Identity	E12				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.00 - 2.40 Soil/Solid 20/11/2009 23/11/2009 091124-65 647290				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	132				
Toluene-d8**	%	TM116	98.4				
4-Bromofluorobenzene**	%	TM116	105				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	16.8				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	<9.00				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	<6.00				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	<9.00				

SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66672

Results Legend		Sample Identity	F11			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 646961			
Component	LOD/Units	Method				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	245	M		
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	400	M		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	311			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M		
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	M		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00			
pH value of soil	1 pH Units	TM133	8.78	M		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	#		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#		
Total Cyanide	<1 mg/kg	TM153	11.1	M		
PCB congener 28	<3 µg/kg	TM168	<3.00			
PCB congener 52	<3 µg/kg	TM168	<3.00			
PCB congener 101	<3 µg/kg	TM168	<3.00			
PCB congener 118	<3 µg/kg	TM168	<3.00			
PCB congener 138	<3 µg/kg	TM168	<3.00			
PCB congener 153	<3 µg/kg	TM168	<3.00			
PCB congener 180	<3 µg/kg	TM168	<3.00			
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00			
Easily Liberated Sulphide	<15 mg/kg	TM180	543.30	#		
Easily Liberated Sulphide	<15 mg/kg	TM180	690	#		
Arsenic	<0.6 mg/kg	TM181	8.31	M		
Cadmium	<0.02 mg/kg	TM181	<0.0200	M		
Chromium	<0.9 mg/kg	TM181	17.0	M		
Copper	<1.4 mg/kg	TM181	13.6	M		
Lead	<0.7 mg/kg	TM181	35.1	M		
Mercury	<0.14 mg/kg	TM181	<0.140	M		
Nickel	<0.2 mg/kg	TM181	15.8	M		
Selenium	<1 mg/kg	TM181	<1.00	#		
Zinc	<1.9 mg/kg	TM181	37.9	M		
Total Sulphate	<48 mg/kg	TM221	745	M		

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F11
Depth (m)	2.50 - 3.00
Sample Type	Soil/Solid
Date Sampled	20/11/2009
Date Received	23/11/2009
SDG Ref	091124-65
Lab Sample No.(s)	646961

Component	LOD/Units	Method				
Aliphatics >C12-C16	<100 µg/kg	TM173	6870			
Aliphatics >C16-C21	<100 µg/kg	TM173	1440			
Aliphatics >C21-C35	<100 µg/kg	TM173	3080			
Aliphatics >C35-C44	<100 µg/kg	TM173	<100			
Total Aliphatics >C12-C44	<100 µg/kg	TM173	11400			
Aliphatics >C16-C35	<100 µg/kg	TM173	4520			

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F11
Depth (m)	2.50 - 3.00
Sample Type	Soil/Solid
Date Sampled	20/11/2009
Date Received	23/11/2009
SDG Ref	091124-65
Lab Sample No.(s)	646961

Component	LOD/Units	Method					
GRO C5-C12	<44 µg/kg	TM089	6050	#			
MTBE	<5 µg/kg	TM089	<5.00	#			
Benzene	<10 µg/kg	TM089	298	M			
Toluene	<2 µg/kg	TM089	304	M			
Ethyl Benzene	<3 µg/kg	TM089	207	M			
m & p Xylene	<6 µg/kg	TM089	897	M			
o Xylene	<3 µg/kg	TM089	338	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	1230	M			
Sum of BTEX	<10 µg/kg	TM089	2040	M			
Aliphatics C5-C6	<10 µg/kg	TM089	344				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0				
Aliphatics >C8-C10	<10 µg/kg	TM089	361				
Aliphatics >C10-C12	<10 µg/kg	TM089	1180				
Total Aliphatics C5-C12	<10 µg/kg	TM089	1890				
Aromatics C6-C7	<10 µg/kg	TM089	298				
Aromatics >C7-C8	<10 µg/kg	TM089	304				
Aromatics >EC8-EC10	<10 µg/kg	TM089	1980				
Aromatics >EC10-EC12	<10 µg/kg	TM089	1780				
Total Aromatics C6-C12	<10 µg/kg	TM089	4360				

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

PAH micro by GCMS

Results Legend		Sample Identity	F11				
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	2.50 - 3.00				
		Sample Type	Soil/Solid				
		Date Sampled	20/11/2009				
		Date Received	23/11/2009				
		SDG Ref	091124-65				
		Lab Sample No.(s)	646961				
Component	LOD/Units	Method					
Naphthalene (S)	<9 µg/kg	TM218	13900				
				M			
Acenaphthylene (S)	<12 µg/kg	TM218	52.6				
				M			
Acenaphthene (S)	<8 µg/kg	TM218	328				
				M			
Fluorene (S)	<10 µg/kg	TM218	125				
				M			
Phenanthrene (S)	<15 µg/kg	TM218	247				
				M			
Anthracene (S)	<16 µg/kg	TM218	59.9				
				M			
Fluoranthene (S)	<17 µg/kg	TM218	108				
				M			
Pyrene (S)	<15 µg/kg	TM218	74.4				
				M			
Benzo(a)anthracene (S)	<14 µg/kg	TM218	<14.0				
				M			
Chrysene (S)	<10 µg/kg	TM218	48.4				
				M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	40.9				
				M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	21.5				
				M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	32.1				
				M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	18.4				
				M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0				
				M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	24.0				
				M			
PAH 16 EPA Total	<118 µg/kg	TM218	15100				
				M			

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SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66672

VOC MS (S)

Results Legend			Sample Identity	F11				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00				
			Sample Type	Soil/Solid				
			Date Sampled	20/11/2009				
			Date Received	23/11/2009				
			SDG Ref	091124-65				
			Lab Sample No.(s)	646961				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	208					
Toluene-d8**	%	TM116	190					
4-Bromofluorobenzene**	%	TM116	177					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	M				
Chloromethane	<12 µg/kg	TM116	<12.0	#				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	M				
Bromoethane	<9 µg/kg	TM116	<9.00	M				
Chloroethane	<12 µg/kg	TM116	<12.0	M				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	M				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	#				
Carbon Disulphide	<9 µg/kg	TM116	25.7	M				
Dichloromethane	<10 µg/kg	TM116	<10.0	M				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	M				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	M				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Bromochloromethane	<10 µg/kg	TM116	<10.0	M				
Chloroform	<10 µg/kg	TM116	<10.0	M				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	M				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	M				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	M				
Benzene	<9 µg/kg	TM116	218	M				
Trichloroethene	<9 µg/kg	TM116	<9.00	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Dibromomethane	<12 µg/kg	TM116	<12.0	M				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	M				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	M				
Toluene	<6 µg/kg	TM116	211	M				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	25.8	M				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	M				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	M				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	M				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	M				
Chorobenzene	<7 µg/kg	TM116	<7.00	M				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	M				
Ethylbenzene	<9 µg/kg	TM116	142	M				

SDG: 091124-65
Job: D_MOUCHEL_ELE-62
Client Reference: 20/11/09 (f11, A3,D12 & E12)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66672

VOC MS (S)

Results Legend		Sample Identity	F11				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 20/11/2009 23/11/2009 091124-65 646961				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	650	#			
o-Xylene	<11 µg/kg	TM116	235	M			
Styrene	<11 µg/kg	TM116	28.3	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	15.9	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	14.5	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	120	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	280	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	9830	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-63
Sample Delivery Group (SDG): 091124-75
Your Reference: 20-11-09 (F2)
Location: Limerick Gasworks
Report No.: 66962

A total of 3 samples was received on Monday November 23, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66962

SOLID

Results Legend	Sample ID	F2						Total
		0.50 - 1.00		5.00 - 5.50		7.00 - 7.50		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0 3
Asbestos Presence Screen	All		X					0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0 3 3
Easily Liberated Sulphide	All		X		X		X	0 3 3
EPH CWG (Aliphatic) GC (S)	All		X		X			0 3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0 3
GRO BTEX MTBE GC (S)	All		X		X		X	0 3
Hexavalent Chromium (s)	All	X		X		X		0 3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0 3
	Cadmium		X		X		X	0 3
	Chromium		X		X		X	0 3
	Copper		X		X		X	0 3
	Lead		X		X		X	0 3
	Mercury		X		X		X	0 3
	Nickel		X		X		X	0 3
	Selenium		X		X		X	0 3
	Zinc		X		X		X	0 3
PAH micro by GCMS	All		X		X		X	0 3
PCBs by GCMS	All		X					0 1
pH	All		X		X		X	0 3
Phenols by HPLC (S)	All		X		X		X	0 3
Sample description	All		X		X		X	0 3
Total Sulphate	All		X		X		X	0 3
TPH CWG GC (S)	All		X		X		X	0 3
VOC MS (S)	All						X	0 1

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SDG:	091124-75	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-63	Attention:	Verity Sankey
Client Reference:	20-11-09 (F2)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66962

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
F2	0.50 - 1.00	Brown	Silty Sand	0.063 - 0.1 mm	Tar
	5.00 - 5.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	7.00 - 7.50	Brown	Sludge / Sediment	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66962

Test Completion dates

SDG reference: 091124-75

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
F2	0.50 - 1.00	SOLID	04/12/2009	04/12/2009	08/12/2009	27/11/2009	02/12/2009	01/12/2009	30/11/2009	01/12/2009	01/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	28/11/2009	26/11/2009	02/12/2009
	5.00 - 5.50	SOLID	04/12/2009	04/12/2009	08/12/2009	27/11/2009	02/12/2009	01/12/2009	30/11/2009	01/12/2009	01/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	26/11/2009	02/12/2009
	7.00 - 7.50	SOLID	04/12/2009	04/12/2009	08/12/2009	27/11/2009	02/12/2009	01/12/2009	30/11/2009	01/12/2009	01/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	26/11/2009	02/12/2009

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SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66191

Results Legend			Sample Identity	F2	F2	F2
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	5.00 - 5.50	7.00 - 7.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/11/2009	20/11/2009	20/11/2009
			Date Received	23/11/2009	23/11/2009	23/11/2009
			SDG Ref	091124-75	091124-75	091124-75
Lab Sample No.(s)	647657	647731	647767			
Component	LOD/Units	Method				
Asbestos Presence Screen	-	TM001	No ACM Detected			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	43.4	27.8	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	72.5	40.0	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	56.4	31.1	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.101	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0200	<0.0100	0.806	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	5.59	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	1.79	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0300	0.00	0.09	
pH value of soil	1 pH Units	TM133	7.58	9.15	8.69	
Hexavalent Chromium	<0.6 mg/kg	TM151	0.089	<0.60	<3.0	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<3.00	
Total Cyanide	<1 mg/kg	TM153	1550	786	94.4	
PCB congener 28	<3 µg/kg	TM168	<3.00			
PCB congener 52	<3 µg/kg	TM168	<3.00			
PCB congener 101	<3 µg/kg	TM168	<3.00			
PCB congener 118	<3 µg/kg	TM168	<3.00			
PCB congener 138	<3 µg/kg	TM168	<3.00			
PCB congener 153	<3 µg/kg	TM168	<3.00			
PCB congener 180	<3 µg/kg	TM168	<3.00			
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00			
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	725.76	510.14	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	943	571	
Arsenic	<0.6 mg/kg	TM181	19.4	8.46	5.39	
Cadmium	<0.02 mg/kg	TM181	<0.0200	0.0333	<0.0200	
Chromium	<0.9 mg/kg	TM181	11.7	14.7	3.99	
Copper	<1.4 mg/kg	TM181	310	8.55	2.22	
Lead	<0.7 mg/kg	TM181	416	19.2	3.64	
Mercury	<0.14 mg/kg	TM181	0.428	<0.140	0.160	
Nickel	<0.2 mg/kg	TM181	7.43	14.8	2.03	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	229	39.8	10.3	
Total Sulphate	<48 mg/kg	TM221	87300	3110	1630	

SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66191

EPH CWG (Aliphatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F2	F2	F2
Depth (m)	0.50 - 1.00	5.00 - 5.50	7.00 - 7.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-75	091124-75	091124-75
Lab Sample No.(s)	647657	647731	647767

Component	LOD/Units	Method	F2	F2	F2
Aliphatics >C12-C16	<100 µg/kg	TM173	25200	1500	20000
Aliphatics >C16-C21	<100 µg/kg	TM173	47500	1800	40500
Aliphatics >C21-C35	<100 µg/kg	TM173	245000	5370	45200
Aliphatics >C35-C44	<100 µg/kg	TM173	63800	371	2240
Total Aliphatics >C12-C44	<100 µg/kg	TM173	381000	9040	108000
Aliphatics >C16-C35	<100 µg/kg	TM173	292000	7170	85700

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SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66191

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F2	F2	F2
Depth (m)	0.50 - 1.00	5.00 - 5.50	7.00 - 7.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-75	091124-75	091124-75
Lab Sample No.(s)	647657	647731	647767

Component	LOD/Units	Method	F2	F2	F2
Aromatics >EC12-EC16	<100 µg/kg	TM173	53400	10200	70700
Aromatics >EC16-EC21	<100 µg/kg	TM173	151000	9670	182000
Aromatics >EC21-EC35	<100 µg/kg	TM173	932000	27700	471000
Aromatics >EC35-EC44	<100 µg/kg	TM173	226000	7740	93900
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	1360000	55300	818000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	1360000	55300	818000

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SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66191

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	F2	F2	F2			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	5.00 - 5.50	7.00 - 7.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009	23/11/2009			
			SDG Ref	091124-75	091124-75	091124-75			
			Lab Sample No.(s)	647657	647731	647767			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	321	641	196000				
MTBE	<5 µg/kg	TM089	54.1	<6.00	318	#	#	#	#
Benzene	<10 µg/kg	TM089	22.1	49.4	1930	M	M	M	M
Toluene	<2 µg/kg	TM089	34.4	29.9	7780	M	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	33.8	5740	M	M	M	M
m & p Xylene	<6 µg/kg	TM089	18.5	31.2	26700	M	M	M	M
o Xylene	<3 µg/kg	TM089	<6.00	15.6	11800	M	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	18.5	46.8	38500	M	M	M	M
Sum of BTEX	<10 µg/kg	TM089	75.0	160	54000	M	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	259	80.7	11.4				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	10000				
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	55.1	21600				
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	116	34900				
Total Aliphatics C5-C12	<10 µg/kg	TM089	259	252	62800				
Aromatics C6-C7	<10 µg/kg	TM089	22.1	49.4	1930				
Aromatics >C7-C8	<10 µg/kg	TM089	34.4	29.9	7780				
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	763	76700				
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	174	46700				
Total Aromatics C6-C12	<10 µg/kg	TM089	56.6	417	133000				

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SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66191

PAH micro by GCMS

Results Legend			Sample Identity	F2	F2	F2			
# ISO17025 accredited. mCERES accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	5.00 - 5.50	7.00 - 7.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009	23/11/2009			
			SDG Ref	091124-75	091124-75	091124-75			
			Lab Sample No.(s)	647657	647731	647767			
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	7200	1090	383000				
Acenaphthylene (S)	<12 µg/kg	TM218	10200	791	74800				
Acenaphthene (S)	<8 µg/kg	TM218	2060	905	25200				
Fluorene (S)	<10 µg/kg	TM218	11500	804	67600				
Phenanthrene (S)	<15 µg/kg	TM218	174000	966	177000				
Anthracene (S)	<16 µg/kg	TM218	58200	553	59600				
Fluoranthene (S)	<17 µg/kg	TM218	229000	1690	124000				
Pyrene (S)	<15 µg/kg	TM218	168000	1240	84800				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	78600	608	39600				
Chrysene (S)	<10 µg/kg	TM218	60600	476	28800				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	69200	536	38700				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	31000	227	13600				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	60200	478	30900				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	33800	225	15200				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	9940	84.8	4030				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	35500	226	16800				
PAH 16 EPA Total	<118 µg/kg	TM218	1040000	10900	1180000				

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SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 66191

TPH CWG GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F2	F2	F2
Depth (m)	0.50 - 1.00	5.00 - 5.50	7.00 - 7.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091124-75	091124-75	091124-75
Lab Sample No.(s)	647657	647731	647767

Component	LOD/Units	Method	F2	F2	F2
Total Aliphatics >C5-C44	<100 µg/kg	TM173	381000	9290	171000
Total Aromatics >C6-C44	<100 µg/kg	TM173	1360000	55700	951000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	1740000	65000	1120000

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SDG: 091124-75
Job: D_MOUCHEL_ELE-63
Client Reference: 20-11-09 (F2)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No.: 66191

VOC MS (S)

Results Legend			Sample Identity	F2				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	7.00 - 7.50				
			Sample Type	Soil/Solid				
			Date Sampled	20/11/2009				
			Date Received	23/11/2009				
			SDG Ref	091124-75				
			Lab Sample No.(s)	647767				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	133					
Toluene-d8**	%	TM116	67.3					
4-Bromofluorobenzene**	%	TM116	74.2					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	M				
Chloromethane	<12 µg/kg	TM116	<12.0	#				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	M				
Bromoethane	<9 µg/kg	TM116	<9.00	M				
Chloroethane	<12 µg/kg	TM116	<12.0	M				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	M				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	#				
Carbon Disulphide	<9 µg/kg	TM116	52.3	M				
Dichloromethane	<10 µg/kg	TM116	<10.0	M				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	M				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	M				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Bromochloromethane	<10 µg/kg	TM116	<10.0	M				
Chloroform	<10 µg/kg	TM116	<10.0	M				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	M				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	M				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	M				
Benzene	<9 µg/kg	TM116	2150	M				
Trichloroethene	<9 µg/kg	TM116	<9.00	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Dibromomethane	<12 µg/kg	TM116	<12.0	M				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	M				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	M				
Toluene	<6 µg/kg	TM116	10100	M				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	M				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	M				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	M				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	M				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	M				
Chorobenzene	<7 µg/kg	TM116	<7.00	M				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	M				
Ethylbenzene	<9 µg/kg	TM116	7170	M				

SDG: 091124-75
 Job: D_MOUCHEL_ELE-63
 Client Reference: 20-11-09 (F2)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: David Megson
 Order No.:
 Report No: 66191

VOC MS (S)

Results Legend		Sample Identity	F2				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	7.00 - 7.50				
		Sample Type	Soil/Solid				
		Date Sampled	20/11/2009				
		Date Received	23/11/2009				
		SDG Ref	091124-75				
		Lab Sample No.(s)	647767				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	53400	#			
o-Xylene	<11 µg/kg	TM116	21400	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	698	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	998	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	6350	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	33300	#			
sec-Butylbenzene	<8 µg/kg	TM116	128	#			
4-Isopropyltoluene	<8 µg/kg	TM116	387	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	633000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

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APPENDIX

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APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

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Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-64
Sample Delivery Group (SDG): 091125-36 **Report No.:** 67195
Your Reference: 20/11/09 (M3)
Location: Limerick Gasworks

A total of 3 samples was received on Monday November 23, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091125-36
Job: D_MOUCHEL_ELE-64
Client Reference: 20/11/09 (M3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67195

SOLID

Results Legend	Sample ID	M3						Total
		0.50 - 0.60		1.50 - 2.00		3.50 - 4.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0 3
Asbestos Presence Screen	All		X					0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0 3 3
Easily Liberated Sulphide	All		X		X		X	0 3 3
EPH CWG (Aliphatic) GC (S)	All		X		X			0 3
EPH CWG (Aromatic) GC (S)	All		X		X			0 2
GRO BTEX MTBE GC (S)	All		X		X			0 3
Hexavalent Chromium (s)	All	X		X		X		0 3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0 3
	Cadmium		X		X		X	0 3
	Chromium		X		X		X	0 3
	Copper		X		X		X	0 3
	Lead		X		X		X	0 3
	Mercury		X		X		X	0 3
	Nickel		X		X		X	0 3
	Selenium		X		X		X	0 3
	Zinc		X		X		X	0 3
	PAH by GCMS	All		X				
PAH micro by GCMS	All				X		X	0 2
pH	All		X		X		X	0 3
Phenols by HPLC (S)	All		X		X		X	0 3
Sample description	All		X		X		X	0 3
Total Sulphate	All		X		X		X	0 3
TPH CWG GC (S)	All		X		X		X	0 3

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SDG:	091125-36	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-64	Attention:	Verity Sankey
Client Reference:	20/11/09 (M3)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67195

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
M3	0.50 - 0.60	Brown	Sand	0.1 - 2 mm	Stones
	1.50 - 2.00	Brown	Sand	0.1 - 2 mm	Stones
	3.50 - 4.00	Brown	Sand	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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Job: D_MOUCHEL_ELE-64
Client Reference: 20/11/09 (M3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67195

Test Completion dates

SDG reference: 091125-36

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GC/MS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
M3	0.50 - 0.60	SOLID	11/12/2009	01/12/2009	27/11/2009	30/11/2009	26/11/2009	02/12/2009	03/12/2009	30/11/2009	10/12/2009	03/12/2009	03/12/2009	02/12/2009	30/11/2009	26/11/2009	03/12/2009
	1.50 - 2.00	SOLID	04/12/2009	01/12/2009	27/11/2009	30/11/2009	26/11/2009	03/12/2009	03/12/2009	30/11/2009	04/12/2009	02/12/2009	04/12/2009	02/12/2009	30/11/2009	03/12/2009	03/12/2009
	3.50 - 4.00	SOLID	04/12/2009	01/12/2009	27/11/2009	30/11/2009	27/11/2009	30/11/2009	03/12/2009	30/11/2009	04/12/2009	04/12/2009	04/12/2009	03/12/2009	30/11/2009	02/12/2009	02/12/2009

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SDG: 091125-36
Job: D_MOUCHEL_ELE-64
Client Reference: 20/11/09 (M3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67195

Results Legend			Sample Identity	M3	M3	M3
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 0.60	1.50 - 2.00	3.50 - 4.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/11/2009	20/11/2009	20/11/2009
			Date Received	23/11/2009	23/11/2009	23/11/2009
			SDG Ref	091125-36	091125-36	091125-36
Lab Sample No.(s)	650156	650204	650237			
Component	LOD/Units	Method				
Asbestos Presence Screen	-	TM001	No ACM Detected			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0	<15.0	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0200	<0.0100	<0.0100	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0300	<0.0100	<0.0100	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0500	0.00	0.00	
pH value of soil	1 pH Units	TM133	7.92	7.43	8.31	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.0	<0.60	<0.60	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	<0.600	<0.600	
Total Cyanide	<1 mg/kg	TM153	133	72.1	5.80	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	117.16	37.27	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	186	60.0	
Arsenic	<0.6 mg/kg	TM181	13.3	13.2	15.0	
Cadmium	<0.02 mg/kg	TM181	0.137	<0.0200	<0.0200	
Chromium	<0.9 mg/kg	TM181	26.2	18.7	10.3	
Copper	<1.4 mg/kg	TM181	808	57.4	24.2	
Lead	<0.7 mg/kg	TM181	2070	24.8	63.1	
Mercury	<0.14 mg/kg	TM181	1.51	0.264	0.510	
Nickel	<0.2 mg/kg	TM181	33.8	30.2	9.75	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	512	28.2	35.0	
Total Sulphate	<48 mg/kg	TM221	1160	39300	7570	

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-65
Sample Delivery Group (SDG): 091125-37 **Report No.:** 66980
Your Reference: 20/11/09 (G6)
Location: Limerick Gasworks

A total of 6 samples was received on Monday November 23, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091125-37
 Job: D_MOUCHEL_ELE-65
 Client Reference: 20/11/09 (G6)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 66980

SOLID

Results Legend	Sample ID	G6														Total
		1.50 - 2.00		2.50 - 3.00		4.50 - 5.00		6.50 - 7.00		8.00 - 8.50		8.70 - 8.90				
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)			
Ammonium Soil by Titration	All															0
		X		X		X		X		X		X		X		6
Cyanides Complex/Free/Total/Thiocya	Total Cyanide															0
		X		X		X		X		X		X		X		6
Easily Liberated Sulphide	All															0
		X		X		X		X		X		X		X		6
EPH CWG (Aliphatic) GC (S)	All															0
		X		X		X		X		X		X		X		6
EPH CWG (Aromatic) GC (S)	All															0
		X		X		X		X		X		X		X		6
GRO BTEX MTBE GC (S)	All															0
		X		X		X		X		X		X		X		6
Hexavalent Chromium (s)	All															0
		X		X		X		X		X		X		X		6
Metals by iCap-OES (Soil)	Arsenic															0
		X		X		X		X		X		X		X		6
	Cadmium															0
		X		X		X		X		X		X		X		6
	Chromium															0
		X		X		X		X		X		X		X		6
	Copper															0
		X		X		X		X		X		X		X		6
	Lead															0
		X		X		X		X		X		X		X		6
	Mercury															0
		X		X		X		X		X		X		X		6
	Nickel															0
		X		X		X		X		X		X		X		6
	Selenium															0
		X		X		X		X		X		X		X		6
	Zinc															0
		X		X		X		X		X		X		X		6
PAH micro by GCMS	All															0
		X		X		X		X		X		X		X		6
PCBs by GCMS	All															0
		X												X		2
pH	All															0
			X		X		X		X		X		X		X	6
Phenols by HPLC (S)	All															0
			X		X		X		X		X		X		X	6
Sample description	All															0
		X		X		X		X		X		X		X		6
Total Sulphate	All															0
		X		X		X		X		X		X		X		6
TPH CWG GC (S)	All															0
		X		X		X		X		X		X		X		6
VOC MS (S)	All															0
		X		X										X		3

SDG:	091125-37	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-65	Attention:	Verity Sankey
Client Reference:	20/11/09 (G6)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66980

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
G6	1.50 - 2.00	Brown	Sand	0.1 - 2 mm	Stones
	2.50 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.50 - 5.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	6.50 - 7.00	Brown	Sand	0.1 - 2 mm	Stones
	8.00 - 8.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	8.70 - 8.90	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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Client Reference: 20/11/09 (G6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66980

Test Completion dates

SDG reference: 091125-37

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration	
G6	1.50 - 2.00	SOLID	08/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009
	2.50 - 3.00	SOLID	08/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009
	4.50 - 5.00	SOLID	08/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009
	6.50 - 7.00	SOLID	08/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009
	8.00 - 8.50	SOLID	08/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009
	8.70 - 8.90	SOLID	08/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009

SDG: 091125-37
Job: D_MOUCHEL_ELE-65
Client Reference: 20/11/09 (G6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66980

Results Legend			Sample Identity		G6	G6	G6	G6	G6	G6
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.50 - 2.00	2.50 - 3.00	4.50 - 5.00	6.50 - 7.00	8.00 - 8.50	8.70 - 8.90
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled		20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
			Date Received		23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
			SDG Ref		091125-37	091125-37	091125-37	091125-37	091125-37	091125-37
Lab Sample No.(s)		650259	650289	650329	650350	650381	650425			
Component	LOD/Units	Method								
Ammoniacal Nitrogen as N	<15 mg/kg	TM024			78.2	290	246	182	40.7	164
					M	M	M	M	M	M
Exchangeable Ammonium as NH4	<15 mg/kg	TM024			143	466	380	295	77.5	310
					M	M	M	M	M	M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024			111	363	295	229	60.3	241
Catechol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.100
Phenol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.0100	<0.0100	0.0882	<0.0100	42.2
					M	M	M	M	M	M
Cresols	<0.01 mg/kg	TM062 (S)			<0.0100	0.125	<0.0100	0.328	<0.0100	71.2
					M	M	M	M	M	M
Resorcinol	<0.05 mg/kg	TM062 (S)			<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.500
Xylenols	<0.015 mg/kg	TM062 (S)			<0.0150	2.76	<0.0150	0.290	110	37.6
					M	M	M	M	M	M
1-Naphthol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.0100	<0.0100	0.0252	<0.0100	<0.100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)			<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.100
					M	M	M	M	M	M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)			<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.150
					M	M	M	M	M	M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)			<0.0100	2.89	0.00	0.731	110	151
pH value of soil	1 pH Units	TM133			8.51	8.90	8.47	8.52	12.07	10.14
					M	M	M	M	M	M
Hexavalent Chromium	<0.6 mg/kg	TM151			<6.0	0.074	<0.60	<0.60	<0.60	<3.0
					#	#	#	#	#	#
Hexavalent Chromium	<0.6 mg/kg	TM151			<6.00	0.0927	<0.600	<0.600	<0.600	<3.00
					#	#	#	#	#	#
Total Cyanide	<1 mg/kg	TM153			436	75.2	<1.00	36.3	51.1	28.3
					M	M	M	M	M	M
PCB congener 28	<3 µg/kg	TM168			<3.00					<3.00
PCB congener 52	<3 µg/kg	TM168			<3.00					<3.00
PCB congener 101	<3 µg/kg	TM168			<3.00					<3.00
PCB congener 118	<3 µg/kg	TM168			<3.00					<3.00
PCB congener 138	<3 µg/kg	TM168			<3.00					<3.00
PCB congener 153	<3 µg/kg	TM168			<3.00					<3.00
PCB congener 180	<3 µg/kg	TM168			<3.00					<3.00
Total of 7 Congener PCBs	<3 µg/kg	TM168			<3.00					<3.00
Easily Liberated Sulphide	<15 mg/kg	TM180			1106.29	323.13	<15.00	<15.00	639.38	1725.14
					#	#	#	#	#	#
Easily Liberated Sulphide	<15 mg/kg	TM180			1570	404	<15.0	<15.0	946	2540
					#	#	#	#	#	#
Arsenic	<0.6 mg/kg	TM181			4.86	5.16	4.96	4.51	8.86	17.3
					M	M	M	M	M	M
Cadmium	<0.02 mg/kg	TM181			0.196	<0.0200	<0.0200	<0.0200	<0.0200	1.77
					M	M	M	M	M	M
Chromium	<0.9 mg/kg	TM181			8.80	45.0	66.2	51.2	18.9	23.3
					M	M	M	M	M	M
Copper	<1.4 mg/kg	TM181			17.1	32.1	37.1	29.3	23.6	37.7
					M	M	M	M	M	M
Lead	<0.7 mg/kg	TM181			29.1	115	52.6	42.4	49.4	126
					M	M	M	M	M	M
Mercury	<0.14 mg/kg	TM181			0.377	0.468	0.404	0.200	0.425	0.856
					M	M	M	M	M	M
Nickel	<0.2 mg/kg	TM181			10.5	45.6	69.9	47.2	21.5	28.5
					M	M	M	M	M	M
Selenium	<1 mg/kg	TM181			1.26	<1.00	<1.00	<1.00	<1.00	<1.00
					#	#	#	#	#	#
Zinc	<1.9 mg/kg	TM181			20.1	59.5	87.6	57.0	28.6	96.2
					M	M	M	M	M	M
Total Sulphate	<48 mg/kg	TM221			14600	3980	1220	4680	265000	6380
					M	M	M	M	M	M

SDG: 091125-37
Job: D_MOUCHEL_ELE-65
Client Reference: 20/11/09 (G6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66980

EPH CWG (Aromatic) GC (S)

Results Legend <small># ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.</small>	Sample Identity	G6	G6	G6	G6	G6	G6
	Depth (m)	1.50 - 2.00	2.50 - 3.00	4.50 - 5.00	6.50 - 7.00	8.00 - 8.50	8.70 - 8.90
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
	Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091125-37	091125-37	091125-37	091125-37	091125-37	091125-37	091125-37
Lab Sample No.(s)	650259	650289	650329	650350	650381	650425	

Component	LOD/Units	Method	G6	G6	G6	G6	G6	G6
Aromatics >EC12-EC16	<100 µg/kg	TM173	300000	57400	60600	92400	54000	99300
Aromatics >EC16-EC21	<100 µg/kg	TM173	619000	26500	25400	130000	220000	72100
Aromatics >EC21-EC35	<100 µg/kg	TM173	1080000	78100	73800	328000	621000	244000
Aromatics >EC35-EC44	<100 µg/kg	TM173	230000	8540	12400	80900	127000	45400
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	2230000	171000	172000	632000	1020000	461000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	2230000	171000	172000	632000	1020000	461000

SDG: 091125-37
Job: D_MOUCHEL_ELE-65
Client Reference: 20/11/09 (G6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66980

GRO BTEX MTBE GC (S)

Results Legend # ISO17025 accredited. M mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Sample Identity	G6	G6	G6	G6	G6	G6
	Depth (m)	1.50 - 2.00	2.50 - 3.00	4.50 - 5.00	6.50 - 7.00	8.00 - 8.50	8.70 - 8.90
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
	Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
	SDG Ref	091125-37	091125-37	091125-37	091125-37	091125-37	091125-37
Lab Sample No.(s)	650259	650289	650329	650350	650381	650425	

Component	LOD/Units	Method	G6	G6	G6	G6	G6	G6
GRO C5-C12	<44 µg/kg	TM089	105000 #	11400 #	1610 #	92300 #	8350 #	4900 #
MTBE	<5 µg/kg	TM089	42.6 #	18.8 #	<7.00 #	<5.00 #	<5.00 #	30.9 #
Benzene	<10 µg/kg	TM089	<10.0 M	950 M	109 M	606 M	1870 M	2070 M
Toluene	<2 µg/kg	TM089	491 M	283 M	37.2 M	2210 M	2120 M	673 M
Ethyl Benzene	<3 µg/kg	TM089	2390 M	206 M	27.6 M	2370 M	231 M	73.5 M
m & p Xylene	<6 µg/kg	TM089	12300 M	1220 M	163 M	9590 M	1590 M	245 M
o Xylene	<3 µg/kg	TM089	6340 M	689 M	69.6 M	4900 M	713 M	131 M
Sum m&p and o Xylene	<10 µg/kg	TM089	18600 M	1910 M	233 M	14500 M	2300 M	376 M
Sum of BTEX	<10 µg/kg	TM089	21500 M	3350 M	407 M	19700 M	6520 M	3190 M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	61.4	20.5	2320	48.1	73.0
Aliphatics >C6-C8	<10 µg/kg	TM089	3240	443	54.8	7060	<10.0	110
Aliphatics >C8-C10	<10 µg/kg	TM089	13100	1120	125	<10.0	<10.0	201
Aliphatics >C10-C12	<10 µg/kg	TM089	19200	1900	327	30500	1150	396
Total Aliphatics C5-C12	<10 µg/kg	TM089	35500	3530	527	39800	1200	780
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	950	109	606	1870	2070
Aromatics >C7-C8	<10 µg/kg	TM089	491	283	37.2	2210	2120	673
Aromatics >EC8-EC10	<10 µg/kg	TM089	40600	3800	447	9140	2490	751
Aromatics >EC10-EC12	<10 µg/kg	TM089	28800	2850	490	45700	1730	594
Total Aromatics C6-C12	<10 µg/kg	TM089	69900	7880	1080	57600	8200	4090

SDG: 091125-37
Job: D_MOUCHEL_ELE-65
Client Reference: 20/11/09 (G6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66980

PAH micro by GCMS

Results Legend <small># ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.</small>	Sample Identity	G6	G6	G6	G6	G6	G6
	Depth (m)	1.50 - 2.00	2.50 - 3.00	4.50 - 5.00	6.50 - 7.00	8.00 - 8.50	8.70 - 8.90
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009	20/11/2009
	Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
	SDG Ref	091125-37	091125-37	091125-37	091125-37	091125-37	091125-37
Lab Sample No.(s)	650259	650289	650329	650350	650381	650425	

Component	LOD/Units	Method	G6	G6	G6	G6	G6	G6
Naphthalene (S)	<9 µg/kg	TM218	753000 M	54.7 M	29300 M	36400 M	24500 M	8970 M
Acenaphthylene (S)	<12 µg/kg	TM218	53900 M	120 M	798 M	3530 M	6310 M	586 M
Acenaphthene (S)	<8 µg/kg	TM218	35700 M	50.6 M	2970 M	2390 M	3580 M	491 M
Fluorene (S)	<10 µg/kg	TM218	84100 M	120 M	2060 M	4330 M	15100 M	1270 M
Phenanthrene (S)	<15 µg/kg	TM218	167000 M	545 M	4150 M	11000 M	132000 M	5680 M
Anthracene (S)	<16 µg/kg	TM218	65700 M	167 M	1150 M	3600 M	33900 M	1320 M
Fluoranthene (S)	<17 µg/kg	TM218	101000 M	511 M	2790 M	7360 M	101000 M	4290 M
Pyrene (S)	<15 µg/kg	TM218	68300 M	368 M	2070 M	5000 M	72600 M	3190 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	29600 M	235 M	1040 M	2240 M	30600 M	1800 M
Chrysene (S)	<10 µg/kg	TM218	25100 M	182 M	872 M	1880 M	26000 M	1470 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	29500 M	261 M	1070 M	2030 M	30500 M	2110 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	12100 M	76.2 M	494 M	918 M	11900 M	743 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	28700 M	199 M	907 M	1960 M	29900 M	1660 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	17600 M	115 M	474 M	1030 M	17300 M	871 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	4300 M	36.8 M	133 M	273 M	3920 M	244 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	19400 M	155 M	503 M	1110 M	18900 M	906 M
PAH 16 EPA Total	<118 µg/kg	TM218	1490000 M	3200 M	50800 M	85100 M	559000 M	35600 M

SDG: 091125-37
Job: D_MOUCHEL_ELE-65
Client Reference: 20/11/09 (G6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
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Report No.: 66980

VOC MS (S)

Results Legend			Sample Identity	G6	G6	G6			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 2.00	2.50 - 3.00	8.70 - 8.90			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009	23/11/2009			
			SDG Ref	091125-37	091125-37	091125-37			
			Lab Sample No.(s)	650259	650289	650425			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	247	91.4	88.4				
Toluene-d8**	%	TM116	132	89.6	84.7				
4-Bromofluorobenzene**	%	TM116	127	76.9	70.7				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#	#	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
Carbon Disulphide	<9 µg/kg	TM116	1040	13800	762	M	M	M	
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	M	M	M	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Benzene	<9 µg/kg	TM116	143	389	883	M	M	M	
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	M	M	M	
Toluene	<6 µg/kg	TM116	1350	128	297	M	M	M	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	M	M	M	
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
Ethylbenzene	<9 µg/kg	TM116	5080	111	42.6	M	M	M	

SDG: 091125-37
Job: D_MOUCHEL_ELE-65
Client Reference: 20/11/09 (G6)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66980

VOC MS (S)

Results Legend		Sample Identity	G6	G6	G6			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.50 - 2.00	2.50 - 3.00	8.70 - 8.90			
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
		Date Sampled	20/11/2009	20/11/2009	20/11/2009			
		Date Received	23/11/2009	23/11/2009	23/11/2009			
		SDG Ref	091125-37	091125-37	091125-37			
		Lab Sample No.(s)	650259	650289	650425			
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	40500 #	765 #	171 #			
o-Xylene	<11 µg/kg	TM116	13300 M	345 M	80.1 M			
Styrene	<11 µg/kg	TM116	<11.0 M	22.8 M	<11.0 M			
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M			
Isopropylbenzene	<9 µg/kg	TM116	1340 M	25.9 M	<9.00 M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M			
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M			
Propylbenzene	<6 µg/kg	TM116	1610 M	33.9 M	<6.00 M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	8570 M	182 M	28.1 M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	56500 #	387 #	47.9 #			
sec-Butylbenzene	<8 µg/kg	TM116	221 #	<8.00 #	<8.00 #			
4-Isopropyltoluene	<8 µg/kg	TM116	580 #	29.5 #	<8.00 #			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #			
Naphthalene	<7 µg/kg	TM116	88100 #	9980 #	3650 #			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #			

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 07 December 2009
Job: D_MOUCHEL_ELE-67
Sample Delivery Group (SDG): 091125-38 **Report No.:** 66670
Your Reference: 20-11-2009 E2
Location: Limerick Gasworks

A total of 2 samples was received on Monday November 23, 2009 and completed on Monday December 07, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley



Operations Director - Land UK & Ireland



SDG: 091125-38
Job: D_MOUCHEL_ELE-67
Client Reference: 20-11-2009 E2
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66670

SOLID

Results Legend	Sample ID	E2		Total			
		Depth (m)					
		1.00 - 1.50	3.50 - 4.00				
 Test  No Determination Possible	Container	60g VOC Dublin	JAR (D)	60g VOC Dublin	JAR (D)	TUB (D)	
		Ammonium Soil by Titration	All				
			X			X	2
Cyanides Complex/Free/Total/Thiocya	Total Cyanide						0
			X			X	2
Easily Liberated Sulphide	All						0
			X			X	2
EPH CWG (Aliphatic) GC (S)	All						0
		X				X	2
EPH CWG (Aromatic) GC (S)	All						0
		X				X	2
GRO BTEX MTBE GC (S)	All						0
		X		X			2
Hexavalent Chromium (s)	All						0
			X			X	2
Metals by iCap-OES (Soil)	Arsenic		X			X	0
		X				X	2
	Cadmium						0
		X				X	2
	Chromium						0
		X				X	2
	Copper						0
		X				X	2
	Lead						0
		X				X	2
	Mercury						0
		X				X	2
	Nickel						0
		X				X	2
	Selenium						0
		X				X	2
	Zinc						0
		X				X	2
PAH by GCMS	All						0
		X					1
PAH micro by GCMS	All						0
						X	1
PCBs by GCMS	All						0
		X					1
pH	All						0
			X			X	2
Phenols by HPLC (S)	All						0
			X			X	2
Sample description	All						0
		X				X	2
Total Sulphate	All						0
		X				X	2
TPH CWG GC (S)	All						0
		X				X	2

SDG:	091125-38	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-67	Attention:	Verity Sankey
Client Reference:	20-11-2009 E2	Order No.:	
Location:	Limerick Gasworks	Report No.:	66670

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
E2	1.00 - 1.50	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	3.50 - 4.00	Grey	Silty Sand	0.063 - 0.1 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091125-38
Job: D_MOUCHEL_ELE-67
Client Reference: 20-11-2009 E2
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66670

Test Completion dates

SDG reference: 091125-38

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
E2	1.00 - 1.50	SOLID	07/12/2009	27/11/2009	26/11/2009	30/11/2009	27/11/2009	30/11/2009	02/12/2009	30/11/2009	27/11/2009	07/12/2009	29/11/2009	29/11/2009	02/12/2009	28/11/2009	02/12/2009
	3.50 - 4.00	SOLID	07/12/2009	01/12/2009	26/11/2009	30/11/2009	27/11/2009	29/11/2009	29/11/2009	01/12/2009	30/11/2009	07/12/2009	01/12/2009	01/12/2009	03/12/2009	28/11/2009	02/12/2009

SDG: 091125-38
Job: D_MOUCHEL_ELE-67
Client Reference: 20-11-2009 E2
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66670

Results Legend

ISO17025 accredited.
 # mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity					
			Depth (m)	Sample Type				
			E2	E2				
			1.00 - 1.50	3.50 - 4.00				
			Soil/Solid	Soil/Solid				
			20/11/2009	20/11/2009				
			23/11/2009	23/11/2009				
			091125-38	091125-38				
			650308	650438				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0				
			M	M				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0				
			M	M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	<0.0200	<0.0100				
			M	M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0400				
			M	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150				
			M	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100				
			M	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150				
			M	M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.0300	<0.0400				
pH value of soil	1 pH Units	TM133	8.09	8.75				
			M	M				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60				
			#	#				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600				
			#	#				
Total Cyanide	<1 mg/kg	TM153	56.8	1.33				
			M	M				
PCB congener 28	<3 µg/kg	TM168	<3.00					
PCB congener 52	<3 µg/kg	TM168	<3.00					
PCB congener 101	<3 µg/kg	TM168	<3.00					
PCB congener 118	<3 µg/kg	TM168	<3.00					
PCB congener 138	<3 µg/kg	TM168	<3.00					
PCB congener 153	<3 µg/kg	TM168	<3.00					
PCB congener 180	<3 µg/kg	TM168	<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	17.77				
			#	#				
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	20.6				
			#	#				
Arsenic	<0.6 mg/kg	TM181	39.3	5.01				
			M	M				
Cadmium	<0.02 mg/kg	TM181	<0.0200	0.0753				
			M	M				
Chromium	<0.9 mg/kg	TM181	25.1	5.18				
			M	M				
Copper	<1.4 mg/kg	TM181	102	7.90				
			M	M				
Lead	<0.7 mg/kg	TM181	445	41.5				
			M	M				
Mercury	<0.14 mg/kg	TM181	<0.140	1.09				
			M	M				
Nickel	<0.2 mg/kg	TM181	33.9	4.33				
			M	M				
Selenium	<1 mg/kg	TM181	1.46	<1.00				
			#	#				
Zinc	<1.9 mg/kg	TM181	247	24.4				
			M	M				
Total Sulphate	<48 mg/kg	TM221	30700	2940				
			M	M				

SDG: 091125-38
Job: D_MOUCHEL_ELE-67
Client Reference: 20-11-2009 E2
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66670

GRO BTEX MTBE GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Table with columns: Sample Identity, E2, E2. Rows include Depth (m), Sample Type, Date Sampled, Date Received, SDG Ref, Lab Sample No.(s).

Main data table with columns: Component, LOD/Units, Method, E2, E2. Rows include GRO C5-C12, MTBE, Benzene, Toluene, Ethyl Benzene, m & p Xylene, o Xylene, Sum m&p and o Xylene, Sum of BTEX, Aliphatics C5-C6, Aliphatics >C6-C8, Aliphatics >C8-C10, Aliphatics >C10-C12, Total Aliphatics C5-C12, Aromatics C6-C7, Aromatics >C7-C8, Aromatics >EC8-EC10, Aromatics >EC10-EC12, Total Aromatics C6-C12.

SDG: 091125-38
Job: D_MOUCHEL_ELE-67
Client Reference: 20-11-2009 E2
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66670

PAH micro by GCMS

Results Legend			Sample Identity	E2				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	3.50 - 4.00 Soil/Solid 20/11/2009 23/11/2009 091125-38 650438				
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	487					
				M				
Acenaphthylene (S)	<12 µg/kg	TM218	80.8					
				M				
Acenaphthene (S)	<8 µg/kg	TM218	89.2					
				M				
Fluorene (S)	<10 µg/kg	TM218	224					
				M				
Phenanthrene (S)	<15 µg/kg	TM218	868					
				M				
Anthracene (S)	<16 µg/kg	TM218	253					
				M				
Fluoranthene (S)	<17 µg/kg	TM218	722					
				M				
Pyrene (S)	<15 µg/kg	TM218	525					
				M				
Benzo(a)anthracene (S)	<14 µg/kg	TM218	311					
				M				
Chrysene (S)	<10 µg/kg	TM218	232					
				M				
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	309					
				M				
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	132					
				M				
Benzo(a)pyrene (S)	<15 µg/kg	TM218	265					
				M				
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	127					
				M				
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	51.9					
				M				
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	181					
				M				
PAH 16 EPA Total	<118 µg/kg	TM218	4860					
				M				

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-69
Sample Delivery Group (SDG): 091125-44 **Report No.:** 67206
Your Reference: 20/11/09 (M5)
Location: Limerick Gasworks

A total of 4 samples was received on Monday November 23, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091125-44
Job: D_MOUCHEL_ELE-69
Client Reference: 20/11/09 (M5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67206

SOLID

Results Legend	Sample ID	M5								Total
		0.70 - 1.00		3.50 - 4.00		6.50 - 7.00		8.50 - 9.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test										
N No Determination Possible										
Ammonium Soil by Titration	All		X		X		X		X	0 4
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	0 4
Easily Liberated Sulphide	All		X		X		X		X	0 4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0 4
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	0 4
GRO BTEX MTBE GC (S)	All	X		X		X		X		0 4
Hexavalent Chromium (s)	All		X		X		X		X	0 4
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0 4
	Cadmium		X		X		X		X	0 4
	Chromium		X		X		X		X	0 4
	Copper		X		X		X		X	0 4
	Lead		X		X		X		X	0 4
	Mercury		X		X		X		X	0 4
	Nickel		X		X		X		X	0 4
	Selenium		X		X		X		X	0 4
	Zinc		X		X		X		X	0 4
PAH micro by GCMS	All		X		X		X		X	0 4
PCBs by GCMS	All				X					0 1
pH	All		N		X		X		X	1 3
Phenols by HPLC (S)	All		X		X		X		X	0 4
Sample description	All		X		X		X		X	0 4
Total Sulphate	All		X		X		X		X	0 4
TPH CWG GC (S)	All		X		X		X		X	0 4
VOC MS (S)	All	X		X				X		0 3

SDG:	091125-44	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-69	Attention:	Verity Sankey
Client Reference:	20/11/09 (M5)	Order No.:	
Location:	Limerick Gasworks	Report No:	67206

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
M5	0.70 - 1.00	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	3.50 - 4.00	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	6.50 - 7.00	Brown	Silty Clay	0.063 - 0.1 mm	Oil/Petroleum
	8.50 - 9.00	Black	Sludge / Sediment	0.063 - 0.1 mm	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091125-44
Job: D_MOUCHEL_ELE-69
Client Reference: 20/11/09 (M5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67206

Test Completion dates

SDG reference: 091125-44

Sample ID	Depth	Type	Ammonium Soil by Titration	Cyanide Comp/Free/Total/Thiocyanate	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX/MTBE GC (S)	Hexavalent Chromium (s)	Metals by Cap-OES (Soil)	PAH by GC/MS	PCBs by GC/MS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
M5	0.70 - 1.00	SOLID	02/12/2009	30/11/2009	03/12/2009	03/12/2009	07/12/2009	07/12/2009	30/11/2009	02/12/2009	01/12/2009	30/11/2009	26/11/2009	01/12/2009	26/11/2009	01/12/2009	08/12/2009	09/12/2009
	3.50 - 4.00	SOLID	03/12/2009	30/11/2009	03/12/2009	01/12/2009	01/12/2009	07/12/2009	27/11/2009	01/12/2009	30/11/2009	30/11/2009	26/11/2009	28/11/2009	26/11/2009	01/12/2009	08/12/2009	11/12/2009
	6.50 - 7.00	SOLID	03/12/2009	30/11/2009	02/12/2009	03/12/2009	03/12/2009	07/12/2009	30/11/2009	02/12/2009	01/12/2009	01/12/2009	26/11/2009	30/11/2009	26/11/2009	01/12/2009	08/12/2009	09/12/2009
	8.50 - 9.00	SOLID	04/12/2009	27/11/2009	04/12/2009	30/11/2009	10/12/2009	10/12/2009	27/11/2009	30/11/2009	27/11/2009	27/11/2009	26/11/2009	27/11/2009	26/11/2009	27/11/2009	27/11/2009	10/12/2009

SDG 091125-44
Job: D_MOUCHEL_ELE-69
Client Reference: 20/11/09 (M5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67206

Results Legend			Sample Identity	M5	M5	M5	M5		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.70 - 1.00	3.50 - 4.00	6.50 - 7.00	8.50 - 9.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009		
			Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
			SDG Ref	091125-44	091125-44	091125-44	091125-44		
Lab Sample No.(s)	650817	650822	673216	650828					
Component	LOD/Units	Method							
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	60.8	49.3	135	1920			
			M	M	M	M			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	86.8	71.0	207	4810			
			M	M	M	M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	67.5	55.2	161	3740			
Catechol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100	<0.500	<0.100			
Phenol	<0.01 mg/kg	TM062 (S)	90.6	1.36	50.4	49.5			
			M	M	M	M			
Cresols	<0.01 mg/kg	TM062 (S)	289	3.95	95.2	149			
			M	M	M	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.500	<0.0500	<2.50	<0.500			
Xylenols	<0.015 mg/kg	TM062 (S)	290	5.07	145	152			
			M	M	M	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100	<0.500	7.10			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100	<0.500	<0.100			
			M	M	M	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.150	<0.0150	<0.750	<0.150			
			M	M	M	M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	669	10.4	291	358			
pH value of soil	1 pH Units	TM133		7.84	7.96	8.89			
				M	M	M			
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.0	<6.0	<6.0	<60			
			#	#	#	#			
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	<6.00	<6.00	<60.0			
			#	#	#	#			
Total Cyanide	<1 mg/kg	TM153	3.26	9.48	144	2500			
			M	M	M	M			
PCB congener 28	<3 µg/kg	TM168		<3.00					
PCB congener 52	<3 µg/kg	TM168		<3.00					
PCB congener 101	<3 µg/kg	TM168		<3.00					
PCB congener 118	<3 µg/kg	TM168		<3.00					
PCB congener 138	<3 µg/kg	TM168		<3.00					
PCB congener 153	<3 µg/kg	TM168		<3.00					
PCB congener 180	<3 µg/kg	TM168		<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	21.71	<15.00	104.77	43091.27			
			#	#	#	#			
Easily Liberated Sulphide	<15 mg/kg	TM180	24.1	<15.0	125	84000			
			#	#	#	#			
Arsenic	<0.6 mg/kg	TM181	6.91	6.26	12.2	98.3			
			M	M	M	M			
Cadmium	<0.02 mg/kg	TM181	0.417	0.275	1.47	1.03			
			M	M	M	M			
Chromium	<0.9 mg/kg	TM181	22.1	8.69	12.2	51.4			
			M	M	M	M			
Copper	<1.4 mg/kg	TM181	17.1	12.8	29.1	158			
			M	M	M	M			
Lead	<0.7 mg/kg	TM181	55.7	41.1	259	10100			
			M	M	M	M			
Mercury	<0.14 mg/kg	TM181	0.450	0.955	0.358	<0.140			
			M	M	M	M			
Nickel	<0.2 mg/kg	TM181	21.3	10.9	15.2	39.1			
			M	M	M	M			
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	3.20			
			#	#	#	#			
Zinc	<1.9 mg/kg	TM181	91.5	33.3	47.2	33.3			
			M	M	M	M			
Total Sulphate	<48 mg/kg	TM221	1720	343	2990	16200			
			M	M	M	M			

SDG: 091125-44
Job: D_MOUCHEL_ELE-69
Client Reference: 20/11/09 (M5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67206

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	M5	M5	M5	M5		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.70 - 1.00	3.50 - 4.00	6.50 - 7.00	8.50 - 9.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009		
			Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
			SDG Ref	091125-44	091125-44	091125-44	091125-44		
			Lab Sample No.(s)	650817	650822	673216	650828		
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	1420000	11100	714000	2610000			
			M	#	#	M			
MTBE	<5 µg/kg	TM089	3260	26.9	2530	8820			
			M	#	#	M			
Benzene	<10 µg/kg	TM089	139000	360	28000	76500			
			M	M	M	M			
Toluene	<2 µg/kg	TM089	183000	483	64100	172000			
			M	M	M	M			
Ethyl Benzene	<3 µg/kg	TM089	27400	188	15700	167000			
			M	M	M	M			
m & p Xylene	<6 µg/kg	TM089	168000	1030	87400	283000			
			M	M	M	M			
o Xylene	<3 µg/kg	TM089	65700	426	39800	115000			
			M	M	M	M			
Sum m&p and o Xylene	<10 µg/kg	TM089	234000	1450	127000	398000			
			M	M	M	M			
Sum of BTEX	<10 µg/kg	TM089	584000	2490	235000	814000			
			M	M	M	M			
Aliphatics C5-C6	<10 µg/kg	TM089	2610	<10.0	1180	4000			
			M			M			
Aliphatics >C6-C8	<10 µg/kg	TM089	60400	302	33000	175000			
			M			M			
Aliphatics >C8-C10	<10 µg/kg	TM089	120000	1050	61100	325000			
			M			M			
Aliphatics >C10-C12	<10 µg/kg	TM089	186000	2280	116000	317000			
			M			M			
Total Aliphatics C5-C12	<10 µg/kg	TM089	369000	3630	211000	822000			
			M			M			
Aromatics C6-C7	<10 µg/kg	TM089	139000	360	28000	76500			
			M			M			
Aromatics >C7-C8	<10 µg/kg	TM089	183000	483	64100	172000			
			M			M			
Aromatics >EC8-EC10	<10 µg/kg	TM089	442000	3210	234000	1050000			
			M			M			
Aromatics >EC10-EC12	<10 µg/kg	TM089	279000	3420	174000	476000			
			M			M			
Total Aromatics C6-C12	<10 µg/kg	TM089	1040000	7480	500000	1780000			
			M			M			

SDG: 091125-44
Job: D_MOUCHEL_ELE-69
Client Reference: 20/11/09 (M5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67206

PAH micro by GCMS

Results Legend			Sample Identity	M5	M5	M5	M5		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.70 - 1.00	3.50 - 4.00	6.50 - 7.00	8.50 - 9.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009		
			Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
			SDG Ref	091125-44	091125-44	091125-44	091125-44		
			Lab Sample No.(s)	650817	650822	673216	650828		
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	321000 M	25400 M	225000 M	3620000 M			
Acenaphthylene (S)	<12 µg/kg	TM218	69900 M	6930 M	38800 M	84200 M			
Acenaphthene (S)	<8 µg/kg	TM218	12000 M	1160 M	8910 M	29100 M			
Fluorene (S)	<10 µg/kg	TM218	45800 M	4320 M	30800 M	74000 M			
Phenanthrene (S)	<15 µg/kg	TM218	119000 M	12100 M	79500 M	128000 M			
Anthracene (S)	<16 µg/kg	TM218	42500 M	4370 M	28500 M	33000 M			
Fluoranthene (S)	<17 µg/kg	TM218	83100 M	14300 M	56200 M	81600 M			
Pyrene (S)	<15 µg/kg	TM218	55800 M	11200 M	38800 M	55800 M			
Benz(a)anthracene (S)	<14 µg/kg	TM218	27100 M	8660 M	18300 M	24900 M			
Chrysene (S)	<10 µg/kg	TM218	21600 M	6700 M	14600 M	18600 M			
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	23200 M	11100 M	15600 M	22800 M			
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	9910 M	3950 M	6960 M	8530 M			
Benzo(a)pyrene (S)	<15 µg/kg	TM218	20500 M	8500 M	14100 M	17900 M			
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	10100 M	4240 M	6990 M	7850 M			
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	2820 M	1240 M	1950 M	2390 M			
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	10700 M	4450 M	7380 M	8350 M			
PAH 16 EPA Total	<118 µg/kg	TM218	874000 M	129000 M	592000 M	4220000 M			

SDG 091125-44
Job: D_MOUCHEL_ELE-69
Client Reference: 20/11/09 (M5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67206

VOC MS (S)

Results Legend			Sample Identity	M5	M5	M5			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.70 - 1.00	3.50 - 4.00	8.50 - 9.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009	23/11/2009			
			SDG Ref	091125-44	091125-44	091125-44			
			Lab Sample No.(s)	650817	650822	650828			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	336	124	141				
Toluene-d8**	%	TM116	105	83.3	114				
4-Bromofluorobenzene**	%	TM116	124	67.7	125				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	46.1	<9.00	4110				
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Benzene	<9 µg/kg	TM116	25500	398	62400				
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0				
Toluene	<6 µg/kg	TM116	91000	605	170000				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0				
Ethylbenzene	<9 µg/kg	TM116	21300	225	213000				

SDG: 091125-44
Job: D_MOUCHEL_ELE-69
Client Reference: 20/11/09 (M5)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67206

VOC MS (S)

Results Legend		Sample Identity	M5	M5	M5			
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.70 - 1.00	3.50 - 4.00	8.50 - 9.00			
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
		Date Sampled	20/11/2009	20/11/2009	20/11/2009			
		Date Received	23/11/2009	23/11/2009	23/11/2009			
		SDG Ref	091125-44	091125-44	091125-44			
		Lab Sample No.(s)	650817	650822	650828			
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	152000	1570	376000			
			#	#				
o-Xylene	<11 µg/kg	TM116	61900	627	143000			
			M	M	M			
Styrene	<11 µg/kg	TM116	<11.0	<11.0	<11.0			
			M	M	M			
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	<12.0			
			M	M	M			
Isopropylbenzene	<9 µg/kg	TM116	1520	38.2	6300			
			M	M	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	<15.0			
			#	#	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	<13.0			
			M	M	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	<14.0			
			M	M	M			
Propylbenzene	<6 µg/kg	TM116	4380	62.0	10500			
			M	M	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	<14.0			
			#	#	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	23300	370	79100			
			M	M	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	<9.00			
			#	#	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0			
			#	#	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	56600	768	168000			
			#	#	#			
sec-Butylbenzene	<8 µg/kg	TM116	282	11.4	813			
			#	#	#			
4-Isopropyltoluene	<8 µg/kg	TM116	1180	41.9	3090			
			#	#	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00			
			#	#	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	<11.0			
			M	M	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00			
			#	#	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00			
			M	M	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	<11.0			
			M	M	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	<7.00			
			#	#	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	257			
			#	#	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	<15.0			
			#	#	#			
Naphthalene	<7 µg/kg	TM116	1730000	163000	3170000			
				#				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0			
			#	#	#			

Notification of NDPs (No determination possible)

SDG Number	091125-44	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	20/11/09 (M5)	Report No.	29650-0
Attention	Dave Watts	Date Received	25/11/2009 11:19:53

Sample No	Sample Identity	Depth (m)	Test	Comment
659182	M5	0.70 - 1.00	pH	Sample contains oil / product
659182	M5	0.70 - 1.00	pH	Sample contains oil / product
659182	M5	0.70 - 1.00	pH	Sample contains oil / product

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 10 December 2009
Job: D_MOUCHEL_ELE-70
Sample Delivery Group (SDG): 091125-47 **Report No.:** 67130
Your Reference: Limerick Gasworks
Location: Limerick Gasworks

A total of 4 samples was received on Monday November 23, 2009 and completed on Thursday December 10, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091125-47
Job: D_MOUCHEL_ELE-70
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67130

SOLID

Results Legend	Sample ID	F12				G12				Total
		1.80 - 2.10		0.50 - 1.00		1.50 - 2.00		3.30 - 3.80		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test										
N No Determination Possible										
Ammonium Soil by Titration	All		X		X		X		X	0 4
Asbestos Presence Screen	All		X							0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	0 4
Easily Liberated Sulphide	All		X		X		X		X	0 4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0 4
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	0 4
GRO BTEX MTBE GC (S)	All	X		X		X		X		0 4
Hexavalent Chromium (s)	All		X		X		X		X	0 4
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0 4
	Cadmium		X		X		X		X	0 4
	Chromium		X		X		X		X	0 4
	Copper		X		X		X		X	0 4
	Lead		X		X		X		X	0 4
	Mercury		X		X		X		X	0 4
	Nickel		X		X		X		X	0 4
	Selenium		X		X		X		X	0 4
	Zinc		X		X		X		X	0 4
PAH micro by GCMS	All		X		X		X		X	0 4
PCBs by GCMS	All						X			0 1
pH	All		X		X		X		X	0 4
Phenols by HPLC (S)	All		X		X		X		X	0 4
Sample description	All		X		X		X		X	0 4
Total Sulphate	All		X		X		X		X	0 4
TPH CWG GC (S)	All		X		X		X		X	0 4
VOC MS (S)	All					X				0 1

SDG:	091125-47	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-70	Attention:	Verity Sankey
Client Reference:	Limerick Gasworks	Order No.:	
Location:	Limerick Gasworks	Report No.:	67130

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
F12	1.80 - 2.10	Brown	Sandy Clay	0.1 - 2 mm	Stones
G12	0.50 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	1.50 - 2.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	3.30 - 3.80	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091125-47
Job: D_MOUCHEL_ELE-70
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67130

Test Completion dates

SDG reference: 091125-47

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
F12	1.80 - 2.10	SOLID	01/12/2009	26/11/2009	30/11/2009	03/12/2009	03/12/2009	03/12/2009	04/12/2009	01/12/2009	03/12/2009	01/12/2009	01/12/2009	27/11/2009	01/12/2009		01/12/2009	04/12/2009	04/12/2009
G12	0.50 - 1.00	SOLID	02/12/2009		30/11/2009	03/12/2009	03/12/2009	03/12/2009	04/12/2009	01/12/2009	02/12/2009	01/12/2009	01/12/2009	27/11/2009	01/12/2009		01/12/2009	04/12/2009	04/12/2009
	1.50 - 2.00	SOLID	02/12/2009		30/11/2009	03/12/2009	04/12/2009	04/12/2009	07/12/2009	01/12/2009	03/12/2009	02/12/2009	02/12/2009	27/11/2009	01/12/2009		01/12/2009	04/12/2009	04/12/2009
	3.30 - 3.80	SOLID	02/12/2009		30/11/2009	03/12/2009	04/12/2009	04/12/2009	04/12/2009	01/12/2009	03/12/2009	01/12/2009	01/12/2009	27/11/2009	01/12/2009		01/12/2009	04/12/2009	04/12/2009

SDG: 091125-47
Job: D_MOUCHEL_ELE-70
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67130

Results Legend			Sample Identity	F12	G12	G12	G12		
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.80 - 2.10 Soil/Solid 20/11/2009 23/11/2009 091125-47 651099	0.50 - 1.00 Soil/Solid 20/11/2009 23/11/2009 091125-47 650780	1.50 - 2.00 Soil/Solid 20/11/2009 23/11/2009 091125-47 650864	3.30 - 3.80 Soil/Solid 20/11/2009 23/11/2009 091125-47 651021		
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	142	M	<15.0	M	<15.0	M	69.7
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	201	M	<15.0	M	<15.0	M	98.1
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	156		<15.0		<15.0		76.3
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		<0.0100
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	0.275	M	1.36
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	0.517	M	2.92
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.0500		<0.0500		<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	0.352	M	6.08
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		<0.0100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	<0.0100
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M	<0.0150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00		0.00		1.14		10.4
pH value of soil	1 pH Units	TM133	8.86	M	10.28	M	8.86	M	8.79
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	#	0.095	#	<0.60	#	0.0095
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#	<0.600	#	<0.600	#	<0.600
Total Cyanide	<1 mg/kg	TM153	<1.00	M	<1.00	M	21.1	M	1.18
PCB congener 28	<3 µg/kg	TM168					<3.00		
PCB congener 52	<3 µg/kg	TM168					<3.00		
PCB congener 101	<3 µg/kg	TM168					<3.00		
PCB congener 118	<3 µg/kg	TM168					<3.00		
PCB congener 138	<3 µg/kg	TM168					<3.00		
PCB congener 153	<3 µg/kg	TM168					<3.00		
PCB congener 180	<3 µg/kg	TM168					<3.00		
Total of 7 Congener PCBs	<3 µg/kg	TM168					<3.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	222.31	#	<15.00	#	71.66	#	19.14
Easily Liberated Sulphide	<15 mg/kg	TM180	245	#	<15.0	#	78.8	#	21.0
Arsenic	<0.6 mg/kg	TM181	5.62	M	4.26	M	6.83	M	5.17
Cadmium	<0.02 mg/kg	TM181	<0.0200	M	0.390	M	<0.0200	M	<0.0200
Chromium	<0.9 mg/kg	TM181	5.35	M	19.5	M	4.77	M	5.80
Copper	<1.4 mg/kg	TM181	4.00	M	21.0	M	5.45	M	4.27
Lead	<0.7 mg/kg	TM181	6.65	M	27.8	M	18.5	M	5.72
Mercury	<0.14 mg/kg	TM181	0.205	M	0.388	M	0.311	M	0.264
Nickel	<0.2 mg/kg	TM181	4.96	M	28.4	M	3.46	M	5.85
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	<1.00	#	<1.00
Zinc	<1.9 mg/kg	TM181	12.9	M	49.3	M	22.8	M	17.4
Total Sulphate	<48 mg/kg	TM221	554	M	2750	M	981	M	371

SDG: 091125-47
Job: D_MOUCHEL_ELE-70
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67130

GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F12	G12	G12	G12
Depth (m)	1.80 - 2.10	0.50 - 1.00	1.50 - 2.00	3.30 - 3.80
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009
Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009
SDG Ref	091125-47	091125-47	091125-47	091125-47
Lab Sample No.(s)	651099	650780	650864	651021

Component	LOD/Units	Method	F12	G12	G12	G12
GRO C5-C12	<44 µg/kg	TM089	981 #	356 #	132000 #	70100 #
MTBE	<5 µg/kg	TM089	<5.00 #	<5.00 #	178 #	376 #
Benzene	<10 µg/kg	TM089	27.5 M	23.2 M	145 M	1270 M
Toluene	<2 µg/kg	TM089	<7.00 M	19.0 M	579 M	5400 M
Ethyl Benzene	<3 µg/kg	TM089	20.9 M	<5.00 M	2040 M	1790 M
m & p Xylene	<6 µg/kg	TM089	37.4 M	17.9 M	7560 M	10500 M
o Xylene	<3 µg/kg	TM089	13.2 M	10.6 M	4170 M	3990 M
Sum m&p and o Xylene	<10 µg/kg	TM089	50.6 M	28.5 M	11700 M	14400 M
Sum of BTEX	<10 µg/kg	TM089	99.0 M	70.7 M	14500 M	22900 M
Aliphatics C5-C6	<10 µg/kg	TM089	16.7	39.2	135	288
Aliphatics >C6-C8	<10 µg/kg	TM089	28.6	<10.0	4460	4140
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	23.1	18700	6770
Aliphatics >C10-C12	<10 µg/kg	TM089	357	80.4	26500	10200
Total Aliphatics C5-C12	<10 µg/kg	TM089	403	143	49800	21400
Aromatics C6-C7	<10 µg/kg	TM089	27.5	23.2	145	1270
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	19.0	579	5400
Aromatics >EC8-EC10	<10 µg/kg	TM089	37.7	63.1	41800	26400
Aromatics >EC10-EC12	<10 µg/kg	TM089	536	121	39700	15200
Total Aromatics C6-C12	<10 µg/kg	TM089	601	226	82300	48300

SDG: 091125-47
Job: D_MOUCHEL_ELE-70
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67130

PAH micro by GCMS

Results Legend		Sample Identity	F12	G12	G12	G12		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.80 - 2.10 Soil/Solid 20/11/2009 23/11/2009 091125-47 651099	0.50 - 1.00 Soil/Solid 20/11/2009 23/11/2009 091125-47 650780	1.50 - 2.00 Soil/Solid 20/11/2009 23/11/2009 091125-47 650864	3.30 - 3.80 Soil/Solid 20/11/2009 23/11/2009 091125-47 651021		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	1110 M	125 M	622000 M	157000 M		
Acenaphthylene (S)	<12 µg/kg	TM218	32.5 M	66.7 M	72200 M	31000 M		
Acenaphthene (S)	<8 µg/kg	TM218	59.6 M	391 M	52800 M	11200 M		
Fluorene (S)	<10 µg/kg	TM218	51.1 M	327 M	81300 M	27100 M		
Phenanthrene (S)	<15 µg/kg	TM218	66.3 M	3270 M	205000 M	69500 M		
Anthracene (S)	<16 µg/kg	TM218	<16.0 M	698 M	63500 M	23100 M		
Fluoranthene (S)	<17 µg/kg	TM218	33.9 M	2320 M	132000 M	47600 M		
Pyrene (S)	<15 µg/kg	TM218	27.9 M	1730 M	95200 M	34200 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	<14.0 M	378 M	36000 M	14600 M		
Chrysene (S)	<10 µg/kg	TM218	16.2 M	332 M	28600 M	11100 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	19.7 M	210 M	34300 M	11900 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	<14.0 M	99.4 M	14800 M	4960 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	19.1 M	158 M	29200 M	11200 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	<18.0 M	73.9 M	15200 M	5750 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0 M	26.5 M	4160 M	1660 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	<24.0 M	99.3 M	18900 M	6860 M		
PAH 16 EPA Total	<118 µg/kg	TM218	1440 M	10300 M	150000 M	469000 M		

SDG: 091125-47
Job: D_MOUCHEL_ELE-70
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67130

VOC MS (S)

Results Legend		Sample Identity	G12				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.50 - 2.00				
		Sample Type	Soil/Solid				
		Date Sampled	20/11/2009				
		Date Received	23/11/2009				
		SDG Ref	091125-47				
		Lab Sample No.(s)	650864				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	147				
Toluene-d8**	%	TM116	58.9				
4-Bromofluorobenzene**	%	TM116	71.7				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0				
Chloromethane	<12 µg/kg	TM116	<12.0				
Vinyl Chloride	<10 µg/kg	TM116	<10.0				
Bromoethane	<9 µg/kg	TM116	<9.00				
Chloroethane	<12 µg/kg	TM116	<12.0				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00				
Carbon Disulphide	<9 µg/kg	TM116	55.7				
Dichloromethane	<10 µg/kg	TM116	<10.0				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Bromochloromethane	<10 µg/kg	TM116	<10.0				
Chloroform	<10 µg/kg	TM116	<10.0				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0				
Carbontetrachloride	<11 µg/kg	TM116	<11.0				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0				
Benzene	<9 µg/kg	TM116	203				
Trichloroethene	<9 µg/kg	TM116	<9.00				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0				
Dibromomethane	<12 µg/kg	TM116	<12.0				
Bromodichloromethane	<11 µg/kg	TM116	<11.0				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0				
Toluene	<6 µg/kg	TM116	355				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00				
Tetrachloroethene	<9 µg/kg	TM116	<9.00				
Dibromochloromethane	<9 µg/kg	TM116	<9.00				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0				
Chorobenzene	<7 µg/kg	TM116	<7.00				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0				
Ethylbenzene	<9 µg/kg	TM116	3170				

SDG: 091125-47
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VOC MS (S)

Results Legend		Sample Identity	G12				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.50 - 2.00				
		Sample Type	Soil/Solid				
		Date Sampled	20/11/2009				
		Date Received	23/11/2009				
		SDG Ref	091125-47				
		Lab Sample No.(s)	650864				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	14700	#			
o-Xylene	<11 µg/kg	TM116	6420	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	1240	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	1790	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	55800	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	113000	#			
sec-Butylbenzene	<8 µg/kg	TM116	250	#			
4-Isopropyltoluene	<8 µg/kg	TM116	845	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	2710000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 08 December 2009
Job: D_MOUCHEL_ELE-71
Sample Delivery Group (SDG): 091125-54 **Report No.:** 66968
Your Reference: Limerick Gasworks
Location: 23-11-09 M4

A total of 3 samples was received on Tuesday November 24, 2009 and completed on Tuesday December 08, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091125-54
Job: D_MOUCHEL_ELE-71
Client Reference: Limerick Gasworks
Location: 23-11-09 M4

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66968

SOLID

Results Legend	Sample ID	M4						Total
		0.00 - 0.20		0.60 - 1.30		3.00 - 3.50		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0 3
Asbestos Presence Screen	All		X					0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0 3
Easily Liberated Sulphide	All		X		X		X	0 3
EPH CWG (Aliphatic) GC (S)	All		X		X		X	0 3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0 3
GRO BTEX MTBE GC (S)	All		X		X		X	0 3
Hexavalent Chromium (s)	All	X		X		X		0 3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0 3
	Cadmium		X		X		X	0 3
	Chromium		X		X		X	0 3
	Copper		X		X		X	0 3
	Lead		X		X		X	0 3
	Mercury		X		X		X	0 3
	Nickel		X		X		X	0 3
	Selenium		X		X		X	0 3
	Zinc		X		X		X	0 3
PAH micro by GCMS	All		X		X		X	0 3
pH	All		X		X		X	0 3
Phenols by HPLC (S)	All		X		X		X	0 3
Sample description	All		X		X		X	0 3
Total Sulphate	All		X		X		X	0 3
TPH CWG GC (S)	All		X		X		X	0 3

SDG:	091125-54	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-71	Attention:	Verity Sankey
Client Reference:	Limerick Gasworks	Order No.:	
Location:	23-11-09 M4	Report No.:	66968

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
M4	0.00 - 0.20	Brown	Sandy Clay	0.1 - 2 mm	Stones
	0.60 - 1.30	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091125-54
Job: D_MOUCHEL_ELE-71
Client Reference: Limerick Gasworks
Location: 23-11-09 M4

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66968

Test Completion dates

SDG reference: 091125-54

Sample ID	Depth	Type	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GC/MS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
M4	0.00 - 0.20	SOLID	08/12/2009	01/12/2009	30/11/2009	01/12/2009	26/11/2009	01/12/2009	03/12/2009	01/12/2009	07/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	26/11/2009	03/12/2009
	0.60 - 1.30	SOLID	08/12/2009	01/12/2009	30/11/2009	01/12/2009	26/11/2009	01/12/2009	03/12/2009	01/12/2009	07/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	03/12/2009	03/12/2009
	3.00 - 3.50	SOLID	04/12/2009	01/12/2009	27/11/2009	01/12/2009	02/12/2009	01/12/2009	02/12/2009	01/12/2009	04/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	03/12/2009	03/12/2009

SDG: 091125-54
Job: D_MOUCHEL_ELE-71
Client Reference: Limerick Gasworks
Location: 23-11-09 M4

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66968

Results Legend			Sample Identity	M4	M4	M4
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.20	0.60 - 1.30	3.00 - 3.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	23/11/2009	23/11/2009	23/11/2009
			Date Received	24/11/2009	24/11/2009	24/11/2009
			SDG Ref	091125-54	091125-54	091125-54
Lab Sample No.(s)	651265	651348	651500			
Component	LOD/Units	Method				
Asbestos Presence Screen	-	TM001	No ACM Detected			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	22.6	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0	33.4	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	26.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.253	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.220	
pH value of soil	1 pH Units	TM133	8.07	8.99	9.00	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<0.60	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	
Total Cyanide	<1 mg/kg	TM153	81.3	<1.00	52.1	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	<15.00	27.17	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	<15.0	31.2	
Arsenic	<0.6 mg/kg	TM181	127	5.73	6.09	
Cadmium	<0.02 mg/kg	TM181	4.48	<0.0200	0.588	
Chromium	<0.9 mg/kg	TM181	20.0	6.39	6.46	
Copper	<1.4 mg/kg	TM181	121	7.28	10.7	
Lead	<0.7 mg/kg	TM181	6380	10.7	22.9	
Mercury	<0.14 mg/kg	TM181	4.28	0.235	0.705	
Nickel	<0.2 mg/kg	TM181	52.5	8.62	5.14	
Selenium	<1 mg/kg	TM181	<5.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	1300	35.0	23.8	
Total Sulphate	<48 mg/kg	TM221	1350	458	2290	

SDG: 091125-54
Job: D_MOUCHEL_ELE-71
Client Reference: Limerick Gasworks
Location: 23-11-09 M4

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66968

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	M4	M4	M4			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.20	0.60 - 1.30	3.00 - 3.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	23/11/2009	23/11/2009	23/11/2009			
			Date Received	24/11/2009	24/11/2009	24/11/2009			
			SDG Ref	091125-54	091125-54	091125-54			
			Lab Sample No.(s)	651265	651348	651500			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	447	<44.0	2240				
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	17.3				
			#	#	#				
Benzene	<10 µg/kg	TM089	31.4	<10.0	557				
			M	M	M				
Toluene	<2 µg/kg	TM089	15.7	<2.00	33.4				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	47.2				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	13.1	<6.00	73.6				
			M	M	M				
o Xylene	<3 µg/kg	TM089	<5.00	<3.00	27.6				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	13.1	<10.0	101				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	60.3	<10.0	738				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	26.3				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	122				
Aliphatics >C8-C10	<10 µg/kg	TM089	27.1	<10.0	182				
Aliphatics >C10-C12	<10 µg/kg	TM089	130	11.4	353				
Total Aliphatics C5-C12	<10 µg/kg	TM089	157	11.4	683				
Aromatics C6-C7	<10 µg/kg	TM089	31.4	<10.0	557				
Aromatics >C7-C8	<10 µg/kg	TM089	15.7	<10.0	33.4				
Aromatics >EC8-EC10	<10 µg/kg	TM089	53.8	<10.0	422				
Aromatics >EC10-EC12	<10 µg/kg	TM089	195	17.2	529				
Total Aromatics C6-C12	<10 µg/kg	TM089	296	17.2	1540				

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-72
Sample Delivery Group (SDG): 091125-56 **Report No.:** 67281
Your Reference: 20/11/09(L4)
Location: Limerick Gasworks

A total of 4 samples was received on Monday November 23, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091125-56
Job: D_MOUCHEL_ELE-72
Client Reference: 20/11/09(L4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67281

SOLID

Results Legend	Sample ID	L4										Total
		0.50 - 1.00		3.00 - 3.50		6.50 - 7.00		8.00 - 8.30		Total		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)			
X Test												
N No Determination Possible												
Ammonium Soil by Titration	All		X		X		X			X		0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X			X		4
Easily Liberated Sulphide	All		X		X		X			X		0
EPH CWG (Aliphatic) GC (S)	All		X		X		X			X		4
EPH CWG (Aromatic) GC (S)	All		X		X		X			X		0
GRO BTEX MTBE GC (S)	All	X		X		X			X			4
Hexavalent Chromium (s)	All		X		X		X			X		0
Metals by iCap-OES (Soil)	Arsenic		X		X		X			X		4
	Cadmium		X		X		X			X		0
	Chromium		X		X		X			X		4
	Copper		X		X		X			X		0
	Lead		X		X		X			X		4
	Mercury		X		X		X			X		0
	Nickel		X		X		X			X		4
	Selenium		X		X		X			X		0
	Zinc		X		X		X			X		4
PAH micro by GCMS	All		X		X		X			X		0
PCBs by GCMS	All				X							1
pH	All		X		X			N			N	2
Phenols by HPLC (S)	All		X		X		X			X		0
Sample description	All		X		X		X			X		4
Total Sulphate	All		X		X		X			X		0
TPH CWG GC (S)	All		X		X		X			X		0
VOC MS (S)	All	X		X					X		N	1
												3

SDG:	091125-56	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-72	Attention:	Verity Sankey
Client Reference:	20/11/09(L4)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67281

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
L4	0.50 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	3.00 - 3.50	Brown	Sand	0.1 - 2 mm	Stones
	6.50 - 7.00	Black	N/A	N/A	Tar
	8.00 - 8.30	Black	N/A	N/A	Tar

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091125-56
Job: D_MOUCHEL_ELE-72
Client Reference: 20/11/09(L4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67281

Test Completion dates

SDG reference: 091125-56

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
L4	0.50 - 1.00	SOLID	11/12/2009	08/12/2009	01/12/2009	26/11/2009	01/12/2009	27/11/2009	02/12/2009	30/11/2009	03/12/2009	30/11/2009	07/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	02/12/2009
	3.00 - 3.50	SOLID	04/12/2009	01/12/2009	26/11/2009	30/11/2009	27/11/2009	02/12/2009	30/11/2009	03/12/2009	03/12/2009	01/12/2009	04/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	02/12/2009
	6.50 - 7.00	SOLID	08/12/2009	01/12/2009	26/11/2009	02/12/2009				30/11/2009	03/12/2009	01/12/2009	07/12/2009	03/12/2009	03/12/2009	02/12/2009	30/11/2009	02/12/2009
	8.00 - 8.30	SOLID	10/12/2009	01/12/2009	26/11/2009	01/12/2009				30/11/2009	03/12/2009	03/12/2009	10/12/2009	03/12/2009	03/12/2009	03/12/2009	30/11/2009	02/12/2009

SDG: 091125-56
Job: D_MOUCHEL_ELE-72
Client Reference: 20/11/09(L4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67281

Results Legend			Sample Identity	L4	L4	L4	L4
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	3.00 - 3.50	6.50 - 7.00	8.00 - 8.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009
			Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009
			SDG Ref	091125-56	091125-56	091125-56	091125-56
Lab Sample No.(s)	651427	651637	651816	651962			
Component	LOD/Units	Method					
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	43.1	230	273	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	66.5	312	382	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	51.7	243	297	
Catechol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100	<1.00	<1.00	
Phenol	<0.01 mg/kg	TM062 (S)	6.59	0.396	651	870	
Cresols	<0.01 mg/kg	TM062 (S)	56.1	2.58	1550	2070	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.500	<0.0500	<5.00	<5.00	
Xylenols	<0.015 mg/kg	TM062 (S)	107	15.1	1090	1340	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100	<1.00	<1.00	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100	<1.00	<1.00	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.150	<0.0150	<1.50	<1.50	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	170	18.1	3290	4280	
pH value of soil	1 pH Units	TM133	8.92	8.62			
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.0	<3.0	<12	<3.0	
Hexavalent Chromium	<0.6 mg/kg	TM151	<3.00	<3.00	<12.0	<3.00	
Total Cyanide	<1 mg/kg	TM153	2.94	28.2	113	370	
PCB congener 28	<3 µg/kg	TM168		<3.00			
PCB congener 52	<3 µg/kg	TM168		<3.00			
PCB congener 101	<3 µg/kg	TM168		<3.00			
PCB congener 118	<3 µg/kg	TM168		<3.00			
PCB congener 138	<3 µg/kg	TM168		<3.00			
PCB congener 153	<3 µg/kg	TM168		<3.00			
PCB congener 180	<3 µg/kg	TM168		<3.00			
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00			
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	63.05	187.79	1477.21	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	75.7	198	1610	
Arsenic	<0.6 mg/kg	TM181	6.56	20.6	4.04	14.5	
Cadmium	<0.02 mg/kg	TM181	0.0572	0.0681	0.158	<0.0200	
Chromium	<0.9 mg/kg	TM181	16.1	15.3	1.08	7.70	
Copper	<1.4 mg/kg	TM181	13.1	33.3	1.90	25.7	
Lead	<0.7 mg/kg	TM181	35.7	51.3	50.8	400	
Mercury	<0.14 mg/kg	TM181	0.304	0.325	0.763	0.449	
Nickel	<0.2 mg/kg	TM181	16.1	22.8	<0.200	7.56	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	43.3	67.1	20.6	33.3	
Total Sulphate	<48 mg/kg	TM221	601	2400	8720	67300	

SDG: 091125-56
Job: D_MOUCHEL_ELE-72
Client Reference: 20/11/09(L4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67281

GRO BTEX MTBE GC (S)

Results Legend		Sample Identity	L4	L4	L4	L4		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. *This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.50 - 1.00	3.00 - 3.50	6.50 - 7.00	8.00 - 8.30		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009		
		Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
		SDG Ref	091125-56	091125-56	091125-56	091125-56		
		Lab Sample No.(s)	651427	651637	651816	651962		
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	291000 #	77300 #	1330000 #	3070000 M		
MTBE	<5 µg/kg	TM089	619 #	<5.00 #	2610 #	17700 M		
Benzene	<10 µg/kg	TM089	11500 M	1720 M	122000 #	837000 M		
Toluene	<2 µg/kg	TM089	25200 M	5630 M	156000 #	538000 M		
Ethyl Benzene	<3 µg/kg	TM089	5880 M	1550 M	27400 #	43700 M		
m & p Xylene	<6 µg/kg	TM089	35600 M	8760 M	153000 #	281000 M		
o Xylene	<3 µg/kg	TM089	16100 M	3770 M	60900 #	100000 M		
Sum m&p and o Xylene	<10 µg/kg	TM089	51700 M	12500 M	214000 #	381000 M		
Sum of BTEX	<10 µg/kg	TM089	94300 M	21400 M	519000 #	1800000 M		
Aliphatics C5-C6	<10 µg/kg	TM089	102	3050	2060	16300 M		
Aliphatics >C6-C8	<10 µg/kg	TM089	18100	6210	45700	220000 M		
Aliphatics >C8-C10	<10 µg/kg	TM089	22400	8030	114000	215000 M		
Aliphatics >C10-C12	<10 µg/kg	TM089	48700	10600	189000	190000 M		
Total Aliphatics C5-C12	<10 µg/kg	TM089	89400	27900	351000	641000 M		
Aromatics C6-C7	<10 µg/kg	TM089	11500	1720	122000	837000 M		
Aromatics >C7-C8	<10 µg/kg	TM089	25200	5630	156000	538000 M		
Aromatics >EC8-EC10	<10 µg/kg	TM089	91200	26100	412000	748000 M		
Aromatics >EC10-EC12	<10 µg/kg	TM089	73100	15900	283000	284000 M		
Total Aromatics C6-C12	<10 µg/kg	TM089	201000	49400	974000	2410000 M		

SDG: 091125-56
 Job: D_MOUCHEL_ELE-72
 Client Reference: 20/11/09(L4)
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67281

PAH micro by GCMS

Results Legend		Sample Identity	L4	L4	L4	L4		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.50 - 1.00	3.00 - 3.50	6.50 - 7.00	8.00 - 8.30		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	20/11/2009	20/11/2009	20/11/2009	20/11/2009		
		Date Received	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
		SDG Ref	091125-56	091125-56	091125-56	091125-56		
		Lab Sample No.(s)	651427	651637	651816	651962		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	646000 M	499000 M	29900000 M	8550000 M		
Acenaphthylene (S)	<12 µg/kg	TM218	139000 M	117000 M	6530000 M	1900000 M		
Acenaphthene (S)	<8 µg/kg	TM218	25800 M	23200 M	1070000 M	283000 M		
Fluorene (S)	<10 µg/kg	TM218	94700 M	80200 M	4210000 M	1190000 M		
Phenanthrene (S)	<15 µg/kg	TM218	236000 M	200000 M	10300000 M	2970000 M		
Anthracene (S)	<16 µg/kg	TM218	84500 M	73600 M	3760000 M	1110000 M		
Fluoranthene (S)	<17 µg/kg	TM218	166000 M	143000 M	6960000 M	2040000 M		
Pyrene (S)	<15 µg/kg	TM218	116000 M	96900 M	4820000 M	1370000 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	50000 M	43000 M	2120000 M	641000 M		
Chrysene (S)	<10 µg/kg	TM218	39400 M	33100 M	1510000 M	477000 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	45200 M	40700 M	1890000 M	521000 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	19700 M	16300 M	798000 M	230000 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	38100 M	31200 M	1490000 M	469000 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	17500 M	14300 M	694000 M	207000 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	5010 M	3880 M	187000 M	57600 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	19200 M	15200 M	743000 M	225000 M		
PAH 16 EPA Total	<118 µg/kg	TM218	1740000 M	1430000 M	77000000 M	22200000 M		

SDG: 091125-56
Job: D_MOUCHEL_ELE-72
Client Reference: 20/11/09(L4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67281

VOC MS (S)

Results Legend			Sample Identity	L4	L4	L4			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	3.00 - 3.50	6.50 - 7.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009	23/11/2009			
			SDG Ref	091125-56	091125-56	091125-56			
			Lab Sample No.(s)	651427	651637	651816			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	135	126	181				
Toluene-d8**	%	TM116	61.1	70.4	55.1				
4-Bromofluorobenzene**	%	TM116	62.4	70.9	128				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#	#	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
Carbon Disulphide	<9 µg/kg	TM116	<9.00	18.0	478	M	M	M	
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	M	M	M	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
1,1,1-Trichloroethane	<12 µg/kg	TM116	16.5	<12.0	414	M	M	M	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Benzene	<9 µg/kg	TM116	8430	1370	748000	M	M	M	
Trichloroethene	<9 µg/kg	TM116	35.4	<9.00	990	#	#	#	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	M	M	M	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	M	M	M	
Toluene	<6 µg/kg	TM116	28600	9700	594000	M	M	M	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	M	M	M	
Tetrachloroethene	<9 µg/kg	TM116	33.5	<9.00	<9.00	M	M	M	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	M	M	M	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	M	M	M	
Chorobenzene	<7 µg/kg	TM116	16.5	<7.00	<7.00	M	M	M	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
Ethylbenzene	<9 µg/kg	TM116	6950	1930	223000	M	M	M	

SDG: 091125-56
Job: D_MOUCHEL_ELE-72
Client Reference: 20/11/09(L4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67281

VOC MS (S)

Results Legend			Sample Identity	L4	L4	L4			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 1.00	3.00 - 3.50	6.50 - 7.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	20/11/2009	20/11/2009	20/11/2009			
			Date Received	23/11/2009	23/11/2009	23/11/2009			
			SDG Ref	091125-56	091125-56	091125-56			
			Lab Sample No.(s)	651427	651637	651816			
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	55200	19100	1420000	#	#		
o-Xylene	<11 µg/kg	TM116	22800	7660	493000	M	M		
Styrene	<11 µg/kg	TM116	10800	<11.0	<11.0	M	M		
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M		
Isopropylbenzene	<9 µg/kg	TM116	410	248	7140	M	M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	<15.0	#	#		
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M		
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	M	M		
Propylbenzene	<6 µg/kg	TM116	772	478	11300	M	M		
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	#	#		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	4900	1700	118000	M	M		
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#		
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	26700	6370	266000	#	#		
sec-Butylbenzene	<8 µg/kg	TM116	66.6	59.4	866	#	#		
4-Isopropyltoluene	<8 µg/kg	TM116	316	187	<8.00	#	#		
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	#	#		
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M		
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	#	#		
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	M	M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M		
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	<7.00	#	#		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#		
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	<15.0	#	#		
Naphthalene	<7 µg/kg	TM116	729000	108000	10600000	#	#		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#		

Notification of NDPs (No determination possible)

SDG Number	091125-56	Location	Limerick Gasworks
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	20/11/09(L4)	Report No.	29699-0
Attention	Dave Watts	Date Received	25/11/2009 14:34:48

Sample No	Sample Identity	Depth (m)	Test	Comment
651961	L4	8.00 - 8.30	VOC MS (S)	Sample unsuitable for analysis
651961	L4	8.00 - 8.30	VOC MS (S)	Sample unsuitable for analysis
651961	L4	8.00 - 8.30	VOC MS (S)	Sample unsuitable for analysis
660559	L4	8.00 - 8.30	pH	Sample contains oil / product
660559	L4	8.00 - 8.30	pH	Sample contains oil / product
660559	L4	8.00 - 8.30	pH	Sample contains oil / product
671673	L4	6.50 - 7.00	pH	Sample contains oil / product
671673	L4	6.50 - 7.00	pH	Sample contains oil / product
671673	L4	6.50 - 7.00	pH	Sample contains oil / product

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 10 December 2009
Job: D_MOUCHEL_ELE-73
Sample Delivery Group (SDG): 091126-52 **Report No.:** 67183
Your Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

A total of 4 samples was received on Tuesday November 24, 2009 and completed on Thursday December 10, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091126-52
Job: D_MOUCHEL_ELE-73
Client Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67183

SOLID

Results Legend	Sample ID	D11				E11				Total
		1.00 - 1.50		2.00 - 2.40		0.35 - 0.50		2.00 - 2.50		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
Ammonium Soil by Titration	All		X		X		X		X	0
Asbestos Presence Screen	All						X			0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	0
Easily Liberated Sulphide	All		X		X		X		X	4
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	4
GRO BTEX MTBE GC (S)	All		X		X		X		X	0
Hexavalent Chromium (s)	All	X		X		X		X		4
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0
	Cadmium		X		X		X		X	4
	Chromium		X		X		X		X	0
	Copper		X		X		X		X	4
	Lead		X		X		X		X	0
	Mercury		X		X		X		X	4
	Nickel		X		X		X		X	0
	Selenium		X		X		X		X	4
	Zinc		X		X		X		X	0
PAH micro by GCMS	All		X		X		X		X	4
PCBs by GCMS	All						X			0
pH	All		X		X		X		X	1
Phenols by HPLC (S)	All		X		X		X		X	0
Sample description	All		X		X		X		X	4
Total Sulphate	All		X		X		X		X	0
TPH CWG GC (S)	All		X		X		X		X	4
VOC MS (S)	All			X				X		0

SDG:	091126-52	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-73	Attention:	Verity Sankey
Client Reference:	23-11-09 (D11 and E11)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67183

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D11	1.00 - 1.50	Grey	Silty Sand	0.063 - 0.1 mm	Stones
	2.00 - 2.40	Grey	Silty Clay	0.063 - 0.1 mm	Stones
E11	0.35 - 0.50	Black	Sand	0.1 - 2 mm	Stones
	2.00 - 2.50	Grey	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091126-52
Job: D_MOUCHEL_ELE-73
Client Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67183

Test Completion dates

SDG reference: 091126-52

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
D11	1.00 - 1.50	SOLID	03/12/2009	03/11/2009	03/12/2009	03/12/2009	02/12/2009	02/12/2009	10/12/2009	30/11/2009	04/12/2009	01/12/2009	01/12/2009	27/11/2009	30/11/2009	27/11/2009	01/12/2009	01/12/2009	03/12/2009
	2.00 - 2.40	SOLID	03/12/2009	03/11/2009	03/12/2009	03/12/2009	02/12/2009	02/12/2009	10/12/2009	30/11/2009	04/12/2009	01/12/2009	01/12/2009	27/11/2009	30/11/2009	27/11/2009	01/12/2009	01/12/2009	03/12/2009
E11	0.35 - 0.50	SOLID	03/12/2009	27/11/2009	30/11/2009	03/12/2009	02/12/2009	02/12/2009	03/12/2009	30/11/2009	04/12/2009	01/12/2009	02/12/2009	27/11/2009	30/11/2009	27/11/2009	01/12/2009	01/12/2009	09/12/2009
	2.00 - 2.50	SOLID	03/12/2009	03/11/2009	30/11/2009	04/12/2009	04/12/2009	04/12/2009	09/12/2009	30/11/2009	04/12/2009	01/12/2009	01/12/2009	27/11/2009	30/11/2009	27/11/2009	01/12/2009	01/12/2009	10/12/2009

SDG: 091126-52
Job: D_MOUCHEL_ELE-73
Client Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67183

Results Legend			Sample Identity		D11	D11	E11	E11
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		1.00 - 1.50	2.00 - 2.40	0.35 - 0.50	2.00 - 2.50
			Sample Type		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled		23/11/2009	23/11/2009	23/11/2009	23/11/2009
			Date Received		24/11/2009	24/11/2009	24/11/2009	24/11/2009
			SDG Ref		091126-52	091126-52	091126-52	091126-52
			Lab Sample No.(s)		654767	654787	654805	654878
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001					No ACM Detected	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	M	18.6	M	<15.0	28.3
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	M	26.5	M	<15.0	42.3
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	M	20.6	M	<15.0	32.9
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100	<0.0100
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0300	<0.0200
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0300	0.162
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.0500		<0.0500	<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	1.03
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		0.0222		<0.0100	<0.0100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	<0.0100
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	<0.0150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00		<0.0200		<0.0600	1.22
pH value of soil	1 pH Units	TM133	8.28	M	8.46	M	8.33	8.96
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	#	<0.60	#	<0.60	<0.60
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#	<0.600	#	<0.600	<0.600
Total Cyanide	<1 mg/kg	TM153	10.6	M	17.5	M	7.54	<1.00
PCB congener 28	<3 µg/kg	TM168					<3.00	
PCB congener 52	<3 µg/kg	TM168					<3.00	
PCB congener 101	<3 µg/kg	TM168					<3.00	
PCB congener 118	<3 µg/kg	TM168					<3.00	
PCB congener 138	<3 µg/kg	TM168					<3.00	
PCB congener 153	<3 µg/kg	TM168					<3.00	
PCB congener 180	<3 µg/kg	TM168					<3.00	
Total of 7 Congener PCBs	<3 µg/kg	TM168					<3.00	
Easily Liberated Sulphide	<15 mg/kg	TM180	114.03	#	50.86	#	22.25	213.89
Easily Liberated Sulphide	<15 mg/kg	TM180	135	#	56.5	#	25.4	248
Arsenic	<0.6 mg/kg	TM181	11.6	M	6.56	M	28.2	3.65
Cadmium	<0.02 mg/kg	TM181	0.362	M	0.0461	M	<0.0200	0.136
Chromium	<0.9 mg/kg	TM181	12.2	M	7.34	M	16.7	6.50
Copper	<1.4 mg/kg	TM181	5.90	M	<1.40	M	86.4	2.29
Lead	<0.7 mg/kg	TM181	10.6	M	4.51	M	92.3	5.31
Mercury	<0.14 mg/kg	TM181	0.396	M	0.384	M	<0.140	0.332
Nickel	<0.2 mg/kg	TM181	11.2	M	4.05	M	35.8	2.88
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	1.06	<1.00
Zinc	<1.9 mg/kg	TM181	32.7	M	12.9	M	105	11.1
Total Sulphate	<48 mg/kg	TM221	513	M	616	M	1520	2470

SDG: 091126-52
Job: D_MOUCHEL_ELE-73
Client Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67183

GRO BTEX MTBE GC (S)

Component	LOD/Units	Method	D11		E11	
			Sample Identity	Depth (m)	Sample Identity	Depth (m)
Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			D11	1.00 - 1.50	E11	0.35 - 0.50
			Sample Type	Soil/Solid	Sample Type	Soil/Solid
			Date Sampled	23/11/2009	Date Sampled	23/11/2009
			Date Received	24/11/2009	Date Received	24/11/2009
			SDG Ref	091126-52	SDG Ref	091126-52
			Lab Sample No.(s)	654767	Lab Sample No.(s)	654878
GRO C5-C12	<44 µg/kg	TM089	133000	#	27400	#
MTBE	<5 µg/kg	TM089	<5.00	#	53.6	44.1
Benzene	<10 µg/kg	TM089	20.1	M	<10.0	143
Toluene	<2 µg/kg	TM089	339	M	30.8	1070
Ethyl Benzene	<3 µg/kg	TM089	3560	M	11.4	873
m & p Xylene	<6 µg/kg	TM089	12100	M	53.6	4460
o Xylene	<3 µg/kg	TM089	6210	M	27.4	1930
Sum m&p and o Xylene	<10 µg/kg	TM089	18300	M	80.9	6390
Sum of BTEX	<10 µg/kg	TM089	22200	M	123	8470
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0		32.9	33.0
Aliphatics >C6-C8	<10 µg/kg	TM089	1820		209	2780
Aliphatics >C8-C10	<10 µg/kg	TM089	19000		128	5430
Aliphatics >C10-C12	<10 µg/kg	TM089	24700		605	10100
Total Aliphatics C5-C12	<10 µg/kg	TM089	45500		976	18300
Aromatics C6-C7	<10 µg/kg	TM089	20.1		<10.0	143
Aromatics >C7-C8	<10 µg/kg	TM089	339		30.8	1070
Aromatics >EC8-EC10	<10 µg/kg	TM089	50400		285	15400
Aromatics >EC10-EC12	<10 µg/kg	TM089	37000		908	15100
Total Aromatics C6-C12	<10 µg/kg	TM089	87800		1220	31700

SDG: 091126-52
Job: D_MOUCHEL_ELE-73
Client Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67183

PAH micro by GCMS

Results Legend		Sample Identity	D11	D11	E11	E11		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.00 - 1.50	2.00 - 2.40	0.35 - 0.50	2.00 - 2.50		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
		Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009		
		SDG Ref	091126-52	091126-52	091126-52	091126-52		
		Lab Sample No.(s)	654767	654787	654805	654878		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	403000 M	82200 M	9920 M	96800 M		
Acenaphthylene (S)	<12 µg/kg	TM218	16800 M	10500 M	7310 M	20200 M		
Acenaphthene (S)	<8 µg/kg	TM218	33600 M	7070 M	1020 M	6770 M		
Fluorene (S)	<10 µg/kg	TM218	32300 M	10600 M	2210 M	16500 M		
Phenanthrene (S)	<15 µg/kg	TM218	44800 M	17000 M	11500 M	38400 M		
Anthracene (S)	<16 µg/kg	TM218	13700 M	5300 M	5260 M	13900 M		
Fluoranthene (S)	<17 µg/kg	TM218	16300 M	7340 M	28400 M	25900 M		
Pyrene (S)	<15 µg/kg	TM218	9640 M	4590 M	22000 M	17300 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	3030 M	1670 M	13300 M	7990 M		
Chrysene (S)	<10 µg/kg	TM218	2260 M	1220 M	9810 M	5670 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	2150 M	1150 M	15800 M	6160 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	1090 M	619 M	7750 M	3060 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1880 M	1110 M	15700 M	5630 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	810 M	464 M	9070 M	2400 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	331 M	145 M	2560 M	804 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	904 M	514 M	9590 M	2370 M		
PAH 16 EPA Total	<118 µg/kg	TM218	583000 M	151000 M	171000 M	270000 M		

SDG: 091126-52
Job: D_MOUCHEL_ELE-73
Client Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67183

VOC MS (S)

Results Legend			Sample Identity	D11	E11				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.00 - 2.40	2.00 - 2.50				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	23/11/2009	23/11/2009				
			Date Received	24/11/2009	24/11/2009				
			SDG Ref	091126-52	091126-52				
			Lab Sample No.(s)	654787	654878				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	133	136					
Toluene-d8**	%	TM116	87.1	77.1					
4-Bromofluorobenzene**	%	TM116	71.8	66.5					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	#	#			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
Carbon Disulphide	<9 µg/kg	TM116	15.7	11.8	M	M			
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Benzene	<9 µg/kg	TM116	36.8	86.9	M	M			
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	M	M			
Toluene	<6 µg/kg	TM116	172	1100	M	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	M	M			
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
Ethylbenzene	<9 µg/kg	TM116	760	1130	M	M			

SDG: 091126-52
Job: D_MOUCHEL_ELE-73
Client Reference: 23-11-09 (D11 and E11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67183

VOC MS (S)

Results Legend			Sample Identity		D11	E11				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)		2.00 - 2.40	2.00 - 2.50				
			Sample Type		Soil/Solid	Soil/Solid				
			Date Sampled		23/11/2009	23/11/2009				
			Date Received		24/11/2009	24/11/2009				
			SDG Ref		091126-52	091126-52				
			Lab Sample No.(s)		654787	654878				
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116			2980	16600	#	#		
o-Xylene	<11 µg/kg	TM116			1310	2480	M	M		
Styrene	<11 µg/kg	TM116			<11.0	<11.0	M	M		
Bromoform	<12 µg/kg	TM116			<12.0	<12.0	M	M		
Isopropylbenzene	<9 µg/kg	TM116			260	177	M	M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116			<15.0	<15.0	#	#		
1,2,3-Trichloropropane	<13 µg/kg	TM116			<13.0	<13.0	M	M		
Bromobenzene	<14 µg/kg	TM116			<14.0	<14.0	M	M		
Propylbenzene	<6 µg/kg	TM116			433	260	M	M		
2-Chlorotoluene	<14 µg/kg	TM116			<14.0	<14.0	#	#		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116			1360	1120	M	M		
4-Chlorotoluene	<9 µg/kg	TM116			<9.00	<9.00	#	#		
tert-Butylbenzene	<12 µg/kg	TM116			<12.0	<12.0	#	#		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116			3500	2470	#	#		
sec-Butylbenzene	<8 µg/kg	TM116			68.8	26.3	#	#		
4-Isopropyltoluene	<8 µg/kg	TM116			197	124	#	#		
1,3-Dichlorobenzene	<8 µg/kg	TM116			<8.00	<8.00	#	#		
1,4-Dichlorobenzene	<11 µg/kg	TM116			<11.0	<11.0	M	M		
n-Butylbenzene	<7 µg/kg	TM116			766	<7.00	#	#		
1,2-Dichlorobenzene	<8 µg/kg	TM116			<8.00	<8.00	M	M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116			<11.0	<11.0	M	M		
Tert-amyl methyl ether	<7 µg/kg	TM116			<7.00	<7.00	#	#		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116			<9.00	<9.00	#	#		
Hexachlorobutadiene	<15 µg/kg	TM116			<15.0	<15.0	#	#		
Naphthalene	<7 µg/kg	TM116			120000	453000	#	#		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116			<12.0	<12.0	#	#		

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-74
Sample Delivery Group (SDG): 091126-54 **Report No.:** 67279
Your Reference: 23/11/09 and 24/11/09 (F8/A3/B)
Location: Limerick Gasworks

A total of 6 samples was received on Tuesday November 24, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091126-54
Job: D_MOUCHEL_ELE-74
Client Reference: 23/11/09 and 24/11/09 (F8/A3/B4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67279

SOLID

Results Legend	Sample ID	A3		B4				F8	Total			
		Depth (m)		Depth (m)		Depth (m)		Depth (m)				
		60g VOC Dublin JAR (D)	TUB (D) 1.80 - 2.40	60g VOC Dublin JAR (D)	TUB (D) 2.50 - 3.00	60g VOC Dublin JAR (D)	TUB (D) 0.00 - 0.50	60g VOC Dublin JAR (D)		TUB (D) 1.00 - 1.50	60g VOC Dublin JAR (D)	TUB (D) 2.80 - 3.00
Ammonium Soil by Titration	All		X			X		X				0
Asbestos Presence Screen	All					X			X			5
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X			X				X		0
Easily Liberated Sulphide	All		X			X			X			5
EPH CWG (Aliphatic) GC (S)	All		X			X			X			0
EPH CWG (Aromatic) GC (S)	All		X			X			X			5
GRO BTEX MTBE GC (S)	All	X			X	X			X			0
Hexavalent Chromium (s)	All		X			X			X			5
Metals by iCap-OES (Soil)	Arsenic	X				X			X			0
	Cadmium	X				X			X			5
	Chromium	X				X			X			0
	Copper	X				X			X			5
	Lead	X				X			X			0
	Mercury	X				X			X			5
	Nickel	X				X			X			0
	Selenium	X				X			X			5
	Zinc	X				X			X			0
PAH micro by GCMS	All	X				X			X			5
PCBs by GCMS	All			X					X			0
pH	All		X			X			X			2
Phenols by HPLC (S)	All		X			X			X			0
Sample description	All	X			X	X			X			6
Total Sulphate	All	X			X	X			X			0
TPH CWG GC (S)	All	X				X			X			5
VOC MS (S)	All			X						X		0
				X		X						3

SDG:	091126-54	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-74	Attention:	Verity Sankey
Client Reference:	23/11/09 and 24/11/09 (F8/A3/B4)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67279

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
A3	1.80 - 2.40	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.50 - 3.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
B4	0.00 - 0.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	1.00 - 1.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.80 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
F8	1.00 - 1.50	Brown	Sandy Clay	0.1 - 2 mm	Oil/Petroleum

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091126-54
Job: D_MOUCHEL_ELE-74
Client Reference: 23/11/09 and 24/11/09 (F8/A3/B4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67279

Test Completion dates

SDG reference: 091126-54

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Icap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
A3	1.80 - 2.40	SOLID	03/12/2009		01/12/2009	03/12/2009	02/12/2009	02/12/2009	09/12/2009	01/12/2009	03/12/2009	02/12/2009		30/11/2009	02/12/2009		02/12/2009	09/12/2009	02/12/2009
	2.50 - 3.00	SOLID										04/12/2009			30/11/2009				02/12/2009
B4	0.00 - 0.50	SOLID	03/12/2009	27/11/2009	30/11/2009	03/12/2009	02/12/2009	02/12/2009	04/12/2009	01/12/2009	03/12/2009	02/12/2009	07/12/2009	30/11/2009	02/12/2009	03/12/2009	02/12/2009	02/12/2009	04/12/2009
	1.00 - 1.50	SOLID	07/12/2009		30/11/2009	04/12/2009	05/12/2009	04/12/2009	04/12/2009	04/12/2009	02/12/2009	05/12/2009	07/12/2009	30/11/2009	04/12/2009	03/12/2009	08/12/2009	05/12/2009	04/12/2009
	2.80 - 3.00	SOLID	03/12/2009		30/11/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	01/12/2009	02/12/2009	02/12/2009	02/12/2009	30/11/2009	02/12/2009	03/12/2009	02/12/2009	03/12/2009	03/12/2009
F8	1.00 - 1.50	SOLID	03/12/2009		01/12/2009	03/12/2009	03/12/2009	03/12/2009	10/12/2009	02/12/2009	02/12/2009	02/12/2009		30/11/2009	02/12/2009			10/12/2009	11/12/2009

SDG: 091126-54
Job: D_MOUCHEL_ELE-74
Client Reference: 23/11/09 and 24/11/09 (F8/A3/B4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66756

Results Legend			Sample Identity	A3	A3	B4	B4	B4	F8
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.80 - 2.40	2.50 - 3.00	0.00 - 0.50	1.00 - 1.50	2.80 - 3.00	1.00 - 1.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009
			Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009
			SDG Ref	091126-54	091126-54	091126-54	091126-54	091126-54	091126-54
Lab Sample No.(s)	654917	654934	654944	654976	655001	679315			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		<15.0	<15.0	<15.0	<15.0	20.1
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	M	<15.0	M	<15.0	M	31.0
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		<15.0		<15.0		24.1
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		<0.100
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	6.06
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	12.9
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.0500		<0.0500		<0.500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M	19.0
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		<0.100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	<0.100
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M	<0.150
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00		0.00		0.00		38.0
pH value of soil	1 pH Units	TM133	8.25		8.81		8.45		10.99
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	#	0.075	#	<0.60	#	<12
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#	<0.600	#	<0.600	#	<12.0
Total Cyanide	<1 mg/kg	TM153	<1.00	M	<1.00	M	2.37	M	290
PCB congener 28	<3 µg/kg	TM168			<3.00		<3.00		
PCB congener 52	<3 µg/kg	TM168			<3.00		<3.00		
PCB congener 101	<3 µg/kg	TM168			<3.00		<3.00		
PCB congener 118	<3 µg/kg	TM168			<3.00		<3.00		
PCB congener 138	<3 µg/kg	TM168			<3.00		<3.00		
PCB congener 153	<3 µg/kg	TM168			<3.00		<3.00		
PCB congener 180	<3 µg/kg	TM168			<3.00		<3.00		
Total of 7 Congener PCBs	<3 µg/kg	TM168			<3.00		<3.00		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	#	<15.00	#	15.87	#	21.60
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	#	<15.0	#	18.6	#	25.5
Arsenic	<0.6 mg/kg	TM181	18.7	M	7.68	M	52.0	M	11.8
Cadmium	<0.02 mg/kg	TM181	0.421	M	0.121	M	<0.0200	M	<0.0200
Chromium	<0.9 mg/kg	TM181	30.0	M	16.8	M	36.3	M	7.54
Copper	<1.4 mg/kg	TM181	18.8	M	23.5	M	47.8	M	22.2
Lead	<0.7 mg/kg	TM181	70.5	M	61.5	M	517	M	383
Mercury	<0.14 mg/kg	TM181	0.254	M	0.345	M	<0.140	M	0.229
Nickel	<0.2 mg/kg	TM181	35.5	M	23.0	M	37.3	M	9.23
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	1.01	#	<1.00
Zinc	<1.9 mg/kg	TM181	89.8	M	480	M	77.7	M	34.6
Total Sulphate	<48 mg/kg	TM221	491	M	3930	M	2430	M	3440

SDG: 091126-54
Job: D_MOUCHEL_ELE-74
Client Reference: 23/11/09 and 24/11/09 (F8/A3/B4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66756

EPH CWG (Aromatic) GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	A3	B4	B4	B4	F8
Depth (m)	1.80 - 2.40	0.00 - 0.50	1.00 - 1.50	2.80 - 3.00	1.00 - 1.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	24/11/2009	24/11/2009	24/11/2009	24/11/2009	23/11/2009
Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009
SDG Ref	091126-54	091126-54	091126-54	091126-54	091126-54
Lab Sample No.(s)	654917	654944	654976	655001	679315

Component	LOD/Units	Method	A3	B4	B4	B4	F8
Aromatics >EC12-EC16	<100 µg/kg	TM173	1910	5640	5800	60600	1010000
Aromatics >EC16-EC21	<100 µg/kg	TM173	2910	11800	26000	181000	2230000
Aromatics >EC21-EC35	<100 µg/kg	TM173	20100	161000	237000	189000	6150000
Aromatics >EC35-EC44	<100 µg/kg	TM173	7390	45100	103000	27100	943000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	32300	224000	372000	458000	10300000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	32300	224000	372000	458000	10300000

SDG: 091126-54
Job: D_MOUCHEL_ELE-74
Client Reference: 23/11/09 and 24/11/09 (F8/A3/B4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66756

PAH micro by GCMS

Results Legend			Sample Identity	A3	B4	B4	B4	F8
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.80 - 2.40 Soil/Solid 24/11/2009 24/11/2009 091126-54 654917	0.00 - 0.50 Soil/Solid 24/11/2009 24/11/2009 091126-54 654944	1.00 - 1.50 Soil/Solid 24/11/2009 24/11/2009 091126-54 654976	2.80 - 3.00 Soil/Solid 24/11/2009 24/11/2009 091126-54 655001	1.00 - 1.50 Soil/Solid 23/11/2009 24/11/2009 091126-54 679315
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	25.2	97.6	342	1060	2060000	
			M	M	M	M	M	M
Acenaphthylene (S)	<12 µg/kg	TM218	49.2	126	489	552	526000	
			M	M	M	M	M	M
Acenaphthene (S)	<8 µg/kg	TM218	<8.00	17.7	78.3	2900	203000	
			M	M	M	M	M	M
Fluorene (S)	<10 µg/kg	TM218	<10.0	26.9	134	5890	461000	
			M	M	M	M	M	M
Phenanthrene (S)	<15 µg/kg	TM218	38.1	253	1920	654	1170000	
			M	M	M	M	M	M
Anthracene (S)	<16 µg/kg	TM218	16.8	85.0	970	2510	457000	
			M	M	M	M	M	M
Fluoranthene (S)	<17 µg/kg	TM218	40.1	561	6440	1490	982000	
			M	M	M	M	M	M
Pyrene (S)	<15 µg/kg	TM218	33.7	533	5600	1120	667000	
			M	M	M	M	M	M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	24.2	291	3140	234	332000	
			M	M	M	M	M	M
Chrysene (S)	<10 µg/kg	TM218	25.6	288	2580	208	240000	
			M	M	M	M	M	M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	28.6	398	4140	204	270000	
			M	M	M	M	M	M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	19.2	182	1570	85.9	115000	
			M	M	M	M	M	M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	29.0	330	3260	184	240000	
			M	M	M	M	M	M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	24.1	228	2070	111	116000	
			M	M	M	M	M	M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	<23.0	73.0	564	33.9	30900	
			M	M	M	M	M	M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	27.0	289	2510	132	121000	
			M	M	M	M	M	M
PAH 16 EPA Total	<118 µg/kg	TM218	381	3780	35800	17400	7980000	
			M	M	M	M	M	M

SDG: 091126-54
Job: D_MOUCHEL_ELE-74
Client Reference: 23/11/09 and 24/11/09 (F8/A3/B4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66756

VOC MS (S)

Results Legend			Sample Identity	A3	B4	F8			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	1.00 - 1.50	1.00 - 1.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	24/11/2009	24/11/2009	23/11/2009			
			Date Received	24/11/2009	24/11/2009	24/11/2009			
			SDG Ref	091126-54	091126-54	091126-54			
			Lab Sample No.(s)	654934	654976	679315			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		123	113	148			
Toluene-d8**	%	TM116		85.0	99.3	64.8			
4-Bromofluorobenzene**	%	TM116		80.4	73.5	90.9			
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Carbon Disulphide	<9 µg/kg	TM116		28.8	<9.00	36.4			
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00			
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0			
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Benzene	<9 µg/kg	TM116		318	<9.00	5850			
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0			
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0			
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0			
Toluene	<6 µg/kg	TM116		9.82	12.8	<6.00			
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0			
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00			
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0			
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0			
Ethylbenzene	<9 µg/kg	TM116		747	<9.00	4700			

SDG: 091126-54
Job: D_MOUCHEL_ELE-74
Client Reference: 23/11/09 and 24/11/09 (F8/A3/B4)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66756

VOC MS (S)

Results Legend			Sample Identity	A3	B4	F8			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	1.00 - 1.50	1.00 - 1.50			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	24/11/2009	24/11/2009	23/11/2009			
			Date Received	24/11/2009	24/11/2009	24/11/2009			
			SDG Ref	091126-54	091126-54	091126-54			
			Lab Sample No.(s)	654934	654976	679315			
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	26.6	16.8	18300	#	#	#	
o-Xylene	<11 µg/kg	TM116	34.5	<11.0	8270	M	M	M	
Styrene	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
Bromoform	<12 µg/kg	TM116	<12.0	<12.0	<12.0	M	M	M	
Isopropylbenzene	<9 µg/kg	TM116	165	<9.00	813	M	M	M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	<15.0	<15.0	#	#	#	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	M	M	M	
Bromobenzene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	M	M	M	
Propylbenzene	<6 µg/kg	TM116	182	<6.00	1300	M	M	M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	<14.0	<14.0	#	#	#	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8.00	<8.00	6080	M	M	M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#	#	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	<10.0	<10.0	12900	#	#	#	
sec-Butylbenzene	<8 µg/kg	TM116	23.8	<8.00	153	#	#	#	
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	#	#	#	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	#	#	#	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	#	#	#	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	<8.00	<8.00	M	M	M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	M	M	M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	<7.00	<7.00	#	#	#	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	#	#	#	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	<15.0	<15.0	#	#	#	
Naphthalene	<7 µg/kg	TM116	<7.00	314	182000	#	#	#	
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	#	#	#	

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 05 December 2009
Job: D_MOUCHEL_ELE-75
Sample Delivery Group (SDG): 091126-64 **Report No.:** 66645
Your Reference: 20/11/09 & 23/11/09 (M6 & A11)
Location: Limerick Gasworks

A total of 3 samples was received on Tuesday November 24, 2009 and completed on Saturday December 05, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091126-64
Job: D_MOUCHEL_ELE-75
Client Reference: 20/11/09 & 23/11/09 (M6 & A11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 66645

SOLID

Results Legend	Sample ID	A11		M6		Total
		1.50 - 1.70		0.20 - 0.50		
		60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	
X Test						
N No Determination Possible						
Ammonium Soil by Titration	All		X		X	0 2
Asbestos Presence Screen	All				X	0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X	0 2
Easily Liberated Sulphide	All		X		X	0 2
EPH CWG (Aliphatic) GC (S)	All		X		X	0 2
EPH CWG (Aromatic) GC (S)	All		X		X	0 2
GRO BTEX MTBE GC (S)	All	X		X		0 2
Hexavalent Chromium (s)	All		X		X	0 2
Metals by iCap-OES (Soil)	Arsenic		X		X	0 2
	Cadmium		X		X	0 2
	Chromium		X		X	0 2
	Copper		X		X	0 2
	Lead		X		X	0 2
	Mercury		X		X	0 2
	Nickel		X		X	0 2
	Selenium		X		X	0 2
	Zinc		X		X	0 2
PAH micro by GCMS	All		X		X	0 2
PCBs by GCMS	All		X			0 1
pH	All		X		X	0 2
Phenols by HPLC (S)	All		X		X	0 2
Sample description	All		X		X	0 3
Total Sulphate	All		X		X	0 2
TPH CWG GC (S)	All		X		X	0 2
VOC MS (S)	All	X			X	0 2

SDG:	091126-64	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-75	Attention:	Verity Sankey
Client Reference:	20/11/09 & 23/11/09 (M6 & A11)	Order No.:	
Location:	Limerick Gasworks	Report No.:	66645

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
A11	1.50 - 1.70	Grey	Sandy Clay	0.1 - 2 mm	Oil/Petroleum
M6	0.20 - 0.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	8.90	Grey	Clay	<0.063 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091126-64
Job: D_MOUCHEL_ELE-75
Client Reference: 20/11/09 & 23/11/09 (M6 & A11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 66645

Test Completion dates

SDG reference: 091126-64

Sample ID	Depth	Type	Ammonium Soil by Titration	Asbestos Presence Screen	Cyanide Comp/Free/Total/Thiocyana	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by ICap-OES (Soil)	PAH by GCMS	PCBs by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
A11	1.50 - 1.70	SOLID	03/12/2009	30/11/2009	03/12/2009	04/12/2009	04/12/2009	04/12/2009	03/12/2009	01/12/2009	02/12/2009	01/12/2009	04/12/2009	30/11/2009	02/12/2009			05/12/2009	03/12/2009
M6	0.20 - 0.50	SOLID	03/12/2009	27/11/2009	30/11/2009	01/12/2009	04/12/2009	04/12/2009	03/12/2009	01/12/2009	02/12/2009	01/12/2009	01/12/2009	27/11/2009	01/12/2009			04/12/2009	03/12/2009
	8.90	SOLID																	03/12/2009

SDG: 091126-64
Job: D_MOUCHEL_ELE-75
Client Reference: 20/11/09 & 23/11/09 (M6 & A11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66645

Results Legend		Sample Identity	A11	M6			
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 1.70 Soil/Solid 23/11/2009 24/11/2009 091126-64 655350	0.20 - 0.50 Soil/Solid 20/11/2009 24/11/2009 091126-64 655163			
Component	LOD/Units	Method					
Asbestos Presence Screen	-	TM001		No ACM Detected			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0			
Catechol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100			
Phenol	<0.01 mg/kg	TM062 (S)	<0.100	0.0767			
Cresols	<0.01 mg/kg	TM062 (S)	<0.100	0.537			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.500	<0.0500			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.150	0.767			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100			
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.100	<0.0100			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.150	<0.0150			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	<0.100	1.38			
pH value of soil	1 pH Units	TM133	8.32	9.89			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<3.0			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<3.00			
Total Cyanide	<1 mg/kg	TM153	<1.00	3.33			
PCB congener 28	<3 µg/kg	TM168	<3.00				
PCB congener 52	<3 µg/kg	TM168	<3.00				
PCB congener 101	<3 µg/kg	TM168	<3.00				
PCB congener 118	<3 µg/kg	TM168	<3.00				
PCB congener 138	<3 µg/kg	TM168	<3.00				
PCB congener 153	<3 µg/kg	TM168	<3.00				
PCB congener 180	<3 µg/kg	TM168	<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	38.85	<15.00			
Easily Liberated Sulphide	<15 mg/kg	TM180	42.3	<15.0			
Arsenic	<0.6 mg/kg	TM181	<0.600	8.60			
Cadmium	<0.02 mg/kg	TM181	<0.0200	1.04			
Chromium	<0.9 mg/kg	TM181	<0.900	20.4			
Copper	<1.4 mg/kg	TM181	<1.40	23.4			
Lead	<0.7 mg/kg	TM181	<0.700	41.2			
Mercury	<0.14 mg/kg	TM181	<0.140	0.224			
Nickel	<0.2 mg/kg	TM181	<0.200	21.4			
Selenium	<1 mg/kg	TM181	<1.00	<1.00			
Zinc	<1.9 mg/kg	TM181	<1.90	76.1			
Total Sulphate	<48 mg/kg	TM221	437	956			

SDG: 091126-64
Job: D_MOUCHEL_ELE-75
Client Reference: 20/11/09 & 23/11/09 (M6 & A11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66645

GRO BTEX MTBE GC (S)

Component	LOD/Units	Method	Sample Identity		A11		M6	
			Depth (m)	Sample Type	Depth (m)	Sample Type	Depth (m)	Sample Type
Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			1.50 - 1.70	Soil/Solid	0.20 - 0.50	Soil/Solid		
GRO C5-C12	<44 µg/kg	TM089	23/11/2009		20/11/2009			
MTBE	<5 µg/kg	TM089	24/11/2009		24/11/2009			
Benzene	<10 µg/kg	TM089	091126-64		091126-64			
Toluene	<2 µg/kg	TM089	655350		655163			
Ethyl Benzene	<3 µg/kg	TM089						
m & p Xylene	<6 µg/kg	TM089						
o Xylene	<3 µg/kg	TM089						
Sum m&p and o Xylene	<10 µg/kg	TM089						
Sum of BTEX	<10 µg/kg	TM089						
Aliphatics C5-C6	<10 µg/kg	TM089						
Aliphatics >C6-C8	<10 µg/kg	TM089						
Aliphatics >C8-C10	<10 µg/kg	TM089						
Aliphatics >C10-C12	<10 µg/kg	TM089						
Total Aliphatics C5-C12	<10 µg/kg	TM089						
Aromatics C6-C7	<10 µg/kg	TM089						
Aromatics >C7-C8	<10 µg/kg	TM089						
Aromatics >EC8-EC10	<10 µg/kg	TM089						
Aromatics >EC10-EC12	<10 µg/kg	TM089						
Total Aromatics C6-C12	<10 µg/kg	TM089						

SDG: 091126-64
Job: D_MOUCHEL_ELE-75
Client Reference: 20/11/09 & 23/11/09 (M6 & A11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 66645

VOC MS (S)

Results Legend			Sample Identity	A11	M6			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 1.70	8.90			
			Sample Type	Soil/Solid	Soil/Solid			
			Date Sampled	23/11/2009	23/11/2009			
			Date Received	24/11/2009	24/11/2009			
			SDG Ref	091126-64	091126-64			
			Lab Sample No.(s)	655350	655336			
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	151	128				
Toluene-d8**	%	TM116	70.8	78.5				
4-Bromofluorobenzene**	%	TM116	57.7	64.5				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	M	M		
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	#	#		
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	M	M		
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	M	M		
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M		
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	M	M		
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#		
Carbon Disulphide	<9 µg/kg	TM116	<9.00	15.0	M	M		
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M		
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	M	M		
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	M	M		
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	M	M		
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M		
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M		
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M		
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	M	M		
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M		
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	M	M		
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	M	M		
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	M	M		
Benzene	<9 µg/kg	TM116	390	389	M	M		
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#		
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M		
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	M	M		
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	M	M		
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	M	M		
Toluene	<6 µg/kg	TM116	2050	2180	M	M		
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0				
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	M	M		
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	M	M		
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M		
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	M	M		
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	M	M		
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	M	M		
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	M	M		
Ethylbenzene	<9 µg/kg	TM116	1820	2120	M	M		

SDG: 091126-64
Job: D_MOUCHEL_ELE-75
Client Reference: 20/11/09 & 23/11/09 (M6 & A11)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 66645

VOC MS (S)

Results Legend			Sample Identity		A11	M6				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.50 - 1.70	8.90					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	23/11/2009	23/11/2009					
			Date Received	24/11/2009	24/11/2009					
			SDG Ref	091126-64	091126-64					
			Lab Sample No.(s)	655350	655336					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	13200	#	8670	#				
o-Xylene	<11 µg/kg	TM116	5420	M	327000	M				
Styrene	<11 µg/kg	TM116	<11.0	M	<11.0	M				
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0	M				
Isopropylbenzene	<9 µg/kg	TM116	316	M	218	M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0	#				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0	M				
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0	M				
Propylbenzene	<6 µg/kg	TM116	568	M	445	M				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0	#				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	2230	M	1840	M				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00	#				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	7890	#	5420	#				
sec-Butylbenzene	<8 µg/kg	TM116	54.3	#	44.0	#				
4-Isopropyltoluene	<8 µg/kg	TM116	197	#	155	#				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<8.00	#				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0	M				
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00	#				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00	M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0	M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<7.00	#				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00	#				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0	#				
Naphthalene	<7 µg/kg	TM116	558000		364000					
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#				

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-77
Sample Delivery Group (SDG): 091126-69 **Report No.:** 67271
Your Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

A total of 7 samples was received on Tuesday November 24, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67271

SOLID

Results Legend	Sample ID	C11		C12		F12 WS		F9		Total
		Depth (m)		Depth (m)		Depth (m)		Depth (m)		
		Container		Container		Container		Container		
X Test										
N No Determination Possible										
		1.50 - 2.00	2.00 - 2.50	2.00 - 2.30	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00	1.00 - 1.50		
		250g Amber Jar	TUB (D)	TUB (D)	250g Amber Jar	60g VOC Dublin	250g Amber Jar	60g VOC Dublin		
Ammonium Soil by Titration	All									0
		X	X	X	X	X	X	X	X	7
Cyanides Complex/Free/Total/Thiocya	Total Cyanide									0
		X	X	X	X	X	X	X	X	7
Easily Liberated Sulphide	All									0
		X	X	X	X	X	X	X	X	7
EPH CWG (Aliphatic) GC (S)	All	X	X	X		X	X	X		6
EPH CWG (Aromatic) GC (S)	All		X	X	X	X	X	X		6
GRO BTEX MTBE GC (S)	All	X	X	X	X	X	X	X		7
Hexavalent Chromium (s)	All	X	X	X	X	X	X	X	X	7
Metals by iCap-OES (Soil)	Arsenic	X	X	X	X	X	X	X	X	7
	Cadmium	X	X	X	X	X	X	X	X	7
	Chromium	X	X	X	X	X	X	X	X	7
	Copper	X	X	X	X	X	X	X	X	7
	Lead	X	X	X	X	X	X	X	X	7
	Mercury	X	X	X	X	X	X	X	X	7
	Nickel	X	X	X	X	X	X	X	X	7
	Selenium	X	X	X	X	X	X	X	X	7
	Zinc	X	X	X	X	X	X	X	X	7
PAH micro by GCMS	All	X	X	X	X	X	X	X		7
PCBs by GCMS	All		X					X		2
pH	All		X	X	X	X	X	X	N	1
Phenols by HPLC (S)	All		X	X	X	X	X	X	X	6
Sample description	All	X	X	X	X	X	X	X	X	7
Total Sulphate	All	X	X	X	X	X	X	X		7
TPH CWG GC (S)	All	X	X	X	X	X	X	X		7
VOC MS (S)	All		X	X	X	X		X		5

SDG:	091126-69	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-77	Attention:	Verity Sankey
Client Reference:	23-11-09 (F9-C11-C12-F12 WS)	Order No.:	
Location:	Limerick Gasworks	Report No:	67271

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C11	1.50 - 2.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	2.00 - 2.50	Brown	Silty Clay	0.063 - 0.1 mm	Stones
C12	2.00 - 2.30	Brown	Sandy Clay	0.1 - 2 mm	Oil/Petroleum
F12 WS	0.50 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Tar
F9	0.00 - 0.50	Black	N/A	N/A	Tar
	0.50 - 1.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones
	1.00 - 1.50	Black	N/A	N/A	Tar

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67271

Test Completion dates

SDG reference: 091126-69

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
C11	1.50 - 2.00	SOLID	04/12/2009	04/12/2009	01/12/2009	27/11/2009	01/12/2009	30/11/2009	02/12/2009	03/11/2009	03/12/2009	01/12/2009	03/12/2009	04/12/2009	02/12/2009	02/12/2009	30/11/2009	02/12/2009
	2.00 - 2.50	SOLID	03/12/2009	04/12/2009	01/12/2009	30/11/2009	01/12/2009	02/12/2009	01/12/2009	01/12/2009	03/12/2009	04/12/2009	03/12/2009	03/12/2009	03/12/2009	02/12/2009	03/11/2009	02/12/2009
C12	2.00 - 2.30	SOLID	03/12/2009	04/12/2009	01/12/2009	27/11/2009	04/12/2009	03/12/2009	01/12/2009	01/12/2009	02/12/2009	04/12/2009	03/12/2009	02/12/2009	02/12/2009	08/12/2009	04/12/2009	03/12/2009
F12 WS	0.50 - 1.00	SOLID	03/12/2009	04/12/2009	01/12/2009	27/11/2009	30/11/2009	27/11/2009	01/12/2009	01/12/2009	04/12/2009	01/12/2009	03/12/2009	04/12/2009	02/12/2009	02/12/2009	30/11/2009	02/12/2009
F9	0.00 - 0.50	SOLID	03/12/2009	04/12/2009	01/12/2009	27/11/2009	02/12/2009	30/11/2009	01/12/2009	01/12/2009	02/12/2009	01/12/2009	03/12/2009	03/12/2009	03/12/2009	02/12/2009	02/12/2009	02/12/2009
	0.50 - 1.00	SOLID	04/12/2009	04/12/2009	01/12/2009	27/11/2009	01/12/2009	30/11/2009	01/12/2009	01/12/2009	02/12/2009	01/12/2009	03/12/2009	03/12/2009	03/12/2009	08/12/2009	30/11/2009	02/12/2009
	1.00 - 1.50	SOLID	03/12/2009	04/12/2009	01/12/2009	27/11/2009	02/12/2009	30/11/2009	01/12/2009	01/12/2009	03/12/2009	01/12/2009	03/12/2009	07/12/2009	03/12/2009	02/12/2009	30/11/2009	02/12/2009

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

Results Legend			Sample Identity	C11	C11	C12	F12 WS	F9	F9
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.50 - 2.00 Soil/Solid 23/11/2009 24/11/2009 091126-69 655527	2.00 - 2.50 Soil/Solid 23/11/2009 24/11/2009 091126-69 655609	2.00 - 2.30 Soil/Solid 23/11/2009 24/11/2009 091126-69 655663	0.50 - 1.00 Soil/Solid 23/11/2009 24/11/2009 091126-69 655688	0.00 - 0.50 Soil/Solid 23/11/2009 24/11/2009 091126-69 655377	0.50 - 1.00 Soil/Solid 24/11/2009 091126-69 655445
Component	LOD/Units	Method							
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	18.3	15.5	<15.0	<15.0	50.8	<15.0	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	29.0	23.7	<15.0	<15.0	80.3	<15.0	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	22.6	18.4	<15.0	<15.0	62.5	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0300	<0.500	<0.100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.157	<0.0100	295	<0.100	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.291	0.0666	856	1.97	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	<2.50	<0.500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	762	18.1	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.500	<0.100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.500	<0.100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	<0.750	<0.150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	0.459	<0.100	1910	20.1	
pH value of soil	1 pH Units	TM133	8.32	8.30	9.29	8.70	7.95	7.51	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	0.0092	<0.60	<0.60	<12	<6.0	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	<0.600	<12.0	<6.00	
Total Cyanide	<1 mg/kg	TM153	15.5	17.7	35.2	<1.00	61.6	150	
PCB congener 28	<3 µg/kg	TM168		<3.00					
PCB congener 52	<3 µg/kg	TM168		<3.00					
PCB congener 101	<3 µg/kg	TM168		<3.00					
PCB congener 118	<3 µg/kg	TM168		<3.00					
PCB congener 138	<3 µg/kg	TM168		<3.00					
PCB congener 153	<3 µg/kg	TM168		<3.00					
PCB congener 180	<3 µg/kg	TM168		<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	20.63	55.99	175.93	57.28	16.14	22.46	
Easily Liberated Sulphide	<15 mg/kg	TM180	25.4	66.6	197	63.6	19.9	28.5	
Arsenic	<0.6 mg/kg	TM181	10.1	8.99	6.80	5.71	7.07	29.5	
Cadmium	<0.02 mg/kg	TM181	<0.0200	<0.0200	0.142	0.186	<0.0200	0.244	
Chromium	<0.9 mg/kg	TM181	14.8	9.25	7.30	7.86	1.29	17.9	
Copper	<1.4 mg/kg	TM181	19.3	9.46	4.83	4.06	14.9	131	
Lead	<0.7 mg/kg	TM181	35.2	15.9	8.77	6.48	73.7	444	
Mercury	<0.14 mg/kg	TM181	0.724	0.266	<0.140	0.390	2.58	0.458	
Nickel	<0.2 mg/kg	TM181	21.8	12.3	8.90	4.79	5.49	31.4	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	<1.00	1.62	
Zinc	<1.9 mg/kg	TM181	45.7	27.0	18.9	17.4	45.7	197	
Total Sulphate	<48 mg/kg	TM221	2350	827	1160	632	1540	6520	

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

EPH CWG (Aliphatic) GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 subcontracted test.
 * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C11	C11	C12	F12 WS	F9	F9
Depth (m)	1.50 - 2.00	2.00 - 2.50	2.00 - 2.30	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009
SDG Ref	091126-69	091126-69	091126-69	091126-69	091126-69	091126-69
Lab Sample No.(s)	655527	655609	655663	655688	655377	655445

Component	LOD/Units	Method						
Aliphatics >C12-C16	<100 µg/kg	TM173	53300	73100	86900	46900	1400000	1320000
Aliphatics >C16-C21	<100 µg/kg	TM173	36000	60900	81800	99000	3520000	1420000
Aliphatics >C21-C35	<100 µg/kg	TM173	67800	33500	40300	127000	4040000	1230000
Aliphatics >C35-C44	<100 µg/kg	TM173	27000	5580	2280	15400	394000	142000
Total Aliphatics >C12-C44	<100 µg/kg	TM173	184000	173000	211000	289000	9350000	4120000
Total Aliphatics & Aromatics >C12-C44	<100 µg/kg	TM173				1740000		
Aliphatics >C16-C35	<100 µg/kg	TM173	104000	94500	122000	226000	7560000	2660000
Aliphatics >C35-C40	<100 µg/kg	TM173				10300		
Aliphatics >C40-C44	<100 µg/kg	TM173				5120		
Total Aliphatics >C12-C35	<100 µg/kg	TM173				273000		
Total Aliphatics >C12-C40	<100 µg/kg	TM173				284000		

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

EPH CWG (Aromatic) GC (S)

Results Legend	Sample Identity	C11	C11	C12	F12 WS	F9	F9
	Depth (m)	1.50 - 2.00	2.00 - 2.50	2.00 - 2.30	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
	Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009
	SDG Ref	091126-69	091126-69	091126-69	091126-69	091126-69	091126-69
	Lab Sample No.(s)	655527	655609	655663	655688	655377	655445

Component	LOD/Units	Method	C11	C11	C12	F12 WS	F9	F9
Aromatics >EC12-EC16	<100 µg/kg	TM173	39500	115000	146000	97400	6680000	432000
Aromatics >EC16-EC21	<100 µg/kg	TM173	44000	153000	247000	315000	15100000	1210000
Aromatics >EC21-EC35	<100 µg/kg	TM173	129000	175000	375000	887000	28100000	4790000
Aromatics >EC35-EC44	<100 µg/kg	TM173	55400	37200	82800	156000	3910000	844000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	268000	480000	851000	1460000	53700000	7270000
Aromatics >EC35-EC40	<100 µg/kg	TM173	24800					
Aromatics >EC40-EC44	<100 µg/kg	TM173	30600					
Total Aromatics >EC12-EC35	<100 µg/kg	TM173	212000					
Total Aromatics >EC12-EC40	<100 µg/kg	TM173	237000					
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	268000	480000	851000	1460000	53700000	7270000

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

GRO BTEX MTBE GC (S)

Results Legend	Sample Identity	C11	C11	C12	F12 WS	F9	F9
	Depth (m)	1.50 - 2.00	2.00 - 2.50	2.00 - 2.30	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009
	Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009
	SDG Ref	091126-69	091126-69	091126-69	091126-69	091126-69	091126-69
	Lab Sample No.(s)	655527	655609	655663	655688	655377	655445

Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	16900	42900	30400	52300	140000	11100	#
MTBE	<5 µg/kg	TM089	45.5	26.2	113	40.0	118	<5.00	#
Benzene	<10 µg/kg	TM089	25.8	19.0	26.9	180	7510	411	M
Toluene	<2 µg/kg	TM089	35.7	83.3	58.2	1310	16200	897	M
Ethyl Benzene	<3 µg/kg	TM089	193	639	147	630	2780	221	M
m & p Xylene	<6 µg/kg	TM089	499	1890	662	5680	18600	1250	M
o Xylene	<3 µg/kg	TM089	320	1030	464	2740	7970	575	M
Sum m&p and o Xylene	<10 µg/kg	TM089	819	2920	1130	8420	26600	1820	M
Sum of BTEX	<10 µg/kg	TM089	1070	3660	1360	10500	53100	3350	M
Aliphatics C5-C6	<10 µg/kg	TM089	25.2	13.3	<10.0	<10.0	88.0	73.5	
Aliphatics >C6-C8	<10 µg/kg	TM089	231	572	1260	2780	10900	599	
Aliphatics >C8-C10	<10 µg/kg	TM089	1840	5120	4290	6980	15400	1110	
Aliphatics >C10-C12	<10 µg/kg	TM089	4350	10300	6770	8600	15000	1710	
Total Aliphatics C5-C12	<10 µg/kg	TM089	6450	16000	12300	18400	41400	3490	
Aromatics C6-C7	<10 µg/kg	TM089	25.8	19.0	26.9	180	7510	411	
Aromatics >C7-C8	<10 µg/kg	TM089	35.7	83.3	58.2	1310	16200	897	
Aromatics >EC8-EC10	<10 µg/kg	TM089	3770	11200	7700	19500	52400	3710	
Aromatics >EC10-EC12	<10 µg/kg	TM089	6530	15500	10200	12900	22500	2570	
Total Aromatics C6-C12	<10 µg/kg	TM089	10400	26800	17900	33900	98700	7580	

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

PAH micro by GCMS

Results Legend # ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Sample Identity	C11	C11	C12	F12 WS	F9	F9
	Depth (m)	1.50 - 2.00	2.00 - 2.50	2.00 - 2.30	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00		
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
	Date Sampled	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
	Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	24/11/2009	
	SDG Ref	091126-69	091126-69	091126-69	091126-69	091126-69	091126-69	091126-69	
	Lab Sample No.(s)	655527	655609	655663	655688	655377	655445		
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	24700 M	127000 M	100000 M	122000 M	7120000 M	65800 M	
Acenaphthylene (S)	<12 µg/kg	TM218	2970 M	7720 M	32600 M	60300 M	1920000 M	114000 M	
Acenaphthene (S)	<8 µg/kg	TM218	5810 M	19400 M	19400 M	10700 M	399000 M	14600 M	
Fluorene (S)	<10 µg/kg	TM218	5270 M	15200 M	42800 M	42700 M	1940000 M	34000 M	
Phenanthrene (S)	<15 µg/kg	TM218	9640 M	27000 M	76400 M	110000 M	4340000 M	99300 M	
Anthracene (S)	<16 µg/kg	TM218	3230 M	7300 M	27800 M	41600 M	1630000 M	67800 M	
Fluoranthene (S)	<17 µg/kg	TM218	6510 M	13100 M	40000 M	76200 M	2700000 M	295000 M	
Pyrene (S)	<15 µg/kg	TM218	4340 M	8600 M	25800 M	54600 M	1720000 M	189000 M	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	2050 M	2810 M	9070 M	24200 M	947000 M	105000 M	
Chrysene (S)	<10 µg/kg	TM218	1510 M	2020 M	6990 M	17800 M	706000 M	71700 M	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	2680 M	3080 M	6670 M	22300 M	747000 M	131000 M	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	911 M	1130 M	3160 M	8810 M	336000 M	44400 M	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1990 M	2320 M	5480 M	19400 M	569000 M	96500 M	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	1230 M	1390 M	2750 M	10100 M	237000 M	50000 M	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	306 M	385 M	706 M	2540 M	81700 M	14000 M	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1410 M	1690 M	3090 M	10400 M	261000 M	50600 M	
PAH 16 EPA Total	<118 µg/kg	TM218	74500 M	240000 M	403000 M	634000 M	25700000 M	1440000 M	

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

VOC MS (S)

Results Legend			Sample Identity	C11	C12	F12 WS	F9		
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.00 - 2.50	2.00 - 2.30	0.50 - 1.00	0.00 - 0.50		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
			Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009		
			SDG Ref	091126-69	091126-69	091126-69	091126-69		
Lab Sample No.(s)	655609	655663	655688	655377					
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	146	127	155	163			
Toluene-d8**	%	TM116	82.8	78.6	71.1	62.3			
4-Bromofluorobenzene**	%	TM116	69.1	63.9	71.6	73.7			
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	<13.0			
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0			
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00			
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00			
Carbon Disulphide	<9 µg/kg	TM116	42.5	17.4	<9.00	277			
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	<8.00			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0			
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0			
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	<13.0			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0			
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0			
Benzene	<9 µg/kg	TM116	161	40.4	157	13300			
Trichloroethene	<9 µg/kg	TM116	70.4	13.5	33.5	<9.00			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0			
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	<25.0			
Toluene	<6 µg/kg	TM116	251	56.2	1170	56300			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0	<27.0			
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	<14.0			
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0			
Ethylbenzene	<9 µg/kg	TM116	1280	160	1060	16600			

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

VOC MS (S)

Results Legend		Sample Identity	C11	C12	F12 WS	F9		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	2.00 - 2.50	2.00 - 2.30	0.50 - 1.00	0.00 - 0.50		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	23/11/2009	23/11/2009	23/11/2009	23/11/2009		
		Date Received	24/11/2009	24/11/2009	24/11/2009	24/11/2009		
		SDG Ref	091126-69	091126-69	091126-69	091126-69		
	Lab Sample No.(s)	655609	655663	655688	655377			
Component	LOD/Units	Method						
p/m-Xylene	<13 µg/kg	TM116	2820 #	580 #	17800 #	136000 #		
o-Xylene	<11 µg/kg	TM116	1840 M	299 M	7540 M	65100 M		
Styrene	<11 µg/kg	TM116	<11.0 M	18.0 M	1810 M	<11.0 M		
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	<12.0 M		
Isopropylbenzene	<9 µg/kg	TM116	406 M	117 M	231 M	2460 M		
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #		
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	<13.0 M		
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	<14.0 M		
Propylbenzene	<6 µg/kg	TM116	618 M	234 M	379 M	5320 M		
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #	<14.0 #		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	2070 M	856 M	4900 M	33500 M		
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #		
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	<12.0 #		
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	6950 #	1830 #	9880 #	60800 #		
sec-Butylbenzene	<8 µg/kg	TM116	76.4 #	57.6 #	67.5 #	795 #		
4-Isopropyltoluene	<8 µg/kg	TM116	308 #	167 #	256 #	2940 #		
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	<8.00 #		
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M		
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #		
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	<8.00 M		
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M		
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #		
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #		
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #		
Naphthalene	<7 µg/kg	TM116	196000 #	400000 #	202000 #	1640000 #		
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	22.7 #	<12.0 #		

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

Results Legend			Sample Identity	F9				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.00 - 1.50 Soil/Solid 23/11/2009 24/11/2009 091126-69 655475				
Component	LOD/Units	Method						
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	111	M				
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	171	M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	133					
Catechol	<0.01 mg/kg	TM062 (S)	<0.500					
Phenol	<0.01 mg/kg	TM062 (S)	93.4	M				
Cresols	<0.01 mg/kg	TM062 (S)	559	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<2.50					
Xylenols	<0.015 mg/kg	TM062 (S)	689	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.500					
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.500	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.750	M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	1340					
Hexavalent Chromium	<0.6 mg/kg	TM151	<6.0	#				
Hexavalent Chromium	<0.6 mg/kg	TM151	<6.00	#				
Total Cyanide	<1 mg/kg	TM153	760	M				
PCB congener 28	<3 µg/kg	TM168	<3.00					
PCB congener 52	<3 µg/kg	TM168	<3.00					
PCB congener 101	<3 µg/kg	TM168	<3.00					
PCB congener 118	<3 µg/kg	TM168	<3.00					
PCB congener 138	<3 µg/kg	TM168	<3.00					
PCB congener 153	<3 µg/kg	TM168	<3.00					
PCB congener 180	<3 µg/kg	TM168	<3.00					
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3.00					
Easily Liberated Sulphide	<15 mg/kg	TM180	47.05	#				
Easily Liberated Sulphide	<15 mg/kg	TM180	56.5	#				
Arsenic	<0.6 mg/kg	TM181	15.4	M				
Cadmium	<0.02 mg/kg	TM181	0.264	M				
Chromium	<0.9 mg/kg	TM181	2.06	M				
Copper	<1.4 mg/kg	TM181	18.6	M				
Lead	<0.7 mg/kg	TM181	239	M				
Mercury	<0.14 mg/kg	TM181	1.52	M				
Nickel	<0.2 mg/kg	TM181	4.32	M				
Selenium	<1 mg/kg	TM181	<1.00	#				
Zinc	<1.9 mg/kg	TM181	258	M				
Total Sulphate	<48 mg/kg	TM221	3380	M				

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

VOC MS (S)

Results Legend			Sample Identity	F9				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.50				
			Sample Type	Soil/Solid				
			Date Sampled	23/11/2009				
			Date Received	24/11/2009				
			SDG Ref	091126-69				
			Lab Sample No.(s)	655475				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	136					
Toluene-d8**	%	TM116	58.2					
4-Bromofluorobenzene**	%	TM116	72.4					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0					
Chloromethane	<12 µg/kg	TM116	<12.0					
Vinyl Chloride	<10 µg/kg	TM116	<10.0					
Bromoethane	<9 µg/kg	TM116	<9.00					
Chloroethane	<12 µg/kg	TM116	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00					
Carbon Disulphide	<9 µg/kg	TM116	320					
Dichloromethane	<10 µg/kg	TM116	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Bromochloromethane	<10 µg/kg	TM116	<10.0					
Chloroform	<10 µg/kg	TM116	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0					
Carbontetrachloride	<11 µg/kg	TM116	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0					
Benzene	<9 µg/kg	TM116	206000					
Trichloroethene	<9 µg/kg	TM116	123000					
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Dibromomethane	<12 µg/kg	TM116	<12.0					
Bromodichloromethane	<11 µg/kg	TM116	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0					
Toluene	<6 µg/kg	TM116	219000					
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00					
Tetrachloroethene	<9 µg/kg	TM116	<9.00					
Dibromochloromethane	<9 µg/kg	TM116	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0					
Chorobenzene	<7 µg/kg	TM116	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0					
Ethylbenzene	<9 µg/kg	TM116	48600					

SDG: 091126-69
Job: D_MOUCHEL_ELE-77
Client Reference: 23-11-09 (F9-C11-C12-F12 WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67271

VOC MS (S)

Results Legend		Sample Identity	F9				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.00 - 1.50				
		Sample Type	Soil/Solid				
		Date Sampled	23/11/2009				
		Date Received	24/11/2009				
		SDG Ref	091126-69				
		Lab Sample No.(s)	655475				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	332000				
o-Xylene	<11 µg/kg	TM116	141000				
Styrene	<11 µg/kg	TM116	<11.0				
Bromoform	<12 µg/kg	TM116	<12.0				
Isopropylbenzene	<9 µg/kg	TM116	5640				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0				
Bromobenzene	<14 µg/kg	TM116	<14.0				
Propylbenzene	<6 µg/kg	TM116	9500				
2-Chlorotoluene	<14 µg/kg	TM116	<14.0				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	48200				
4-Chlorotoluene	<9 µg/kg	TM116	<9.00				
tert-Butylbenzene	<12 µg/kg	TM116	<12.0				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	114000				
sec-Butylbenzene	<8 µg/kg	TM116	1680				
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0				
n-Butylbenzene	<7 µg/kg	TM116	<7.00				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00				
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0				
Naphthalene	<7 µg/kg	TM116	3950000				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0				

Notification of NDPs (No determination possible)

SDG Number	091126-69	Location	Not Specified
Client	D_MOUCHEL_ELE	Order No.	
Client Reference	23-11-09 (F9-C11-C12-F12 WS)	Report No.	28776-1
Attention	Dave Watts	Date Received	26/11/2009 11:28:40

Sample No	Sample Identity	Depth (m)	Test	Comment
665602	F9	1.00 - 1.50	pH	Sample contains oil / product
665602	F9	1.00 - 1.50	pH	Sample contains oil / product
665602	F9	1.00 - 1.50	pH	Sample contains oil / product

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-76
Sample Delivery Group (SDG): 091126-79 **Report No.:** 67269
Your Reference: 24/11/09 (G3)
Location: Limerick Gasworks

A total of 3 samples was received on Wednesday November 25, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091126-79
Job: D_MOUCHEL_ELE-76
Client Reference: 24/11/09 (G3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67269

SOLID

Results Legend	Sample ID	G3.						Total
		0.00 - 0.50		1.50 - 2.00		8.50 - 9.00		
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	
X Test								
N No Determination Possible								
Ammonium Soil by Titration	All		X		X		X	0
								3
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X	0
								3
Easily Liberated Sulphide	All		X		X		X	0
								3
EPH CWG (Aliphatic) GC (S)	All		X		X		X	0
								3
EPH CWG (Aromatic) GC (S)	All		X		X		X	0
								3
GRO BTEX MTBE GC (S)	All		X		X		X	0
		X		X		X		3
Hexavalent Chromium (s)	All		X		X		X	0
								3
Metals by iCap-OES (Soil)	Arsenic		X		X		X	0
								3
	Cadmium		X		X		X	0
								3
	Chromium		X		X		X	0
								3
	Copper		X		X		X	0
								3
	Lead		X		X		X	0
								3
	Mercury		X		X		X	0
								3
	Nickel		X		X		X	0
								3
	Selenium		X		X		X	0
								3
	Zinc		X		X		X	0
								3
PAH micro by GCMS	All		X		X		X	0
								3
PCBs by GCMS	All				X			0
								1
pH	All		X		X		X	0
								3
Phenols by HPLC (S)	All		X		X		X	0
								3
Sample description	All		X		X		X	0
								3
Total Sulphate	All		X		X		X	0
								3
TPH CWG GC (S)	All		X		X		X	0
								3
VOC MS (S)	All					X		0
								1

SDG:	091126-79	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-76	Attention:	Verity Sankey
Client Reference:	24/11/09 (G3)	Order No.:	
Location:	Limerick Gasworks	Report No:	67269

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
G3.	0.00 - 0.50	Brown	Sand	0.1 - 2 mm	Stones
	1.50 - 2.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	8.50 - 9.00	Brown	Silty Clay	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091126-79
Job: D_MOUCHEL_ELE-76
Client Reference: 24/11/09 (G3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67269

Test Completion dates

SDG reference: 091126-79

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
G3.	0.00 - 0.50	SOLID	03/12/2009	03/12/2009	02/12/2009	30/11/2009	02/12/2009	01/12/2009	04/12/2009	02/12/2009	03/12/2009	01/12/2009	03/12/2009	02/12/2009	03/12/2009	03/12/2009	02/12/2009	03/12/2009
	1.50 - 2.00	SOLID	11/12/2009	02/12/2009	30/11/2009	02/12/2009	01/12/2009	02/12/2009	02/12/2009	03/12/2009	02/12/2009	01/12/2009	11/12/2009	02/12/2009	03/12/2009	03/12/2009	02/12/2009	03/12/2009
	8.50 - 9.00	SOLID	02/12/2009	03/12/2009	02/12/2009	30/11/2009	02/12/2009	01/12/2009	02/12/2009	02/12/2009	02/12/2009	01/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	02/12/2009	03/12/2009

SDG: 091126-79
Job: D_MOUCHEL_ELE-76
Client Reference: 24/11/09 (G3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67269

Results Legend			Sample Identity			G3.			G3.			G3.			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.50	1.50 - 2.00	8.50 - 9.00									
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid									
			Date Sampled	24/11/2009	24/11/2009	24/11/2009									
			Date Received	25/11/2009	25/11/2009	25/11/2009									
			SDG Ref	091126-79	091126-79	091126-79									
			Lab Sample No.(s)	655729	679375	655734									
Component	LOD/Units	Method													
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	122	M	M	M							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	23.3	199	M	M	M							
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	155										
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100										
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.0508	M	M	M							
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.178	M	M	M							
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500										
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0300	M	M	M							
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100										
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	M	M	M							
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	M	M	M							
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.210										
pH value of soil	1 pH Units	TM133	7.53	10.19	8.27	M	M	M							
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<0.60	#	#	#							
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	#	#	#							
Total Cyanide	<1 mg/kg	TM153	408	22.1	15.5	M	M	M							
PCB congener 28	<3 µg/kg	TM168		<3.00											
PCB congener 52	<3 µg/kg	TM168		<3.00											
PCB congener 101	<3 µg/kg	TM168		<3.00											
PCB congener 118	<3 µg/kg	TM168		<3.00											
PCB congener 138	<3 µg/kg	TM168		<3.00											
PCB congener 153	<3 µg/kg	TM168		<3.00											
PCB congener 180	<3 µg/kg	TM168		<3.00											
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00											
Easily Liberated Sulphide	<15 mg/kg	TM180	18.20	20.53	400.46	#	#	#							
Easily Liberated Sulphide	<15 mg/kg	TM180	20.6	25.5	509	#	#	#							
Arsenic	<0.6 mg/kg	TM181	26.6	17.1	7.50	M	M	M							
Cadmium	<0.02 mg/kg	TM181	0.0398	0.0512	0.0479	M	M	M							
Chromium	<0.9 mg/kg	TM181	23.6	17.5	14.1	M	M	M							
Copper	<1.4 mg/kg	TM181	77.9	47.7	9.49	M	M	M							
Lead	<0.7 mg/kg	TM181	251	487	18.1	M	M	M							
Mercury	<0.14 mg/kg	TM181	0.581	0.732	<0.140	M	M	M							
Nickel	<0.2 mg/kg	TM181	39.5	29.8	13.4	M	M	M							
Selenium	<1 mg/kg	TM181	1.18	<1.00	<1.00	#	#	#							
Zinc	<1.9 mg/kg	TM181	329	68.3	36.3	M	M	M							
Total Sulphate	<48 mg/kg	TM221	93400	6180	781	M	M	M							

SDG: 091126-79
Job: D_MOUCHEL_ELE-76
Client Reference: 24/11/09 (G3)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67269

VOC MS (S)

Results Legend			Sample Identity	G3.				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	8.50 - 9.00				
			Sample Type	Soil/Solid				
			Date Sampled	24/11/2009				
			Date Received	25/11/2009				
			SDG Ref	091126-79				
			Lab Sample No.(s)	655734				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	105					
Toluene-d8**	%	TM116	94.9					
4-Bromofluorobenzene**	%	TM116	83.4					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	M				
Chloromethane	<12 µg/kg	TM116	<12.0	#				
Vinyl Chloride	<10 µg/kg	TM116	<10.0	M				
Bromoethane	<9 µg/kg	TM116	<9.00	M				
Chloroethane	<12 µg/kg	TM116	<12.0	M				
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	M				
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	#				
Carbon Disulphide	<9 µg/kg	TM116	<9.00	M				
Dichloromethane	<10 µg/kg	TM116	<10.0	M				
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	M				
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	M				
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Bromochloromethane	<10 µg/kg	TM116	<10.0	M				
Chloroform	<10 µg/kg	TM116	<10.0	M				
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	M				
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	M				
Carbontetrachloride	<11 µg/kg	TM116	<11.0	M				
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	M				
Benzene	<9 µg/kg	TM116	109	M				
Trichloroethene	<9 µg/kg	TM116	<9.00	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	M				
Dibromomethane	<12 µg/kg	TM116	<12.0	M				
Bromodichloromethane	<11 µg/kg	TM116	<11.0	M				
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	M				
Toluene	<6 µg/kg	TM116	52.1	M				
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	M				
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	M				
Tetrachloroethene	<9 µg/kg	TM116	<9.00	M				
Dibromochloromethane	<9 µg/kg	TM116	<9.00	M				
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	M				
Chorobenzene	<7 µg/kg	TM116	<7.00	M				
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	M				
Ethylbenzene	<9 µg/kg	TM116	<9.00	M				

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-78
Sample Delivery Group (SDG): 091126-85 **Report No.:** 67273
Your Reference: 24/11/09 (D1)
Location: Limerick Gasworks

A total of 4 samples was received on Wednesday November 25, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091126-85
Job: D_MOUCHEL_ELE-78
Client Reference: 24/11/09 (D1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67273

SOLID

Results Legend	Sample ID	D1								Total
		1.00 - 1.50		2.50 - 3.00		4.00 - 4.50		5.00 - 5.50		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test										
N No Determination Possible										
Ammonium Soil by Titration	All		X		X		X		X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X	4
Easily Liberated Sulphide	All		X		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	4
GRO BTEX MTBE GC (S)	All		X		X		X		X	0
Hexavalent Chromium (s)	All	X		X		X		X		4
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0
	Cadmium		X		X		X		X	4
	Chromium		X		X		X		X	0
	Copper		X		X		X		X	4
	Lead		X		X		X		X	0
	Mercury		X		X		X		X	4
	Nickel		X		X		X		X	0
	Selenium		X		X		X		X	4
	Zinc		X		X		X		X	0
PAH micro by GCMS	All		X		X		X		X	4
PCBs by GCMS	All								X	0
pH	All		X		X		X		X	1
Phenols by HPLC (S)	All		X		X		X		X	0
Sample description	All		X		X		X		X	4
Total Sulphate	All		X		X		X		X	0
TPH CWG GC (S)	All		X		X		X		X	4
VOC MS (S)	All					X		X		0
										2

SDG:	091126-85	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-78	Attention:	Verity Sankey
Client Reference:	24/11/09 (D1)	Order No.:	
Location:	Limerick Gasworks	Report No.:	67273

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D1	1.00 - 1.50	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.50 - 3.00	Brown	Sandy Clay	0.1 - 2 mm	Stones
	4.00 - 4.50	Beige	Sandy Clay	0.1 - 2 mm	Stones
	5.00 - 5.50	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091126-85
Job: D_MOUCHEL_ELE-78
Client Reference: 24/11/09 (D1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67273

Test Completion dates

SDG reference: 091126-85

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by ICap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Ammonium Soil by Titration
D1	1.00 - 1.50	SOLID	11/12/2009	09/12/2009	08/12/2009	09/12/2009	08/12/2009	03/12/2009	04/12/2009	02/12/2009	03/12/2009	07/12/2009	04/12/2009	01/12/2009	02/12/2009	04/12/2009	01/12/2009	03/12/2009
	2.50 - 3.00	SOLID	02/12/2009	08/12/2009	01/12/2009	02/12/2009	02/12/2009	02/12/2009	04/12/2009	01/12/2009	04/12/2009	01/12/2009	01/12/2009	09/12/2009	05/12/2009	04/12/2009	01/12/2009	07/12/2009
	4.00 - 4.50	SOLID	03/11/2009	03/12/2009	27/11/2009	30/11/2009	02/12/2009	01/12/2009	01/12/2009	01/12/2009	04/12/2009	01/12/2009	01/12/2009	09/12/2009	04/12/2009	04/12/2009	01/12/2009	03/12/2009
	5.00 - 5.50	SOLID	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	03/12/2009	04/12/2009	02/12/2009	03/12/2009	03/12/2009	01/12/2009	10/12/2009	03/12/2009	03/12/2009	04/12/2009	30/11/2009

SDG: 091126-85
Job: D_MOUCHEL_ELE-78
Client Reference: 24/11/09 (D1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67273

Component	LOD/Units	Method	Sample Identity				
			D1	D1	D1	D1	
Results Legend							
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.							
			Depth (m)	1.00 - 1.50	2.50 - 3.00	4.00 - 4.50	5.00 - 5.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	24/11/2009	24/11/2009	24/11/2009	24/11/2009
			Date Received	25/11/2009	25/11/2009	25/11/2009	25/11/2009
			SDG Ref	091126-85	091126-85	091126-85	091126-85
			Lab Sample No.(s)	716781	655785	655840	716782
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	17.1	36.5	
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	<15.0	25.8	54.8	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	20.0	42.7	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0200	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	0.105	0.339	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	0.234	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	<0.0150	<0.0150	<0.0150	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	<0.0900	0.597	
pH value of soil	1 pH Units	TM133	8.81	8.71	8.62	9.16	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	<0.60	<0.60	<0.60	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	<0.600	<0.600	<0.600	
Total Cyanide	<1 mg/kg	TM153	2.26	<1.00	22.9	407	
PCB congener 28	<3 µg/kg	TM168				<3.00	
PCB congener 52	<3 µg/kg	TM168				<3.00	
PCB congener 101	<3 µg/kg	TM168				<3.00	
PCB congener 118	<3 µg/kg	TM168				<3.00	
PCB congener 138	<3 µg/kg	TM168				<3.00	
PCB congener 153	<3 µg/kg	TM168				<3.00	
PCB congener 180	<3 µg/kg	TM168				<3.00	
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00	
Easily Liberated Sulphide	<15 mg/kg	TM180	19.58	18.53	303.64	1646.40	
Easily Liberated Sulphide	<15 mg/kg	TM180	23.9	21.9	355	1930	
Arsenic	<0.6 mg/kg	TM181	18.0	14.3	10.7	4.72	
Cadmium	<0.02 mg/kg	TM181	0.221	0.239	0.158	0.0411	
Chromium	<0.9 mg/kg	TM181	18.2	11.9	11.3	14.5	
Copper	<1.4 mg/kg	TM181	158	27.6	17.3	11.3	
Lead	<0.7 mg/kg	TM181	249	234	47.8	86.4	
Mercury	<0.14 mg/kg	TM181	1.48	0.937	0.373	0.514	
Nickel	<0.2 mg/kg	TM181	22.6	15.7	11.2	15.0	
Selenium	<1 mg/kg	TM181	<1.00	<1.00	<1.00	<1.00	
Zinc	<1.9 mg/kg	TM181	65.2	41.1	35.2	32.7	
Total Sulphate	<48 mg/kg	TM221	1180	951	1840	5920	

SDG: 091126-85
Job: D_MOUCHEL_ELE-78
Client Reference: 24/11/09 (D1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67273

GRO BTEX MTBE GC (S)

Results Legend		Sample Identity	D1	D1	D1	D1		
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	1.00 - 1.50	2.50 - 3.00	4.00 - 4.50	5.00 - 5.50		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	24/11/2009	24/11/2009	24/11/2009	24/11/2009		
		Date Received	25/11/2009	25/11/2009	25/11/2009	25/11/2009		
		SDG Ref	091126-85	091126-85	091126-85	091126-85		
	Lab Sample No.(s)	716781	655785	655840	716782			
Component	LOD/Units	Method						
GRO C5-C12	<44 µg/kg	TM089	<44.0	<44.0	5370	162000		
			#	#	#	#		
MTBE	<5 µg/kg	TM089	<5.00	<5.00	26.9	866		
			#	#	#	#		
Benzene	<10 µg/kg	TM089	<10.0	<10.0	658	1790		
			M	M	M	M		
Toluene	<2 µg/kg	TM089	<2.00	<2.00	36.3	8690		
			M	M	M	M		
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	577	5140		
			M	M	M	M		
m & p Xylene	<6 µg/kg	TM089	<6.00	<6.00	113	26400		
			M	M	M	M		
o Xylene	<3 µg/kg	TM089	<3.00	<3.00	158	10200		
			M	M	M	M		
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	<10.0	271	36600		
			M	M	M	M		
Sum of BTEX	<10 µg/kg	TM089	<10.0	<10.0	1540	52200		
			M	M	M	M		
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	12.9	59.0		
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	413	17900		
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	<10.0	436	17200		
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	<10.0	914	19100		
Total Aliphatics C5-C12	<10 µg/kg	TM089	<10.0	<10.0	1780	54300		
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	658	1790		
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	36.3	8690		
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	<10.0	1500	67500		
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	<10.0	1370	28600		
Total Aromatics C6-C12	<10 µg/kg	TM089	<10.0	<10.0	3570	107000		

SDG: 091126-85
Job: D_MOUCHEL_ELE-78
Client Reference: 24/11/09 (D1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67273

PAH micro by GCMS

Results Legend		Sample Identity	D1	D1	D1	D1		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	1.00 - 1.50 Soil/Solid 24/11/2009 25/11/2009 091126-85 716781	2.50 - 3.00 Soil/Solid 24/11/2009 25/11/2009 091126-85 655785	4.00 - 4.50 Soil/Solid 24/11/2009 25/11/2009 091126-85 655840	5.00 - 5.50 Soil/Solid 24/11/2009 25/11/2009 091126-85 716782		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	783 M	354 M	3000 M	853000 M		
Acenaphthylene (S)	<12 µg/kg	TM218	475 M	415 M	2270 M	118000 M		
Acenaphthene (S)	<8 µg/kg	TM218	165 M	52.7 M	1990 M	30600 M		
Fluorene (S)	<10 µg/kg	TM218	374 M	120 M	1500 M	106000 M		
Phenanthrene (S)	<15 µg/kg	TM218	5810 M	1990 M	900 M	265000 M		
Anthracene (S)	<16 µg/kg	TM218	2300 M	1110 M	283 M	92800 M		
Fluoranthene (S)	<17 µg/kg	TM218	11300 M	5450 M	1290 M	175000 M		
Pyrene (S)	<15 µg/kg	TM218	8850 M	4590 M	1180 M	118000 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	6010 M	3970 M	1040 M	48200 M		
Chrysene (S)	<10 µg/kg	TM218	4880 M	3660 M	851 M	37100 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	5290 M	6180 M	1820 M	37600 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3080 M	2620 M	760 M	16600 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	5870 M	5110 M	1500 M	34600 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	3360 M	3370 M	1100 M	16900 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1130 M	1200 M	346 M	4680 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	3480 M	3530 M	1190 M	19400 M		
PAH 16 EPA Total	<118 µg/kg	TM218	63200 M	43700 M	21000 M	1970000 M		

SDG: 091126-85
Job: D_MOUCHEL_ELE-78
Client Reference: 24/11/09 (D1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67273

VOC MS (S)

Results Legend			Sample Identity		D1	D1				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	4.00 - 4.50	5.00 - 5.50					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	24/11/2009	24/11/2009					
			Date Received	25/11/2009	25/11/2009					
			SDG Ref	091126-85	091126-85					
			Lab Sample No.(s)	655840	716782					
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM116		105	136					
Toluene-d8**	%	TM116		95.9	61.6					
4-Bromofluorobenzene**	%	TM116		82.8	69.5					
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0					
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0					
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0					
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00					
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
Carbon Disulphide	<9 µg/kg	TM116		<9.00	<9.00					
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0					
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0					
Chloroform	<10 µg/kg	TM116		<10.0	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0					
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0					
Benzene	<9 µg/kg	TM116		275	1530					
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0					
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0					
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0					
Toluene	<6 µg/kg	TM116		12.4	21800					
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00					
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00					
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0					
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0					
Ethylbenzene	<9 µg/kg	TM116		301	20200					

SDG: 091126-85
Job: D_MOUCHEL_ELE-78
Client Reference: 24/11/09 (D1)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67273

VOC MS (S)

Results Legend			Sample Identity		D1	D1				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	4.00 - 4.50	5.00 - 5.50					
			Sample Type	Soil/Solid	Soil/Solid					
			Date Sampled	24/11/2009	24/11/2009					
			Date Received	25/11/2009	25/11/2009					
			SDG Ref	091126-85	091126-85					
			Lab Sample No.(s)	655840	716782					
Component	LOD/Units	Method								
p/m-Xylene	<13 µg/kg	TM116	42.6		113000	#	#			
o-Xylene	<11 µg/kg	TM116	56.7	M	44000	M	M			
Styrene	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
Bromoform	<12 µg/kg	TM116	<12.0	M	<12.0	M	M			
Isopropylbenzene	<9 µg/kg	TM116	48.7	M	1480	M	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#	<15.0	#	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M	<13.0	M	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M	<14.0	M	M			
Propylbenzene	<6 µg/kg	TM116	77.2	M	2180	M	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#	<14.0	#	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8.00	M	30300	M	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#	<9.00	#	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	24.8	#	69200	#	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#	204	#	#			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#	904	#	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#	<8.00	#	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#	<7.00	#	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M	<8.00	M	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M	<11.0	M	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#	<7.00	#	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#	<9.00	#	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#	<15.0	#	#			
Naphthalene	<7 µg/kg	TM116	420	#	1400000	#	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#	<12.0	#	#			

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 17 December 2009
Job: D_MOUCHEL_ELE-80
Sample Delivery Group (SDG): 091130-11 **Report No.:** 67665
Your Reference: D12 WS / E12 WS
Location: Limerick Gasworks

A total of 4 samples was received on Friday November 27, 2009 and completed on Thursday December 10, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091130-11
Job: D_MOUCHEL_ELE-80
Client Reference: D12 WS / E12 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67665

SOLID

Results Legend	Sample ID	D12 WS		E12 WS		Total
		Depth (m)		Depth (m)		
		Container		Container		
X Test						
N No Determination Possible						
		0.20 - 0.25	0.30 - 0.70	0.50 - 0.70		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)		
Ammonium Soil by Titration	All		X	X	X	0 3
Asbestos Presence Screen	All		X			0 1
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X	X	X	0 3
Easily Liberated Sulphide	All		X	X	X	0 3
EPH CWG (Aliphatic) GC (S)	All		X	X	X	0 3
EPH CWG (Aromatic) GC (S)	All		X	X	X	0 3
GRO BTEX MTBE GC (S)	All	X	X	X		0 3
Hexavalent Chromium (s)	All		X	X	X	0 3
Metals by iCap-OES (Soil)	Arsenic		X	X	X	0 3
	Cadmium		X	X	X	0 3
	Chromium		X	X	X	0 3
	Copper		X	X	X	0 3
	Lead		X	X	X	0 3
	Mercury		X	X	X	0 3
	Nickel		X	X	X	0 3
	Selenium		X	X	X	0 3
	Zinc		X	X	X	0 3
PAH micro by GCMS	All		X	X	X	0 3
pH	All		X	X	X	0 3
Phenols by HPLC (S)	All		X	X	X	0 3
Sample description	All		X	X	X	0 3
Total Sulphate	All		X	X	X	0 3
TPH CWG GC (S)	All		X	X	X	0 3
VOC MS (S)	All			X		0 1

SDG:	091130-11	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-80	Attention:	Verity Sankey
Client Reference:	D12 WS / E12 WS	Order No.:	
Location:	Limerick Gasworks	Report No:	67665

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
D12 WS	0.20 - 0.25	Brown	Sand	0.1 - 2 mm	Stones
	0.30 - 0.70	Brown	Silty Clay	0.063 - 0.1 mm	Stones
E12 WS	0.50 - 0.70	Brown	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091130-11
Job: D_MOUCHEL_ELE-80
Client Reference: D12 WS / E12 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67665

Test Completion dates

SDG reference: 091130-11

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PAH by GCMS	Metals by Cap-CES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyanate	Asbestos Presence Screen	Ammonium Soil by Titration
D12 WS	0.20 - 0.25	SOLID	09/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	04/12/2009	08/12/2009	04/12/2009	08/12/2009	06/12/2009	06/12/2009	06/12/2009	04/12/2009	01/12/2009	04/12/2009	04/12/2009
	0.30 - 0.70	SOLID	10/12/2009	08/12/2009	03/12/2009	07/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	04/12/2009	10/12/2009	06/12/2009	06/12/2009	04/12/2009	06/12/2009	04/12/2009	04/12/2009
E12 WS	0.50 - 0.70	SOLID	08/12/2009	09/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	04/12/2009	07/12/2009	04/12/2009	08/12/2009	06/12/2009	06/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009

SDG 091130-11
Job: D_MOUCHEL_ELE-80
Client Reference: D12 WS / E12 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67665

Results Legend			Sample Identity	D12 WS	D12 WS	E12 WS			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.20 - 0.25	0.30 - 0.70	0.50 - 0.70			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	26/11/2009	26/11/2009	26/11/2009			
			Date Received	27/11/2009	27/11/2009	27/11/2009			
			SDG Ref	091130-11	091130-11	091130-11			
			Lab Sample No.(s)	665694	665712	665796			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0	M	<15.0	M	<15.0	M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0		<15.0		<15.0		
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500		<0.0500		<0.0500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100		<0.0100		<0.0100		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100	M	<0.0100	M	<0.0100	M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150	M	<0.0150	M	<0.0150	M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00		0.00		0.00		
pH value of soil	1 pH Units	TM133	10.57	M	7.80	M	8.38	M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60	#	<0.60	#	<0.60	#	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600	#	<0.600	#	<0.600	#	
Total Cyanide	<1 mg/kg	TM153	1.64	M	<1.00	M	1.90	M	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00	#	<15.00	#	47.87	#	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0	#	<15.0	#	51.8	#	
Arsenic	<0.6 mg/kg	TM181	8.81	M	13.2	M	5.69	M	
Cadmium	<0.02 mg/kg	TM181	<0.0200	M	0.0454	M	0.453	M	
Chromium	<0.9 mg/kg	TM181	12.4	M	20.6	M	6.14	M	
Copper	<1.4 mg/kg	TM181	35.2	M	20.2	M	28.5	M	
Lead	<0.7 mg/kg	TM181	501	M	136	M	21.7	M	
Mercury	<0.14 mg/kg	TM181	0.531	M	<0.140	M	1.24	M	
Nickel	<0.2 mg/kg	TM181	14.2	M	37.7	M	6.28	M	
Selenium	<1 mg/kg	TM181	<1.00	#	<1.00	#	<1.00	#	
Zinc	<1.9 mg/kg	TM181	268	M	50.6	M	20.1	M	
Total Sulphate	<48 mg/kg	TM221	22800	M	645	M	1690	M	

SDG 091130-11
Job: D_MOUCHEL_ELE-80
Client Reference: D12 WS / E12 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67665

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D12 WS	D12 WS	E12 WS
Depth (m)	0.20 - 0.25	0.30 - 0.70	0.50 - 0.70
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	26/11/2009	26/11/2009	26/11/2009
Date Received	27/11/2009	27/11/2009	27/11/2009
SDG Ref	091130-11	091130-11	091130-11
Lab Sample No.(s)	665694	665712	665796

Component	LOD/Units	Method	D12 WS	D12 WS	E12 WS
Aromatics >EC12-EC16	<100 µg/kg	TM173	12800	4560	39600
Aromatics >EC16-EC21	<100 µg/kg	TM173	24500	722	85800
Aromatics >EC21-EC35	<100 µg/kg	TM173	79600	9730	674000
Aromatics >EC35-EC44	<100 µg/kg	TM173	25800	8230	204000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	143000	23200	1000000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	143000	23200	1000000

SDG: 091130-11
Job: D_MOUCHEL_ELE-80
Client Reference: D12 WS / E12 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
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GRO BTEX MTBE GC (S)

Results Legend
 # ISO17025 accredited.
 M mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	D12 WS	D12 WS	E12 WS
Depth (m)	0.20 - 0.25	0.30 - 0.70	0.50 - 0.70
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	26/11/2009	26/11/2009	26/11/2009
Date Received	27/11/2009	27/11/2009	27/11/2009
SDG Ref	091130-11	091130-11	091130-11
Lab Sample No.(s)	665694	665712	716414

Component	LOD/Units	Method	D12 WS	D12 WS	E12 WS
GRO C5-C12	<44 µg/kg	TM089	85.5	<44.0	19300
			#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00
			#	#	#
Benzene	<10 µg/kg	TM089	<10.0	<10.0	<10.0
			M	M	M
Toluene	<2 µg/kg	TM089	<4.00	<2.00	<2.00
			M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	<3.00
			M	M	M
m & p Xylene	<6 µg/kg	TM089	<6.00	<6.00	<6.00
			M	M	M
o Xylene	<3 µg/kg	TM089	<3.00	<3.00	<3.00
			M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	<10.0	<10.0
			M	M	M
Sum of BTEX	<10 µg/kg	TM089	<10.0	<10.0	<10.0
			M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	13.0
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	112
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	<10.0	1850
Aliphatics >C10-C12	<10 µg/kg	TM089	34.2	17.3	5830
Total Aliphatics C5-C12	<10 µg/kg	TM089	34.2	17.3	7800
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	<10.0
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	<10.0	2770
Aromatics >EC10-EC12	<10 µg/kg	TM089	51.3	25.9	8740
Total Aromatics C6-C12	<10 µg/kg	TM089	51.3	25.9	11500

SDG 091130-11
 Job: D_MOUCHEL_ELE-80
 Client Reference: D12 WS / E12 WS
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
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PAH micro by GCMS

Component	LOD/Units	Method	Sample Identity			
			D12 WS	D12 WS	E12 WS	
Results Legend # ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.						
			Depth (m)	0.20 - 0.25	0.30 - 0.70	0.50 - 0.70
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	26/11/2009	26/11/2009	26/11/2009
			Date Received	27/11/2009	27/11/2009	27/11/2009
			SDG Ref	091130-11	091130-11	091130-11
			Lab Sample No.(s)	665694	665712	665796
Naphthalene (S)	<9 µg/kg	TM218	206	30.8	534	
Acenaphthylene (S)	<12 µg/kg	TM218	51.4	33.6	637	
Acenaphthene (S)	<8 µg/kg	TM218	9.86	<8.00	6520	
Fluorene (S)	<10 µg/kg	TM218	15.6	<10.0	5600	
Phenanthrene (S)	<15 µg/kg	TM218	649	50.2	6980	
Anthracene (S)	<16 µg/kg	TM218	108	20.3	3570	
Fluoranthene (S)	<17 µg/kg	TM218	1080	176	5150	
Pyrene (S)	<15 µg/kg	TM218	846	167	3850	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	496	124	1240	
Chrysene (S)	<10 µg/kg	TM218	533	103	905	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	1050	172	1360	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	316	63.9	543	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	530	124	1120	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	485	93.0	561	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	133	30.7	143	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	600	139	634	
PAH 16 EPA Total	<118 µg/kg	TM218	7120	1330	39400	

SDG 091130-11
 Job: D_MOUCHEL_ELE-80
 Client Reference: D12 WS / E12 WS
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
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VOC MS (S)

Results Legend			Sample Identity	E12 WS				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.50 - 0.70				
			Sample Type	Soil/Solid				
			Date Sampled	26/11/2009				
			Date Received	27/11/2009				
			SDG Ref	091130-11				
			Lab Sample No.(s)	716414				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	127					
Toluene-d8**	%	TM116	53.6					
4-Bromofluorobenzene**	%	TM116	65.3					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0					
Chloromethane	<12 µg/kg	TM116	<12.0					
Vinyl Chloride	<10 µg/kg	TM116	<10.0					
Bromoethane	<9 µg/kg	TM116	<9.00					
Chloroethane	<12 µg/kg	TM116	<12.0					
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00					
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00					
Carbon Disulphide	<9 µg/kg	TM116	11.6					
Dichloromethane	<10 µg/kg	TM116	<10.0					
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00					
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0					
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00					
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00					
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Bromochloromethane	<10 µg/kg	TM116	<10.0					
Chloroform	<10 µg/kg	TM116	<10.0					
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0					
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0					
Carbontetrachloride	<11 µg/kg	TM116	<11.0					
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0					
Benzene	<9 µg/kg	TM116	<9.00					
Trichloroethene	<9 µg/kg	TM116	<9.00					
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0					
Dibromomethane	<12 µg/kg	TM116	<12.0					
Bromodichloromethane	<11 µg/kg	TM116	<11.0					
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0					
Toluene	<6 µg/kg	TM116	<6.00					
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00					
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00					
Tetrachloroethene	<9 µg/kg	TM116	<9.00					
Dibromochloromethane	<9 µg/kg	TM116	<9.00					
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0					
Chorobenzene	<7 µg/kg	TM116	<7.00					
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0					
Ethylbenzene	<9 µg/kg	TM116	27.4					

SDG 091130-11
 Job: D_MOUCHEL_ELE-80
 Client Reference: D12 WS / E12 WS
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67665

VOC MS (S)

Results Legend		Sample Identity	E12 WS				
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.50 - 0.70				
		Sample Type	Soil/Solid				
		Date Sampled	26/11/2009				
		Date Received	27/11/2009				
		SDG Ref	091130-11				
		Lab Sample No.(s)	716414				
Component	LOD/Units	Method					
p/m-Xylene	<13 µg/kg	TM116	<13.0	#			
o-Xylene	<11 µg/kg	TM116	17.2	M			
Styrene	<11 µg/kg	TM116	<11.0	M			
Bromoform	<12 µg/kg	TM116	<12.0	M			
Isopropylbenzene	<9 µg/kg	TM116	<9.00	M			
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0	#			
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0	M			
Bromobenzene	<14 µg/kg	TM116	<14.0	M			
Propylbenzene	<6 µg/kg	TM116	<6.00	M			
2-Chlorotoluene	<14 µg/kg	TM116	<14.0	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8.00	M			
4-Chlorotoluene	<9 µg/kg	TM116	<9.00	#			
tert-Butylbenzene	<12 µg/kg	TM116	<12.0	#			
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	<10.0	#			
sec-Butylbenzene	<8 µg/kg	TM116	<8.00	#			
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00	#			
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0	M			
n-Butylbenzene	<7 µg/kg	TM116	<7.00	#			
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00	M			
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0	M			
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00	#			
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00	#			
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0	#			
Naphthalene	<7 µg/kg	TM116	<7.00	#			
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0	#			

Table of Results - Appendix

SDG Number : 091130-11

Client : Mouchel

Client Ref : D12 WS / E12 WS

REPORT KEY

NDP		#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
No Determination Possible							
NFD		PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)
No Fibres Detected							

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹
PM001			Dry
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material	Wet
TM001	In - house Method	Determination of asbestos containing material by screening on solids	
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids	Wet
TM062 (S)			Wet
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter	Wet
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser	Wet
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser	Wet
TM173		Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID	Dry
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique	Wet
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES	Dry
TM218		Microwave extraction - EPA method 3546	Wet
TM221			Dry

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 15 January 2010
Job: D_MOUCHEL_ELE-82
Sample Delivery Group (SDG): 091130-15 **Report No.:** 69878
Your Reference: 26/11/09 (N1WS/N2WS/L11WS/
Location: Limerick Gasworks

A total of 7 samples was received on Friday November 27, 2009 and completed on Friday January 15, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091130-15
Job: D_MOUCHEL_ELE-82
Client Reference: 26/11/09 (N1WS/N2WS/L11WS/L12WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 69878

SOLID

Results Legend	Sample ID	L11WS		L12WS		N1WS		N2WS		Total					
		Depth (m)		Depth (m)		Depth (m)		Depth (m)							
		Container		Container		Container		Container							
X Test															
N No Determination Possible															
		0.10 - 0.40	0.10 - 0.40	0.00 - 0.30	0.00 - 0.30	0.70 - 1.00	0.70 - 1.00	1.80 - 2.00	1.80 - 2.00	2.70 - 3.60	2.70 - 3.60	0.70 - 0.90	0.70 - 0.90	2.00 - 2.60	2.00 - 2.60
		60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)
Ammonium Soil by Titration	All	X		X		X		X		X		X		X	0
Asbestos Presence Screen	All					X									7
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X		X		X		X		X		X		0
Easily Liberated Sulphide	All		X		X		X		X		X		X		7
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X		X		X		0
EPH CWG (Aromatic) GC (S)	All		X		X		X		X		X		X		7
GRO BTEX MTBE GC (S)	All		X		X		X		X		X		X		0
Hexavalent Chromium (s)	All	X		X		X		X		X		X		X	7
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X		X		X		0
	Cadmium		X		X		X		X		X		X		7
	Chromium		X		X		X		X		X		X		0
	Copper		X		X		X		X		X		X		7
	Lead		X		X		X		X		X		X		0
	Mercury		X		X		X		X		X		X		7
	Nickel		X		X		X		X		X		X		0
	Selenium		X		X		X		X		X		X		7
	Zinc		X		X		X		X		X		X		0
PAH micro by GCMS	All		X		X		X		X		X		X		7
PCBs by GCMS	All		X				X								0
pH	All		X		X		X		X		X		X		2
Phenols by HPLC (S)	All		X		X		X		X		X		X		0
Sample description	All		X		X		X		X		X		X		7
Total Sulphate	All		X		X		X		X		X		X		0
Total Sulphur	All		X		X		X		X		X		X		7
TPH CWG GC (S)	All		X		X		X		X		X		X		0
VOC MS (S)	All	X			X					X					0
															3

SDG:	091130-15	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-82	Attention:	Verity Sankey
Client Reference:	26/11/09 (N1WS/N2WS/L11WS/L12WS)	Order No.:	
Location:	Limerick Gasworks	Report No.:	69878

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
L11WS	0.10 - 0.40	Brown	Sandy Clay	0.063 - 0.1 mm	Stones
L12WS	0.00 - 0.30	Brown	Sandy Clay	0.1 - 2 mm	Stones
N1WS	0.70 - 1.00	Grey	Sand	0.063 - 0.1 mm	Stones
	1.80 - 2.00	Brown	Silty Sand	0.063 - 0.1 mm	Stones
	2.70 - 3.60	White	Silty Sand	0.063 - 0.1 mm	N/A
N2WS	0.70 - 0.90	Beige	Sand	0.063 - 0.1 mm	Stones
	2.00 - 2.60	Brown	Silty Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG:	091130-15	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-82	Attention:	Verity Sankey
Client Reference:	26/11/09 (N1WS/N2WS/L11WS/L12WS)	Order No.:	
Location:	Limerick Gasworks	Report No:	69878

Test Completion dates

SDG reference: 091130-15

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphur	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
L11WS	0.10 - 0.40	SOLID	03/12/2009	09/12/2009		03/12/2009	01/12/2009	07/12/2009	04/12/2009	04/12/2009	03/12/2009	03/12/2009	04/12/2009	09/12/2009	04/12/2009	04/12/2009	08/12/2009	06/12/2009		08/12/2009
L12WS	0.00 - 0.30	SOLID		09/12/2009		08/12/2009	03/12/2009	07/12/2009	04/12/2009	04/12/2009	04/12/2009	07/12/2009	04/12/2009	09/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009		08/12/2009
N1WS	0.70 - 1.00	SOLID		09/12/2009		04/12/2009	01/12/2009	07/12/2009	04/12/2009		03/12/2009	04/12/2009	09/12/2009	09/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009	01/12/2009	08/12/2009
	1.80 - 2.00	SOLID		09/12/2009		04/12/2009	01/12/2009	08/12/2009	07/12/2009	07/12/2009	03/12/2009	04/12/2009	09/12/2009	09/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009		08/12/2009
	2.70 - 3.60	SOLID		09/12/2009	15/01/2010	15/01/2010	01/12/2009	07/12/2009	04/12/2009		03/12/2009	04/12/2009	09/12/2009	09/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009		08/12/2009
N2WS	0.70 - 0.90	SOLID	03/12/2009	09/12/2009		04/12/2009	01/12/2009	07/12/2009	04/12/2009		03/12/2009	04/12/2009	09/12/2009	09/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009		08/12/2009
	2.00 - 2.60	SOLID		09/12/2009		04/12/2009	01/12/2009	07/12/2009	04/12/2009		03/12/2009	04/12/2009	09/12/2009	09/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009		08/12/2009

SDG: 091130-15
Job: D_MOUCHEL_ELE-82
Client Reference: 26/11/09 (N1WS/N2WS/L11WS/L12WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No.: 69859

Results Legend			Sample Identity	L11WS	L12WS	N1WS	N1WS	N1WS	N2WS
# ISO17025 accredited. # mCERTS accredited. subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.40	0.00 - 0.30	0.70 - 1.00	1.80 - 2.00	2.70 - 3.60	0.70 - 0.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/12/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009
			Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009
			SDG Ref	091130-15	091130-15	091130-15	091130-15	091130-15	091130-15
			Lab Sample No.(s)	666216	666267	665994	666063	666076	666126
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001	No ACM Detected						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15 M	<15 M	<15 M	<15 M	<15 M	<15 M	<15 M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15	<15	<15	<15	<15	<15	<15
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0	0	0	0	0	0	0
Total Sulphur	<0.02 %	TM132					5.1	#	
pH value of soil	1 pH Units	TM133	8.47 M	8.89 M	9.42 M	8.86 M	10.25 M	8.4 M	M
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Total Cyanide	<1 mg/kg	TM153	<1 M	<1 M	16.8 M	<1 M	171 M	99 M	M
PCB congener 28	<3 µg/kg	TM168	<3			<3			
PCB congener 52	<3 µg/kg	TM168	<3			<3			
PCB congener 101	<3 µg/kg	TM168	<3			<3			
PCB congener 118	<3 µg/kg	TM168	<3			<3			
PCB congener 138	<3 µg/kg	TM168	<3			<3			
PCB congener 153	<3 µg/kg	TM168	<3			<3			
PCB congener 180	<3 µg/kg	TM168	<3			<3			
Total of 7 Congener PCBs	<3 µg/kg	TM168	<3			<3			
Easily Liberated Sulphide	<15 mg/kg	TM180	<15 #	<15 #	<15 #	83.5 #	888.51 #	149.96 #	#
Easily Liberated Sulphide	<15 mg/kg	TM180	<15 #	<15 #	<15 #	153 #	1710 #	207 #	#
Arsenic	<0.6 mg/kg	TM181	6.21 M	7.14 M	9.61 M	370 M	10.5 M	10.1 M	M
Cadmium	<0.02 mg/kg	TM181	0.932 M	0.189 M	0.256 M	4.9 M	0.233 M	0.219 M	M
Chromium	<0.9 mg/kg	TM181	8.42 M	8.15 M	18.4 M	38.3 M	13.2 M	13 M	M
Copper	<1.4 mg/kg	TM181	11.3 M	15.8 M	38.9 M	146 M	29.2 M	31.7 M	M
Lead	<0.7 mg/kg	TM181	22.8 M	53.7 M	65.9 M	873 M	20.4 M	38.8 M	M
Mercury	<0.14 mg/kg	TM181	0.179 M	0.167 M	1.06 M	0.163 M	0.278 M	0.16 M	M
Nickel	<0.2 mg/kg	TM181	10.4 M	9.46 M	21.3 M	73.8 M	15 M	19.9 M	M
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #	9.99 #	<1 #	<1 #	#
Zinc	<1.9 mg/kg	TM181	25.8 M	76 M	40.5 M	867 M	19.7 M	15.5 M	M
Total Sulphate	<48 mg/kg	TM221	2410 M	262 M	16800 M	12200 M	3440000 M	128000 M	M

SDG: 091130-15
Job: D_MOUCHEL_ELE-82
Client Reference: 26/11/09 (N1WS/N2WS/L11WS/L12WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 69859

GRO BTEX MTBE GC (S)

Results Legend	Sample Identity	L11WS	L12WS	N1WS	N1WS	N1WS	N2WS
	Depth (m)	0.10 - 0.40	0.00 - 0.30	0.70 - 1.00	1.80 - 2.00	2.70 - 3.60	0.70 - 0.90
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	03/12/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009
	Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009
	SDG Ref	091130-15	091130-15	091130-15	091130-15	091130-15	091130-15
	Lab Sample No.(s)	666216	666267	665994	666063	666076	666126

Component	LOD/Units	Method	L11WS	L12WS	N1WS	N1WS	N1WS	N2WS
GRO C5-C12	<44 µg/kg	TM089	159 #	<44 #	<44 #	<44 #	<44 #	<44 #
MTBE	<5 µg/kg	TM089	10.7 #	<5 #	<5 #	<5 #	<5 #	<5 #
Benzene	<10 µg/kg	TM089	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Toluene	<2 µg/kg	TM089	13.9 M	<2 M	<2 M	<2 M	<2 M	<2 M
Ethyl Benzene	<3 µg/kg	TM089	<3 M	<3 M	<3 M	<3 M	<3 M	<3 M
m & p Xylene	<6 µg/kg	TM089	10.7 M	<6 M	<6 M	<6 M	<6 M	<6 M
o Xylene	<3 µg/kg	TM089	<4 M	<3 M	<3 M	<3 M	<3 M	<3 M
Sum m&p and o Xylene	<10 µg/kg	TM089	10.7 M	<10 M	<10 M	<10 M	<10 M	<10 M
Sum of BTEX	<10 µg/kg	TM089	24.6 M	<10 M	<10 M	<10 M	<10 M	<10 M
Aliphatics C5-C6	<10 µg/kg	TM089	38	<10	<10	<10	<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089	54.9	<10	<10	<10	<10	<10
Aliphatics >C8-C10	<10 µg/kg	TM089	12.4	<10	<10	<10	<10	<10
Aliphatics >C10-C12	<10 µg/kg	TM089	<10	<10	<10	<10	<10	<10
Total Aliphatics C5-C12	<10 µg/kg	TM089	105	<10	<10	<10	<10	<10
Aromatics C6-C7	<10 µg/kg	TM089	<10	<10	<10	<10	<10	<10
Aromatics >C7-C8	<10 µg/kg	TM089	13.9	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089	29.3	<10	<10	<10	<10	<10
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10	<10	<10	<10	<10	<10
Total Aromatics C6-C12	<10 µg/kg	TM089	43.2	<10	<10	<10	<10	<10

SDG: 091130-15
Job: D_MOUCHEL_ELE-82
Client Reference: 26/11/09 (N1WS/N2WS/L11WS/L12WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No.: 69859

PAH micro by GCMS

Results Legend	Sample Identity		L11WS	L12WS	N1WS	N1WS	N1WS	N2WS
	Depth (m)	Sample Type	0.10 - 0.40 Soil/Solid	0.00 - 0.30 Soil/Solid	0.70 - 1.00 Soil/Solid	1.80 - 2.00 Soil/Solid	2.70 - 3.60 Soil/Solid	0.70 - 0.90 Soil/Solid
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Date Sampled	03/12/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009	26/11/2009
	Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009
	SDG Ref	091130-15	091130-15	091130-15	091130-15	091130-15	091130-15	091130-15
	Lab Sample No.(s)	666216	666267	665994	666063	666076	666126	666126

Component	LOD/Units	Method	L11WS	L12WS	N1WS	N1WS	N1WS	N2WS
Naphthalene (S)	<9 µg/kg	TM218	348 M	90.8 M	1710 M	2120 M	2250 M	251 M
Acenaphthylene (S)	<12 µg/kg	TM218	613 M	365 M	393 M	619 M	1890 M	518 M
Acenaphthene (S)	<8 µg/kg	TM218	37.3 M	44.4 M	139 M	88.7 M	72.4 M	23.1 M
Fluorene (S)	<10 µg/kg	TM218	117 M	118 M	91.7 M	229 M	111 M	31.4 M
Phenanthrene (S)	<15 µg/kg	TM218	738 M	1620 M	5220 M	13300 M	7450 M	890 M
Anthracene (S)	<16 µg/kg	TM218	346 M	453 M	1140 M	2840 M	15900 M	342 M
Fluoranthene (S)	<17 µg/kg	TM218	2180 M	3920 M	10600 M	30000 M	44200 M	7000 M
Pyrene (S)	<15 µg/kg	TM218	1710 M	3240 M	9190 M	23800 M	108000 M	7700 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1470 M	1600 M	7250 M	16800 M	36400 M	7040 M
Chrysene (S)	<10 µg/kg	TM218	1310 M	1460 M	6860 M	16200 M	40800 M	4980 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	2100 M	2490 M	10400 M	19300 M	58600 M	14400 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	917 M	955 M	4860 M	9290 M	26000 M	5740 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	1920 M	1970 M	8840 M	14500 M	43800 M	10600 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	1150 M	1160 M	7090 M	11900 M	31100 M	8720 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	299 M	308 M	1990 M	3710 M	7860 M	2090 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1330 M	1320 M	8790 M	14300 M	34700 M	10200 M
PAH 16 EPA Total	<118 µg/kg	TM218	16600 M	21100 M	84600 M	179000 M	459000 M	80500 M

SDG: 091130-15
Job: D_MOUCHEL_ELE-82
Client Reference: 26/11/09 (N1WS/N2WS/L11WS/L12WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 69859

VOC MS (S)

Results Legend			Sample Identity	L11WS	N1WS	N2WS			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.40	0.70 - 1.00	0.70 - 0.90			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	03/12/2009	26/11/2009	26/11/2009			
			Date Received	27/11/2009	27/11/2009	27/11/2009			
			SDG Ref	091130-15	091130-15	091130-15			
			Lab Sample No.(s)	666216	665994	666126			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	107	127	112				
Toluene-d8**	%	TM116	92.9	93.4	97.3				
4-Bromofluorobenzene**	%	TM116	78.9	79.4	98.4				
Dichlorodifluoromethane	<13 µg/kg	TM116	<13	<13	<13	M	M	M	
Chloromethane	<12 µg/kg	TM116	<12	<12	<12	#	#	#	
Vinyl Chloride	<10 µg/kg	TM116	<10	<10	<10	M	M	M	
Bromoethane	<9 µg/kg	TM116	<9	<9	<9	M	M	M	
Chloroethane	<12 µg/kg	TM116	<12	<12	<12	M	M	M	
Trichlorofluoromethane	<7 µg/kg	TM116	<7	<7	<7	M	M	M	
1,1-Dichloroethene	<9 µg/kg	TM116	<9	<9	<9	#	#	#	
Carbon Disulphide	<9 µg/kg	TM116	<9	60.4	162	M	M	M	
Dichloromethane	<10 µg/kg	TM116	<10	<10	<10	M	M	M	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9	<9	<9	M	M	M	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12	<12	<12	M	M	M	
1,1-Dichloroethane	<8 µg/kg	TM116	<8	<8	<8	M	M	M	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9	<9	<9	M	M	M	
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10	<10	M	M	M	
Bromochloromethane	<10 µg/kg	TM116	<10	<10	<10	M	M	M	
Chloroform	<10 µg/kg	TM116	<10	<10	<10	M	M	M	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12	<12	<12	M	M	M	
1,1-Dichloropropene	<13 µg/kg	TM116	<13	<13	<13	M	M	M	
Carbontetrachloride	<11 µg/kg	TM116	<11	<11	<11	M	M	M	
1,2-Dichloroethane	<10 µg/kg	TM116	<10	<10	<10	M	M	M	
Benzene	<9 µg/kg	TM116	<9	<9	<9	M	M	M	
Trichloroethene	<9 µg/kg	TM116	<9	<9	<9	#	#	#	
1,2-Dichloropropane	<10 µg/kg	TM116	<10	<10	<10	M	M	M	
Dibromomethane	<12 µg/kg	TM116	<12	<12	<12	M	M	M	
Bromodichloromethane	<11 µg/kg	TM116	<11	<11	<11	M	M	M	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25	<25	<25	M	M	M	
Toluene	<6 µg/kg	TM116	12.1	<6	<6	M	M	M	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27	<27	<27	M	M	M	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9	<9	<9	M	M	M	
1,3-Dichloropropane	<7 µg/kg	TM116	<7	<7	<7	M	M	M	
Tetrachloroethene	<9 µg/kg	TM116	<9	<9	<9	M	M	M	
Dibromochloromethane	<9 µg/kg	TM116	<9	<9	<9	M	M	M	
1,2-Dibromoethane	<14 µg/kg	TM116	<14	<14	<14	M	M	M	
Chorobenzene	<7 µg/kg	TM116	<7	<7	<7	M	M	M	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11	<11	<11	M	M	M	
Ethylbenzene	<9 µg/kg	TM116	<9	<9	<9	M	M	M	

SDG: 091130-15
Job: D_MOUCHEL_ELE-82
Client Reference: 26/11/09 (N1WS/N2WS/L11WS/L12WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No.: 69859

VOC MS (S)

Results Legend			Sample Identity	L11WS	N1WS	N2WS			
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.10 - 0.40	0.70 - 1.00	0.70 - 0.90			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	03/12/2009	26/11/2009	26/11/2009			
			Date Received	27/11/2009	27/11/2009	27/11/2009			
			SDG Ref	091130-15	091130-15	091130-15			
			Lab Sample No.(s)	666216	665994	666126			
			Method						
Component	LOD/Units	Method							
p/m-Xylene	<13 µg/kg	TM116	<13 #	<13 #	<13 #				
o-Xylene	<11 µg/kg	TM116	<11 M	<11 M	<11 M				
Styrene	<11 µg/kg	TM116	<11 M	<11 M	<11 M				
Bromoform	<12 µg/kg	TM116	<12 M	<12 M	<12 M				
Isopropylbenzene	<9 µg/kg	TM116	<9 M	<9 M	<9 M				
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15 #	<15 #	<15 #				
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13 M	<13 M	<13 M				
Bromobenzene	<14 µg/kg	TM116	<14 M	<14 M	<14 M				
Propylbenzene	<6 µg/kg	TM116	<6 M	<6 M	<6 M				
2-Chlorotoluene	<14 µg/kg	TM116	<14 #	<14 #	<14 #				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M				
4-Chlorotoluene	<9 µg/kg	TM116	<9 #	<9 #	<9 #				
tert-Butylbenzene	<12 µg/kg	TM116	<12 #	<12 #	<12 #				
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	<10 #	<10 #	<10 #				
sec-Butylbenzene	<8 µg/kg	TM116	<8 #	<8 #	<8 #				
4-Isopropyltoluene	<8 µg/kg	TM116	<8 #	<8 #	<8 #				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 #	<8 #	<8 #				
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11 M	<11 M	<11 M				
n-Butylbenzene	<7 µg/kg	TM116	<7 #	<7 #	<7 #				
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M				
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11 M	<11 M	<11 M				
Tert-amyl methyl ether	<7 µg/kg	TM116	<7 #	<7 #	<7 #				
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #				
Hexachlorobutadiene	<15 µg/kg	TM116	<15 #	<15 #	<15 #				
Naphthalene	<7 µg/kg	TM116	<7 #	<7 #	<7 #				
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12 #	<12 #	<12 #				

SDG: 091130-15
Job: D_MOUCHEL_ELE-82
Client Reference: 26/11/09 (N1WS/N2WS/L11WS/L12WS)
Location: Limerick Gasworks

Customer: Mouchel
Attention: David Megson
Order No.:
Report No: 69859

Results Legend		Sample Identity	N2WS				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.00 - 2.60 Soil/Solid 26/11/2009 27/11/2009 091130-15 666188				
Component	LOD/Units	Method					
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15	M			
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0				
pH value of soil	1 pH Units	TM133	10.33	M			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.6	#			
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.6	#			
Total Cyanide	<1 mg/kg	TM153	5.91	M			
Easily Liberated Sulphide	<15 mg/kg	TM180	63.02	#			
Easily Liberated Sulphide	<15 mg/kg	TM180	80.7	#			
Arsenic	<0.6 mg/kg	TM181	10.1	M			
Cadmium	<0.02 mg/kg	TM181	0.191	M			
Chromium	<0.9 mg/kg	TM181	8.28	M			
Copper	<1.4 mg/kg	TM181	14.2	M			
Lead	<0.7 mg/kg	TM181	59.6	M			
Mercury	<0.14 mg/kg	TM181	0.21	M			
Nickel	<0.2 mg/kg	TM181	10.6	M			
Selenium	<1 mg/kg	TM181	<1	#			
Zinc	<1.9 mg/kg	TM181	42.6	M			
Total Sulphate	<48 mg/kg	TM221	8500	M			

Table of Results - Appendix

SDG Number : 091130-15

Client : Mouchel

Client Ref : 26/11/09 (N1WS/N2WS/L11)

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹
PM001		Preparation of Samples for Metals Analysis	Dry
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material	Wet
TM001	In - house Method	Determination of asbestos containing material by screening on solids	
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids	Wet
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC	Wet
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	
TM132	In - house Method	ELTRA CS800 Operators Guide	Dry
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter	Wet
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser	Wet
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser	Wet
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils	Dry
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID	Dry
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique	Wet
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES	Dry
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry	
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546	Wet
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer	Dry

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 10 December 2009
Job: D_MOUCHEL_ELE-81
Sample Delivery Group (SDG): 091130-16 **Report No.:** 67185
Your Reference: F10 WS / F9 WS
Location: Limerick Gasworks

A total of 4 samples was received on Thursday November 26, 2009 and completed on Thursday December 10, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67185

SOLID

Results Legend	Sample ID	F10 WS				F9 WS				Total
		0.00 - 0.75		1.00 - 2.00		0.00 - 1.00		1.80 - 2.00		
		60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	60g VOC Dublin JAR (D) TUB (D)	
X Test										
N No Determination Possible										
Ammonium Soil by Titration	All		X		X		X		X	0
Asbestos Identification	All				X				X	4
Asbestos Presence Screen	All						X			0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X				X			2
Easily Liberated Sulphide	All		X		X		X		X	0
EPH CWG (Aliphatic) GC (S)	All		X		X		X		X	4
EPH CWG (Aromatic) GC (S)	All		X		X		X		X	0
GRO BTEX MTBE GC (S)	All		X		X				X	0
Hexavalent Chromium (s)	All			X			X			3
Metals by iCap-OES (Soil)	Arsenic		X		X		X		X	0
	Cadmium		X		X		X		X	4
	Chromium		X		X		X		X	0
	Copper		X		X		X		X	4
	Lead		X		X		X		X	0
	Mercury		X		X		X		X	4
	Nickel		X		X		X		X	0
	Selenium		X		X		X		X	4
	Zinc		X		X		X		X	0
PAH micro by GCMS	All		X		X		X		X	4
PCBs by GCMS	All				X					0
pH	All		X		X		X		X	0
Phenols by HPLC (S)	All		X		X		X		X	4
Sample description	All		X		X		X		X	0
Total Sulphate	All		X		X		X		X	4
TPH CWG GC (S)	All		X		X				X	0
VOC MS (S)	All			X			X			3
				X				X		0
									X	2

SDG:	091130-16	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-81	Attention:	Verity Sankey
Client Reference:	F10 WS / F9 WS	Order No.:	
Location:	Limerick Gasworks	Report No:	67185

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
F10 WS	0.00 - 0.75	Brown	Silty Sand	0.063 - 0.1 mm	Crushed Brick
	1.00 - 2.00	Grey	Silty Sand	0.063 - 0.1 mm	Oil/Petroleum
F9 WS	0.00 - 1.00	Brown	Sand	0.1 - 2 mm	Stones
	1.80 - 2.00	Brown	Sand	0.1 - 2 mm	Oil/Petroleum

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67185

Test Completion dates

SDG reference: 091130-16

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Asbestos Identification	Ammonium Soil by Titration
F10 WS	0.00 - 0.75	SOLID	08/12/2009	09/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	07/12/2009	04/12/2009	07/12/2009	04/12/2009	08/12/2009	07/12/2009	07/12/2009	04/12/2009	04/12/2009	01/12/2009		08/12/2009
	1.00 - 2.00	SOLID	04/12/2009	09/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	07/12/2009	04/12/2009	07/12/2009	04/12/2009	08/12/2009	07/12/2009	07/12/2009	08/12/2009	04/12/2009	06/12/2009	01/12/2009	04/12/2009
F9 WS	0.00 - 1.00	SOLID	04/12/2009	08/12/2009	08/12/2009	03/12/2009	07/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	08/12/2009	04/12/2009	06/12/2009	06/12/2009	04/12/2009	06/12/2009	06/12/2009	08/12/2009	08/12/2009
	1.80 - 2.00	SOLID	08/12/2009	09/12/2009	08/12/2009	03/12/2009	07/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	08/12/2009	04/12/2009	06/12/2009	06/12/2009	04/12/2009	06/12/2009	06/12/2009	08/12/2009	08/12/2009

SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67185

Results Legend		Sample Identity	F10 WS	F10 WS	F9 WS	F9 WS		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.00 - 0.75	1.00 - 2.00	0.00 - 1.00	1.80 - 2.00		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	26/11/2009	26/11/2009	26/11/2009	26/11/2009		
		Date Received	26/11/2009	26/11/2009	26/11/2009	26/11/2009		
		SDG Ref	091130-16	091130-16	091130-16	091130-16		
		Lab Sample No.(s)	666258	666301	666326	666369		
Component	LOD/Units	Method						
Asbestos Presence Screen	-	TM001	No ACM Detected		Possible ACM Detect			
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	23.3 M	<15.0 M	32.6 M		
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	18.1	<15.0	25.3		
Date of Analysis	-	TM048			7/12/9			
Analysed By	-	TM048			Paul Poynton			
Comments	-	TM048			Unable to identify sub			
Chrysotile (White) Asbestos	-	TM048			Detected #			
Amosite (Brown) Asbestos	-	TM048			Not Detected #			
Crocidolite (Blue) Asbestos	-	TM048			Not Detected #			
Fibrous Anthophyllite	-	TM048			Not Detected #			
Fibrous Tremolite	-	TM048			Not Detected #			
Fibrous Actinolite	-	TM048			Not Detected #			
Non-Asbestos Fibre	-	TM048			Not Detected #			
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.100		
Phenol	<0.01 mg/kg	TM062 (S)	0.120 M	<0.100 M	<0.0100 M	21.8 M		
Cresols	<0.01 mg/kg	TM062 (S)	0.204 M	<0.100 M	<0.0100 M	33.4 M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.500	<0.0500	<0.500		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.120 M	<0.150 M	<0.0150 M	<0.150 M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.100	<0.0100	<0.100		
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.100 M	<0.0100 M	<0.100 M		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.150 M	<0.0150 M	<0.150 M		
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.468	0.00	0.00	55.2		
pH value of soil	1 pH Units	TM133	11.35 M	8.08 M	8.47 M	10.66 M		
Hexavalent Chromium	<0.6 mg/kg	TM151	0.0092 #	<3.0 #	<0.60 #	<3.0 #		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<3.00 #	<0.600 #	<3.00 #		
Total Cyanide	<1 mg/kg	TM153	11.9 M	602 M	18.6 M	760 M		
PCB congener 28	<3 µg/kg	TM168		<3.00				
PCB congener 52	<3 µg/kg	TM168		<3.00				
PCB congener 101	<3 µg/kg	TM168		<3.00				
PCB congener 118	<3 µg/kg	TM168		<3.00				
PCB congener 138	<3 µg/kg	TM168		<3.00				
PCB congener 153	<3 µg/kg	TM168		<3.00				
PCB congener 180	<3 µg/kg	TM168		<3.00				
Total of 7 Congener PCBs	<3 µg/kg	TM168		<3.00				
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00 #	24.92 #	120.05 #	11630.86 #		
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0 #	28.4 #	154 #	13400 #		
Arsenic	<0.6 mg/kg	TM181	14.3 M	4.82 M	24.7 M	2.12 M		
Cadmium	<0.02 mg/kg	TM181	0.537 M	0.0309 M	0.978 M	<0.0200 M		
Chromium	<0.9 mg/kg	TM181	17.6 M	7.35 M	20.5 M	3.34 M		

SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67185

Results Legend
 # ISO17025 accredited.
 # mCERTS accredited.
 * subcontracted test.
 ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	F10 WS	F10 WS	F9 WS	F9 WS
Depth (m)	0.00 - 0.75	1.00 - 2.00	0.00 - 1.00	1.80 - 2.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	26/11/2009	26/11/2009	26/11/2009	26/11/2009
Date Received	26/11/2009	26/11/2009	26/11/2009	26/11/2009
SDG Ref	091130-16	091130-16	091130-16	091130-16
Lab Sample No.(s)	666258	666301	666326	666369

Component	LOD/Units	Method	F10 WS	F10 WS	F9 WS	F9 WS
Copper	<1.4 mg/kg	TM181	24.6 M	3.20 M	66.3 M	9.27 M
Lead	<0.7 mg/kg	TM181	228 M	6.19 M	1100 M	19.4 M
Mercury	<0.14 mg/kg	TM181	0.727 M	<0.140 M	<0.140 M	<0.140 M
Nickel	<0.2 mg/kg	TM181	22.9 M	5.84 M	31.2 M	3.50 M
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	<1.00 #
Zinc	<1.9 mg/kg	TM181	64.4 M	15.6 M	1180 M	10.1 M
Total Sulphate	<48 mg/kg	TM221	3110 M	965 M	1420 M	33400 M

SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67185

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	F10 WS	F10 WS	F9 WS			
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.00 - 0.75	1.00 - 2.00	1.80 - 2.00			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	26/11/2009	26/11/2009	26/11/2009			
			Date Received	26/11/2009	26/11/2009	26/11/2009			
			SDG Ref	091130-16	091130-16	091130-16			
			Lab Sample No.(s)	666258	666301	666369			
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	509	86000	124000				
			#	#	#				
MTBE	<5 µg/kg	TM089	<5.00	<5.00	308				
			#	#	#				
Benzene	<10 µg/kg	TM089	18.0	144	3410				
			M	M	M				
Toluene	<2 µg/kg	TM089	22.8	1270	10500				
			M	M	M				
Ethyl Benzene	<3 µg/kg	TM089	<3.00	335	2540				
			M	M	M				
m & p Xylene	<6 µg/kg	TM089	24.0	7260	16300				
			M	M	M				
o Xylene	<3 µg/kg	TM089	14.4	3290	7480				
			M	M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089	38.4	10600	23800				
			M	M	M				
Sum of BTEX	<10 µg/kg	TM089	79.2	12300	40200				
			M	M	M				
Aliphatics C5-C6	<10 µg/kg	TM089	17.8	39.2	57.3				
Aliphatics >C6-C8	<10 µg/kg	TM089	40.4	4220	7310				
Aliphatics >C8-C10	<10 µg/kg	TM089	40.0	13900	12900				
Aliphatics >C10-C12	<10 µg/kg	TM089	106	13800	17600				
Total Aliphatics C5-C12	<10 µg/kg	TM089	204	32000	37800				
Aromatics C6-C7	<10 µg/kg	TM089	18.0	144	3410				
Aromatics >C7-C8	<10 µg/kg	TM089	22.8	1270	10500				
Aromatics >EC8-EC10	<10 µg/kg	TM089	98.4	31800	45700				
Aromatics >EC10-EC12	<10 µg/kg	TM089	159	20700	26400				
Total Aromatics C6-C12	<10 µg/kg	TM089	298	53900	85900				

SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67185

PAH micro by GCMS

Results Legend		Sample Identity	F10 WS	F10 WS	F9 WS	F9 WS		
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m)	0.00 - 0.75	1.00 - 2.00	0.00 - 1.00	1.80 - 2.00		
		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
		Date Sampled	26/11/2009	26/11/2009	26/11/2009	26/11/2009		
		Date Received	26/11/2009	26/11/2009	26/11/2009	26/11/2009		
		SDG Ref	091130-16	091130-16	091130-16	091130-16		
		Lab Sample No.(s)	666258	666301	666326	666369		
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	2120 M	432000 M	1420 M	2310000 M		
Acenaphthylene (S)	<12 µg/kg	TM218	3650 M	43200 M	7180 M	730000 M		
Acenaphthene (S)	<8 µg/kg	TM218	1310 M	42300 M	707 M	223000 M		
Fluorene (S)	<10 µg/kg	TM218	2550 M	71100 M	1120 M	652000 M		
Phenanthrene (S)	<15 µg/kg	TM218	13100 M	104000 M	7300 M	1640000 M		
Anthracene (S)	<16 µg/kg	TM218	4410 M	37800 M	4010 M	598000 M		
Fluoranthene (S)	<17 µg/kg	TM218	17200 M	48900 M	37500 M	1160000 M		
Pyrene (S)	<15 µg/kg	TM218	12200 M	31400 M	31100 M	764000 M		
Benzo(a)anthracene (S)	<14 µg/kg	TM218	7300 M	13100 M	19800 M	373000 M		
Chrysene (S)	<10 µg/kg	TM218	5800 M	10300 M	14700 M	256000 M		
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	9650 M	11700 M	35200 M	389000 M		
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	3860 M	4810 M	12900 M	165000 M		
Benzo(a)pyrene (S)	<15 µg/kg	TM218	6900 M	9240 M	27700 M	313000 M		
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	4100 M	4600 M	15800 M	149000 M		
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1150 M	1420 M	4360 M	42800 M		
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	4350 M	5090 M	17100 M	157000 M		
PAH 16 EPA Total	<118 µg/kg	TM218	99700 M	871000 M	238000 M	9920000 M		

SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67185

VOC MS (S)

Results Legend			Sample Identity	F10 WS	F9 WS				
# ISO17025 accredited. # mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 2.00	1.80 - 2.00				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	26/11/2009					
			Date Received	26/11/2009	26/11/2009				
			SDG Ref	091130-16	091130-16				
			Lab Sample No.(s)	666301	666369				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	136	189					
Toluene-d8**	%	TM116	65.2	53.5					
4-Bromofluorobenzene**	%	TM116	90.4	85.6					
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	#	#			
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
Carbon Disulphide	<9 µg/kg	TM116	13.9	337	M	M			
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	M	M			
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	M	M			
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	M	M			
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	M	M			
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	M	M			
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Benzene	<9 µg/kg	TM116	279	8110	M	M			
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	#	#			
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	M	M			
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	M	M			
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	M	M			
Toluene	<6 µg/kg	TM116	1080	47200	M	M			
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0					
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	M	M			
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	M	M			
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	M	M			
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	M	M			
Chlorobenzene	<7 µg/kg	TM116	<7.00	<7.00	M	M			
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	M	M			
Ethylbenzene	<9 µg/kg	TM116	1110	18100	M	M			

SDG: 091130-16
Job: D_MOUCHEL_ELE-81
Client Reference: F10 WS / F9 WS
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67185

VOC MS (S)

Results Legend			Sample Identity		F10 WS	F9 WS
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	1.00 - 2.00	1.80 - 2.00	
			Sample Type	Soil/Solid	Soil/Solid	
			Date Sampled	26/11/2009	26/11/2009	
			Date Received	26/11/2009	26/11/2009	
			SDG Ref	091130-16	091130-16	
			Lab Sample No.(s)	666301	666369	
Component	LOD/Units	Method				
p/m-Xylene	<13 µg/kg	TM116	11800		147000	
			#		#	
o-Xylene	<11 µg/kg	TM116	5230		62500	
			M		M	
Styrene	<11 µg/kg	TM116	306		<11.0	
			M		M	
Bromoform	<12 µg/kg	TM116	<12.0		<12.0	
			M		M	
Isopropylbenzene	<9 µg/kg	TM116	344		3180	
			M		M	
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0		<15.0	
			#		#	
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0		<13.0	
			M		M	
Bromobenzene	<14 µg/kg	TM116	<14.0		<14.0	
			M		M	
Propylbenzene	<6 µg/kg	TM116	422		5030	
			M		M	
2-Chlorotoluene	<14 µg/kg	TM116	<14.0		<14.0	
			#		#	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	7670		27300	
			M		M	
4-Chlorotoluene	<9 µg/kg	TM116	<9.00		<9.00	
			#		#	
tert-Butylbenzene	<12 µg/kg	TM116	<12.0		<12.0	
			#		#	
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	12300		70700	
			#		#	
sec-Butylbenzene	<8 µg/kg	TM116	137		581	
			#		#	
4-Isopropyltoluene	<8 µg/kg	TM116	560		2770	
			#		#	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00		<8.00	
			#		#	
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0		<11.0	
			M		M	
n-Butylbenzene	<7 µg/kg	TM116	<7.00		<7.00	
			#		#	
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00		<8.00	
			M		M	
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0		<11.0	
			M		M	
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00		<7.00	
			#		#	
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00		<9.00	
			#		#	
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0		<15.0	
			#		#	
Naphthalene	<7 µg/kg	TM116	753000		2070000	
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0		473	
			#		#	

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 11 December 2009
Job: D_MOUCHEL_ELE-83
Sample Delivery Group (SDG): 091130-18 **Report No.:** 67231
Your Reference: Limerick Gasworks
Location: Limerick Gasworks

A total of 8 samples was received on Friday November 27, 2009 and completed on Friday December 11, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



SDG: 091130-18
 Job: D_MOUCHEL_ELE-83
 Client Reference: Limerick Gasworks
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 67231

SOLID

Results Legend	Sample ID	L1 WS										M1 WS	Total						
		0.20 - 1.00		1.00 - 1.90		2.00 - 2.80		3.00 - 3.40		0.50 - 1.00				1.50 - 2.00		2.50 - 3.00		3.50 - 3.90	
		60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)			60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)	60g VOC Dublin JAR (D)	TUB (D)
Ammonium Soil by Titration	All																	0	
Asbestos Presence Screen	All																	7	
Cyanides Complex/Free/Total/Thiocya	Total Cyanide																	0	
Easily Liberated Sulphide	All																	7	
EPH CWG (Aliphatic) GC (S)	All																	0	
EPH CWG (Aromatic) GC (S)	All																	7	
GRO BTEX MTBE GC (S)	All																	0	
Hexavalent Chromium (s)	All																	7	
Metals by iCap-OES (Soil)	Arsenic																	0	
	Cadmium																	7	
	Chromium																	0	
	Copper																	7	
	Lead																	0	
	Mercury																	7	
	Nickel																	0	
	Selenium																	7	
	Zinc																	0	
PAH micro by GCMS	All																	7	
PCBs by GCMS	All																	0	
pH	All																	2	
Phenols by HPLC (S)	All																	0	
Sample description	All																	0	
Total Sulphate	All																	8	
TPH CWG GC (S)	All																	0	
VOC MS (S)	All																	0	
																		5	

SDG:	091130-18	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-83	Attention:	Verity Sankey
Client Reference:	Limerick Gasworks	Order No.:	
Location:	Limerick Gasworks	Report No.:	67231

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
0.063mm - 0.1mm fine,
0.1mm - 2mm medium,
2mm - 10mm coarse,
>10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
L1 WS	0.20 - 1.00	Brown	Sand	0.1 - 2 mm	Stones
	1.00 - 1.90	Brown	Sandy Clay	0.1 - 2 mm	Stones
	2.00 - 2.80	White	Chalk	0.063 - 0.1 mm	Stones
	3.00 - 3.40	Brown	Sand	0.1 - 2 mm	Stones
M1 WS	0.50 - 1.00	Beige	Sandy Clay	0.1 - 2 mm	Stones
	1.50 - 2.00	White	Silty Clay	0.063 - 0.1 mm	Stones
	2.50 - 3.00	White	Chalk	0.063 - 0.1 mm	Stones
	3.50 - 3.90	White	Chalk	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091130-18
 Job: D_MOUCHEL_ELE-83
 Client Reference: Limerick Gasworks
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Verity Sankey
 Order No.:
 Report No: 67231

Test Completion dates

SDG reference: 091130-18

Sample ID	Depth	Type	VOC MS (S)	TPH CWG GC (S)	Total Sulphate	Sample description	Phenols by HPLC (S)	pH	PCBs by GCMS	PAH by GCMS	Metals by Icap-OES (Soil)	Hexavalent Chromium (s)	GRO BTEX MTBE GC (S)	EPH CWG (Aromatic) GC (S)	EPH CWG (Aliphatic) GC (S)	Easily Liberated Sulphide	Cyanide Comp/Free/Total/Thiocyana	Asbestos Presence Screen	Ammonium Soil by Titration
L1 WS	0.20 - 1.00	SOLID	08/12/2009	10/12/2009	03/12/2009	01/12/2009	07/12/2009	04/12/2009	03/12/2009	03/12/2009	03/12/2009	04/12/2009	09/12/2009	04/12/2009	04/12/2009	08/12/2009	06/12/2009	08/12/2009	08/12/2009
	1.00 - 1.90	SOLID		10/12/2009	03/12/2009	01/12/2009	02/12/2009	02/12/2009	03/12/2009	03/12/2009	03/12/2009	04/12/2009	09/12/2009	04/12/2009	04/12/2009	04/12/2009	03/12/2009	03/12/2009	04/12/2009
	2.00 - 2.80	SOLID		10/12/2009	08/12/2009	03/12/2009	04/12/2009	02/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	09/12/2009	05/12/2009	05/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009
	3.00 - 3.40	SOLID		08/12/2009		03/12/2009			07/12/2009										
M1 WS	0.50 - 1.00	SOLID	08/12/2009	10/12/2009	08/12/2009	01/12/2009	07/12/2009	04/12/2009	03/12/2009	03/12/2009	04/12/2009	04/12/2009	09/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009	01/12/2009	08/12/2009
	1.50 - 2.00	SOLID		10/12/2009	03/12/2009	01/12/2009	02/12/2009	02/12/2009	04/12/2009	02/12/2009	02/12/2009	03/12/2009	09/12/2009	04/12/2009	04/12/2009	04/12/2009	03/12/2009	03/12/2009	04/12/2009
	2.50 - 3.00	SOLID		11/12/2009	03/12/2009	01/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	02/12/2009	03/12/2009	11/12/2009	04/12/2009	04/12/2009	04/12/2009	03/12/2009	03/12/2009	08/12/2009
	3.50 - 3.90	SOLID		08/12/2009	11/12/2009	03/12/2009	07/12/2009	04/12/2009	04/12/2009	04/12/2009	04/12/2009	08/12/2009	04/12/2009	11/12/2009	05/12/2009	05/12/2009	08/12/2009	06/12/2009	08/12/2009

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67231

Results Legend			Sample Identity	L1 WS	L1 WS	L1 WS	L1 WS	M1 WS	M1 WS
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.20 - 1.00	1.00 - 1.90	2.00 - 2.80	3.00 - 3.40	0.50 - 1.00	1.50 - 2.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	25/11/2009	25/11/2009	25/11/2009	25/11/2009	26/11/2009	26/11/2009
			Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009
			SDG Ref	091130-18	091130-18	091130-18	091130-18	091130-18	091130-18
Lab Sample No.(s)	666431	666570	666593	666642	666322	666355			
Component	LOD/Units	Method							
Asbestos Presence Screen	-	TM001					No ACM Detected		
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	<15.0 M	<15.0 M	<15.0 M	<15.0 M	<15.0 M	
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00	0.00	0.00	0.00	0.00	
pH value of soil	1 pH Units	TM133	8.11 M	8.52 M	11.24 M	8.58 M	8.21 M		
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60 #	<0.60 #	0.080 #	<0.60 #	<0.60 #	<0.60 #	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<0.600 #	<0.600 #	<0.600 #	<0.600 #	<0.600 #	
Total Cyanide	<1 mg/kg	TM153	40.9 M	20.9 M	392 M	137 M	292 M		
PCB congener 28	<3 µg/kg	TM168				<3.00		<3.00	
PCB congener 52	<3 µg/kg	TM168				<3.00		<3.00	
PCB congener 101	<3 µg/kg	TM168				<3.00		<3.00	
PCB congener 118	<3 µg/kg	TM168				<3.00		<3.00	
PCB congener 138	<3 µg/kg	TM168				<3.00		<3.00	
PCB congener 153	<3 µg/kg	TM168				<3.00		<3.00	
PCB congener 180	<3 µg/kg	TM168				<3.00		<3.00	
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00		<3.00	
Easily Liberated Sulphide	<15 mg/kg	TM180	88.12 #	25.43 #	1522.31 #	213.43 #	653.24 #		
Easily Liberated Sulphide	<15 mg/kg	TM180	96.2 #	29.8 #	2220 #	299 #	954 #		
Arsenic	<0.6 mg/kg	TM181	8.85 M	13.9 M	6.84 M	7.95 M	8.11 M		
Cadmium	<0.02 mg/kg	TM181	1.10 M	2.68 M	0.240 M	0.140 M	1.01 M		
Chromium	<0.9 mg/kg	TM181	13.1 M	32.8 M	16.8 M	11.6 M	12.1 M		
Copper	<1.4 mg/kg	TM181	35.3 M	98.3 M	52.5 M	26.6 M	27.6 M		
Lead	<0.7 mg/kg	TM181	74.0 M	63.0 M	11.1 M	278 M	7.17 M		
Mercury	<0.14 mg/kg	TM181	<0.140 M	<0.140 M	0.183 M	0.173 M	0.142 M		
Nickel	<0.2 mg/kg	TM181	16.4 M	56.6 M	34.1 M	13.8 M	16.9 M		
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	<1.00 #	<1.00 #		
Zinc	<1.9 mg/kg	TM181	27.2 M	41.4 M	12.8 M	24.6 M	13.2 M		
Total Sulphate	<48 mg/kg	TM221	48900 M	9520 M	853000 M	23300 M	2380000 M		

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67231

EPH CWG (Aromatic) GC (S)

Results Legend
ISO17025 accredited.
M mCERTS accredited.
subcontracted test.
This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	L1 WS	L1 WS	L1 WS	M1 WS	M1 WS
Depth (m)	0.20 - 1.00	1.00 - 1.90	2.00 - 2.80	0.50 - 1.00	1.50 - 2.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	25/11/2009	25/11/2009	25/11/2009	26/11/2009	26/11/2009
Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009
SDG Ref	091130-18	091130-18	091130-18	091130-18	091130-18
Lab Sample No.(s)	666431	666570	666593	666322	666355

Component	LOD/Units	Method	L1 WS	L1 WS	L1 WS	M1 WS	M1 WS
Aromatics >EC12-EC16	<100 µg/kg	TM173	4140	4300	10100	3570	2170
Aromatics >EC16-EC21	<100 µg/kg	TM173	10600	19900	97000	14900	9970
Aromatics >EC21-EC35	<100 µg/kg	TM173	128000	188000	553000	368000	351000
Aromatics >EC35-EC44	<100 µg/kg	TM173	45900	57100	140000	96700	95900
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	189000	270000	801000	484000	459000
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	189000	270000	801000	484000	459000

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67231

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	L1 WS	L1 WS	L1 WS	M1 WS	M1 WS	
# ISO17025 accredited. M mCERTS accredited. subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.20 - 1.00	1.00 - 1.90	2.00 - 2.80	0.50 - 1.00	1.50 - 2.00	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
			Date Sampled	25/11/2009	25/11/2009	25/11/2009	26/11/2009	26/11/2009	
			Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009	
			SDG Ref	091130-18	091130-18	091130-18	091130-18	091130-18	
			Lab Sample No.(s)	666431	666570	666593	666322	666355	
Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	201	188	<44.0	<44.0	<44.0		
			#	#	#	#	#	#	#
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	#
			#	#	#	#	#	#	#
Benzene	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	M
			M	M	M	M	M	M	M
Toluene	<2 µg/kg	TM089	<2.00	<3.00	<2.00	<2.00	<2.00	<2.00	M
			M	M	M	M	M	M	M
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	M
			M	M	M	M	M	M	M
m & p Xylene	<6 µg/kg	TM089	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	M
			M	M	M	M	M	M	M
o Xylene	<3 µg/kg	TM089	<4.00	<3.00	<3.00	<3.00	<3.00	<3.00	M
			M	M	M	M	M	M	M
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	M
			M	M	M	M	M	M	M
Sum of BTEX	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	M
			M	M	M	M	M	M	M
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aliphatics >C8-C10	<10 µg/kg	TM089	32.8	17.5	<10.0	<10.0	<10.0	<10.0	
Aliphatics >C10-C12	<10 µg/kg	TM089	47.6	57.9	<10.0	<10.0	<10.0	<10.0	
Total Aliphatics C5-C12	<10 µg/kg	TM089	80.4	75.3	<10.0	<10.0	<10.0	<10.0	
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aromatics >EC8-EC10	<10 µg/kg	TM089	49.2	26.2	<10.0	<10.0	<10.0	<10.0	
Aromatics >EC10-EC12	<10 µg/kg	TM089	71.4	86.8	<10.0	<10.0	<10.0	<10.0	
Total Aromatics C6-C12	<10 µg/kg	TM089	121	113	<10.0	<10.0	<10.0	<10.0	

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67231

PAH micro by GCMS

Results Legend			Sample Identity	L1 WS	L1 WS	L1 WS	M1 WS	M1 WS
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.20 - 1.00	1.00 - 1.90	2.00 - 2.80	0.50 - 1.00	1.50 - 2.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	25/11/2009	25/11/2009	25/11/2009	26/11/2009	26/11/2009
			Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009
			SDG Ref	091130-18	091130-18	091130-18	091130-18	091130-18
			Lab Sample No.(s)	666431	666570	666593	666322	666355
Component	LOD/Units	Method						
Naphthalene (S)	<9 µg/kg	TM218	500 M	1320 M	671 M	199 M	1790 M	
Acenaphthylene (S)	<12 µg/kg	TM218	291 M	655 M	1620 M	208 M	1160 M	
Acenaphthene (S)	<8 µg/kg	TM218	158 M	105 M	380 M	8.15 M	56.3 M	
Fluorene (S)	<10 µg/kg	TM218	151 M	287 M	240 M	10.7 M	44.9 M	
Phenanthrene (S)	<15 µg/kg	TM218	4250 M	8210 M	58800 M	406 M	2160 M	
Anthracene (S)	<16 µg/kg	TM218	1140 M	2520 M	10000 M	251 M	3250 M	
Fluoranthene (S)	<17 µg/kg	TM218	10000 M	17200 M	72400 M	2420 M	11900 M	
Pyrene (S)	<15 µg/kg	TM218	8960 M	14100 M	56800 M	2990 M	38800 M	
Benzo(a)anthracene (S)	<14 µg/kg	TM218	6660 M	10400 M	31700 M	2250 M	19000 M	
Chrysene (S)	<10 µg/kg	TM218	5170 M	7860 M	23100 M	1740 M	17900 M	
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	10800 M	12800 M	41500 M	3690 M	39500 M	
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	4040 M	5020 M	15000 M	1820 M	14200 M	
Benzo(a)pyrene (S)	<15 µg/kg	TM218	9490 M	11700 M	34000 M	3060 M	25100 M	
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	6600 M	7450 M	21800 M	2810 M	19400 M	
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	1800 M	2170 M	5750 M	717 M	4620 M	
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	8030 M	8490 M	24000 M	3200 M	21600 M	
PAH 16 EPA Total	<118 µg/kg	TM218	78100 M	110000 M	398000 M	25800 M	221000 M	

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67231

VOC MS (S)

Results Legend			Sample Identity	L1 WS	L1 WS	L1 WS	M1 WS
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.20 - 1.00	2.00 - 2.80	3.00 - 3.40	0.50 - 1.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	25/11/2009	25/11/2009	25/11/2009	26/11/2009
			Date Received	27/11/2009	27/11/2009	27/11/2009	27/11/2009
			SDG Ref	091130-18	091130-18	091130-18	091130-18
			Lab Sample No.(s)	666431	666593	666642	666322
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116		125	0.940	0.860	127
Toluene-d8**	%	TM116		88.4	90.2	93.1	95.1
4-Bromofluorobenzene**	%	TM116		60.9	85.7	75.6	94.9
Dichlorodifluoromethane	<13 µg/kg	TM116		<13.0	<13.0	<13.0	<13.0
Chloromethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0	<12.0
Vinyl Chloride	<10 µg/kg	TM116		<10.0	<10.0	<10.0	<10.0
Bromoethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
Chloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0	<12.0
Trichlorofluoromethane	<7 µg/kg	TM116		<7.00	<7.00	<7.00	<7.00
1,1-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
Carbon Disulphide	<9 µg/kg	TM116		<9.00	20.2	<9.00	69.3
Dichloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0	<10.0
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
trans-1,2-Dichloroethene	<12 µg/kg	TM116		<12.0	<12.0	<12.0	<12.0
1,1-Dichloroethane	<8 µg/kg	TM116		<8.00	<8.00	<8.00	<8.00
cis-1,2-Dichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
2,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0	<10.0
Bromochloromethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0	<10.0
Chloroform	<10 µg/kg	TM116		<10.0	<10.0	<10.0	<10.0
1,1,1-Trichloroethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0	<12.0
1,1-Dichloropropene	<13 µg/kg	TM116		<13.0	<13.0	<13.0	<13.0
Carbontetrachloride	<11 µg/kg	TM116		<11.0	<11.0	<11.0	<11.0
1,2-Dichloroethane	<10 µg/kg	TM116		<10.0	<10.0	<10.0	<10.0
Benzene	<9 µg/kg	TM116		<9.00	<9.00	158	<9.00
Trichloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
1,2-Dichloropropane	<10 µg/kg	TM116		<10.0	<10.0	<10.0	<10.0
Dibromomethane	<12 µg/kg	TM116		<12.0	<12.0	<12.0	<12.0
Bromodichloromethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0	<11.0
cis-1,3-Dichloropropene	<25 µg/kg	TM116		<25.0	<25.0	<25.0	<25.0
Toluene	<6 µg/kg	TM116		<6.00	<6.00	38.5	<6.00
trans-1,3-Dichloropropene	<27 µg/kg	TM116		<27.0	<27.0	<27.0	<27.0
1,1,2-Trichloroethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
1,3-Dichloropropane	<7 µg/kg	TM116		<7.00	<7.00	<7.00	<7.00
Tetrachloroethene	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
Dibromochloromethane	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00
1,2-Dibromoethane	<14 µg/kg	TM116		<14.0	<14.0	<14.0	<14.0
Chorobenzene	<7 µg/kg	TM116		<7.00	<7.00	<7.00	<7.00
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116		<11.0	<11.0	<11.0	<11.0
Ethylbenzene	<9 µg/kg	TM116		<9.00	<9.00	<9.00	<9.00

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67231

VOC MS (S)

Component	LOD/Units	Method	Sample Identity			
			Depth (m)	Sample Type	Date Sampled	Date Received
			L1 WS	L1 WS	L1 WS	M1 WS
			0.20 - 1.00	2.00 - 2.80	3.00 - 3.40	0.50 - 1.00
			Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			25/11/2009	25/11/2009	25/11/2009	26/11/2009
			27/11/2009	27/11/2009	27/11/2009	27/11/2009
			SDG Ref	SDG Ref	SDG Ref	SDG Ref
			091130-18	091130-18	091130-18	091130-18
			Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)
			666431	666593	666642	666322
p/m-Xylene	<13 µg/kg	TM116	<13.0 #	<13.0 #	<13.0 #	<13.0 #
o-Xylene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M
Styrene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M
Bromoform	<12 µg/kg	TM116	<12.0 M	<12.0 M	<12.0 M	<12.0 M
Isopropylbenzene	<9 µg/kg	TM116	<9.00 M	<9.00 M	<9.00 M	<9.00 M
1,1,2,2-Tetrachloroethane	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #
1,2,3-Trichloropropane	<13 µg/kg	TM116	<13.0 M	<13.0 M	<13.0 M	<13.0 M
Bromobenzene	<14 µg/kg	TM116	<14.0 M	<14.0 M	<14.0 M	<14.0 M
Propylbenzene	<6 µg/kg	TM116	<6.00 M	<6.00 M	<6.00 M	<6.00 M
2-Chlorotoluene	<14 µg/kg	TM116	<14.0 #	<14.0 #	<14.0 #	<14.0 #
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	<8.00 M
4-Chlorotoluene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #
tert-Butylbenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	<12.0 #
1,2,4-Trimethylbenzene	<10 µg/kg	TM116	<10.0 #	<10.0 #	<10.0 #	<10.0 #
sec-Butylbenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	<8.00 #
4-Isopropyltoluene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	<8.00 #
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8.00 #	<8.00 #	<8.00 #	<8.00 #
1,4-Dichlorobenzene	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M
n-Butylbenzene	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #
1,2-Dichlorobenzene	<8 µg/kg	TM116	<8.00 M	<8.00 M	<8.00 M	<8.00 M
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116	<11.0 M	<11.0 M	<11.0 M	<11.0 M
Tert-amyl methyl ether	<7 µg/kg	TM116	<7.00 #	<7.00 #	<7.00 #	<7.00 #
1,2,4-Trichlorobenzene	<9 µg/kg	TM116	<9.00 #	<9.00 #	<9.00 #	<9.00 #
Hexachlorobutadiene	<15 µg/kg	TM116	<15.0 #	<15.0 #	<15.0 #	<15.0 #
Naphthalene	<7 µg/kg	TM116	<7.00 #	<7.00 #	423 #	<7.00 #
1,2,3-Trichlorobenzene	<12 µg/kg	TM116	<12.0 #	<12.0 #	<12.0 #	<12.0 #

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67231

Results Legend		Sample Identity	M1 WS	M1 WS				
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	2.50 - 3.00 Soil/Solid 26/11/2009 27/11/2009 091130-18 666380	3.50 - 3.90 Soil/Solid 26/11/2009 27/11/2009 091130-18 666409				
Component	LOD/Units	Method						
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	<15.0 M				
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0				
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100				
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100				
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M				
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	0.00				
pH value of soil	1 pH Units	TM133	10.99 M	9.95 M				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60 #	0.072 #				
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<0.600 #				
Total Cyanide	<1 mg/kg	TM153	482 M	336 M				
Easily Liberated Sulphide	<15 mg/kg	TM180	1218.92 #	1777.06 #				
Easily Liberated Sulphide	<15 mg/kg	TM180	1730 #	2930 #				
Arsenic	<0.6 mg/kg	TM181	8.22 M	9.20 M				
Cadmium	<0.02 mg/kg	TM181	0.835 M	0.163 M				
Chromium	<0.9 mg/kg	TM181	11.8 M	15.0 M				
Copper	<1.4 mg/kg	TM181	24.2 M	27.5 M				
Lead	<0.7 mg/kg	TM181	13.9 M	10.3 M				
Mercury	<0.14 mg/kg	TM181	0.151 M	<0.140 M				
Nickel	<0.2 mg/kg	TM181	15.4 M	18.6 M				
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #				
Zinc	<1.9 mg/kg	TM181	17.6 M	15.9 M				
Total Sulphate	<48 mg/kg	TM221	1840000 M	1210000 M				

SDG: 091130-18
 Job: D_MOUCHEL_ELE-83
 Client Reference: Limerick Gasworks
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67231

PAH micro by GCMS

Results Legend			Sample Identity	M1 WS	M1 WS				
# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	2.50 - 3.00	3.50 - 3.90				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	26/11/2009	26/11/2009				
			Date Received	27/11/2009	27/11/2009				
			SDG Ref	091130-18	091130-18				
			Lab Sample No.(s)	666380	666409				
			Method						
Component	LOD/Units	Method							
Naphthalene (S)	<9 µg/kg	TM218	1800	1070					
			M	M					
Acenaphthylene (S)	<12 µg/kg	TM218	933	585					
			M	M					
Acenaphthene (S)	<8 µg/kg	TM218	198	78.4					
			M	M					
Fluorene (S)	<10 µg/kg	TM218	106	32.4					
			M	M					
Phenanthrene (S)	<15 µg/kg	TM218	8290	3640					
			M	M					
Anthracene (S)	<16 µg/kg	TM218	3120	2200					
			M	M					
Fluoranthene (S)	<17 µg/kg	TM218	27500	21900					
			M	M					
Pyrene (S)	<15 µg/kg	TM218	54400	30400					
			M	M					
Benzo(a)anthracene (S)	<14 µg/kg	TM218	16000	12100					
			M	M					
Chrysene (S)	<10 µg/kg	TM218	16400	10200					
			M	M					
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	33300	18500					
			M	M					
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	12200	6870					
			M	M					
Benzo(a)pyrene (S)	<15 µg/kg	TM218	22400	12800					
			M	M					
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	15800	9810					
			M	M					
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	4150	2490					
			M	M					
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	17600	11100					
			M	M					
PAH 16 EPA Total	<118 µg/kg	TM218	234000	144000					
			M	M					

SDG: 091130-18
Job: D_MOUCHEL_ELE-83
Client Reference: Limerick Gasworks
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67231

VOC MS (S)

Results Legend			Sample Identity	M1 WS					
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	3.50 - 3.90					
			Sample Type	Soil/Solid					
			Date Sampled	26/11/2009					
			Date Received	27/11/2009					
			SDG Ref	091130-18					
			Lab Sample No.(s)	666409					
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	0.900						
Toluene-d8**	%	TM116	91.3						
4-Bromofluorobenzene**	%	TM116	78.9						
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0						
Chloromethane	<12 µg/kg	TM116	<12.0						
Vinyl Chloride	<10 µg/kg	TM116	<10.0						
Bromoethane	<9 µg/kg	TM116	<9.00						
Chloroethane	<12 µg/kg	TM116	<12.0						
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00						
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00						
Carbon Disulphide	<9 µg/kg	TM116	151						
Dichloromethane	<10 µg/kg	TM116	<10.0						
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00						
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0						
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00						
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00						
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0						
Bromochloromethane	<10 µg/kg	TM116	<10.0						
Chloroform	<10 µg/kg	TM116	<10.0						
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0						
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0						
Carbontetrachloride	<11 µg/kg	TM116	<11.0						
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0						
Benzene	<9 µg/kg	TM116	<9.00						
Trichloroethene	<9 µg/kg	TM116	<9.00						
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0						
Dibromomethane	<12 µg/kg	TM116	<12.0						
Bromodichloromethane	<11 µg/kg	TM116	<11.0						
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0						
Toluene	<6 µg/kg	TM116	<6.00						
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0						
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00						
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00						
Tetrachloroethene	<9 µg/kg	TM116	<9.00						
Dibromochloromethane	<9 µg/kg	TM116	<9.00						
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0						
Chorobenzene	<7 µg/kg	TM116	<7.00						
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0						
Ethylbenzene	<9 µg/kg	TM116	<9.00						

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPOINIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Mouchel
Ground Engineering
Rowan House
Lloyd Drive
Cheshire
CH65 9HQ

Attention: Verity Sankey

CERTIFICATE OF ANALYSIS

Date: 16 December 2009
Job: D_MOUCHEL_ELE-85
Sample Delivery Group (SDG): 091201-89 **Report No.:** 67630
Your Reference:
Location: Limerick Gasworks

A total of 6 samples was received on Monday November 30, 2009 and completed on Wednesday December 16, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley
Operations Director - Land UK & Ireland



SDG: 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No.: 67630

SOLID

Results Legend	Sample ID	C12AMS		C12BWS		D12WMS		Total
		Depth (m)		Depth (m)		Depth (m)		
		Container		Container		Container		
X Test								
N No Determination Possible								
		0.35 - 0.50	1.25 - 1.30	0.30 - 0.50	1.20 - 1.25	0.30 - 0.80	0.90 - 1.00	
		60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin TUB (D)	60g VOC Dublin JAR (D)	60g VOC Dublin JAR (D)	
Ammonium Soil by Titration	All		X	X		X	X	0
Cyanides Complex/Free/Total/Thiocya	Total Cyanide		X	X		X	X	0
Easily Liberated Sulphide	All		X	X		X	X	0
EPH CWG (Aliphatic) GC (S)	All		X	X		X	X	0
EPH CWG (Aromatic) GC (S)	All		X	X		X	X	0
GRO BTEX MTBE GC (S)	All	X	X	X		X	X	0
Hexavalent Chromium (s)	All		X	X		X	X	0
Metals by iCap-OES (Soil)	Arsenic	X	X	X		X	X	0
	Cadmium	X	X	X		X	X	0
	Chromium	X	X	X		X	X	0
	Copper	X	X	X		X	X	0
	Lead	X	X	X		X	X	0
	Mercury	X	X	X		X	X	0
	Nickel	X	X	X		X	X	0
	Selenium	X	X	X		X	X	0
	Zinc	X	X	X		X	X	0
PAH micro by GCMS	All	X	X	X		X	X	0
pH	All		X	X		X	X	0
Phenols by HPLC (S)	All		X	X		X	X	0
Sample description	All	X	X	X		X	X	0
Total Sulphate	All	X	X	X		X	X	0
TPH CWG GC (S)	All	X	X	X		X	X	0
VOC MS (S)	All	X	X	X		X	X	0
		X	X	X		X	X	6

SDG:	091201-89	Customer:	Mouchel
Job:	D_MOUCHEL_ELE-85	Attention:	Verity Sankey
Client Reference:		Order No.:	
Location:	Limerick Gasworks	Report No.:	67630

Sample Descriptions

Grain Sizes:

<0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
C12 AWS	0.35 - 0.50	Brown	Sand	0.1 - 2 mm	Stones
	1.25 - 1.30	Brown	Sandy Clay	0.1 - 2 mm	Stones
C12 BWS	0.30 - 0.50	Brown	Sand	0.1 - 2 mm	Stones
	1.20 - 1.25	Brown	Sand	0.1 - 2 mm	Stones
D12 WS	0.30 - 0.80	Brown	Sandy Clay	0.1 - 2 mm	Stones
	0.90 - 1.00	Brown	Sandy Clay	0.1 - 2 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Verity Sankey
Order No.:
Report No: 67630

Test Completion dates

SDG reference: 091201-89

Sample ID	Depth	Type	Cyanide Comp/Free/Total/Thiocyanate	Ammonium Soil by Titration	Easily Liberated Sulphide	EPH CWG (Aliphatic) GC (S)	EPH CWG (Aromatic) GC (S)	GRO BTEX MTBE GC (S)	Hexavalent Chromium (s)	Metals by Cap-OES (Soil)	PAH by GCMS	pH	Phenols by HPLC (S)	Sample description	Total Sulphate	TPH CWG GC (S)	VOC MS (S)
C12 AWS	0.35 - 0.50	SOLID	08/12/2009	03/12/2009	08/12/2009	05/12/2009	05/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	02/12/2009	03/12/2009	02/12/2009	04/12/2009	09/12/2009	09/12/2009
	1.25 - 1.30	SOLID	08/12/2009	03/12/2009	08/12/2009	05/12/2009	05/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	02/12/2009	03/12/2009	02/12/2009	04/12/2009	09/12/2009	09/12/2009
C12 BWS	0.30 - 0.50	SOLID	08/12/2009	03/12/2009	08/12/2009	05/12/2009	05/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	02/12/2009	03/12/2009	02/12/2009	08/12/2009	09/12/2009	09/12/2009
	1.20 - 1.25	SOLID	08/12/2009	03/12/2009	08/12/2009	05/12/2009	05/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	02/12/2009	02/12/2009	02/12/2009	08/12/2009	09/12/2009	10/12/2009
D12 WS	0.30 - 0.80	SOLID	08/12/2009	03/12/2009	08/12/2009	05/12/2009	05/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	02/12/2009	03/12/2009	02/12/2009	08/12/2009	09/12/2009	10/12/2009
	0.90 - 1.00	SOLID	08/12/2009	03/12/2009	08/12/2009	05/12/2009	05/12/2009	08/12/2009	03/12/2009	04/12/2009	03/12/2009	02/12/2009	02/12/2009	02/12/2009	08/12/2009	09/12/2009	09/12/2009

SDG: 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67133

Results Legend			Sample Identity	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
# ISO17025 accredited. M mCERTS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.35 - 0.50	1.25 - 1.30	0.30 - 0.50	1.20 - 1.25	0.30 - 0.80	0.90 - 1.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	24/11/2009 to 27/11/2009	27/11/2009	24/11/2009 to 27/11/2009	27/11/2009	27/11/2009	27/11/2009
			Date Received	27/11/2009	30/11/2009	27/11/2009	30/11/2009	30/11/2009	30/11/2009
			SDG Ref	30/11/2009	091201-89	30/11/2009	091201-89	091201-89	091201-89
Lab Sample No.(s)	091201-89 744795	673389	091201-89 673401	673456	673468	673476			
Component	LOD/Units	Method							
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	<15.0 M	<15.0 M	<15.0 M	<15.0 M	<15.0 M	<15.0 M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0
Catechol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Phenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M
Cresols	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Xylenols	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
2,3,5 - Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M	<0.0100 M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M	<0.0150 M
NG Speciated Phenols	<0.15 mg/kg	TM062 (S)	0.00	<0.0100	0.00	0.00	0.00	0.00	0.00
pH value of soil	1 pH Units	TM133	8.44 M	11.35 M	8.34 M	11.46 M	11.31 M	8.27 M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.60 #	<0.60 #	<0.60 #	<0.60 #	<0.60 #	0.078 #	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<0.600 #	<0.600 #	<0.600 #	<0.600 #	0.0911 #	
Total Cyanide	<1 mg/kg	TM153	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.00 #	<15.00 #	<15.00 #	<15.00 #	<15.00 #	<15.00 #	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0 #	<15.0 #	<15.0 #	<15.0 #	<15.0 #	<15.0 #	
Arsenic	<0.6 mg/kg	TM181	10.3 M	7.53 M	8.69 M	7.51 M	10.3 M	9.34 M	
Cadmium	<0.02 mg/kg	TM181	0.195 M	0.255 M	0.137 M	0.220 M	0.347 M	0.168 M	
Chromium	<0.9 mg/kg	TM181	17.3 M	14.0 M	10.8 M	13.0 M	15.8 M	12.1 M	
Copper	<1.4 mg/kg	TM181	16.7 M	17.3 M	15.4 M	11.2 M	18.1 M	11.0 M	
Lead	<0.7 mg/kg	TM181	97.8 M	25.4 M	32.3 M	22.5 M	200 M	53.0 M	
Mercury	<0.14 mg/kg	TM181	5.16 M	2.39 M	0.434 M	0.201 M	0.303 M	<0.140 M	
Nickel	<0.2 mg/kg	TM181	18.2 M	16.9 M	14.6 M	17.3 M	20.3 M	20.4 M	
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	<1.00 #	<1.00 #	<1.00 #	
Zinc	<1.9 mg/kg	TM181	122 M	46.8 M	61.4 M	46.8 M	112 M	42.5 M	
Total Sulphate	<48 mg/kg	TM221	11000 M	8840 M	5090 M	4000 M	6960 M	947 M	

SDG: 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67133

EPH CWG (Aromatic) GC (S)

Results Legend	Sample Identity	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
	# ISO17025 accredited. mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.35 - 0.50 Soil/Solid 24/11/2009 to 27/11/2009 30/11/2009 091201-89 744795	1.25 - 1.30 Soil/Solid 27/11/2009 30/11/2009 091201-89 673389	0.30 - 0.50 Soil/Solid 24/11/2009 to 27/11/2009 30/11/2009 091201-89 673401	1.20 - 1.25 Soil/Solid 27/11/2009 30/11/2009 091201-89 673456	0.30 - 0.80 Soil/Solid 27/11/2009 30/11/2009 091201-89 673468

Component	LOD/Units	Method	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
Aromatics >EC12-EC16	<100 µg/kg	TM173	673	2040	<100	11700	15000	1040
Aromatics >EC16-EC21	<100 µg/kg	TM173	5660	8460	1890	21700	36100	2460
Aromatics >EC21-EC35	<100 µg/kg	TM173	166000	113000	19700	28700	125000	15600
Aromatics >EC35-EC44	<100 µg/kg	TM173	39300	43900	7400	7630	25700	1150
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	211000	167000	29000	69600	202000	20200
Total Aromatics >EC12-EC44 UK SPEC	<100 µg/kg	TM173	211000	167000	29000	69600	202000	20200

SDG: 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67133

GRO BTEX MTBE GC (S)

Results Legend	Sample Identity	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
	Depth (m)	0.35 - 0.50	1.25 - 1.30	0.30 - 0.50	1.20 - 1.25	0.30 - 0.80	0.90 - 1.00
	Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
	Date Sampled	24/11/2009 to 27/11/2009	27/11/2009	24/11/2009 to 27/11/2009	27/11/2009	27/11/2009	27/11/2009
	Date Received	27/11/2009	30/11/2009	27/11/2009	30/11/2009	30/11/2009	30/11/2009
	SDG Ref	30/11/2009	091201-89	30/11/2009	091201-89	091201-89	091201-89
	Lab Sample No.(s)	091201-89 744795	673389	091201-89 673401	673456	673468	673476

Component	LOD/Units	Method							
GRO C5-C12	<44 µg/kg	TM089	<44.0	124	<44.0	43400	487	1400	
MTBE	<5 µg/kg	TM089	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	
Benzene	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Toluene	<2 µg/kg	TM089	<2.00	<2.00	<2.00	42.2	<2.00	<2.00	
Ethyl Benzene	<3 µg/kg	TM089	<3.00	<3.00	<3.00	271	<3.00	<3.00	
m & p Xylene	<6 µg/kg	TM089	<6.00	<6.00	<6.00	1510	<6.00	<6.00	
o Xylene	<3 µg/kg	TM089	<3.00	<3.00	<3.00	1030	<3.00	<3.00	
Sum m&p and o Xylene	<10 µg/kg	TM089	<10.0	<10.0	<10.0	2540	<10.0	<10.0	
Sum of BTEX	<10 µg/kg	TM089	<10.0	<10.0	<10.0	2850	<10.0	<10.0	
Aliphatics C5-C6	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aliphatics >C6-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0	348	<10.0	<10.0	
Aliphatics >C8-C10	<10 µg/kg	TM089	<10.0	<10.0	<10.0	5350	38.5	172	
Aliphatics >C10-C12	<10 µg/kg	TM089	<10.0	42.8	<10.0	10700	156	386	
Total Aliphatics C5-C12	<10 µg/kg	TM089	<10.0	42.8	<10.0	16400	195	558	
Aromatics C6-C7	<10 µg/kg	TM089	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Aromatics >C7-C8	<10 µg/kg	TM089	<10.0	<10.0	<10.0	42.2	<10.0	<10.0	
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10.0	10.2	<10.0	10800	57.7	258	
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10.0	64.2	<10.0	16100	235	580	
Total Aromatics C6-C12	<10 µg/kg	TM089	<10.0	74.4	<10.0	27000	292	837	

SDG 091201-89
 Job: D_MOUCHEL_ELE-85
 Client Reference:
 Location: Limerick Gasworks

Customer: Mouchel
 Attention: Dave Watts
 Order No.:
 Report No: 67133

PAH micro by GCMS

Results Legend	Sample Identity		C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
	Depth (m)	Sample Type	0.35 - 0.50	1.25 - 1.30	0.30 - 0.50	1.20 - 1.25	0.30 - 0.80	0.90 - 1.00
# ISO17025 accredited. M mCERTS accredited. subcontracted test. This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.	Date Sampled	Soil/Solid	24/11/2009 to 27/11/2009	27/11/2009	24/11/2009 to 27/11/2009	27/11/2009	27/11/2009	27/11/2009
	Date Received		30/11/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009
	SDG Ref		091201-89	091201-89	091201-89	091201-89	091201-89	091201-89
	Lab Sample No.(s)		091201-89 744795	673389	091201-89 673401	673456	673468	673476

Component	LOD/Units	Method	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
Naphthalene (S)	<9 µg/kg	TM218	224 M	127 M	67.3 M	1500 M	13100 M	119 M
Acenaphthylene (S)	<12 µg/kg	TM218	544 M	499 M	58.9 M	172 M	5840 M	129 M
Acenaphthene (S)	<8 µg/kg	TM218	<8.00 M	74.7 M	<8.00 M	688 M	1550 M	89.0 M
Fluorene (S)	<10 µg/kg	TM218	34.1 M	135 M	10.4 M	671 M	4790 M	146 M
Phenanthrene (S)	<15 µg/kg	TM218	394 M	680 M	198 M	1120 M	14900 M	458 M
Anthracene (S)	<16 µg/kg	TM218	362 M	364 M	51.6 M	522 M	4900 M	143 M
Fluoranthene (S)	<17 µg/kg	TM218	875 M	2450 M	387 M	1210 M	10500 M	406 M
Pyrene (S)	<15 µg/kg	TM218	1270 M	2640 M	351 M	816 M	7490 M	272 M
Benzo(a)anthracene (S)	<14 µg/kg	TM218	1660 M	2240 M	267 M	347 M	3500 M	141 M
Chrysene (S)	<10 µg/kg	TM218	1680 M	1950 M	295 M	304 M	2910 M	104 M
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218	2830 M	2400 M	405 M	309 M	2790 M	105 M
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218	1240 M	1120 M	186 M	125 M	1120 M	39.0 M
Benzo(a)pyrene (S)	<15 µg/kg	TM218	2560 M	2270 M	342 M	283 M	2880 M	88.8 M
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218	1450 M	1210 M	275 M	172 M	1460 M	67.7 M
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218	497 M	413 M	73.4 M	46.1 M	369 M	<23.0 M
Benzo(ghi)perylene (S)	<24 µg/kg	TM218	1700 M	1430 M	365 M	214 M	1740 M	92.3 M
PAH 16 EPA Total	<118 µg/kg	TM218	17300 M	20000 M	3330 M	8500 M	79900 M	2400 M

SDG: 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67133

TPH CWG GC (S)

Results Legend
 # ISO17025 accredited.
 m CERTS accredited.
 * subcontracted test.
 This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
 The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
Depth (m)	0.35 - 0.50	1.25 - 1.30	0.30 - 0.50	1.20 - 1.25	0.30 - 0.80	0.90 - 1.00
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	24/11/2009 to 27/11/2009	27/11/2009	24/11/2009 to 27/11/2009	27/11/2009	27/11/2009	27/11/2009
Date Received	30/11/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009
SDG Ref	091201-89	091201-89	091201-89	091201-89	091201-89	091201-89
Lab Sample No.(s)	091201-89 744795	673389	091201-89 673401	673456	673468	673476

Component	LOD/Units	Method	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
Total Aliphatics >C5-C44	<100 µg/kg	TM173	44400	56700	12000	70300	42900	15200
Total Aromatics >C6-C44	<100 µg/kg	TM173	211000	167000	29000	96600	202000	21000
TPH (Aliphatics + Aromatics) >C5-C44	<100 µg/kg	TM173	256000	224000	41000	167000	245000	36200

SDG 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No: 67133

VOC MS (S)

Results Legend			Sample Identity	C12 AWS	C12 AWS	C12 BWS	C12 BWS	D12 WS	D12 WS
# ISO17025 accredited. # mCERTS accredited. # subcontracted test. * This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m)	0.35 - 0.50	1.25 - 1.30	0.30 - 0.50	1.20 - 1.25	0.30 - 0.80	0.90 - 1.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	24/11/2009 to 27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009	27/11/2009
			Date Received	30/11/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009	30/11/2009
			SDG Ref	091201-89	091201-89	091201-89	091201-89	091201-89	091201-89
Lab Sample No.(s)	091201-89 744795	673389	091201-89 673401	673456	673468	673476			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	131	126	159	141	1.01	108	
Toluene-d8**	%	TM116	91.6	92.6	90.9	66.9	93.8	90.7	
4-Bromofluorobenzene**	%	TM116	65.0	84.1	78.6	72.8	77.0	82.3	
Dichlorodifluoromethane	<13 µg/kg	TM116	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	
Chloromethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	
Vinyl Chloride	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Bromoethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
Chloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	
Trichlorofluoromethane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	
1,1-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
Carbon Disulphide	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
Dichloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Methyl Tertiary Butyl Ether	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
trans-1,2-Dichloroethene	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	
1,1-Dichloroethane	<8 µg/kg	TM116	<8.00	<8.00	<8.00	<8.00	<8.00	<8.00	
cis-1,2-Dichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
2,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Bromochloromethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Chloroform	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
1,1,1-Trichloroethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	
1,1-Dichloropropene	<13 µg/kg	TM116	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	
Carbontetrachloride	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0	<11.0	<11.0	
1,2-Dichloroethane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Benzene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
Trichloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
1,2-Dichloropropane	<10 µg/kg	TM116	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	
Dibromomethane	<12 µg/kg	TM116	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	
Bromodichloromethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0	<11.0	<11.0	
cis-1,3-Dichloropropene	<25 µg/kg	TM116	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	
Toluene	<6 µg/kg	TM116	<6.00	<6.00	<6.00	14.6	<6.00	<6.00	
trans-1,3-Dichloropropene	<27 µg/kg	TM116	<27.0	<27.0	<27.0	<27.0	<27.0	<27.0	
1,1,2-Trichloroethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
1,3-Dichloropropane	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	
Tetrachloroethene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
Dibromochloromethane	<9 µg/kg	TM116	<9.00	<9.00	<9.00	<9.00	<9.00	<9.00	
1,2-Dibromoethane	<14 µg/kg	TM116	<14.0	<14.0	<14.0	<14.0	<14.0	<14.0	
Chorobenzene	<7 µg/kg	TM116	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	
1,1,1,2-Tetrachloroethane	<11 µg/kg	TM116	<11.0	<11.0	<11.0	<11.0	<11.0	<11.0	
Ethylbenzene	<9 µg/kg	TM116	<9.00	<9.00	<9.00	221	<9.00	<9.00	

SDG: 091201-89
Job: D_MOUCHEL_ELE-85
Client Reference:
Location: Limerick Gasworks

Customer: Mouchel
Attention: Dave Watts
Order No.:
Report No.: 67133

VOC MS (S)

Component	LOD/Units	Method	C12 AWS		C12 BWS		D12 WS	
			Depth (m)	Sample Type	Depth (m)	Sample Type	Depth (m)	Sample Type
p/m-Xylene	<13 µg/kg	TM116	0.35 - 0.50	Soil/Solid	1.25 - 1.30	Soil/Solid	0.30 - 0.80	Soil/Solid
o-Xylene	<11 µg/kg	TM116	24/11/2009 to 27/11/2009	Soil/Solid	27/11/2009 to 30/11/2009	Soil/Solid	27/11/2009 to 30/11/2009	Soil/Solid
Styrene	<11 µg/kg	TM116	30/11/2009	Soil/Solid	091201-89	Soil/Solid	091201-89	Soil/Solid
Bromoform	<12 µg/kg	TM116	091201-89	Soil/Solid	673389	Soil/Solid	673456	Soil/Solid
Isopropylbenzene	<9 µg/kg	TM116	744795	Soil/Solid		Soil/Solid	673468	Soil/Solid
1,1,1,2-Tetrachloroethane	<15 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,2,3-Trichloropropane	<13 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
Bromobenzene	<14 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
Propylbenzene	<6 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
2-Chlorotoluene	<14 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
4-Chlorotoluene	<9 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
tert-Butylbenzene	<12 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,2,4-Trimethylbenzene	<10 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
sec-Butylbenzene	<8 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
4-Isopropyltoluene	<8 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,3-Dichlorobenzene	<8 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,4-Dichlorobenzene	<11 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
n-Butylbenzene	<7 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,2-Dichlorobenzene	<8 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,2-Dibromo-3-chloropropane	<11 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
Tert-amyl methyl ether	<7 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,2,4-Trichlorobenzene	<9 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
Hexachlorobutadiene	<15 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
Naphthalene	<7 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid
1,2,3-Trichlorobenzene	<12 µg/kg	TM116		Soil/Solid		Soil/Solid		Soil/Solid

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-



Issues with Sulphate analysis on Limerick Gasworks Samples

Introduction:

It was noted that samples analysed from this site at the end of 2009 were reporting sulphate concentrations above 100%. These samples were then re-analysed for *total sulphur* and found to be in the order of ~5% S by mass.

An investigation was therefore conducted in an effort to identify the root cause of the spurious results.

Investigation:

Initial suspicion was some form of optical interference on the emission spectrometer used to analyse the samples. It was noted that these samples were also significantly high in calcium (percentage level), so the possibility of a calcium interference was considered. – It should be noted that no optical interference had been identified for this analysis previously.

The spectra of high-level calcium solutions was examined, but found not to overlap with the sulphur peak. This eliminated calcium as the source of an optical interference, so we enquired with the client about what may have been used on the site.

It was revealed that the site used to treat with *slaked lime* to remove hydrogen sulphide, which then produced calcium hydrosulphide and thiocarbonate; this may have been dumped on the site.

Unfortunately this still does not explain how we obtained a result over 100% (even if the sample contained mainly sulphides that were not removed by the HCl digest, the concentration should not exceed 100%).

Conclusion:

We cannot identify the root cause of this problem, so we cannot currently correct for it. The issue does seem to be site specific, as we have never experienced this problem before.

ALcontrol Laboratories acknowledged that the data generated is unfortunately flawed, and should not be used by the client for the basis of remediation.

Prepared by:

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