

# Former Gasworks, Dock Road, Limerick

## Quarterly Groundwater Monitoring Report – Annual Summary 2011

November 2011

For Bord Gais

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## Document Control Sheet

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2011

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## LIMITATIONS

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Mouchel has used reasonable skill, care and diligence in the design and interpretation of the ground investigation, however, the inherent variability of ground conditions allows only definition of the actual conditions at the location and depths of exploratory holes and samples/tests therefrom, while at intermediate locations conditions can only be inferred.

New information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission

## Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
1.1	Terms of Reference .....	1
1.2	Monitoring Visits .....	1
<b>2</b>	<b>Hydrogeological Site Model</b> .....	<b>2</b>
2.1	Groundwater source and flow direction.....	2
2.2	Groundwater levels.....	2
2.3	Hydraulic gradient estimates.....	4
<b>3</b>	<b>Chemical distribution</b> .....	<b>5</b>
3.1	Visual, olfactory and DNAPL thickness results.....	5
3.2	Chemical results .....	6
3.3	Temporal Variation .....	7
<b>4</b>	<b>Conclusions</b> .....	<b>8</b>
4.1	Hydrology .....	8
4.2	Chemical distribution .....	8

## Drawings

1021927/R02/OD/001 **Characterisation Exploratory Hole Location Plan**

## Appendices

**Appendix A – Groundwater Contour Plots (visits 6 – 8)**

**Appendix B - Temporal Variation Graphs**

**Appendix C – Chemical Test Results (visits 6 – 8)**

**Appendix D – Chemical Screening Spreadsheets (visits 6 – 8)**

# 1 Introduction

## 1.1 Terms of Reference

Mouchel were appointed by Bord Gais Eireann, on 31st March 2009, to provide engineering consultancy services for the assessment and remediation of the former gasworks site, on Dock Road, Limerick, Ireland. Mouchel (formerly known as Mouchel Parkman) have had an involvement with the site extending over a period of some nine years having previously undertaken ground investigations at the site.

This report forms part of the larger scheme of works currently being undertaken on the site, Mouchel have been appointed to conduct groundwater quality monitoring programme to establish a baseline data-set for the site prior to the proposed remediation works.

This report presents a comparison of the groundwater quality data from the three monitoring visits undertaken throughout the past year; Visit 6 – 26<sup>th</sup> to 27<sup>th</sup> January 2011; Visit 7 – 26<sup>th</sup> to 27<sup>th</sup> April 2011; Visit 8 – 24<sup>th</sup> to 26<sup>th</sup> October 2011.

## 1.2 Monitoring Visits

To date, eight groundwater monitoring visits have been undertaken as part of the additional groundwater monitoring programme. This annual report summarises the three visits undertaken in 2011.

For further information on the site characterisation fieldwork, sampling and chemical testing, please refer to the Mouchel Site Characterisation Factual Report, 1021927/R/02 version C dated November 2011.

## 2 Hydrogeological Site Model

### 2.1 Groundwater source and flow direction

The site specific hydrogeology is discussed in depth in the 2010 Quantitative Risk Assessment, Options Appraisal and Remediation Report, reference 1021927/R/03 and the subsequent Addendum Report 1021927/R/18. The findings of the QRA report have been reviewed following completion of two years worth of groundwater monitoring.

The results indicate that the flow direction is generally consistent all year round but the groundwater levels are influenced by seasonal rainfall variations. The results to date suggest that there may be two sources of groundwater entering the site.

- Source 1 – Originating from the southern corner of the site from within the rock outcrop (picked up by monitoring well J10).
- Source 2 – Originating from the south east section where water is draining into the site (picked up by monitoring well K5).

These two sources seem to be partially split by the bedrock which is located at the surface around cells I10, J09, K08, K09, K10, L08, L09 and L10.

The water appears to accumulate in the quarry area and flow towards the south west (A11 / corner of Dock Road and St. Alphonsus Street) and to the west (A3 – A4 / Dock Road). Flow is therefore in an approximately westerly direction as would be expected close to the river (the angle of flow will be to the river (west north west) but with a vector in the direction of river flow, i.e. westerly).

### 2.2 Groundwater levels

The results of the 2011 groundwater monitoring visits are presented overleaf (the DNAPL depths are displayed in brackets). Groundwater contour plots for all three visits undertaken during 2011 are presented as Appendix A.

BH No.	Response zone strata	* Response zone depth m MHD (m Malin Head Datum)	Water level m MHD (DNAPL level m MHD)				
			2010 Annual average	Jan 2011 Visit 6	Apr 2011 Visit 7	October 2011 Visit 8	2011 Annual Average
A3	Limestone bedrock	1.16 – -0.34	2.70	2.76	2.66	2.92	2.78
A4	Limestone bedrock	1.63 – -0.37	2.65	2.64	2.61	lost	2.63
A11	Limestone bedrock	1.84 – 0.84	2.64	2.69	2.70	3.22	2.87
B8	Made ground	4.49 – 0.99	3.65 (2.66)	could not access	could not access	could not access	N/A
C7	Limestone bedrock	-0.45 – -1.95	3.75 (-1.22)	3.75	3.65 (-0.65)	3.92 (-0.60)	3.77
C11	Natural clay	3.36 – 1.86	3.07	3.16	3.11	3.16	3.14
D1	Limestone bedrock	1.06 – -0.44	4.06 (2.16)	4.06 (2.60)	3.93 (2.76)	4.23 (2.11)	4.07
D5	Made ground	5.8 – 3.80	5.17	5.21	5.08	5.37	5.22
E8	Made ground	4.84 – -0.16	4.87	5.01	4.77	5.08	4.95
F11	Limestone bedrock	2.72 – 1.22	5.35	5.06	4.96	5.13	5.05
G2	Limestone bedrock	-2.01 – -3.51	4.85	5.02	4.72	5.19	4.98
G3	Made ground	6.92 – -1.08	4.87	5.06	4.73	5.20	5.00
G4	Limestone bedrock	-2.55 – -4.55	4.86 (-1.92)	5.06	4.72 (-1.64)	5.22 (-2.25)	5.00
G5	Made ground	6.24 – -1.76	4.88	5.06	4.77	5.24	5.02
G8	Limestone bedrock	6.28 – 4.78	6.79	6.87	6.58	6.95	6.80
H12	Limestone bedrock	3.76 – 2.26	5.69	5.66	5.64	5.60	5.63
J10	Limestone bedrock	5.95 – 3.95	6.64	6.85	6.19	6.95	6.66
K1	Made ground	6.96 – 3.46	5.86	5.95	5.83	6.27	6.02
K5	Made ground	7.64 – 2.64	7.74	7.69 (3.64)	7.72 (3.64)	8.31	7.91
L7	Limestone bedrock	6.65 – 5.15	<5.85**	<5.85**	<5.85**	5.97**	5.89
M3	Limestone bedrock	3.23 – 1.73	5.07	5.40	5.01	5.51	5.31
A1	Limestone bedrock	2.27 – 1.27	N/A	N/A	N/A	No DNAPL***	N/A
A9	Made ground	4.64 – 3.09	N/A	N/A	N/A		N/A
C2	Made ground	4.33 - 2.83	N/A	N/A	N/A		N/A

\*Depth estimated from installation details from 2010 QRA report (1021927/R/03).

\*\*Installation was dry during monitoring visit; the depth stated is at the base of the monitoring well.

\*\*\*Groundwater levels measured on completion of drilling without sufficient time to stabilise. They have therefore not been summarised here.

## 2.3 Hydraulic gradient estimates

The results equate to the following estimates of hydraulic gradient across the site:

### 2010 annual average for visits 1-5

G8 – E8 (approximately 1.84 / 13.5m) = 0.136

G3 – A3 (approximately 2.17m / 59.9m) = 0.036

F11 – A11 (approximately 2.71m / 47.15m) = 0.057

Average across the three = 0.076

### 2011 annual average for visits 6-8

G8 – E8 (approximately 1.85m / 13.5m) = 0.137

G3 – A3 (approximately 2.22m / 59.9m) = 0.036

F11 – A11 (approximately 2.18m / 47.15m) = 0.046

Average across the three = 0.073

The average hydraulic gradient is generally consistent with the 2010 average. However, the F11 to A11 gradient has reduced between 2010 and 2011, possibly due to the drier than average year to date in 2011 as indicated by MET Eireann (<http://www.met.ie/climate/monthly-summary.asp>).



### 3 Chemical distribution

#### 3.1 Visual, olfactory and DNAPL thickness results

Whilst undertaking the groundwater monitoring programme, samples collected were inspected for any visual and olfactory evidence of contamination. This ranged from various odours, hydrocarbon sheens and the presence of DNAPL. These results have been collated for the three visits undertaken during 2011 and have been summarised in the table below:

Visit	DNAPL detected	Hydrocarbon sheen / odour	Anaerobic / hydrogen sulphide odour	No evidence of significant contamination
6	D1, G4, K5	A3, A4, A11, C7, C11, D1, D5, E8, G2, G3, G5, G4, H12, K5, M3	D5	F11, G8, J10, K1, L7
7	C7, D1, G4, K5	A3, A4, C7, C11, D1, E8, F11, G2, G3, G4, G5, G8, H12, J10, K5, K5, M3		A11, D5, L7,
8	C7, D1, G4, K5	A3, D1, G2, G5, J10, K5, M3	-	A1, A9, A11, C2, C11, D5, E8, F11, G3, G8, H12, K1, L7

An anaerobic odour was previously noted from locations positioned within the former quarry area (D1 and G2), but was not recorded for the two most recent visits.

A hydrocarbon sheen / odour was recorded intermittently along the site boundary, down flow of the predicted groundwater direction (A3, A4 and A11).

A sheen / odour was regularly noted around the former gasholders and the quarry area (C7, D1, G4, G5 and K5). During visits 6, 7 and 8, a yellow/green colour accompanied by a strong organic / ammoniaical odour was recorded in E8.

DNAPL was recorded in D1, G4 and K5 on all visits, and in C7 during visits 7 and 8. DNAPL was generally encountered around the former gasholders and within the deeper parts of the quarry where response zones were placed in the Limestone bedrock.

## 3.2 Chemical results

The groundwater testing methodology and legislation is discussed in full in the Mouchel Quantitative Risk Assessment, Options Appraisal and Remedial Strategy report reference 1021927/R/03, dated March 2010.

Chemical test results for the three quarterly monitoring visits for 2011 are discussed on a visit by visit basis in the quarterly monitoring reports.

Chemical test results from all three visits are presented as Appendix C. EQS and DWS screening tables for each visit are presented as Appendix D.

Across all three visits during 2011, the chemical test results generally correspond with the visual and olfactory evidence. The locations that appeared to be the most contaminated generally recorded the highest concentrations of contaminants. Concentrations of contaminants varied between visits but generally the following contaminants recorded exceedences:-

### Environmental Quality Standards (EQS)

Concentrations commonly exceed the screening values in the majority of samples for selenium, ammoniacal nitrogen, sulphate, phenols, cyanide, BTEX, total TPH C<sub>5</sub>-C<sub>35</sub> and most of the speciated PAH's.

Exceedences were also recorded for arsenic, nickel, styrene, zinc, acidic pH, 1,2-dichloroethane and trichloroethene, but only at a few locations.

### Drinking Water Standards (DWS)

Concentrations commonly exceed the screening values in the majority of samples for ammonium, sulphate, phenols, cyanide, benzene, total TPH C<sub>5</sub> to C<sub>35</sub>, fluoranthene and total PAH. GRO and benzo(a)pyrene also recorded exceedences in the majority of samples, but not for each monitoring visit.

Exceedences were also recorded for arsenic, nickel, selenium, ethylbenzene, toluene, xylene, pH, 1,2-dichloroethane, trichloroethene and styrene at a few locations.

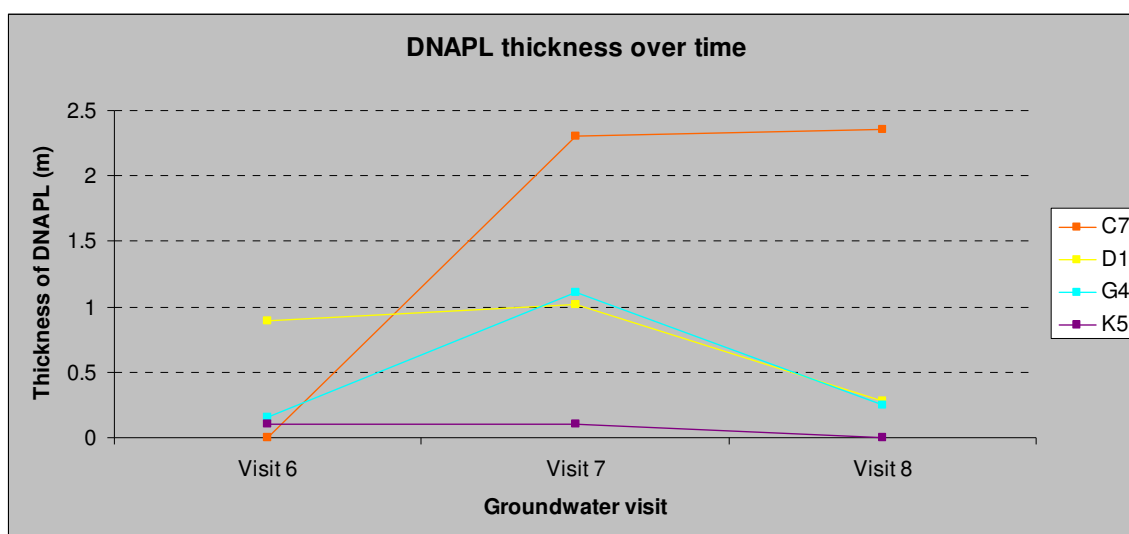
### 3.3 Temporal Variation

The DNAPL thickness and chemical analytical data from the three visits was compared to assess any potential temporal changes and identify any seasonal patterns. Temporal variation plots are presented in Appendix B.

The graphs indicate that although there is some variation in contaminant concentrations, there is no consistent increase or decline in contaminant concentrations over time. However, there are a few exceptions as detailed below:-

Naphthalene – at location C7, significant increase during visit 8 compared to visits 6 and 7; at location D1, significant decrease in visit 8 compared to visits 6 and 7; at location E8, significant decrease in visit 7; at location G2, significant decrease in visits 7 and 8 compared to visit 6. It is possible that the variation at 7 is due to the disappearance of the obstruction, allowing sampling to occur from a greater depth. The other observed variations could be due to the effect of the decreased rainfall during the 2011 monitoring period. However, all the differences are less than one order of magnitude and therefore are not considered to reflect a change in contaminant mobility or migration.

DNAPL was detected at four locations during the 2011 monitoring period. The graph below indicates the variation in the thickness of DNAPL across the three visits. It should be noted that the DNAPL thickness in well C7 during visit 6 is unlikely to be correct due to a blockage.



## 4 Conclusions

### 4.1 Hydrology

The results indicate that the groundwater levels and flow direction are generally consistent all year round. The results to date suggest that there may be two sources of groundwater entering the site along the southern boundary.

Groundwater flow appears to be in a westerly direction, as would be expected close to the river. The angle of flow will be to the river (west north west) but with a vector in the direction of river flow, (i.e. westerly).

The average results of the three visits to date this year equate to an estimated hydraulic gradient across the site of 0.073.

### 4.2 Chemical distribution

#### 4.2.1 *Visual, olfactory and DNAPL thickness results*

Visual and olfactory evidence of contamination has varied slightly throughout the 2011 monitoring period, with a general decrease in the number of locations where a sheen and / or odour were recorded from visit 6 to visit 8.

The DNAPL thickness in C7 appears to be stable throughout the year at 2m to 2.5m thickness. The DNAPL thickness in G4 has varied considerably between visits ranging from approximately 1m to less than 0.5m. The thickness in K5 remained low in visits 6 and 7, but no DNAPL was recorded in visit 8. Location D1 followed a similar variation trend with the observed thickness reducing in visit 8.

#### 4.2.2 *Chemical results*

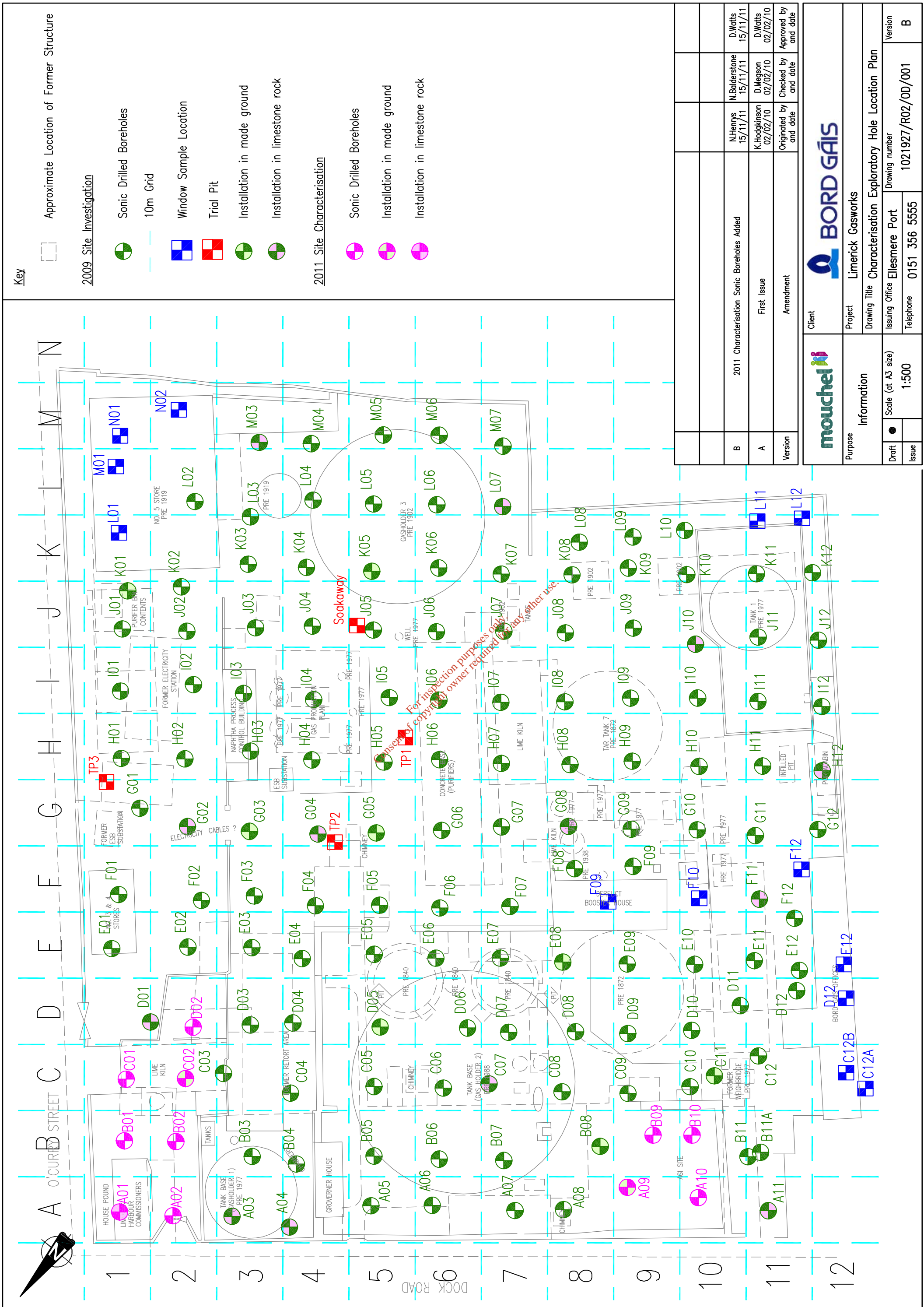
Several contaminants were recorded in concentrations above the EQS and DWS. A Tier 3 Groundwater QRA was undertaken in the QRA report which concluded that although a theoretical risk exists in respect to the River Shannon, this is unlikely to be realised due to the timescales required for contaminants to flow to the receptor and the presence of the wet dock and graving docks (with significant walls) impeding flow. It is also noted that cohesive alluvial deposits may be present in the vicinity of the river further impeding any groundwater flow directly into the river.

It is concluded that the limestone aquifer is not productive due to the brackish nature of the groundwater and the thin water bearing stratum (in the near surface weathered zone). There are also no abstractions within the vicinity of the site.

#### 4.2.3 *Seasonal Pattern*

The chemical results to date have fluctuated slightly with naphthalene recording the largest variations between visits, but none of the determinands plotted recorded variation in excess of one order of magnitude between visits.

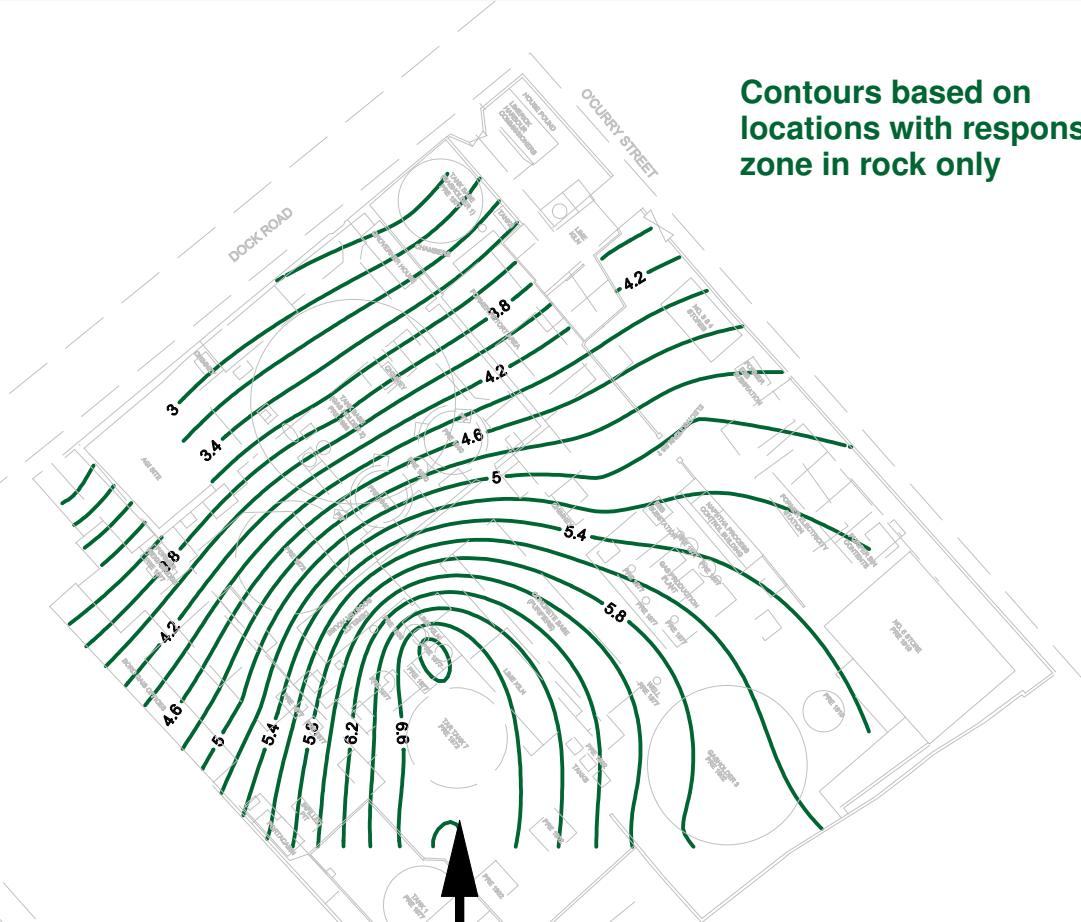
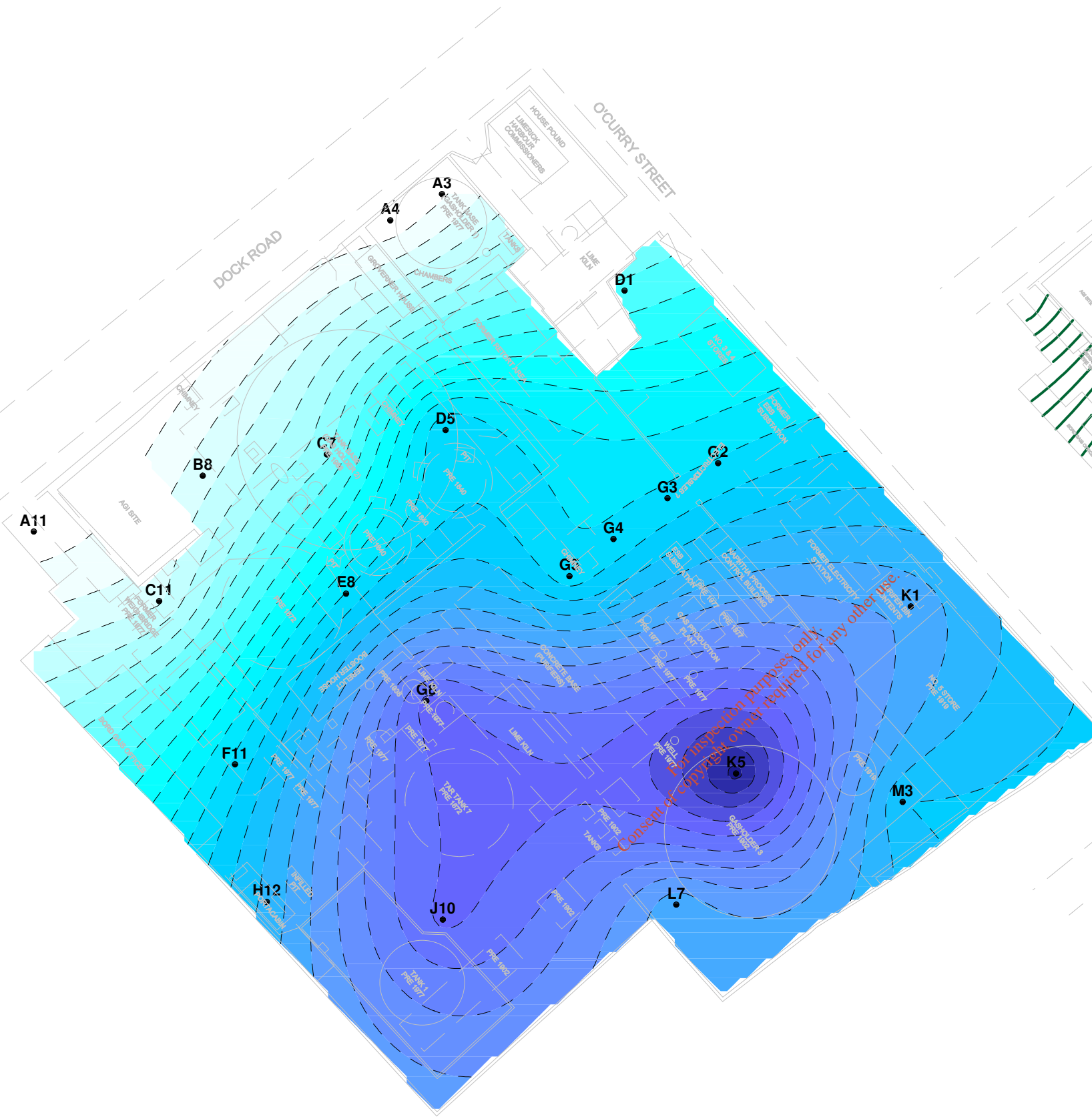
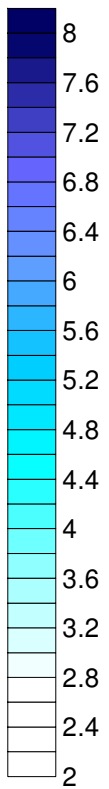
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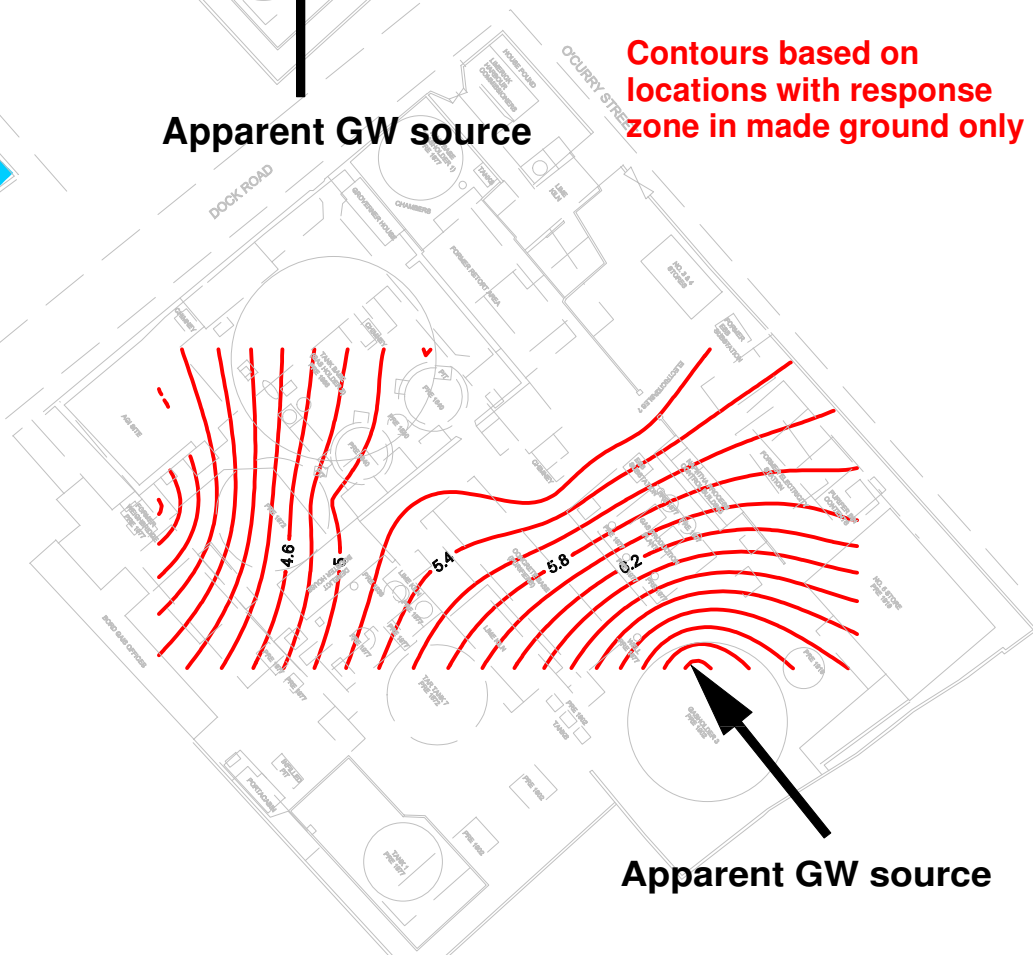


Groundwater Level  
(m MHD)



Contours based on  
locations with response  
zone in rock only

Apparent GW source



Contours based on  
locations with response  
zone in made ground only

Apparent GW source

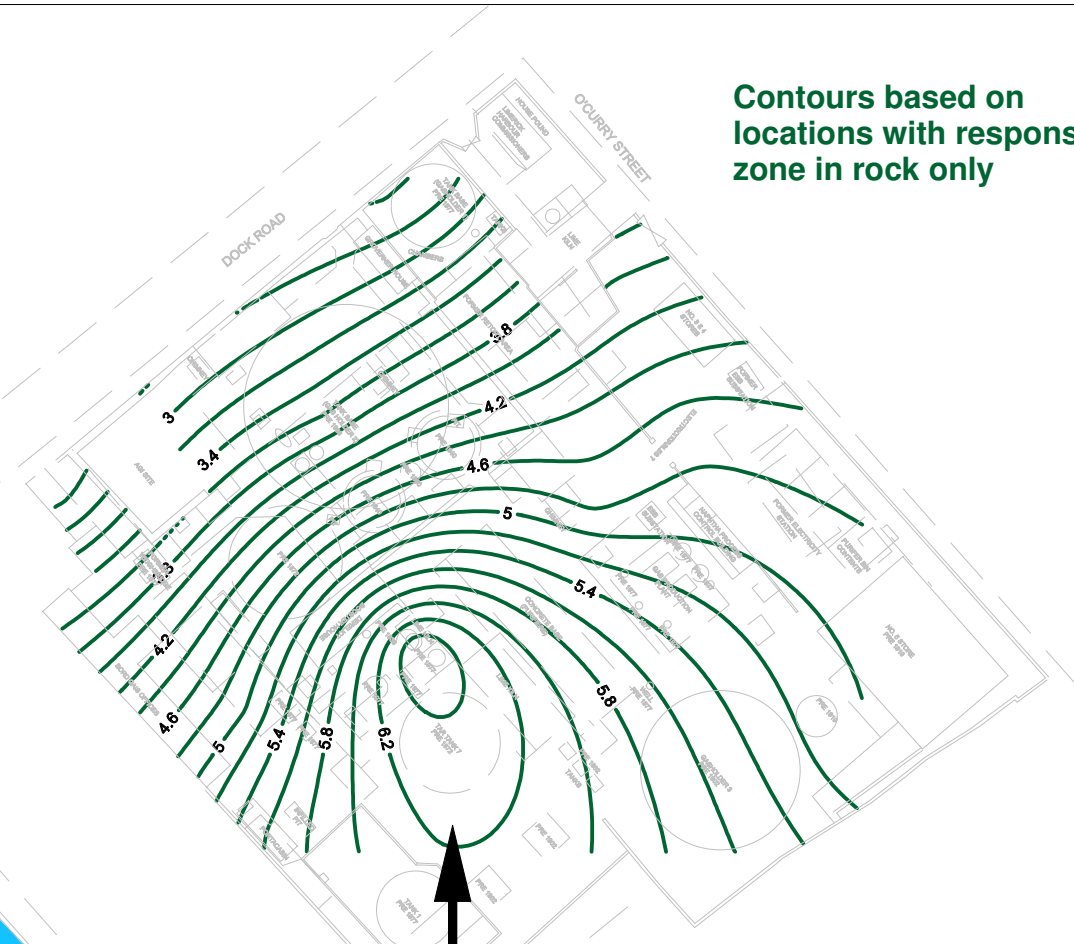
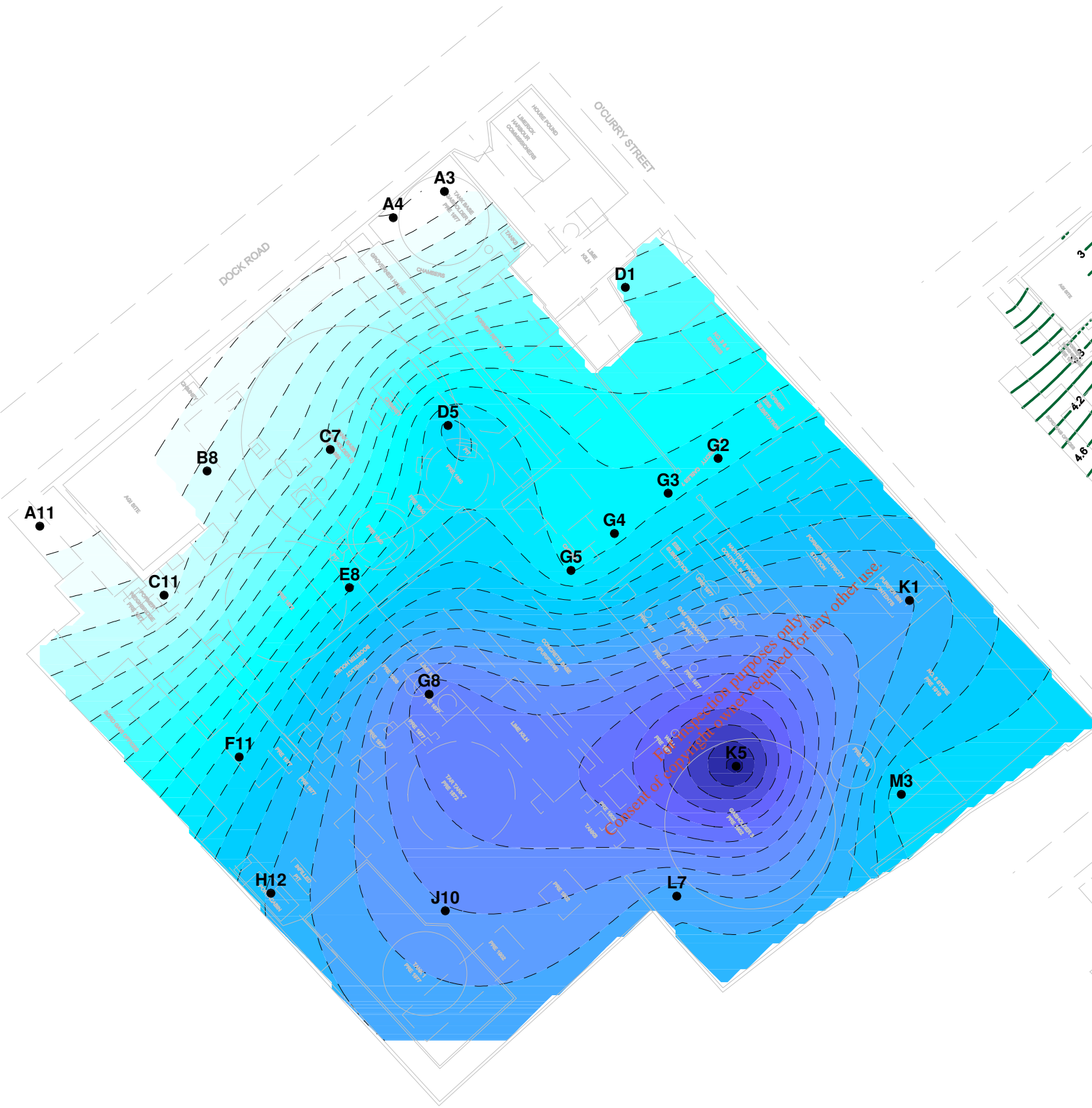
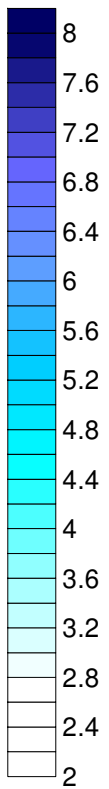
These plots have been produced using data obtained from the groundwater monitoring visit undertaken on 26-27/01/2011. Contours were plotted using the Kriging method based upon a 1m x 1m grid.

	Client	Bord Gais		
	Project	Limerick Gasworks		
Purpose	Drawing Title	Figure 1) Groundwater levels 26-27/01/2011		
<b>Information</b>	Issuing Office	Ellesmere Port	Drawing Number	1034973/R01/OD/001
	Scale	Not to scale	Telephone	0151 356 5555
Version	A	Version	A	

A	First Issue	DM	DM	DW
Version	Amendment	Originated	Checked	Approved

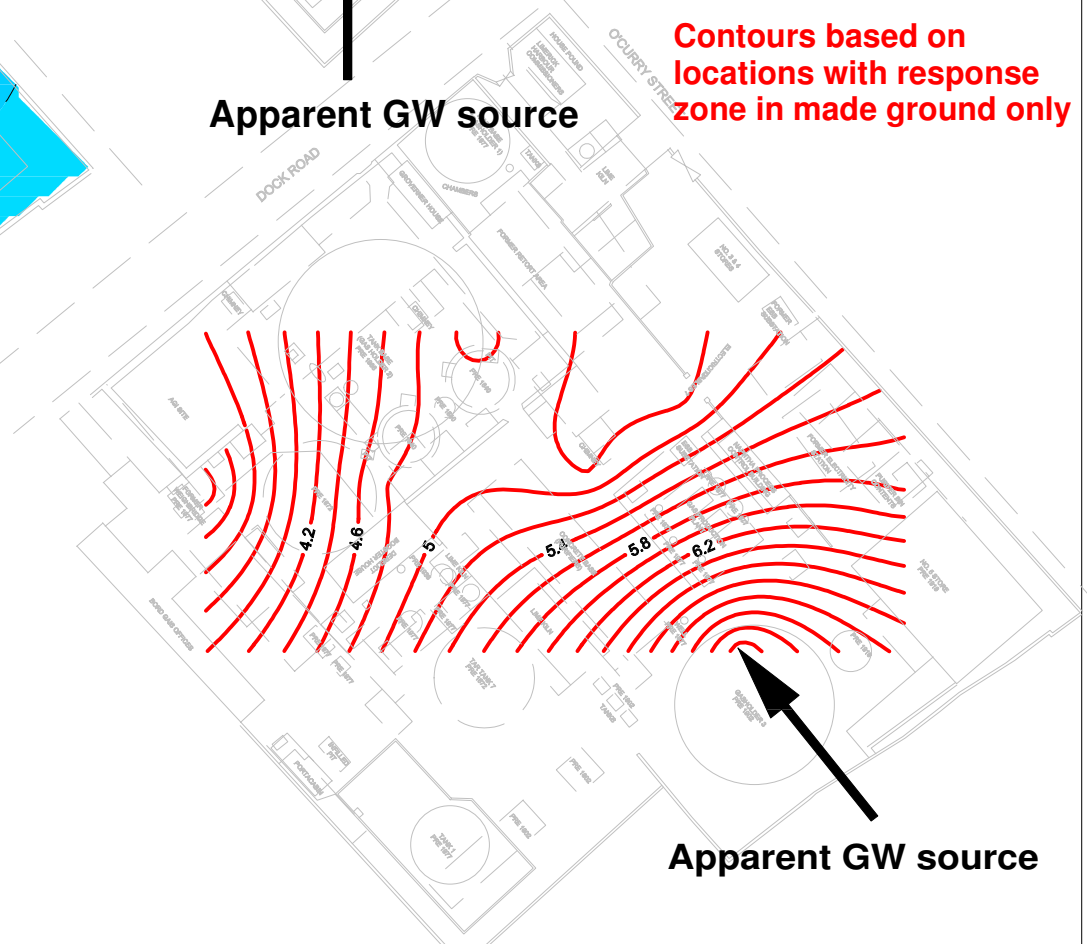


Groundwater Level  
(m MHD)



Contours based on  
locations with response  
zone in rock only

Apparent GW source



Contours based on  
locations with response  
zone in made ground only

Apparent GW source

These plots have been produced using data obtained from the groundwater monitoring visit undertaken on 26-27/04/2011. Contours were plotted using the Kriging method based upon a 1m x 1m grid.

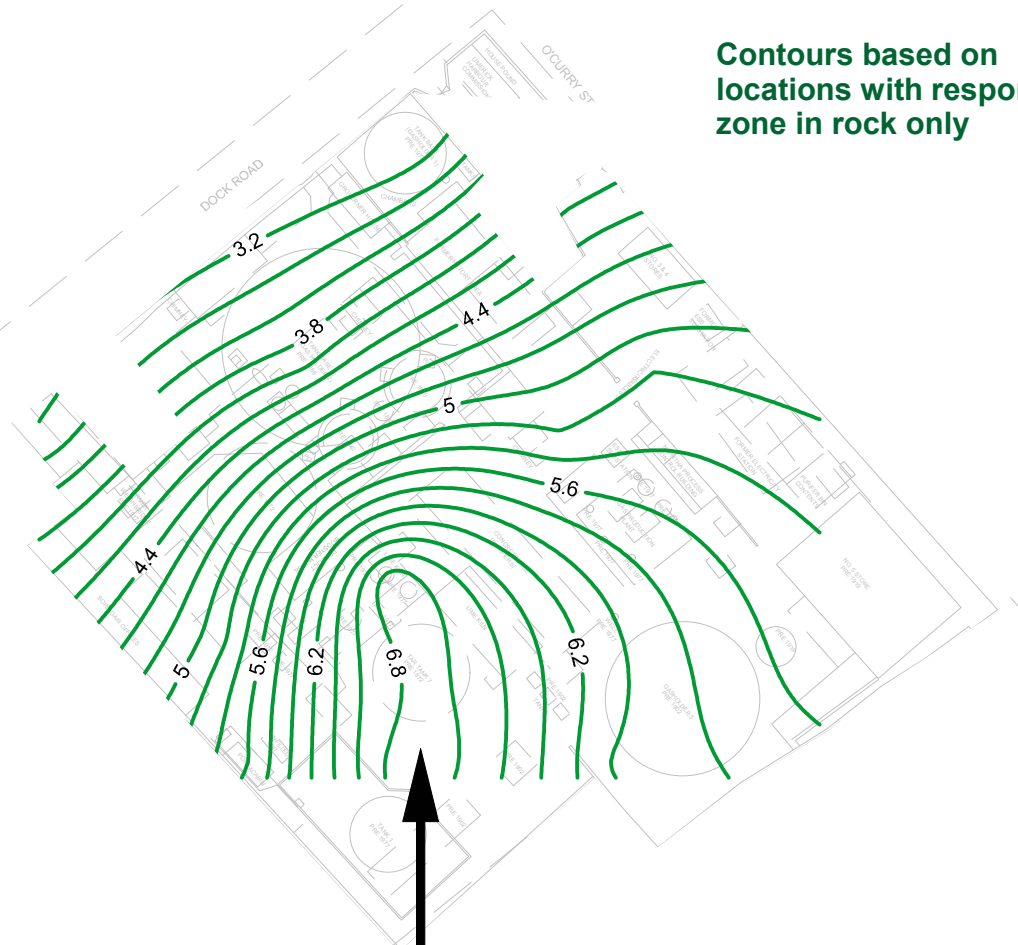
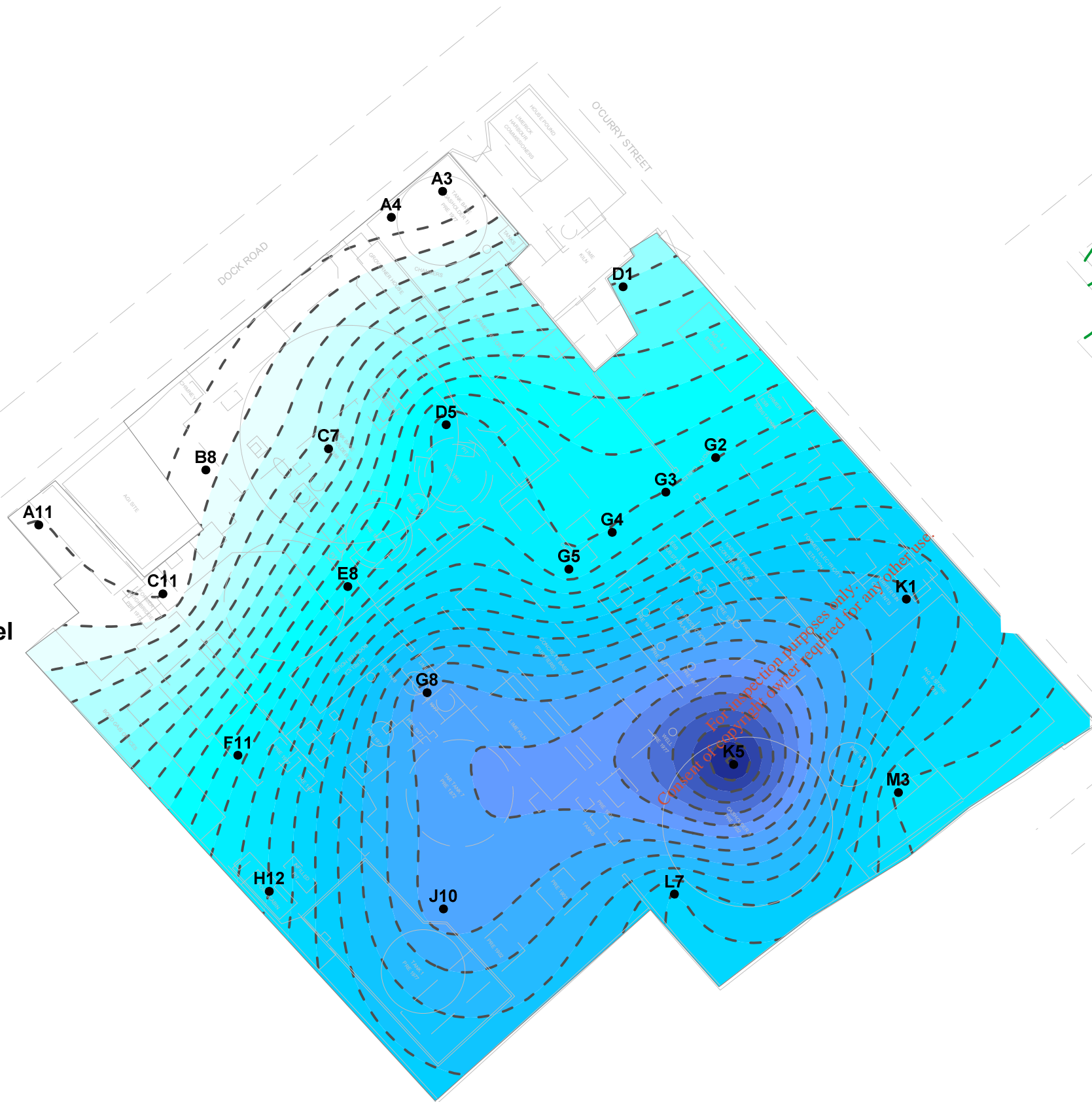
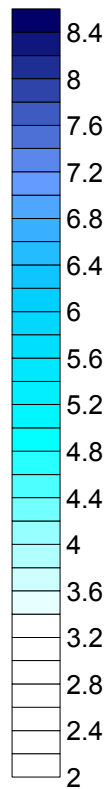
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	Project	Limerick Gasworks		
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<b>Information</b>	Scale	Issuing Office	Drawing Number	Version
	<b>Not to scale</b>	Ellesmere Port	1034973/R02/OD/001	A
	Telephone	0151 356 5555		

A	First Issue		DM	DM	DW
Version	Amendment	Originated	Checked	Approved	



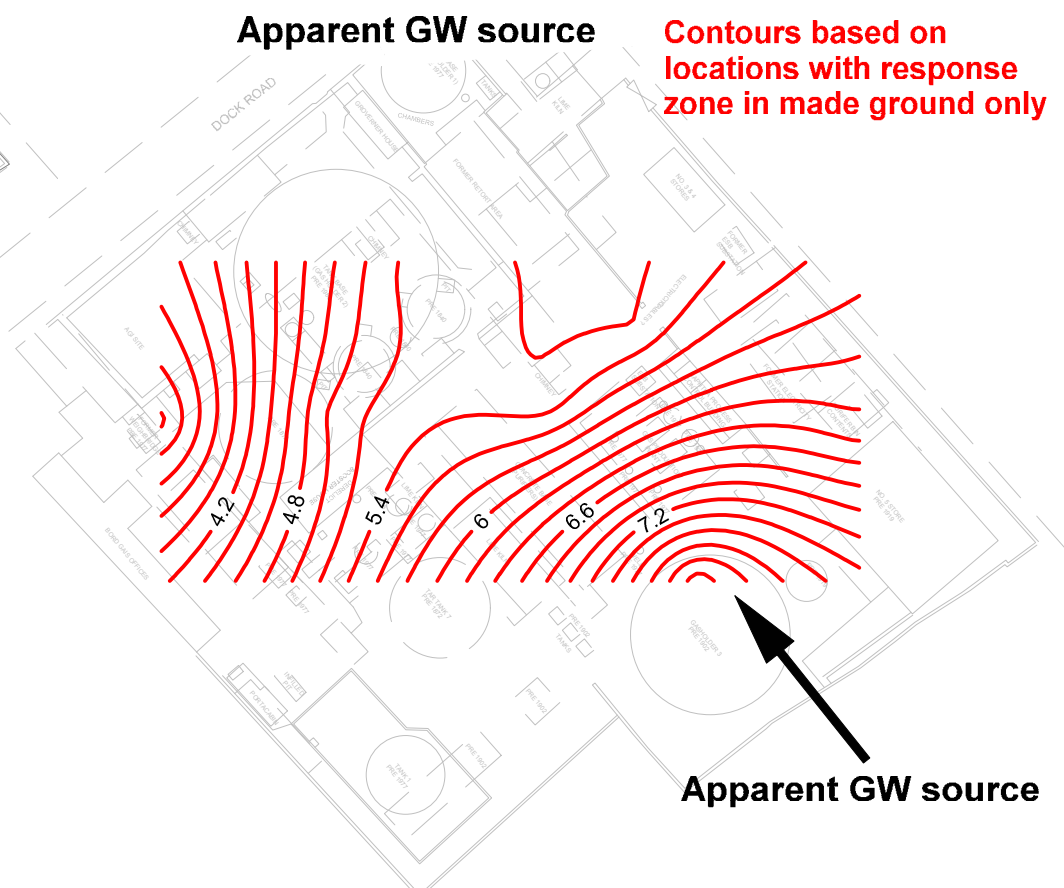


Groundwater Level  
(m MHD)



Contours based on locations with response zone in rock only

Apparent GW source



Contours based on locations with response zone in made ground only

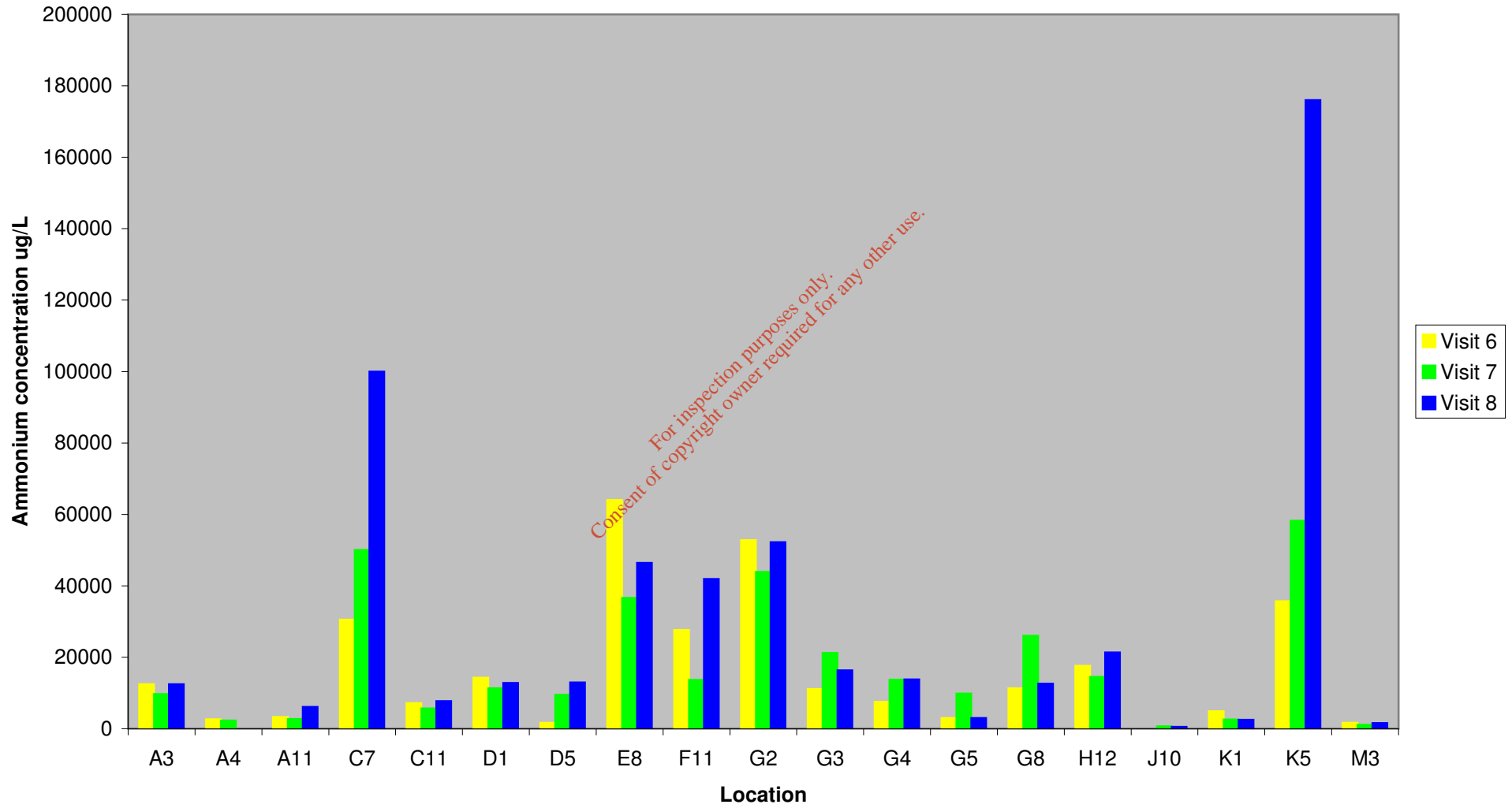
Apparent GW source

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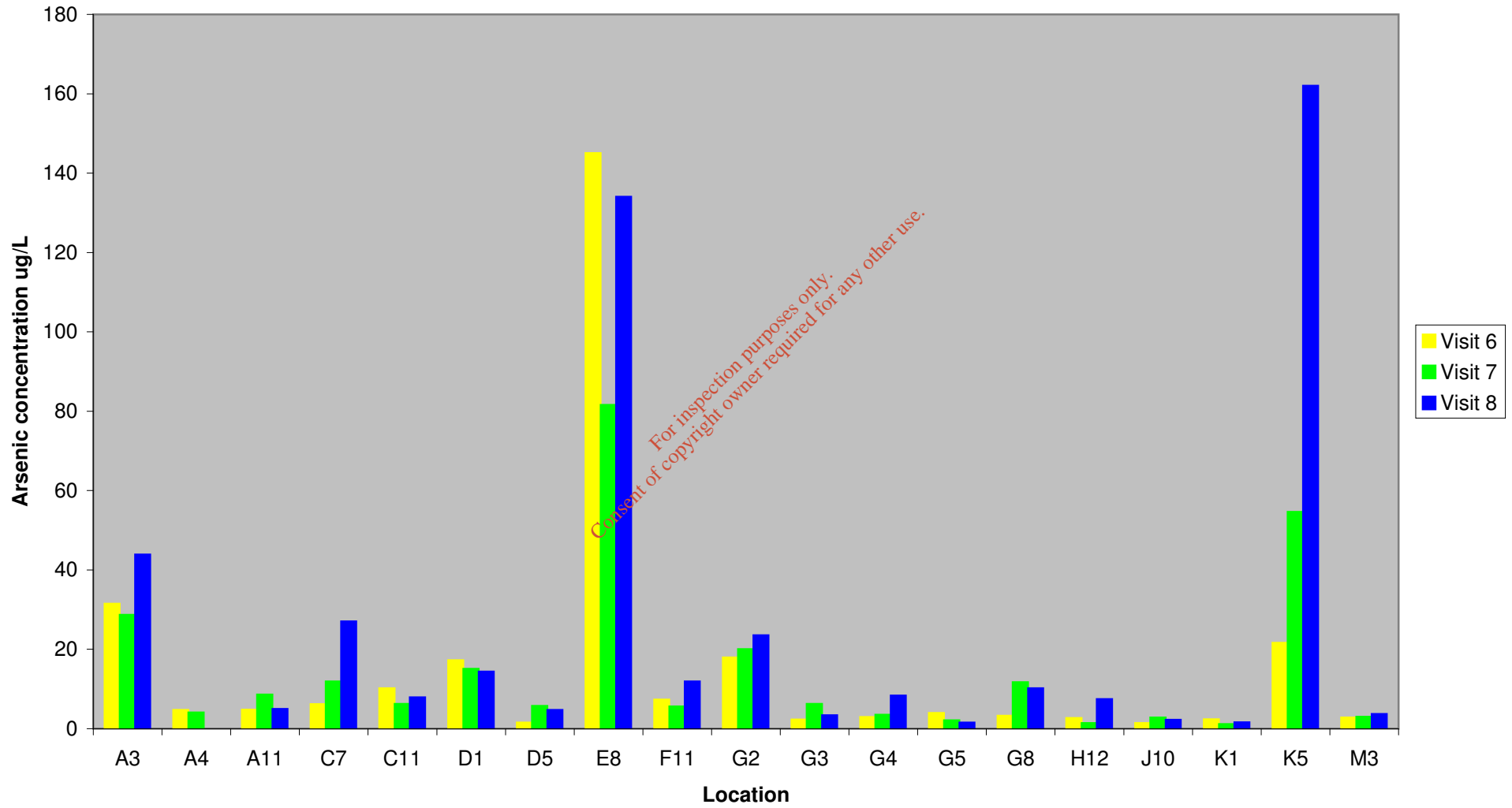
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	Project	Limerick Gasworks		
Purpose	Drawing Title	Figure 1) Groundwater Levels 24-26/10/11		
Scale	Issuing Office	Drawing Number	Version	
Not to scale	Ellesmere Port	1034973/R03/OD/01	A	
	Telephone	0151 356 5555		

A	First Issue		IW	NB	DW
Version	Amendment		Originated	Checked	Approved

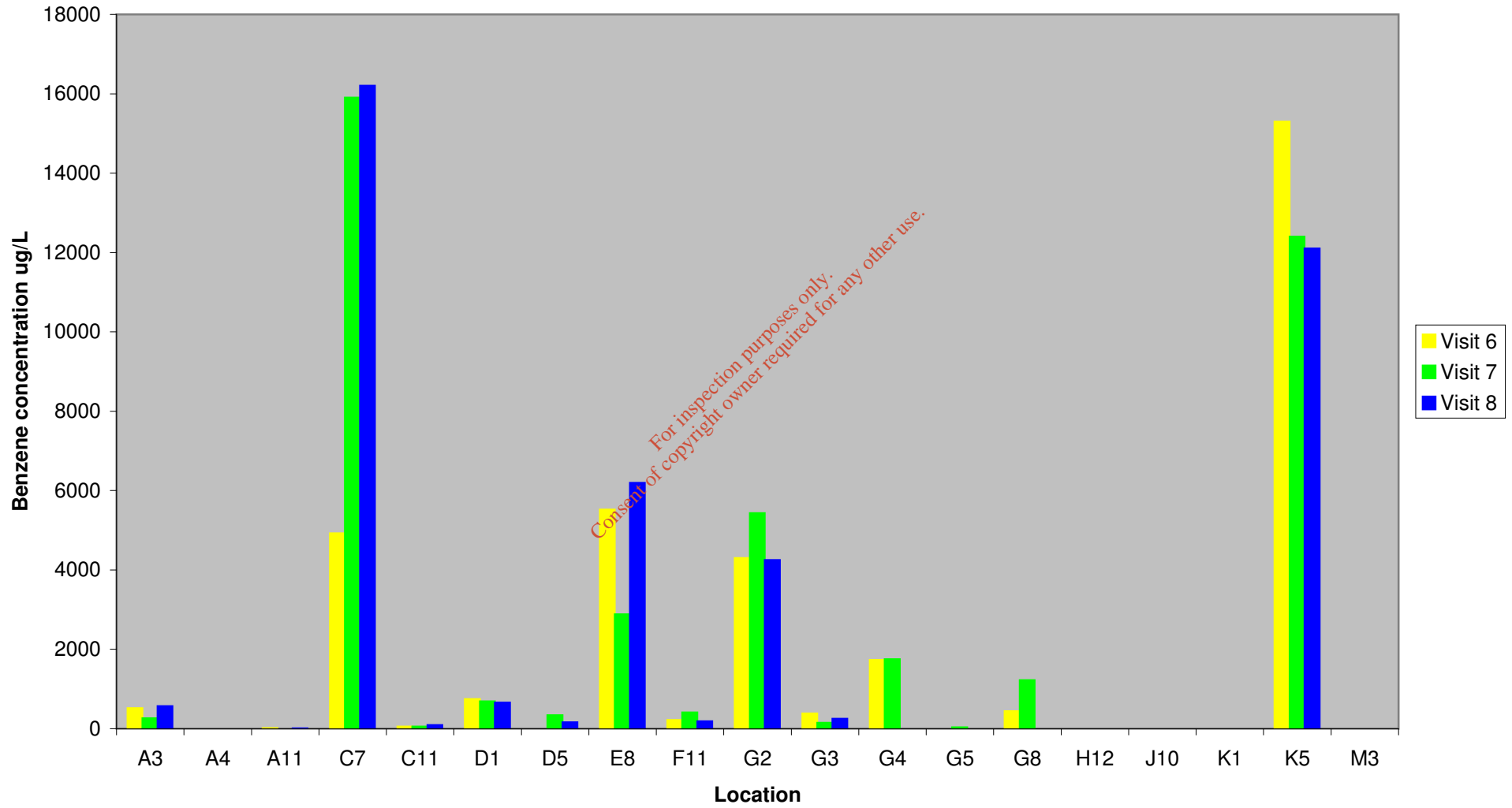
### Ammonium



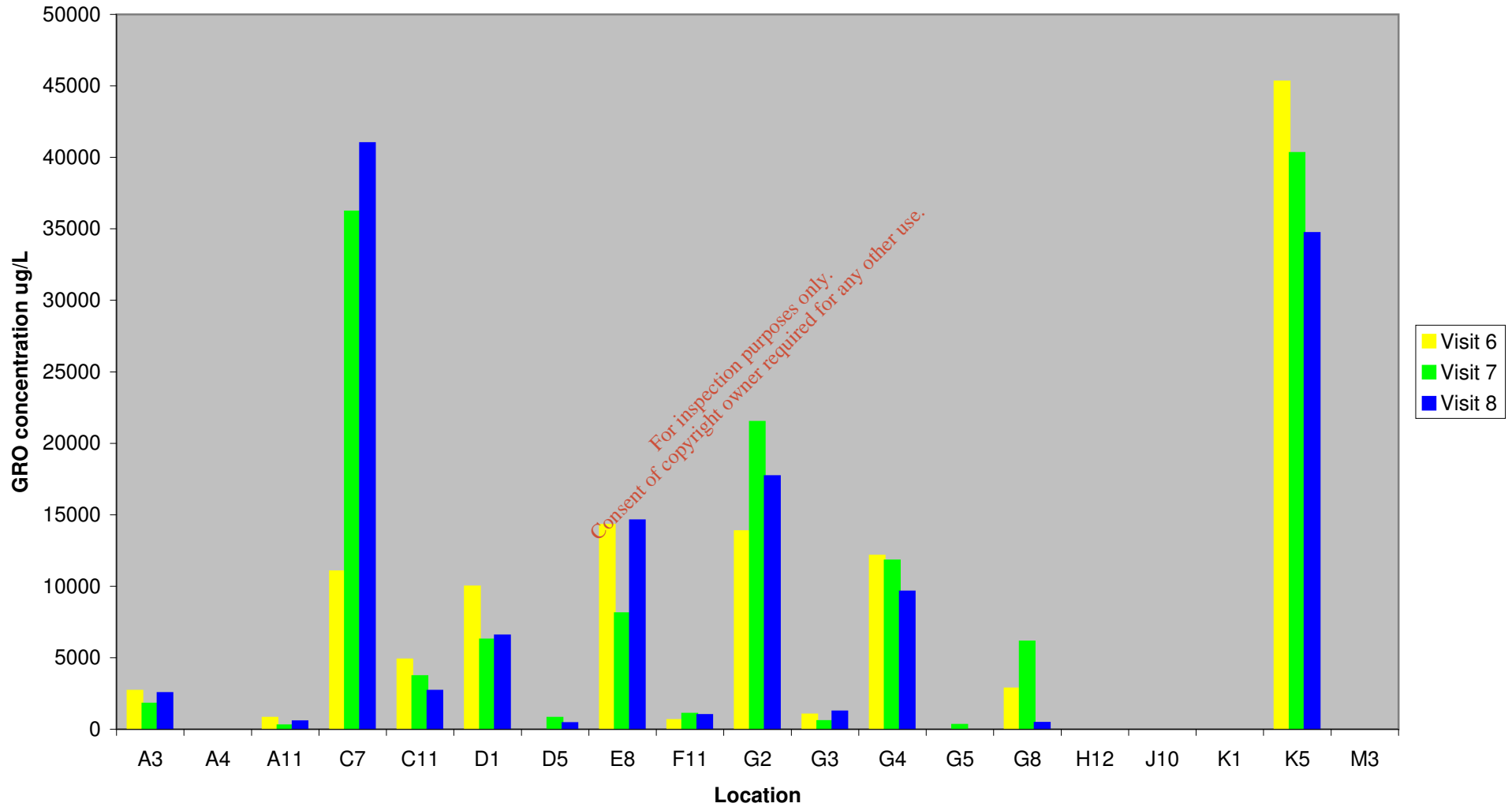
### Arsenic



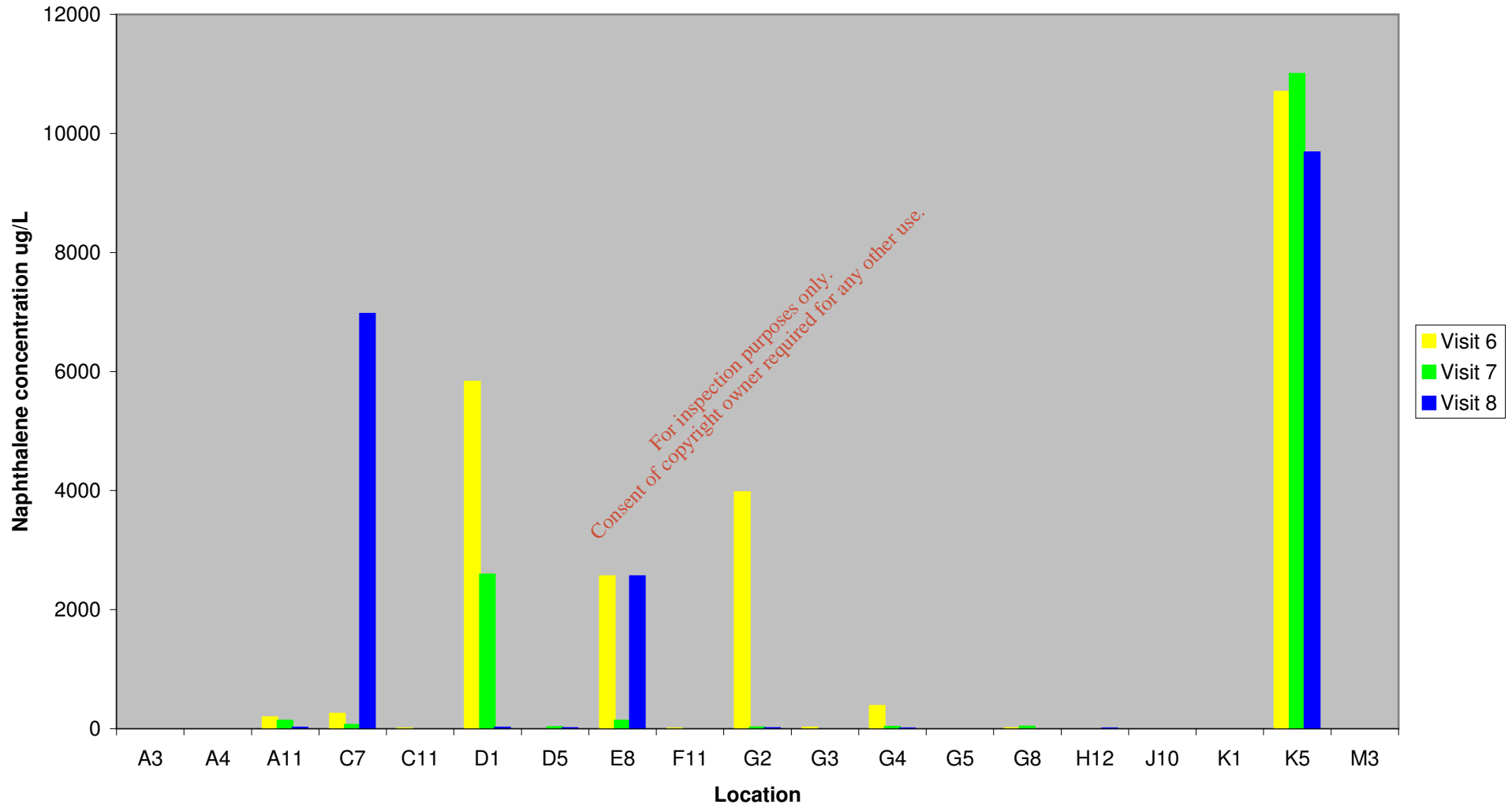
### Benzene



### Petroleum Hydrocarbons - Gasoline Range Organics (GRO)

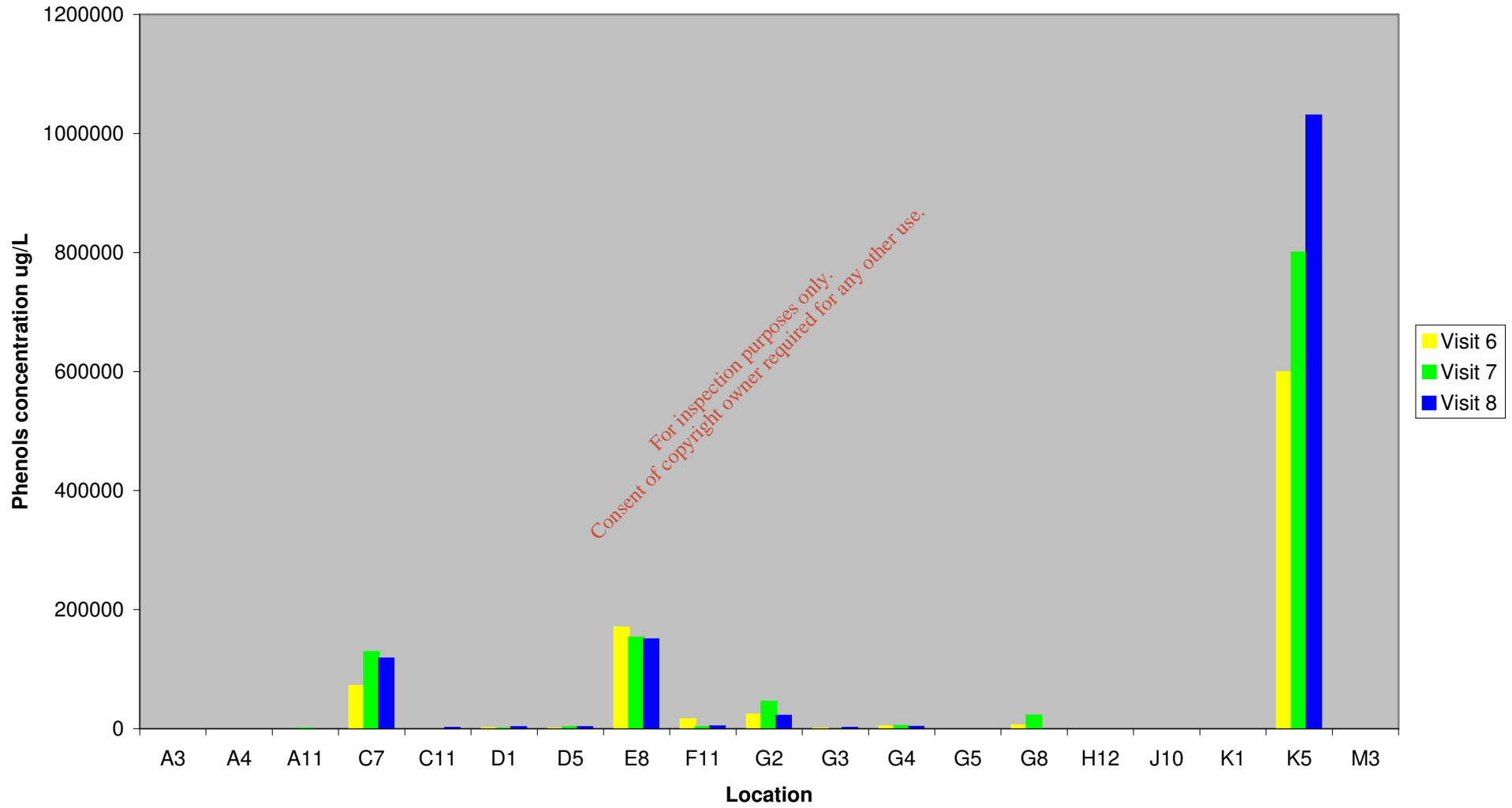


### Naphthalene

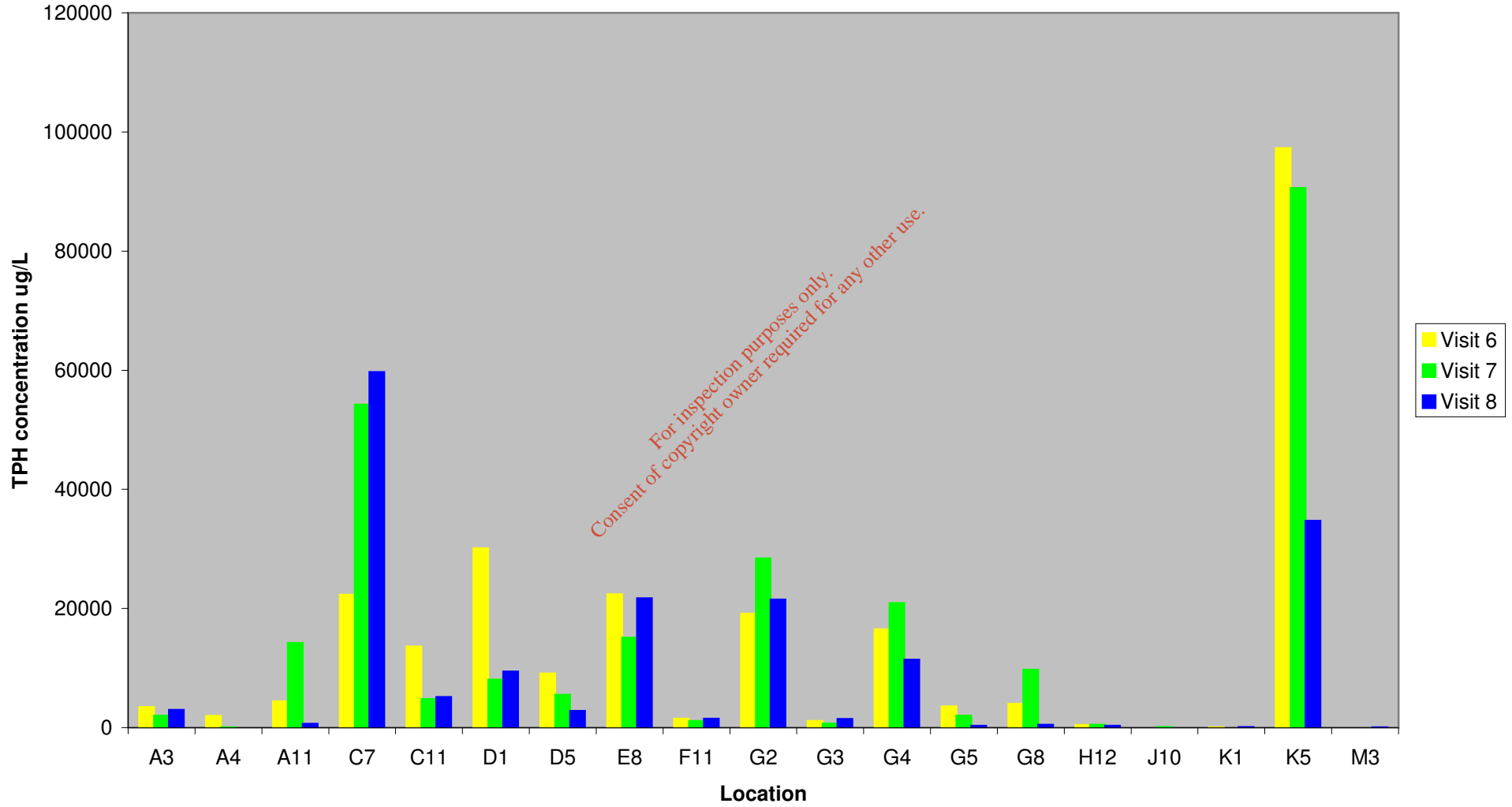


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### Phenols (total of 5 speciated)



### Petroleum Hydrocarbons - 'Total' Petroleum Hydrocarbons (TPH)





Mouchel  
Marina House  
2nd Floor  
Clarence Street  
Dun Laoghaire  
Co Dublin

**Attention:** David Megson

## CERTIFICATE OF ANALYSIS

**Date:** 09 February 2011  
**Customer:** D\_MOUCHEL\_DLG  
**Sample Delivery Group (SDG):** 110127-70  
**Your Reference:** Limerick Gasworks  
**Location:** Limerick Gasworks  
**Report No:** 114955

We received 19 samples on Thursday January 27, 2011 and 14 of these samples were scheduled for analysis which was completed on Wednesday February 09, 2011. 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:



**Sonia McWhan**

Operations Manager





**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2759867	A11	EW006	2.00 - 3.00	26/01/2011
2759855	A3	EW006	2.00 - 4.00	26/01/2011
2759856	A4	EW006	2.00 - 4.00	26/01/2011
2759864	C11	EW006	2.00 - 3.00	26/01/2011
2759857	C7	EW006	2.00 - 3.00	26/01/2011
2759872	D1	EW006	3.00 - 4.00	26/01/2011
2759854	D5	EW006	1.50 - 2.50	26/01/2011
2759863	E8	EW006	2.00 - 4.00	26/01/2011
2759866	F11	EW006	3.00 - 4.00	26/01/2011
2759871	G2	EW006	4.00 - 6.00	26/01/2011
2759870	G3	EW006	4.00 - 5.00	26/01/2011
2759869	G4	EW006	4.00 - 5.00	26/01/2011
2759873	G5	EW006	3.00 - 5.00	26/01/2011
2759865	G8	EW006	1.00 - 2.00	26/01/2011
2759861	H12	EW006	2.00 - 3.00	26/01/2011
2759859	J10	EW006	1.00 - 2.00	26/01/2011
2759860	K1	EW006	2.00 - 4.00	26/01/2011
2759858	K5	EW006	1.00 - 3.00	26/01/2011
2759862	M3	EW006	3.00 - 5.00	26/01/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

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SDG: 110127-70  
 Job: D\_MOUCHEL\_DLG-1  
 Client Reference: Limerick Gasworks

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Dave Watts

Order Number: 4500063958  
 Report Number: 114955  
 Superseded Report:

LIQUID Results Legend	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container								
	2759860	2759855	2759862	2759856	2759854	2759858	2759857	2759863	2759865	2759867	2759859	2759864	2759866
<b>X</b> Test <b>N</b> No Determination Possible													
Ammonium	All	NDPs: 0 Tests: 19											
Anions by Kone (w)	All	NDPs: 0 Tests: 19											
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 19											
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 19											
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 19											
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 19											
GRO by GC-FID (W)	All	NDPs: 0 Tests: 19											
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 19											
Mercury Dissolved	All	NDPs: 0 Tests: 19											
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 19											
pH Value	All	NDPs: 0 Tests: 19											
Phenols by HPLC (W)	All	NDPs: 0 Tests: 19											
Sulphide	All	NDPs: 0 Tests: 19											
TPH CWG (W)	All	NDPs: 0 Tests: 19											
VOC MS (W)	All	NDPs: 0 Tests: 10											



**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

Results Legend			Customer Sample R		A3	A4	C7	D1	D5	H12
#	ISO17025 accredited.		Depth (m)		2.00 - 4.00	2.00 - 4.00	2.00 - 3.00	3.00 - 4.00	1.50 - 2.50	2.00 - 3.00
M	mCERTS accredited.		Sample Type		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.		Date Sampled		26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011
aq	Aqueous / settled sample.		Date Received		27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011
diss.filt	Dissolved / filtered sample.		SDG Ref		110127-70	110127-70	110127-70	110127-70	110127-70	110127-70
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)		2759855	2759856	2759857	2759872	2759854	2759861
*	subcontracted test.		AGS Reference		EW006	EW006	EW006	EW006	EW006	EW006
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	9.63	2.04	23.7			1.24	13.7	
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	12.4	2.62	30.5			1.59	17.6	
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01	<0.01		98.9	<0.01	<0.01	
Arsenic (diss.filt)	<0.12 µg/l	TM152	31.5	4.72	6.19			1.52	2.65	
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	<0.1			<0.1	<0.1	
Chromium (diss.filt)	<0.22 µg/l	TM152	21.5	14.3	8.37			6.43	4.95	
Copper (diss.filt)	<0.85 µg/l	TM152	1.5	1.48	<0.85			2.47	<0.85	
Lead (diss.filt)	<0.02 µg/l	TM152	<0.02	0.06	0.099			0.29	<0.02	
Nickel (diss.filt)	<0.15 µg/l	TM152	4.64	3.98	1.74			2.07	4.96	
Selenium (diss.filt)	<0.39 µg/l	TM152	1.79	1.11	10.7			1.3	<0.39	
Zinc (diss.filt)	<0.41 µg/l	TM152	0.989	1.39	0.907			12.2	<0.41	
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01			<0.01	<0.01	
Sulphate	<3 mg/l	TM184	367	276	18			18.7	210	
Cyanide, Total	<0.05 mg/l	TM227	0.28	0.205	0.081			0.051	<0.05	
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03	<0.03			<0.03	<0.03	
pH	<1 pH Units	TM256	7.84	7.77	8.1			7.79	8.18	
Resorcinol	<0.01 mg/l	TM259	<0.01	<0.01	<0.05			<0.01	<0.01	
Catechol	<0.01 mg/l	TM259	<0.01	<0.01	<0.05			<0.01	<0.01	
Phenol	<0.002 mg/l	TM259	<0.002	<0.002	7.32			0.03	<0.002	
Cresols	<0.006 mg/l	TM259	<0.006	<0.006	24.1			0.17	<0.006	
Xylenols	<0.008 mg/l	TM259	<0.008	<0.008	29.9			0.18	<0.008	
1-Naphthol	<0.01 mg/l	TM259	<0.01	<0.01	<0.05			<0.01	<0.01	
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	<0.003	<0.015			<0.003	<0.003	
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006	<0.006	10.4			<0.006	<0.006	
Phenols, Total 5 speciated	<0.025 mg/l	TM259	<0.025	<0.025	71.7			0.38	<0.025	

CERTIFICATE OF ANALYSIS

**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

Results Legend		Customer Sample R	J10	K1	K5	M3		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.00	2.00 - 4.00	1.00 - 3.00	3.00 - 5.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Non-conforming work.		26/01/2011	26/01/2011	26/01/2011	26/01/2011		
aq	Aqueous / settled sample.		27/01/2011	27/01/2011	27/01/2011	27/01/2011		
diss.filt	Dissolved / filtered sample.		110127-70	110127-70	110127-70	110127-70		
tot.unfilt	Total / unfiltered sample.		2759859	2759860	2759858	2759862		
*	subcontracted test.		EW006	EW006	EW006	EW006		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.							
LOD/Units	Method							
Ammoniacal Nitrogen as N	<0.2 mg/l		TM099	<0.2	3.78	27.8	1.28	#
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	<0.3	4.86	35.7	1.65	#	#
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01	<0.01	<0.01	#	#
Arsenic (diss.filt)	<0.12 µg/l	TM152	1.39	2.36	21.6	2.8	#	#
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	<0.1	<0.1	#	#
Chromium (diss.filt)	<0.22 µg/l	TM152	4.69	3.86	8.06	2.05	#	#
Copper (diss.filt)	<0.85 µg/l	TM152	0.984	3.16	1.58	4.93	#	#
Lead (diss.filt)	<0.02 µg/l	TM152	0.12	0.264	0.48	0.038	#	#
Nickel (diss.filt)	<0.15 µg/l	TM152	3.95	12.7	11.9	7.33	#	#
Selenium (diss.filt)	<0.39 µg/l	TM152	1.72	0.911	15.7	0.544	#	#
Zinc (diss.filt)	<0.41 µg/l	TM152	<0.41	<0.41	<0.41	<0.41	#	#
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	#	#
Sulphate	<3 mg/l	TM184	70.2	765	318	603	#	#
Cyanide, Total	<0.05 mg/l	TM227	<0.05	0.6	1.57	1.23	#	#
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03	<0.06	<0.03	#	#
pH	<1 pH Units	TM256	8.31	8	7.87	8.11	#	#
Resorcinol	<0.01 mg/l	TM259	<0.01	<0.01	<0.5	<0.01	#	#
Catechol	<0.01 mg/l	TM259	<0.01	<0.01	<0.5	<0.01	#	#
Phenol	<0.002 mg/l	TM259	<0.002	<0.002	109	<0.002	#	#
Cresols	<0.006 mg/l	TM259	<0.006	<0.006	263	<0.006	#	#
Xylenols	<0.008 mg/l	TM259	<0.008	<0.008	189	<0.008	#	#
1-Naphthol	<0.01 mg/l	TM259	<0.01	<0.01	<0.5	<0.01	#	#
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	<0.003	<0.15	<0.003	#	#
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006	<0.006	37.9	<0.006	#	#
Phenols, Total 5 speciated	<0.025 mg/l	TM259	<0.025	<0.025	599	<0.025	#	#



## CERTIFICATE OF ANALYSIS

**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

## PAH Spec MS - Aqueous (W)

Results Legend			Customer Sample R	A3	A4	C7	D1	D5	H12	
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	2.00 - 4.00	2.00 - 4.00	2.00 - 3.00	3.00 - 4.00	1.50 - 2.50	2.00 - 3.00	
M	mCERTS accredited.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.			26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011
aq	Aqueous / settled sample.			27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011
diss.filt	Dissolved / filtered sample.			110127-70	110127-70	110127-70	110127-70	110127-70	110127-70	110127-70
tot.unfilt	Total / unfiltered sample.			2759855	2759856	2759857	2759872	2759854	2759861	2759861
*	subcontracted test.		EW006	EW006	EW006	EW006	EW006	EW006	EW006	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
Naphthalene (aq)	<0.1 µg/l	TM178		0.427	0.416	251	5830	0.603	1.79	
Acenaphthene (aq)	<0.015 µg/l	TM178		2.14	0.193	26.5	357	0.138	0.791	
Acenaphthylene (aq)	<0.011 µg/l	TM178		1.94	2.09	178	942	1.23	2.25	
Fluoranthene (aq)	<0.017 µg/l	TM178		5.58	7.94	144	883	5.27	10.7	
Anthracene (aq)	<0.015 µg/l	TM178		1.09	0.601	56.1	434	0.409	1.5	
Phenanthrene (aq)	<0.022 µg/l	TM178		1.69	1.08	154	1020	1.15	4.62	
Fluorene (aq)	<0.014 µg/l	TM178		0.966	0.325	88.7	564	0.203	1.48	
Chrysene (aq)	<0.013 µg/l	TM178		2.43	4.44	47.7	127	3.07	4.58	
Pyrene (aq)	<0.015 µg/l	TM178		11.3	10.4	106	575	4.29	7.08	
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		3.33	4.87	52.3	155	2.94	4.88	
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		2.15	8.81	50.2	58	3.35	7.87	
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		2.53	9.19	38.6	62.1	2.96	6.82	
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		4.98	11.6	42.4	67.1	3.07	9.42	
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		0.419	2.03	6.69	6.09	0.679	1.62	
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		2.08	6.09	26.9	24.6	2.19	5.53	
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		1.68	6.09	23.9	24.2	2.09	5.1	
Polyaromatic hydrocarbons, Total	<0.1 µg/l	TM178		44.7	76.1	1290	11100	33.7	76	

CERTIFICATE OF ANALYSIS

SDG: 110127-70  
 Job: D\_MOUCHEL\_DLG-1  
 Client Reference: Limerick Gasworks

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Dave Watts

Order Number: 4500063958  
 Report Number: 114955  
 Superseded Report:

PAH Spec MS - Aqueous (W)

Results Legend		Customer Sample R	J10	K1	K5	M3			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.00	2.00 - 4.00	1.00 - 3.00	3.00 - 5.00			
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
S	Non-conforming work.		26/01/2011	26/01/2011	26/01/2011	26/01/2011			
aq	Aqueous / settled sample.		27/01/2011	27/01/2011	27/01/2011	27/01/2011			
diss.filt	Dissolved / filtered sample.		110127-70	110127-70	110127-70	110127-70			
tot.unfilt	Total / unfiltered sample.		2759859	2759860	2759858	2759862			
*	subcontracted test.		EW006	EW006	EW006	EW006			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.								
Component	LOD/Units		Method						
Naphthalene (aq)	<0.1 µg/l		TM178	0.101 #	0.175 #	10700 #	<0.1 #		
Acenaphthene (aq)	<0.015 µg/l	TM178	0.0183 #	0.164 #	268 #	<0.015 #			
Acenaphthylene (aq)	<0.011 µg/l	TM178	0.323 #	0.252 #	1320 #	0.0386 #			
Fluoranthene (aq)	<0.017 µg/l	TM178	0.403 #	2.88 #	1250 #	1.46 #			
Anthracene (aq)	<0.015 µg/l	TM178	0.0659 #	0.297 #	662 #	0.0468 #			
Phenanthrene (aq)	<0.022 µg/l	TM178	0.133 #	0.747 #	1860 #	0.0951 #			
Fluorene (aq)	<0.014 µg/l	TM178	0.049 #	0.131 #	829 #	0.029 #			
Chrysene (aq)	<0.013 µg/l	TM178	0.356 #	1.99 #	339 #	0.487 #			
Pyrene (aq)	<0.015 µg/l	TM178	0.332 #	2.83 #	817 #	0.948 #			
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	0.365 #	2.15 #	408 #	0.473 #			
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	0.928 #	3.13 #	224 #	0.723 #			
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	0.771 #	3.11 #	244 #	0.565 #			
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	1.35 #	3.74 #	266 #	0.627 #			
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.28 #	0.833 #	38.7 #	0.115 #			
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	1.12 #	3.23 #	134 #	0.557 #			
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.945 #	2.85 #	129 #	0.453 #			
Polyaromatic hydrocarbons, Total	<0.1 µg/l	TM178	7.54 #	28.5 #	19500 #	6.07 #			

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**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

**TPH CWG (W)**

Results Legend			Customer Sample R		A3	A4	C7	D1	D5	H12	
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>		2.00 - 4.00	2.00 - 4.00	2.00 - 3.00	3.00 - 4.00	1.50 - 2.50	2.00 - 3.00	
M	mCERTS accredited.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
S	Non-conforming work.			26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	
aq	Aqueous / settled sample.			27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	
diss.filt	Dissolved / filtered sample.			110127-70	110127-70	110127-70	110127-70	110127-70	110127-70	110127-70	
tot.unfilt	Total / unfiltered sample.			2759855	2759856	2759857	2759872	2759854	2759861	2759861	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.			EW006	EW006	EW006	EW006	EW006	EW006	EW006	
Component	LOD/Units	Method									
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245			<3	<3	<6	<3	<3	<3	<3
Benzene	<7 µg/l	TM245			516	<7	4920	746	<7	<7	<7
Toluene	<4 µg/l	TM245		15	<4	1870	538	<4	<4	<4	
Ethylbenzene	<5 µg/l	TM245		198	<5	75	248	<5	<5	<5	
m,p-Xylene	<8 µg/l	TM245		53	<8	515	856	<8	<8	<8	
o-Xylene	<3 µg/l	TM245		55	<3	244	422	<3	<3	<3	
m,p,o-Xylene	<10 µg/l	TM245		108	<10	759	1280	<10	<10	<10	
Total Aliphatics & Aromatics >C12-C35	<10 µg/l	TM174		760	1930	11300		9090		433	
BTEX, Total	<10 µg/l	TM245		837	<10	7620	2810	<10		<10	
Aliphatics >C5-C6	<10 µg/l	TM245		11	<10	23	15	<10		<10	
Aliphatics >C6-C8	<10 µg/l	TM245		78	<10	236	154	<10		<10	
Aliphatics >C8-C10	<10 µg/l	TM245		197	<10	588	804	<10		<10	
Aliphatics >C10-C12	<10 µg/l	TM245		849	<10	1300	3390	<10		<10	
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174		<10	415	40		<50		13	
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174		<10	612	109		387		18	
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174		<10	352	398		3750		140	
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174		<10	1380	547		4160		171	
Aromatics >EC5-EC7	<10 µg/l	TM245		516	<10	4920	746	<10		<10	
Aromatics >EC7-EC8	<10 µg/l	TM245		45	<10	1870	538	<10		<10	
Aromatics >EC8-EC10	<10 µg/l	TM245		438	<10	1230	2060	<10		<10	
Aromatics >EC10-EC12	<10 µg/l	TM245		566	<10	869	2260	<10		<10	
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174		372	37	6400		<50		<10	
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174		246	156	1540		359		35	
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174		142	356	2820		4550		227	
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174		760	549	10800		4930		262	
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174		3430	1930	22300	30100	9090		444	
Total Aliphatics >C5-C35 (aq)	<10 µg/l	TM174		1140	1380	2700	6910	4160		178	
Total Aromatics >C6-C35 (aq)	<10 µg/l	TM174		2300	551	19600	23200	4930		266	
Total Aliphatics >C5-C12	<10 µg/l	TM245		1140	<10	2150	4370	<10		<10	
Total Aromatics >EC5-EC12	<10 µg/l	TM245		1540	<10	8880	5610	<10		<10	

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**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

## TPH CWG (W)

Results Legend		Customer Sample R	J10	K1	K5	M3		
#	ISO17025 accredited.	<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	1.00 - 2.00	2.00 - 4.00	1.00 - 3.00	3.00 - 5.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Non-conforming work.		26/01/2011	26/01/2011	26/01/2011	26/01/2011		
aq	Aqueous / settled sample.		27/01/2011	27/01/2011	27/01/2011	27/01/2011		
diss.fit	Dissolved / filtered sample.		110127-70	110127-70	110127-70	110127-70		
tot.unfilt	Total / unfiltered sample.		2759859	2759860	2759858	2759862		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		EW006	EW006	EW006	EW006		
<b>Component</b>	<b>LOD/Units</b>	<b>Method</b>						
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3 #	<3 #	<30 #	<3 #		
Benzene	<7 µg/l	TM245	<7 #	<7 #	15300 #	<7 #		
Toluene	<4 µg/l	TM245	<4 #	<4 #	5350 #	<4 #		
Ethylbenzene	<5 µg/l	TM245	<5 #	<5 #	275 #	<5 #		
m,p-Xylene	<8 µg/l	TM245	<8 #	<8 #	1770 #	<8 #		
o-Xylene	<3 µg/l	TM245	<3 #	<3 #	735 #	<3 #		
m,p,o-Xylene	<10 µg/l	TM245	<10	<10	2510	<10		
Total Aliphatics & Aromatics >C12-C35	<10 µg/l	TM174	<10	46	52100	<10		
BTEX, Total	<10 µg/l	TM245	<10	<10	23400	<10		
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	188	<10		
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	1480	<10		
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	2410	<10		
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	9680	<10		
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	<10	768	<10		
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	<10	585	<10		
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	<10	612	<10		
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	<10	1970	<10		
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	15300	<10		
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	5350	<10		
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	4390	<10		
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	6450	<10		
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10	<10	40800	<10		
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10	<10	4610	<10		
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	46	4710	<10		
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10	46	50100	<10		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	<10	46	97300	<10		
Total Aliphatics >C5-C35 (aq)	<10 µg/l	TM174	<10	<10	15700	<10		
Total Aromatics >C6-C35 (aq)	<10 µg/l	TM174	<10	46	81600	<10		
Total Aliphatics >C5-C12	<10 µg/l	TM245	<10	<10	13800	<10		
Total Aromatics >EC5-EC12	<10 µg/l	TM245	<10	<10	31500	<10		

**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

VOC MS (W)

Results Legend			Customer Sample R		A3	A4	A11	C7	D1	G2
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	2.00 - 4.00	2.00 - 4.00	2.00 - 3.00	2.00 - 3.00	3.00 - 4.00	4.00 - 6.00	
M	mCERTS accredited.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.			26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011
aq	Aqueous / settled sample.			27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011
diss.filt	Dissolved / filtered sample.			110127-70	110127-70	110127-70	110127-70	110127-70	110127-70	110127-70
tot.unfilt	Total / unfiltered sample.			2759855	2759856	2759867	2759857	2759872	2759871	2759871
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		EW006	EW006	EW006	EW006	EW006	EW006	EW006	
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM208	104	105	105	104	99.6	103		
Toluene-d8**	%	TM208	98.6	99.3	98.4	99.1	99.4	98.8		
4-Bromofluorobenzene**	%	TM208	99.6	99	98.9	99.4	98.7	102		
Dichlorodifluoromethane	<7 µg/l	TM208	<7	<7	<7	<7	<7	<7		
Chloromethane	<9 µg/l	TM208	<9	<9	<9	<9	<9	<9		
Vinyl chloride	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2		
Bromomethane	<2 µg/l	TM208	<2	<2	<2	<2	<2	<2		
Chloroethane	<2.5 µg/l	TM208	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5		
Trichlorofluoromethane	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3		
1,1-Dichloroethene	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2		
Carbon disulphide	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	4.78	
Dichloromethane	<3.7 µg/l	TM208	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7		
Methyl tertiary butyl ether (MTBE)	<1.6 µg/l	TM208	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6		
trans-1,2-Dichloroethene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9		
1,1-Dichloroethane	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2		
cis-1,2-Dichloroethene	<2.3 µg/l	TM208	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3		
2,2-Dichloropropane	<3.8 µg/l	TM208	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8		
Bromochloromethane	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9		
Chloroform	<1.8 µg/l	TM208	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8		
1,1,1-Trichloroethane	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3		
1,1-Dichloropropene	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3		
Carbontetrachloride	<1.4 µg/l	TM208	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4		
1,2-Dichloroethane	<3.3 µg/l	TM208	<3.3	<3.3	<3.3	<3.3	19.1	<3.3		
Benzene	<1.3 µg/l	TM208	511	<1.3	13.8	5350	880	5480		
Trichloroethene	<2.5 µg/l	TM208	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5		
1,2-Dichloropropane	<3 µg/l	TM208	<3	<3	<3	<3	<3	<3		
Dibromomethane	<2.7 µg/l	TM208	<2.7	<2.7	<2.7	<2.7	<2.7	<2.7		
Bromodichloromethane	<0.9 µg/l	TM208	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9		
cis-1,3-Dichloropropene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9		
Toluene	<1.4 µg/l	TM208	16.4	<1.4	33.4	1650	326	3420		
trans-1,3-Dichloropropene	<3.5 µg/l	TM208	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5		
1,1,2-Trichloroethane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	113	<2.2	211		
1,3-Dichloropropane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2		
Tetrachloroethene	<1.5 µg/l	TM208	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5		
Dibromochloromethane	<1.7 µg/l	TM208	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7		

**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

VOC MS (W)

Results Legend		Customer Sample R	A3	A4	A11	C7	D1	G2
#	ISO17025 accredited.		2.00 - 4.00	2.00 - 4.00	2.00 - 3.00	2.00 - 3.00	3.00 - 4.00	4.00 - 6.00
M	mCERTS accredited.	Depth (m)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.	Sample Type	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011	26/01/2011
aq	Aqueous / settled sample.	Date Sampled	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011	27/01/2011
diss.filt	Dissolved / filtered sample.	Date Received	110127-70	110127-70	110127-70	110127-70	110127-70	110127-70
tot.unfilt	Total / unfiltered sample.	SDG Ref	2759855	2759856	2759867	2759857	2759872	2759871
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.	Lab Sample No.(s)	EW006	EW006	EW006	EW006	EW006	EW006
		AGS Reference						
Component	LOD/Units	Method						
1,2-Dibromoethane	<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #
Chlorobenzene	<3.5 µg/l	TM208	<3.5 #	<3.5 #	<3.5 #	<3.5 #	<3.5 #	<3.5 #
1,1,1,2-Tetrachloroethane	<1.3 µg/l	TM208	<1.3 #	<1.3 #	<1.3 #	<1.3 #	<1.3 #	<1.3 #
Ethylbenzene	<2.5 µg/l	TM208	206 #	<2.5 #	14.7 #	68.7 #	239 #	332 #
m,p-Xylene	<2.5 µg/l	TM208	58.4 #	<2.5 #	45 #	475 #	898 #	1010 #
o-Xylene	<1.7 µg/l	TM208	60.7 #	<1.7 #	32.5 #	238 #	462 #	754 #
Styrene	<1.2 µg/l	TM208	<1.2 #	<1.2 #	<1.2 #	89.9 #	<1.2 #	<1.2 #
Bromoform	<3 µg/l	TM208	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Isopropylbenzene	<1.4 µg/l	TM208	16.3 #	<1.4 #	2.11 #	2.24 #	23.7 #	28 #
1,1,2,2-Tetrachloroethane	<5.2 µg/l	TM208	<5.2 #	<5.2 #	<5.2 #	<5.2 #	<5.2 #	<5.2 #
1,2,3-Trichloropropane	<7.8 µg/l	TM208	<7.8 #	<7.8 #	<7.8 #	<7.8 #	<7.8 #	<7.8 #
Bromobenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
Propylbenzene	<2.6 µg/l	TM208	7.48 #	<2.6 #	<2.6 #	<2.6 #	25.1 #	29.3 #
2-Chlorotoluene	<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #
1,3,5-Trimethylbenzene	<1.8 µg/l	TM208	6.85 #	<1.8 #	6.11 #	33.2 #	134 #	119 #
4-Chlorotoluene	<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #
tert-Butylbenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
1,2,4-Trimethylbenzene	<1.7 µg/l	TM208	25.3 #	<1.7 #	19.1 #	73.8 #	369 #	294 #
sec-Butylbenzene	<1.7 µg/l	TM208	<1.7 #	<1.7 #	<1.7 #	<1.7 #	<1.7 #	<1.7 #
4-iso-Propyltoluene	<2.6 µg/l	TM208	<2.6 #	<2.6 #	<2.6 #	15.3 #	15 #	9.78 #
1,3-Dichlorobenzene	<2.2 µg/l	TM208	<2.2 #	<2.2 #	<2.2 #	<2.2 #	<2.2 #	<2.2 #
1,4-Dichlorobenzene	<2.7 µg/l	TM208	<2.7 #	<2.7 #	<2.7 #	<2.7 #	<2.7 #	<2.7 #
n-Butylbenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #	7.64 #	<2 #
1,2-Dichlorobenzene	<3.7 µg/l	TM208	<3.7 #	<3.7 #	<3.7 #	<3.7 #	<3.7 #	<3.7 #
1,2-Dibromo-3-chloropropane	<9.8 µg/l	TM208	<9.8 #	<9.8 #	<9.8 #	<9.8 #	<9.8 #	<9.8 #
1,2,4-Trichlorobenzene	<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #
Hexachlorobutadiene	<2.5 µg/l	TM208	<2.5 #	<2.5 #	<2.5 #	<2.5 #	<2.5 #	<2.5 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<3.5 µg/l	TM208	338 #	<3.5 #	225 #	<3.5 #	2600 #	<3.5 #
1,2,3-Trichlorobenzene	<3.1 µg/l	TM208	<3.1 #	<3.1 #	<3.1 #	<3.1 #	<3.1 #	<3.1 #
1,3,5-Trichlorobenzene	<10 µg/l	TM208	<10 #	<10 #	<10 #	<10 #	<10 #	<10 #



**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

## VOC MS (W)

Results Legend			Customer Sample R				
#	ISO17025 accredited.	<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	G4	G5	K5	M3	
M	mCERTS accredited.		4.00 - 5.00	3.00 - 5.00	1.00 - 3.00	3.00 - 5.00	
S	Non-conforming work.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
aq	Aqueous / settled sample.		26/01/2011	26/01/2011	26/01/2011	26/01/2011	
diss.filt	Dissolved / filtered sample.		27/01/2011	27/01/2011	27/01/2011	27/01/2011	
tot.unfilt	Total / unfiltered sample.		110127-70	110127-70	110127-70	110127-70	
*	subcontracted test.		2759869	2759873	2759858	2759862	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		EW006	EW006	EW006	EW006	
Component	LOD/Units		Method				
Dibromofluoromethane**	%		TM208	100	105	105	105
Toluene-d8**	%	TM208	98.8	100	95.2	99.7	
4-Bromofluorobenzene**	%	TM208	101	97.8	80.9	98	
Dichlorodifluoromethane	<7 µg/l	TM208	<7	<7	<7	<7	
Chloromethane	<9 µg/l	TM208	<9	<9	<9	<9	
Vinyl chloride	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	
Bromomethane	<2 µg/l	TM208	<2	<2	<2	<2	
Chloroethane	<2.5 µg/l	TM208	<2.5	<2.5	<2.5	<2.5	
Trichlorofluoromethane	<1.3 µg/l	TM208	<1.3	<1.3	1.34	<1.3	
1,1-Dichloroethene	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	
Carbon disulphide	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	
Dichloromethane	<3.7 µg/l	TM208	<3.7	<3.7	<3.7	<3.7	
Methyl tertiary butyl ether (MTBE)	<1.6 µg/l	TM208	<1.6	<1.6	<1.6	<1.6	
trans-1,2-Dichloroethene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	
1,1-Dichloroethane	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	
cis-1,2-Dichloroethene	<2.3 µg/l	TM208	<2.3	<2.3	<2.3	<2.3	
2,2-Dichloropropane	<3.8 µg/l	TM208	<3.8	<3.8	<3.8	<3.8	
Bromochloromethane	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	
Chloroform	<1.8 µg/l	TM208	<1.8	<1.8	<1.8	<1.8	
1,1,1-Trichloroethane	<1.3 µg/l	TM208	<1.3	<1.3	6.76	<1.3	
1,1-Dichloropropene	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	
Carbontetrachloride	<1.4 µg/l	TM208	<1.4	<1.4	<1.4	<1.4	
1,2-Dichloroethane	<3.3 µg/l	TM208	<3.3	<3.3	<3.3	<3.3	
Benzene	<1.3 µg/l	TM208	1840	<1.3	17200	<1.3	
Trichloroethene	<2.5 µg/l	TM208	<2.5	<2.5	11	<2.5	
1,2-Dichloropropane	<3 µg/l	TM208	<3	<3	<3	<3	
Dibromomethane	<2.7 µg/l	TM208	<2.7	<2.7	<2.7	<2.7	
Bromodichloromethane	<0.9 µg/l	TM208	<0.9	<0.9	<0.9	<0.9	
cis-1,3-Dichloropropene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	
Toluene	<1.4 µg/l	TM208	1460	<1.4	5300	<1.4	
trans-1,3-Dichloropropene	<3.5 µg/l	TM208	<3.5	<3.5	<3.5	<3.5	
1,1,2-Trichloroethane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	<2.2	
1,3-Dichloropropane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	<2.2	
Tetrachloroethene	<1.5 µg/l	TM208	<1.5	<1.5	2.57	<1.5	
Dibromochloromethane	<1.7 µg/l	TM208	<1.7	<1.7	<1.7	<1.7	

**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

VOC MS (W)

Results Legend		Customer Sample R	G4	G5	K5	M3		
#	ISO17025 accredited.		Depth (m)	4.00 - 5.00	3.00 - 5.00	1.00 - 3.00	3.00 - 5.00	
M	mCERTS accredited.	Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Non-conforming work.	Date Sampled	26/01/2011	26/01/2011	26/01/2011	26/01/2011		
aq	Aqueous / settled sample.	Date Received	27/01/2011	27/01/2011	27/01/2011	27/01/2011		
diss.fit	Dissolved / filtered sample.	SDG Ref	110127-70	110127-70	110127-70	110127-70		
tot.unfilt	Total / unfiltered sample.	Lab Sample No.(s)	2759869	2759873	2759858	2759862		
*	subcontracted test.	AGS Reference	EW006	EW006	EW006	EW006		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.							
Component	LOD/Units	Method						
1,2-Dibromoethane	<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #		
Chlorobenzene	<3.5 µg/l	TM208	<3.5 #	<3.5 #	<3.5 #	<3.5 #		
1,1,1,2-Tetrachloroethane	<1.3 µg/l	TM208	<1.3 #	<1.3 #	<1.3 #	<1.3 #		
Ethylbenzene	<2.5 µg/l	TM208	23 #	<2.5 #	239 #	<2.5 #		
m,p-Xylene	<2.5 µg/l	TM208	1030 #	<2.5 #	1470 #	<2.5 #		
o-Xylene	<1.7 µg/l	TM208	547 #	<1.7 #	665 #	<1.7 #		
Styrene	<1.2 µg/l	TM208	<1.2 #	<1.2 #	355 #	<1.2 #		
Bromoform	<3 µg/l	TM208	<3 #	<3 #	<3 #	<3 #		
Isopropylbenzene	<1.4 µg/l	TM208	2.44 #	<1.4 #	10.9 #	<1.4 #		
1,1,2,2-Tetrachloroethane	<5.2 µg/l	TM208	<5.2 #	<5.2 #	<5.2 #	<5.2 #		
1,2,3-Trichloropropane	<7.8 µg/l	TM208	<7.8 #	<7.8 #	<7.8 #	<7.8 #		
Bromobenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #		
Propylbenzene	<2.6 µg/l	TM208	<2.6 #	<2.6 #	15 #	<2.6 #		
2-Chlorotoluene	<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #		
1,3,5-Trimethylbenzene	<1.8 µg/l	TM208	127 #	<1.8 #	79.9 #	<1.8 #		
4-Chlorotoluene	<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #		
tert-Butylbenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #		
1,2,4-Trimethylbenzene	<1.7 µg/l	TM208	241 #	<1.7 #	192 #	<1.7 #		
sec-Butylbenzene	<1.7 µg/l	TM208	<1.7 #	<1.7 #	<1.7 #	<1.7 #		
4-iso-Propyltoluene	<2.6 µg/l	TM208	13 #	<2.6 #	28.4 #	<2.6 #		
1,3-Dichlorobenzene	<2.2 µg/l	TM208	<2.2 #	<2.2 #	<2.2 #	<2.2 #		
1,4-Dichlorobenzene	<2.7 µg/l	TM208	<2.7 #	<2.7 #	<2.7 #	<2.7 #		
n-Butylbenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #		
1,2-Dichlorobenzene	<3.7 µg/l	TM208	<3.7 #	<3.7 #	<3.7 #	<3.7 #		
1,2-Dibromo-3-chloropropane	<9.8 µg/l	TM208	<9.8 #	<9.8 #	<9.8 #	<9.8 #		
1,2,4-Trichlorobenzene	<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #		
Hexachlorobutadiene	<2.5 µg/l	TM208	<2.5 #	<2.5 #	<2.5 #	<2.5 #		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
Naphthalene	<3.5 µg/l	TM208	12.3 #	<3.5 #	6130 #	<3.5 #		
1,2,3-Trichlorobenzene	<3.1 µg/l	TM208	<3.1 #	<3.1 #	<3.1 #	<3.1 #		
1,3,5-Trichlorobenzene	<10 µg/l	TM208	<10 #	<10 #	<10 #	<10 #		

<b>SDG:</b> 110127-70	<b>Location:</b> Limerick Gasworks	<b>Order Number:</b> 4500063958
<b>Job:</b> D_MOUCHEL_DLG-1	<b>Customer:</b> Mouchel	<b>Report Number:</b> 114955
<b>Client Reference:</b> Limerick Gasworks	<b>Attention:</b> Dave Watts	<b>Superseded Report:</b>

### Table of Results - Appendix

**REPORT KEY**

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10<sup>-7</sup>

<b>NDP</b>	No Determination Possible	<b>#</b>	ISO 17025 Accredited	*	Subcontracted Test	<b>M</b>	MCERTS Accredited
<b>NFD</b>	No Fibres Detected	<b>PFD</b>	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	<b>EC</b>	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 <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of DRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

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**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

### Test Completion Dates

Lab Sample No(s)	2759855	2759856	2759867	2759857	2759872	2759854	2759871	2759869	2759873	2759861
Customer Sample Ref.	A3	A4	A11	C7	D1	D5	G2	G4	G5	H12
AGS Ref.	EW006	EW006	EW006	EW006	EW006	EW006	EW006	EW006	EW006	EW006
Depth	2.00 - 4.00	2.00 - 4.00	2.00 - 3.00	2.00 - 3.00	3.00 - 4.00	1.50 - 2.50	4.00 - 6.00	4.00 - 5.00	3.00 - 5.00	2.00 - 3.00
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	01-Feb-2011	01-Feb-2011		01-Feb-2011		01-Feb-2011				01-Feb-2011
Anions by Kone (w)	28-Jan-2011	28-Jan-2011		28-Jan-2011		28-Jan-2011				31-Jan-2011
Cyanide Comp/Free/Total/Thiocyanate	01-Feb-2011	01-Feb-2011		01-Feb-2011		01-Feb-2011				01-Feb-2011
Dissolved Metals by ICP-MS	31-Jan-2011	31-Jan-2011		31-Jan-2011		31-Jan-2011				28-Jan-2011
EPH CWG (Aliphatic) Aqueous GC (W)	02-Feb-2011	02-Feb-2011		02-Feb-2011		02-Feb-2011				02-Feb-2011
EPH CWG (Aromatic) Aqueous GC (W)	02-Feb-2011	02-Feb-2011		02-Feb-2011		02-Feb-2011				02-Feb-2011
GRO by GC-FID (W)	04-Feb-2011	07-Feb-2011			04-Feb-2011	07-Feb-2011				03-Feb-2011
Hexavalent Chromium (w)	01-Feb-2011	01-Feb-2011		01-Feb-2011		01-Feb-2011				31-Jan-2011
Mercury Dissolved	31-Jan-2011	31-Jan-2011		31-Jan-2011		31-Jan-2011				31-Jan-2011
PAH Spec MS - Aqueous (W)	03-Feb-2011	03-Feb-2011		06-Feb-2011	04-Feb-2011	03-Feb-2011				02-Feb-2011
pH Value	28-Jan-2011	28-Jan-2011		28-Jan-2011		28-Jan-2011				31-Jan-2011
Phenols by HPLC (W)	31-Jan-2011	31-Jan-2011		31-Jan-2011		31-Jan-2011				31-Jan-2011
Sulphide	28-Jan-2011	28-Jan-2011		28-Jan-2011	31-Jan-2011	28-Jan-2011				28-Jan-2011
TPH CWG (W)	04-Feb-2011	07-Feb-2011		07-Feb-2011	04-Feb-2011	07-Feb-2011				03-Feb-2011
VOC MS (W)	07-Feb-2011	07-Feb-2011	07-Feb-2011	09-Feb-2011	09-Feb-2011		09-Feb-2011	09-Feb-2011	07-Feb-2011	

Lab Sample No(s)	2759859	2759860	2759858	2759862
Customer Sample Ref.	J10	K1	K5	M3
AGS Ref.	EW006	EW006	EW006	EW006
Depth	1.00 - 2.00	2.00 - 4.00	1.00 - 3.00	3.00 - 5.00
Type	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	01-Feb-2011	01-Feb-2011	01-Feb-2011	01-Feb-2011
Anions by Kone (w)	31-Jan-2011	31-Jan-2011	31-Jan-2011	31-Jan-2011
Cyanide Comp/Free/Total/Thiocyanate	01-Feb-2011	01-Feb-2011	01-Feb-2011	01-Feb-2011
Dissolved Metals by ICP-MS	28-Jan-2011	28-Jan-2011	28-Jan-2011	28-Jan-2011
EPH CWG (Aliphatic) Aqueous GC (W)	02-Feb-2011	02-Feb-2011	02-Feb-2011	02-Feb-2011
EPH CWG (Aromatic) Aqueous GC (W)	02-Feb-2011	02-Feb-2011	02-Feb-2011	02-Feb-2011
GRO by GC-FID (W)	03-Feb-2011	03-Feb-2011	07-Feb-2011	03-Feb-2011
Hexavalent Chromium (w)	31-Jan-2011	31-Jan-2011	31-Jan-2011	01-Feb-2011
Mercury Dissolved	31-Jan-2011	31-Jan-2011	31-Jan-2011	31-Jan-2011
PAH Spec MS - Aqueous (W)	03-Feb-2011	02-Feb-2011	06-Feb-2011	02-Feb-2011
pH Value	31-Jan-2011	31-Jan-2011	31-Jan-2011	31-Jan-2011
Phenols by HPLC (W)	31-Jan-2011	31-Jan-2011	31-Jan-2011	31-Jan-2011
Sulphide	28-Jan-2011	28-Jan-2011	28-Jan-2011	28-Jan-2011
TPH CWG (W)	03-Feb-2011	03-Feb-2011	07-Feb-2011	03-Feb-2011
VOC MS (W)			09-Feb-2011	05-Feb-2011

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**SDG:** 110127-70  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500063958  
**Report Number:** 114955  
**Superseded Report:**

# 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. Results relate only to the items tested

13. **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. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. 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).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.

19. 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.

20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

21. 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.

22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

23. 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.

24. 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.

SOLID MATRICES EXTRACTION SUMMARY				
ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DOM	SOX THERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOX THERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DOM	SOX THERM	IATROSCAN
ELEMENTAL SULPHUR	D&C	DOM	SOX THERM	HPLC
PHENOLS BY GCMS	WET	DOM	SOX THERM	GCMS
HERBICIDES	D&C	HEXANE ACETONE	SOX THERM	GCMS
PESTICIDES	D&C	HEXANE ACETONE	SOX THERM	GCMS
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	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE ACETONE	MICROWAVE TM28.	GCMS
C8-C10 (C8-C10) EZ FLASH	WET	HEXANE ACETONE	SHAWER	GC/EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE ACETONE	SHAWER	GC/EZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DOM ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY			
ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
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)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DOM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DOM	SOLID PHASE EXTRACTION	HPLC
PEST COP/OPP	DOM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DOM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DOM	SOLID PHASE EXTRACTION	GCMS
TPH by INFRARED (R)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by R	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

**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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

**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.



Mouchel  
Marina House  
2nd Floor  
Clarence Street  
Dun Laoghaire  
Co Dublin

**Attention:** David Megson

## CERTIFICATE OF ANALYSIS

**Date:** 10 May 2011  
**Customer:** D\_MOUCHEL\_DLG  
**Sample Delivery Group (SDG):** 110428-57  
**Your Reference:** Limerick Gasworks  
**Location:** Limerick Gasworks  
**Report No:** 128147

We received 19 samples on Thursday April 28, 2011 and 19 of these samples were scheduled for analysis which was completed on Tuesday May 10, 2011. 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).

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Approved By:

**Sonia McWhan**

Operations Manager





**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
3376168	A3	EW007	2.00 - 3.00	27/04/2011
3376169	A4	EW007	2.00 - 3.00	27/04/2011
3376178	C11	EW007	1.50 - 2.00	27/04/2011
3376166	D5	EW007	1.80 - 2.40	27/04/2011
3376177	E8	EW007	1.50 - 2.50	27/04/2011
3376181	F11	EW007	4.00 - 5.00	27/04/2011
3376184	G3	EW007	4.00 - 5.00	27/04/2011
3376179	G8	EW007	1.40 - 2.40	27/04/2011
3376175	H12	EW007	3.00 - 4.00	27/04/2011
3376172	J10	EW007	1.00 - 2.00	27/04/2011
3376173	K1	EW007	3.00 - 4.00	27/04/2011
3376176	M3	EW007	3.00 - 5.00	27/04/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

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 Consent of copyright owner required for any other use.







**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

Results Legend			Customer Sample R		A3	A4	A11	C7	C11	D1
#	ISO17025 accredited.		Depth (m)		2.00 - 3.00	2.00 - 3.00	1.80 - 2.30	4.00 - 6.00	1.50 - 2.00	3.00 - 4.00
M	mCERTS accredited.		Sample Type		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.		Date Sampled		27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011
aq	Aqueous / settled sample.		Date Received		28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011
diss.filt	Dissolved / filtered sample.		SDG Ref		110428-57	110428-57	110428-57	110428-57	110428-57	110428-57
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)		3376168	3376169	3376182	3376170	3376178	3376188
*	subcontracted test.		AGS Reference		EW007	EW007	EW007	EW007	EW007	EW007
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	9.67	2.27	2.71	50	5.62	11.3	#	#
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	12.4	2.92	3.48	64.3	7.23	14.5	#	#
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01	<0.01	<0.01	<0.01	97	#	#
Arsenic (diss.filt)	<0.12 µg/l	TM152	28.7	4.06	8.59	11.9	6.21	15.1	#	#
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	#	#
Chromium (diss.filt)	<0.22 µg/l	TM152	24.6	16.2	8.28	12.3	17.7	22.4	#	#
Copper (diss.filt)	<0.85 µg/l	TM152	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	#	#
Lead (diss.filt)	<0.02 µg/l	TM152	<0.02	0.039	0.121	0.219	<0.02	<0.02	#	#
Nickel (diss.filt)	<0.15 µg/l	TM152	4.84	3.56	2.47	1.51	3.65	3.79	#	#
Selenium (diss.filt)	<0.39 µg/l	TM152	0.811	0.666	0.461	14	1.54	1.38	#	#
Zinc (diss.filt)	<0.41 µg/l	TM152	2.79	1.41	0.459	1.52	<0.41	1.11	#	#
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	0.0228	<0.01	<0.01	#	#
Sulphate	<2 mg/l	TM184	408	264	69.5	29	73.4	468	#	#
Cyanide, Total	<0.05 mg/l	TM227	0.296	0.167	<0.05	<0.05	0.099	1.03	#	#
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	#	#
pH	<1 pH Units	TM256	8.29	8.04	8.19	8.43	8.11	5.23	#	#
Resorcinol	<0.01 mg/l	TM259	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	#	#
Catechol	<0.01 mg/l	TM259	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	#	#
Phenol	<0.002 mg/l	TM259	<0.002	<0.002	<0.002	16.4	<0.002	<0.002	#	#
Cresols	<0.006 mg/l	TM259	<0.006	<0.006	0.23	46.2	0.01	<0.006	#	#
Xylenols	<0.008 mg/l	TM259	<0.008	<0.008	<0.008	52.5	0.05	0.24	#	#
1-Naphthol	<0.01 mg/l	TM259	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	#	#
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	<0.003	<0.003	<0.03	<0.003	<0.003	#	#
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006	<0.006	<0.006	13.6	<0.006	<0.006	#	#
Phenols, Total Detected 5 speciated	<0.013 mg/l	TM259	<0.013	<0.013	0.23	129	0.06	0.24	#	#

CERTIFICATE OF ANALYSIS

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

Results Legend			Customer Sample R		D5	E8	F11	G2	G3	G4				
#	ISO17025 accredited.		Depth (m)		1.80 - 2.40	1.50 - 2.50	4.00 - 5.00	3.50 - 4.50	4.00 - 5.00	2.80 - 3.00				
M	mCERTS accredited.		Sample Type		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)				
S	Non-conforming work.		Date Sampled		27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011				
aq	Aqueous / settled sample.		Date Received		28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011				
diss.filt	Dissolved / filtered sample.		SDG Ref		110428-57	110428-57	110428-57	110428-57	110428-57	110428-57				
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)		3376166	3376177	3376181	3376186	3376184	3376183				
*	subcontracted test.		AGS Reference		EW007	EW007	EW007	EW007	EW007	EW007				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.													
Component	LOD/Units	Method												
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	9.47	#	36.6	#	13.6	#	43.9	#	21.2	#	13.7	#
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	12.2	#	47.1	#	17.5	#	56.4	#	27.3	#	17.6	#
Sulphide	<0.01 mg/l	TM101	0.41	#	<0.01	#	<0.01	#	<0.01	#	<0.01	#	<0.01	#
Arsenic (diss.filt)	<0.12 µg/l	TM152	5.7	#	81.6	#	5.57	#	20	#	6.25	#	3.51	#
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	#	0.122	#	<0.1	#	<0.1	#	<0.1	#	<0.1	#
Chromium (diss.filt)	<0.22 µg/l	TM152	11.8	#	2.6	#	9.29	#	30.7	#	24.5	#	13.3	#
Copper (diss.filt)	<0.85 µg/l	TM152	<0.85	#	1.87	#	<0.85	#	1.34	#	1.26	#	<0.85	#
Lead (diss.filt)	<0.02 µg/l	TM152	0.691	#	0.12	#	0.048	#	<0.02	#	0.032	#	0.052	#
Nickel (diss.filt)	<0.15 µg/l	TM152	5.1	#	34.4	#	2.98	#	6.82	#	8.05	#	10.9	#
Selenium (diss.filt)	<0.39 µg/l	TM152	5.37	#	18.4	#	1.3	#	8.45	#	4.03	#	8.89	#
Zinc (diss.filt)	<0.41 µg/l	TM152	7.29	#	4.85	#	0.728	#	0.985	#	3.25	#	5.84	#
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	#	0.0121	#	<0.01	#	<0.01	#	<0.01	#	<0.01	#
Sulphate	<2 mg/l	TM184	47.4	#	373	#	97.3	#	702	#	500	#	403	#
Cyanide, Total	<0.05 mg/l	TM227	0.209	#	4.72	#	<0.05	#	0.99	#	0.408	#	0.085	#
Chromium, Hexavalent	<0.03 mg/l	TM241	0.056	#	0.09	#	<0.03	#	<0.03	#	<0.03	#	<0.03	#
pH	<1 pH Units	TM256	7.85	#	7.94	#	8.27	#	8.05	#	7.98	#	8.08	#
Resorcinol	<0.01 mg/l	TM259	<0.01	#	<0.1	#	<0.01	#	<0.05	#	<0.01	#	<0.01	#
Catechol	<0.01 mg/l	TM259	<0.01	#	<0.1	#	<0.01	#	<0.05	#	<0.01	#	<0.01	#
Phenol	<0.002 mg/l	TM259	0.15	#	43.1	#	0.01	#	4.04	#	0.01	#	0.06	#
Cresols	<0.006 mg/l	TM259	1.06	#	64.8	#	0.17	#	9.86	#	0.01	#	0.52	#
Xylenols	<0.008 mg/l	TM259	1.05	#	38.9	#	1.33	#	19.9	#	0.06	#	2.37	#
1-Naphthol	<0.01 mg/l	TM259	<0.01	#	0.1	#	<0.01	#	<0.05	#	<0.01	#	0.04	#
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	#	<0.03	#	<0.003	#	<0.015	#	<0.003	#	<0.003	#
2-Isopropylphenol	<0.006 mg/l	TM259	0.38	#	6.23	#	0.96	#	11.5	#	0.05	#	1.5	#
Phenols, Total Detected 5 speciated	<0.013 mg/l	TM259	2.64	#	153	#	2.47	#	45.3	#	0.13	#	4.45	#

<b>SDG:</b> 110428-57	<b>Location:</b> Limerick Gasworks	<b>Order Number:</b> 4500073063
<b>Job:</b> D_MOUCHEL_DLG-1	<b>Customer:</b> Mouchel	<b>Report Number:</b> 128147
<b>Client Reference:</b> Limerick Gasworks	<b>Attention:</b> Dave Watts	<b>Superseded Report:</b>

Results Legend			Customer Sample R		G5	G8	H12	J10	K1	K5
#	ISO17025 accredited.		Depth (m)		5.00 - 6.00	1.40 - 2.40	3.00 - 4.00	1.00 - 2.00	3.00 - 4.00	1.00 - 2.00
M	mCERTS accredited.		Sample Type		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.		Date Sampled		27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011
aq	Aqueous / settled sample.		Date Received		28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011
diss.filt	Dissolved / filtered sample.		SDG Ref		110428-57	110428-57	110428-57	110428-57	110428-57	110428-57
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)		3376190	3376179	3376175	3376172	3376173	3376171
*	subcontracted test.		AGS Reference		EW007	EW007	EW007	EW007	EW007	EW007
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
<b>Component</b>	<b>LOD/Units</b>	<b>Method</b>								
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099			9.84	26	14.5	0.668	2.57	58.2
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099			12.7	33.4	18.6	0.859	3.3	74.8
Sulphide	<0.01 mg/l	TM101			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic (diss.filt)	<0.12 µg/l	TM152			2.1	11.7	1.41	2.82	1.14	54.6
Cadmium (diss.filt)	<0.1 µg/l	TM152			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (diss.filt)	<0.22 µg/l	TM152			30	11	15.2	17.2	10.6	14.1
Copper (diss.filt)	<0.85 µg/l	TM152			1.4	<0.85	<0.85	0.852	3.53	2.99
Lead (diss.filt)	<0.02 µg/l	TM152			0.114	<0.02	<0.02	<0.02	0.237	0.323
Nickel (diss.filt)	<0.15 µg/l	TM152			8.04	5.23	3.34	4.18	6.95	15.2
Selenium (diss.filt)	<0.39 µg/l	TM152			2.12	8.26	1.17	3.84	0.961	18.3
Zinc (diss.filt)	<0.41 µg/l	TM152			3.02	<0.41	0.756	2.38	2.81	3.69
Mercury (diss.filt)	<0.01 µg/l	TM183			<0.01	<0.01	<0.01	<0.01	<0.01	0.0354
Sulphate	<2 mg/l	TM184			605	160	191	73.2	580	495
Cyanide, Total	<0.05 mg/l	TM227			0.458	0.119	<0.05	<0.05	0.848	3.32
Chromium, Hexavalent	<0.03 mg/l	TM241			<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH	<1 pH Units	TM256			7.93	8.33	7.64	8.31	7.94	8.25
Resorcinol	<0.01 mg/l	TM259			<0.01	<0.02	<0.01	<0.01	<0.01	<0.5
Catechol	<0.01 mg/l	TM259			<0.01	<0.02	<0.01	<0.01	<0.01	<0.5
Phenol	<0.002 mg/l	TM259			<0.002	3.71	<0.002	<0.002	<0.002	177
Cresols	<0.006 mg/l	TM259			<0.006	7.05	<0.006	<0.006	<0.006	373
Xylenols	<0.008 mg/l	TM259			<0.008	8.6	<0.008	<0.008	<0.008	213
1-Naphthol	<0.01 mg/l	TM259			<0.01	<0.02	<0.01	<0.01	<0.01	<0.5
2,3,5-Trimethylphenol	<0.003 mg/l	TM259			<0.003	<0.006	<0.003	<0.003	<0.003	<0.15
2-Isopropylphenol	<0.006 mg/l	TM259			<0.006	2.83	<0.006	<0.006	<0.006	37.2
Phenols, Total Detected 5 speciated	<0.013 mg/l	TM259			<0.013	22.2	<0.013	<0.013	<0.013	800





CERTIFICATE OF ANALYSIS

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

Results Legend		Customer Sample R					
#	ISO17025 accredited.	<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	M3				
M	mCERTS accredited.		3.00 - 5.00				
S	Non-conforming work.		Water(GW/SW)				
aq	Aqueous / settled sample.		27/04/2011				
diss.filt	Dissolved / filtered sample.		28/04/2011				
tot.unfilt	Total / unfiltered sample.		110428-57				
*	subcontracted test.		3376176				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		EW007				
Component	LOD/Units		Method				
Ammoniacal Nitrogen as N	<0.2 mg/l		TM099	1.09	#		
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.4	#			
Sulphide	<0.01 mg/l	TM101	<0.01	#			
Arsenic (diss.filt)	<0.12 µg/l	TM152	2.96	#			
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	#			
Chromium (diss.filt)	<0.22 µg/l	TM152	4.24	#			
Copper (diss.filt)	<0.85 µg/l	TM152	8.66	#			
Lead (diss.filt)	<0.02 µg/l	TM152	0.083	#			
Nickel (diss.filt)	<0.15 µg/l	TM152	4.1	#			
Selenium (diss.filt)	<0.39 µg/l	TM152	1.25	#			
Zinc (diss.filt)	<0.41 µg/l	TM152	1.27	#			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	#			
Sulphate	<2 mg/l	TM184	550	#			
Cyanide, Total	<0.05 mg/l	TM227	1.29	#			
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	#			
pH	<1 pH Units	TM256	7.96	#			
Resorcinol	<0.01 mg/l	TM259	<0.01	#			
Catechol	<0.01 mg/l	TM259	<0.01	#			
Phenol	<0.002 mg/l	TM259	0.01	#			
Cresols	<0.006 mg/l	TM259	0.03	#			
Xylenols	<0.008 mg/l	TM259	<0.008	#			
1-Naphthol	<0.01 mg/l	TM259	<0.01	#			
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	#			
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006	#			
Phenols, Total Detected 5 speciated	<0.013 mg/l	TM259	0.04	#			

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## CERTIFICATE OF ANALYSIS

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

## PAH Spec MS - Aqueous (W)

Results Legend			Customer Sample R						
#	ISO17025 accredited.		A3	A4	A11	C7	C11	D1	
M	mCERTS accredited.								
S	Non-conforming work.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	subcontracted test.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.								
		Depth (m)	2.00 - 3.00	2.00 - 3.00	1.80 - 2.30	4.00 - 6.00	1.50 - 2.00	3.00 - 4.00	
		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
		Date Sampled	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	
		Date Received	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	
		SDG Ref	110428-57	110428-57	110428-57	110428-57	110428-57	110428-57	
		Lab Sample No.(s)	3376168	3376169	3376182	3376170	3376178	3376188	
		AGS Reference	EW007	EW007	EW007	EW007	EW007	EW007	
Component	LOD/Units	Method							
Naphthalene (aq)	<0.1 µg/l	TM178	0.142	0.101	135	64.7	1.11	2590	
Acenaphthene (aq)	<0.015 µg/l	TM178	0.422	0.0233	23.7	30.9	2.74	136	
Acenaphthylene (aq)	<0.011 µg/l	TM178	0.307	0.208	79.2	193	1.38	227	
Fluoranthene (aq)	<0.017 µg/l	TM178	0.466	0.756	294	128	8.42	146	
Anthracene (aq)	<0.015 µg/l	TM178	0.111	0.142	46.8	68.6	0.929	75.6	
Phenanthrene (aq)	<0.022 µg/l	TM178	0.248	0.153	125	173	2.81	336	
Fluorene (aq)	<0.014 µg/l	TM178	0.114	0.0554	51	126	0.907	164	
Chrysene (aq)	<0.013 µg/l	TM178	0.193	0.347	267	29.8	2.36	18.9	
Pyrene (aq)	<0.015 µg/l	TM178	2.5	0.829	241	90.6	5.18	88.9	
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	0.228	0.319	290	34.7	2.8	19.4	
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	0.17	0.695	386	28.9	4.12	11	
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	0.272	0.597	434	26.5	4.41	8.5	
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	0.363	0.694	419	29.1	4.42	8.72	
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.0269	0.0788	47.9	5.62	0.622	1.52	
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	0.0965	0.233	125	14.6	1.58	2.42	
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.0902	0.26	118	14.6	1.97	2.41	
PAH, Total Detected USEPA 16 (aq)	<0.17 µg/l	TM178	5.76	5.49	3080	1060	45.8	3840	



CERTIFICATE OF ANALYSIS

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

**PAH Spec MS - Aqueous (W)**

Results Legend			Customer Sample R		D5	E8	F11	G2	G3	G4
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>							
M	mCERTS accredited.			1.80 - 2.40	1.50 - 2.50	4.00 - 5.00	3.50 - 4.50	4.00 - 5.00	2.80 - 3.00	
S	Non-conforming work.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
aq	Aqueous / settled sample.			27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	
diss.filt	Dissolved / filtered sample.			28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	
tot.unfilt	Total / unfiltered sample.			110428-57	110428-57	110428-57	110428-57	110428-57	110428-57	
*	subcontracted test.		3376166	3376177	3376181	3376186	3376184	3376183		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		EW007	EW007	EW007	EW007	EW007	EW007		
Component	LOD/Units	Method								
Naphthalene (aq)	<0.1 µg/l	TM178	23.8	135	0.42	19.1	1.21	31.1	#	#
Acenaphthene (aq)	<0.015 µg/l	TM178	2.43	7.76	0.0355	25.8	1.19	38.1	#	#
Acenaphthylene (aq)	<0.011 µg/l	TM178	18.6	50.1	0.215	28.7	1.54	48.8	#	#
Fluoranthene (aq)	<0.017 µg/l	TM178	85.8	5.82	0.649	6.25	4.14	182	#	#
Anthracene (aq)	<0.015 µg/l	TM178	7.63	6.79	0.061	4.56	0.424	88.9	#	#
Phenanthrene (aq)	<0.022 µg/l	TM178	24.9	21.4	0.16	30	1.19	196	#	#
Fluorene (aq)	<0.014 µg/l	TM178	5.49	20	0.0492	20.8	0.313	121	#	#
Chrysene (aq)	<0.013 µg/l	TM178	59	0.921	0.412	0.566	2.99	46.4	#	#
Pyrene (aq)	<0.015 µg/l	TM178	70.6	3.5	0.551	3.7	3.65	120	#	#
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	48.9	1.27	0.406	0.713	3	55.6	#	#
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	81.6	0.919	0.845	0.393	4.6	41.2	#	#
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	75.4	0.969	0.751	0.41	4.78	45.5	#	#
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	63.2	0.958	0.768	0.404	4.84	48.1	#	#
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	11.6	0.127	0.0946	0.0471	0.907	7.32	#	#
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	27.9	0.294	0.328	0.111	2.54	17.2	#	#
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	29.6	0.345	0.336	0.12	2.72	19.5	#	#
PAH, Total Detected USEPA 16 (aq)	<0.17 µg/l	TM178	636	256	6.08	142	40	1110		

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## CERTIFICATE OF ANALYSIS

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

## PAH Spec MS - Aqueous (W)

Results Legend			Customer Sample R		G5	G8	H12	J10	K1	K5
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>							
M	mCERTS accredited.			5.00 - 6.00	1.40 - 2.40	3.00 - 4.00	1.00 - 2.00	3.00 - 4.00	1.00 - 2.00	
S	Non-conforming work.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
aq	Aqueous / settled sample.			27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	
diss.filt	Dissolved / filtered sample.			28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	
tot.unfilt	Total / unfiltered sample.			110428-57	110428-57	110428-57	110428-57	110428-57	110428-57	
*	subcontracted test.		3376190	3376179	3376175	3376172	3376173	3376171		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		EW007	EW007	EW007	EW007	EW007	EW007		
Component	LOD/Units	Method								
Naphthalene (aq)	<0.1 µg/l	TM178	0.721	35.6	1.35	0.172	0.145	11000		
Acenaphthene (aq)	<0.015 µg/l	TM178	0.354	9.06	0.638	0.0736	0.0233	345		
Acenaphthylene (aq)	<0.011 µg/l	TM178	3.21	66.1	1.96	1	0.0596	1700		
Fluoranthene (aq)	<0.017 µg/l	TM178	16.3	19.1	8.37	1.94	0.64	1660		
Anthracene (aq)	<0.015 µg/l	TM178	1.98	11.1	1.4	0.213	0.0513	911		
Phenanthrene (aq)	<0.022 µg/l	TM178	3.21	41.1	4.06	0.817	0.157	2640		
Fluorene (aq)	<0.014 µg/l	TM178	1	34.1	1.27	0.21	0.0289	1130		
Chrysene (aq)	<0.013 µg/l	TM178	8.05	5.09	4.93	1.63	0.436	451		
Pyrene (aq)	<0.015 µg/l	TM178	11.2	12.6	5.92	1.34	0.636	1120		
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	8.07	7.15	4.77	2.12	0.481	369		
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	10.2	4.95	11.5	5.14	0.741	139		
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	10.4	6.05	8.95	4.11	0.85	178		
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	13.3	6.02	12.4	5.93	0.806	226		
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	2.62	0.701	1.83	1	0.132	27.7		
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	7.49	1.35	4.75	1.81	0.473	84.7		
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	7.63	1.77	5.4	2.19	0.451	92.3		
PAH, Total Detected USEPA 16 (aq)	<0.17 µg/l	TM178	106	262	79.4	29.7	6.11	22100		



SDG: 110428-57
Job: D\_MOUCHEL\_DLG-1
Client Reference: Limerick Gasworks

Location: Limerick Gasworks
Customer: Mouchel
Attention: Dave Watts

Order Number: 4500073063
Report Number: 128147
Superseded Report:

PAH Spec MS - Aqueous (W)

Table with columns for Component, LOD/Units, Method, and concentration values. Includes a Results Legend and Customer Sample R information.

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**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

**TPH CWG (W)**

Results Legend			Customer Sample R		A3	A4	A11	C7	C11	D1	
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>								
M	mCERTS accredited.			2.00 - 3.00	2.00 - 3.00	1.80 - 2.30	4.00 - 6.00	1.50 - 2.00	3.00 - 4.00		
S	Non-conforming work.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
aq	Aqueous / settled sample.			27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011		
diss.filt	Dissolved / filtered sample.			28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011		
tot.unfilt	Total / unfiltered sample.			110428-57	110428-57	110428-57	110428-57	110428-57	110428-57		
*	subcontracted test.			3376168	3376169	3376182	3376170	3376178	3376188		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.			EW007	EW007	EW007	EW007	EW007	EW007		
Component	LOD/Units	Method									
GRO Surrogate % recovery**	%	TM245		113	119	121	119	121	93		
GRO >C5-C12	<50 µg/l	TM245	1780	<50	264	36200	3710	6270			
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3	<15	<3	<3			
Benzene	<7 µg/l	TM245	258	<7	<7	15900	49	685			
Toluene	<4 µg/l	TM245	6	<4	18	5580	25	231			
Ethylbenzene	<5 µg/l	TM245	8	<5	5	195	119	204			
m,p-Xylene	<8 µg/l	TM245	48	<8	15	1400	135	549			
o-Xylene	<3 µg/l	TM245	49	<3	13	597	133	302			
m,p,o-Xylene	<10 µg/l	TM245	97	<10	28	2000	268	851			
BTEX, Total	<10 µg/l	TM245	369	<10	51	23700	461	1970			
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10	244	<10	11			
Aliphatics >C6-C8	<10 µg/l	TM245	65	<10	<10	537	30	116			
Aliphatics >C8-C10	<10 µg/l	TM245	145	<10	32	1500	398	503			
Aliphatics >C10-C12	<10 µg/l	TM245	659	<10	88	5580	1530	2000			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	11	211	31	125	29			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	21	912	32	39	74			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	<10	3950	34	<10	31			
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	32	5070	97	164	134			
Aromatics >EC5-EC7	<10 µg/l	TM245	258	<10	<10	15900	49	685			
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	18	5580	25	231			
Aromatics >EC8-EC10	<10 µg/l	TM245	202	<10	55	3190	651	1390			
Aromatics >EC10-EC12	<10 µg/l	TM245	439	<10	59	3720	1020	1330			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	97	<10	296	15300	406	665			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	109	13	801	1770	287	537			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	13	13	7740	751	219	436			
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	219	26	8840	17800	912	1640			
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	2000	63	14200	54200	4790	8040			

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**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

**TPH CWG (W)**

Results Legend			Customer Sample R		D5	E8	F11	G2	G3	G4
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>		1.80 - 2.40	1.50 - 2.50	4.00 - 5.00	3.50 - 4.50	4.00 - 5.00	2.80 - 3.00
M	mCERTS accredited.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.			27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011
aq	Aqueous / settled sample.			28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011
diss.filt	Dissolved / filtered sample.			110428-57	110428-57	110428-57	110428-57	110428-57	110428-57	110428-57
tot.unfilt	Total / unfiltered sample.			3376166	3376177	3376181	3376186	3376184	3376183	3376183
*	subcontracted test.			EW007	EW007	EW007	EW007	EW007	EW007	EW007
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM245			120	88	118	113	119	120
GRO >C5-C12	<50 µg/l	TM245			802	8100	1080	21500	567	11800
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245			<3	<3	<3	<6	<3	<3
Benzene	<7 µg/l	TM245			337	2880	410	5430	144	1750
Toluene	<4 µg/l	TM245			79	784	153	3940	<4	1520
Ethylbenzene	<5 µg/l	TM245			16	35	13	451	11	209
m,p-Xylene	<8 µg/l	TM245			30	250	72	1930	17	1430
o-Xylene	<3 µg/l	TM245			31	120	37	1020	51	583
m,p,o-Xylene	<10 µg/l	TM245			61	370	109	2950	68	2010
BTEX, Total	<10 µg/l	TM245			493	4070	685	12800	223	5490
Aliphatics >C5-C6	<10 µg/l	TM245			<10	30	<10	60	<10	14
Aliphatics >C6-C8	<10 µg/l	TM245			14	211	33	285	18	124
Aliphatics >C8-C10	<10 µg/l	TM245			43	466	52	1250	50	863
Aliphatics >C10-C12	<10 µg/l	TM245			131	1810	178	3790	143	2820
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174			<10	<10	<10	<10	<10	232
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174			122	<10	<10	<10	<10	132
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174			1180	<10	<10	<10	<10	137
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174			1300	<10	<10	<10	<10	501
Aromatics >EC5-EC7	<10 µg/l	TM245			337	2880	410	5430	144	1750
Aromatics >EC7-EC8	<10 µg/l	TM245			79	784	153	3940	<10	1520
Aromatics >EC8-EC10	<10 µg/l	TM245			106	716	157	4230	112	2800
Aromatics >EC10-EC12	<10 µg/l	TM245			87	1210	118	2530	95	1880
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174			331	6270	11	6130	25	3450
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174			269	497	<10	618	<10	2290
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174			2800	199	<10	100	74	2860
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174			3400	6960	11	6850	99	8600
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174			5500	15100	1090	28400	665	20900

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**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

**TPH CWG (W)**

Results Legend			Customer Sample R	G5	G8	H12	J10	K1	K5	
#	ISO17025 accredited.		<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	5.00 - 6.00	1.40 - 2.40	3.00 - 4.00	1.00 - 2.00	3.00 - 4.00	1.00 - 2.00	
M	mCERTS accredited.			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.			27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011
aq	Aqueous / settled sample.			28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011
diss.filt	Dissolved / filtered sample.			110428-57	110428-57	110428-57	110428-57	110428-57	110428-57	110428-57
tot.unfilt	Total / unfiltered sample.			3376190	3376179	3376175	3376172	3376173	3376171	3376171
*	subcontracted test.			EW007	EW007	EW007	EW007	EW007	EW007	EW007
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM245		110	120	117	123	110	83	
GRO >C5-C12	<50 µg/l	TM245		295	6120	<50	<50	<50	40300	
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245		<3	<3	<3	<3	<3	<15	
Benzene	<7 µg/l	TM245		34	1220	<7	<7	<7	12400	
Toluene	<4 µg/l	TM245		<4	744	<4	<4	<4	4200	
Ethylbenzene	<5 µg/l	TM245		<5	65	<5	<5	<5	206	
m,p-Xylene	<8 µg/l	TM245		8	459	<8	<8	<8	1340	
o-Xylene	<3 µg/l	TM245		9	192	<3	<3	<3	566	
m,p,o-Xylene	<10 µg/l	TM245		17	651	<10	<10	<10	1910	
BTEX, Total	<10 µg/l	TM245		51	2680	<10	<10	<10	18700	
Aliphatics >C5-C6	<10 µg/l	TM245		<10	10	<10	<10	<10	266	
Aliphatics >C6-C8	<10 µg/l	TM245		18	84	<10	<10	<10	1320	
Aliphatics >C8-C10	<10 µg/l	TM245		40	356	<10	<10	<10	2180	
Aliphatics >C10-C12	<10 µg/l	TM245		92	1650	<10	<10	<10	9810	
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174		100	<10	<10	<10	<10	79	
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174		83	<10	<10	<10	<10	63	
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174		98	<10	60	<10	<10	72	
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174		281	<10	60	<10	<10	214	
Aromatics >EC5-EC7	<10 µg/l	TM245		34	1220	<10	<10	<10	12400	
Aromatics >EC7-EC8	<10 µg/l	TM245		<10	744	<10	<10	<10	4200	
Aromatics >EC8-EC10	<10 µg/l	TM245		46	954	<10	<10	<10	3570	
Aromatics >EC10-EC12	<10 µg/l	TM245		62	1100	<10	<10	<10	6540	
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174		101	2840	16	<10	<10	45900	
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174		202	526	50	<10	<10	3210	
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174		1110	209	322	83	<10	1020	
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174		1420	3570	388	83	<10	50100	
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174		1990	9700	455	87	<10	90600	

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CERTIFICATE OF ANALYSIS

Validated

SDG: 110428-57
Job: D\_MOUCHEL\_DLG-1
Client Reference: Limerick Gasworks

Location: Limerick Gasworks
Customer: Mouchel
Attention: Dave Watts

Order Number: 4500073063
Report Number: 128147
Superseded Report:

TPH CWG (W)

Table with columns: Results Legend, Customer Sample R, Component, LOD/Units, Method, and numerical results. Includes a large red watermark: 'For inspection purposes only. Consent of copyright owner required for any other use.'

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

VOC MS (W)

Results Legend			Customer Sample R		A3	A4	A11	C7	D1	G2
#	ISO17025 accredited.		Depth (m)	Sample Type	2.00 - 3.00	2.00 - 3.00	1.80 - 2.30	4.00 - 6.00	3.00 - 4.00	3.50 - 4.50
M	mCERTS accredited.				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.		Date Sampled	Date Sampled	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011
aq	Aqueous / settled sample.		Date Received	Date Received	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011
diss.filt	Dissolved / filtered sample.		SDG Ref	SDG Ref	110428-57	110428-57	110428-57	110428-57	110428-57	110428-57
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)	Lab Sample No.(s)	3376168	3376169	3376182	3376170	3376188	3376186
*	subcontracted test.		AGS Reference	AGS Reference	EW007	EW007	EW007	EW007	EW007	EW007
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM208	105	104	106	103	104	104		
Toluene-d8**	%	TM208	97.3	97	98.8	101	96.6	97.1		
4-Bromofluorobenzene**	%	TM208	98.7	99.2	99.4	91.9	96.6	97.3		
Dichlorodifluoromethane	<7 µg/l	TM208	<7	<7	<7	<7	<7	<7		
Chloromethane	<9 µg/l	TM208	<9	<9	<9	<9	<9	<9		
Vinyl chloride	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2		
Bromomethane	<2 µg/l	TM208	<2	<2	<2	<2	<2	<2		
Chloroethane	<2.5 µg/l	TM208	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5		
Trichlorofluoromethane	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3		
1,1-Dichloroethene	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2		
Carbon disulphide	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3		3.25
Dichloromethane	<3.7 µg/l	TM208	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7		
Methyl tertiary butyl ether (MTBE)	<1.6 µg/l	TM208	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6		
trans-1,2-Dichloroethene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9		
1,1-Dichloroethane	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2		
cis-1,2-Dichloroethene	<2.3 µg/l	TM208	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3		
2,2-Dichloropropane	<3.8 µg/l	TM208	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8		
Bromochloromethane	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9		
Chloroform	<1.8 µg/l	TM208	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8		
1,1,1-Trichloroethane	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3		
1,1-Dichloropropene	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3		
Carbontetrachloride	<1.4 µg/l	TM208	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4		
1,2-Dichloroethane	<3.3 µg/l	TM208	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3		
Benzene	<1.3 µg/l	TM208	202	<1.3	4.35	16400	919	5540		
Trichloroethene	<2.5 µg/l	TM208	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5		
1,2-Dichloropropane	<3 µg/l	TM208	<3	<3	<3	<3	<3	<3		
Dibromomethane	<2.7 µg/l	TM208	<2.7	<2.7	<2.7	<2.7	<2.7	<2.7		
Bromodichloromethane	<0.9 µg/l	TM208	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9		
cis-1,3-Dichloropropene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9		
Toluene	<1.4 µg/l	TM208	3.88	<1.4	15.9	5110	217	3900		
trans-1,3-Dichloropropene	<3.5 µg/l	TM208	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5		
1,1,2-Trichloroethane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2		
1,3-Dichloropropane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2		
Tetrachloroethene	<1.5 µg/l	TM208	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5		
Dibromochloromethane	<1.7 µg/l	TM208	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7		

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

VOC MS (W)

Results Legend		Customer Sample R	A3	A4	A11	C7	D1	G2	
#	ISO17025 accredited.		Depth (m)	2.00 - 3.00	2.00 - 3.00	1.80 - 2.30	4.00 - 6.00	3.00 - 4.00	3.50 - 4.50
M	mCERTS accredited.	Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	
S	Non-conforming work.	Date Sampled	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	
aq	Aqueous / settled sample.	Date Received	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	28/04/2011	
diss.filt	Dissolved / filtered sample.	SDG Ref	110428-57	110428-57	110428-57	110428-57	110428-57	110428-57	
tot.unfilt	Total / unfiltered sample.	Lab Sample No.(s)	3376168	3376169	3376182	3376170	3376188	3376186	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.	AGS Reference	EW007	EW007	EW007	EW007	EW007	EW007	
Component		LOD/Units	Method						
1,2-Dibromoethane		<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #
Chlorobenzene		<3.5 µg/l	TM208	<3.5 #	<3.5 #	<3.5 #	<3.5 #	<3.5 #	<3.5 #
1,1,1,2-Tetrachloroethane		<1.3 µg/l	TM208	<1.3 #	<1.3 #	<1.3 #	<1.3 #	<1.3 #	<1.3 #
Ethylbenzene		<2.5 µg/l	TM208	<2.5 #	<2.5 #	3.42 #	151 #	249 #	391 #
m,p-Xylene		<2.5 µg/l	TM208	40.1 #	<2.5 #	11.6 #	1060 #	681 #	1760 #
o-Xylene		<1.7 µg/l	TM208	43 #	<1.7 #	10.1 #	482 #	384 #	965 #
Styrene		<1.2 µg/l	TM208	<1.2 #	<1.2 #	<1.2 #	242 #	<1.2 #	<1.2 #
Bromoform		<3 µg/l	TM208	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Isopropylbenzene		<1.4 µg/l	TM208	2.83 #	<1.4 #	<1.4 #	6.42 #	23.8 #	26.8 #
1,1,2,2-Tetrachloroethane		<5.2 µg/l	TM208	<5.2 #	<5.2 #	<5.2 #	<5.2 #	<5.2 #	<5.2 #
1,2,3-Trichloropropane		<7.8 µg/l	TM208	<7.8 #	<7.8 #	<7.8 #	<7.8 #	<7.8 #	<7.8 #
Bromobenzene		<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
Propylbenzene		<2.6 µg/l	TM208	<2.6 #	<2.6 #	<2.6 #	8.48 #	29.1 #	28.3 #
2-Chlorotoluene		<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #
1,3,5-Trimethylbenzene		<1.8 µg/l	TM208	5.01 #	<1.8 #	<1.8 #	55.2 #	76.3 #	100 #
4-Chlorotoluene		<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #	<1.9 #
tert-Butylbenzene		<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
1,2,4-Trimethylbenzene		<1.7 µg/l	TM208	17.6 #	<1.7 #	4.72 #	139 #	268 #	376 #
sec-Butylbenzene		<1.7 µg/l	TM208	<1.7 #	<1.7 #	<1.7 #	<1.7 #	<1.7 #	<1.7 #
4-iso-Propyltoluene		<2.6 µg/l	TM208	<2.6 #	<2.6 #	<2.6 #	<2.6 #	<2.6 #	<2.6 #
1,3-Dichlorobenzene		<2.2 µg/l	TM208	<2.2 #	<2.2 #	<2.2 #	<2.2 #	<2.2 #	<2.2 #
1,4-Dichlorobenzene		<2.7 µg/l	TM208	<2.7 #	<2.7 #	<2.7 #	<2.7 #	<2.7 #	<2.7 #
n-Butylbenzene		<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
1,2-Dichlorobenzene		<3.7 µg/l	TM208	<3.7 #	<3.7 #	<3.7 #	<3.7 #	<3.7 #	<3.7 #
1,2-Dibromo-3-chloropropane		<9.8 µg/l	TM208	<9.8 #	<9.8 #	<9.8 #	<9.8 #	<9.8 #	<9.8 #
1,2,4-Trichlorobenzene		<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #	<2.3 #
Hexachlorobutadiene		<2.5 µg/l	TM208	<2.5 #	<2.5 #	<2.5 #	<2.5 #	<2.5 #	<2.5 #
tert-Amyl methyl ether (TAME)		<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene		<3.5 µg/l	TM208	103 #	<3.5 #	74.3 #	5370 #	3450 #	3360 #
1,2,3-Trichlorobenzene		<3.1 µg/l	TM208	<3.1 #	<3.1 #	<3.1 #	<3.1 #	<3.1 #	<3.1 #
1,3,5-Trichlorobenzene		<10 µg/l	TM208	<10 #	<10 #	<10 #	<10 #	<10 #	<10 #

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

**VOC MS (W)**

Results Legend		Customer Sample R	G4	G5	K5	M3		
#	ISO17025 accredited.	<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	2.80 - 3.00	5.00 - 6.00	1.00 - 2.00	3.00 - 5.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Non-conforming work.		27/04/2011	27/04/2011	27/04/2011	27/04/2011		
aq	Aqueous / settled sample.		28/04/2011	28/04/2011	28/04/2011	28/04/2011		
diss.filt	Dissolved / filtered sample.		110428-57	110428-57	110428-57	110428-57		
tot.unfilt	Total / unfiltered sample.		3376183	3376190	3376171	3376176		
*	subcontracted test.		EW007	EW007	EW007	EW007		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	105	102	103	114		
Toluene-d8**	%	TM208	97.5	96.6	94.3	100		
4-Bromofluorobenzene**	%	TM208	97.5	98.6	72.6	102		
Dichlorodifluoromethane	<7 µg/l	TM208	<7	<7	<7	<7	#	#
Chloromethane	<9 µg/l	TM208	<9	<9	<9	<9	#	#
Vinyl chloride	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	#	#
Bromomethane	<2 µg/l	TM208	<2	<2	<2	<2	#	#
Chloroethane	<2.5 µg/l	TM208	<2.5	<2.5	<2.5	<2.5	#	#
Trichlorofluoromethane	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	#	#
1,1-Dichloroethene	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	#	#
Carbon disulphide	<1.3 µg/l	TM208	<1.3	<1.3	1.38	<1.3	#	#
Dichloromethane	<3.7 µg/l	TM208	<3.7	<3.7	<3.7	<3.7	#	#
Methyl tertiary butyl ether (MTBE)	<1.6 µg/l	TM208	<1.6	<1.6	<1.6	<1.6	#	#
trans-1,2-Dichloroethene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	#	#
1,1-Dichloroethane	<1.2 µg/l	TM208	<1.2	<1.2	<1.2	<1.2	#	#
cis-1,2-Dichloroethene	<2.3 µg/l	TM208	<2.3	<2.3	<2.3	<2.3	#	#
2,2-Dichloropropane	<3.8 µg/l	TM208	<3.8	<3.8	<3.8	<3.8	#	#
Bromochloromethane	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	#	#
Chloroform	<1.8 µg/l	TM208	<1.8	<1.8	<1.8	<1.8	#	#
1,1,1-Trichloroethane	<1.3 µg/l	TM208	<1.3	<1.3	5.82	<1.3	#	#
1,1-Dichloropropene	<1.3 µg/l	TM208	<1.3	<1.3	<1.3	<1.3	#	#
Carbontetrachloride	<1.4 µg/l	TM208	<1.4	<1.4	<1.4	<1.4	#	#
1,2-Dichloroethane	<3.3 µg/l	TM208	<3.3	<3.3	<3.3	<3.3	#	#
Benzene	<1.3 µg/l	TM208	1770	24.9	17700	<1.3	#	#
Trichloroethene	<2.5 µg/l	TM208	<2.5	<2.5	<2.5	<2.5	#	#
1,2-Dichloropropane	<3 µg/l	TM208	<3	<3	<3	<3	#	#
Dibromomethane	<2.7 µg/l	TM208	<2.7	<2.7	<2.7	<2.7	#	#
Bromodichloromethane	<0.9 µg/l	TM208	<0.9	<0.9	<0.9	<0.9	#	#
cis-1,3-Dichloropropene	<1.9 µg/l	TM208	<1.9	<1.9	<1.9	<1.9	#	#
Toluene	<1.4 µg/l	TM208	1480	<1.4	5260	<1.4	#	#
trans-1,3-Dichloropropene	<3.5 µg/l	TM208	<3.5	<3.5	<3.5	<3.5	#	#
1,1,2-Trichloroethane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	<2.2	#	#
1,3-Dichloropropane	<2.2 µg/l	TM208	<2.2	<2.2	<2.2	<2.2	#	#
Tetrachloroethene	<1.5 µg/l	TM208	<1.5	<1.5	<1.5	<1.5	#	#
Dibromochloromethane	<1.7 µg/l	TM208	<1.7	<1.7	<1.7	<1.7	#	#



## CERTIFICATE OF ANALYSIS

**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

## VOC MS (W)

Results Legend		Customer Sample R	G4	G5	K5	M3		
#	ISO17025 accredited.							
M	mCERTS accredited.	<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	2.80 - 3.00	5.00 - 6.00	1.00 - 2.00	3.00 - 5.00		
S	Non-conforming work.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
aq	Aqueous / settled sample.		27/04/2011	27/04/2011	27/04/2011	27/04/2011		
diss.filt	Dissolved / filtered sample.		28/04/2011	28/04/2011	28/04/2011	28/04/2011		
tot.unfilt	Total / unfiltered sample.		28/04/2011	28/04/2011	28/04/2011	28/04/2011		
*	subcontracted test.		110428-57	110428-57	110428-57	110428-57		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		3376183	3376190	3376171	3376176		
			EW007	EW007	EW007	EW007		
Component	LOD/Units	Method						
1,2-Dibromoethane	<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #		
Chlorobenzene	<3.5 µg/l	TM208	<3.5 #	<3.5 #	<3.5 #	<3.5 #		
1,1,1,2-Tetrachloroethane	<1.3 µg/l	TM208	<1.3 #	<1.3 #	<1.3 #	<1.3 #		
Ethylbenzene	<2.5 µg/l	TM208	182 #	<2.5 #	230 #	4.22 #		
m,p-Xylene	<2.5 µg/l	TM208	1310 #	5.06 #	1460 #	<2.5 #		
o-Xylene	<1.7 µg/l	TM208	535 #	7.08 #	653 #	<1.7 #		
Styrene	<1.2 µg/l	TM208	<1.2 #	<1.2 #	318 #	3.43 #		
Bromoform	<3 µg/l	TM208	<3 #	<3 #	<3 #	<3 #		
Isopropylbenzene	<1.4 µg/l	TM208	14.3 #	<1.4 #	9.62 #	<1.4 #		
1,1,2,2-Tetrachloroethane	<5.2 µg/l	TM208	<5.2 #	<5.2 #	<5.2 #	<5.2 #		
1,2,3-Trichloropropane	<7.8 µg/l	TM208	<7.8 #	<7.8 #	<7.8 #	<7.8 #		
Bromobenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #		
Propylbenzene	<2.6 µg/l	TM208	13.6 #	<2.6 #	12.8 #	<2.6 #		
2-Chlorotoluene	<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #		
1,3,5-Trimethylbenzene	<1.8 µg/l	TM208	113 #	<1.8 #	60.5 #	<1.8 #		
4-Chlorotoluene	<1.9 µg/l	TM208	<1.9 #	<1.9 #	<1.9 #	<1.9 #		
tert-Butylbenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #		
1,2,4-Trimethylbenzene	<1.7 µg/l	TM208	294 #	4.94 #	152 #	<1.7 #		
sec-Butylbenzene	<1.7 µg/l	TM208	<1.7 #	<1.7 #	<1.7 #	<1.7 #		
4-iso-Propyltoluene	<2.6 µg/l	TM208	<2.6 #	<2.6 #	<2.6 #	<2.6 #		
1,3-Dichlorobenzene	<2.2 µg/l	TM208	<2.2 #	<2.2 #	<2.2 #	<2.2 #		
1,4-Dichlorobenzene	<2.7 µg/l	TM208	<2.7 #	<2.7 #	<2.7 #	<2.7 #		
n-Butylbenzene	<2 µg/l	TM208	<2 #	<2 #	<2 #	<2 #		
1,2-Dichlorobenzene	<3.7 µg/l	TM208	<3.7 #	<3.7 #	<3.7 #	<3.7 #		
1,2-Dibromo-3-chloropropane	<9.8 µg/l	TM208	<9.8 #	<9.8 #	<9.8 #	<9.8 #		
1,2,4-Trichlorobenzene	<2.3 µg/l	TM208	<2.3 #	<2.3 #	<2.3 #	<2.3 #		
Hexachlorobutadiene	<2.5 µg/l	TM208	<2.5 #	<2.5 #	<2.5 #	<2.5 #		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
Naphthalene	<3.5 µg/l	TM208	3020 #	<3.5 #	6080 #	<3.5 #		
1,2,3-Trichlorobenzene	<3.1 µg/l	TM208	<3.1 #	<3.1 #	<3.1 #	<3.1 #		
1,3,5-Trichlorobenzene	<10 µg/l	TM208	<10 #	<10 #	<10 #	<10 #		

<b>SDG:</b> 110428-57	<b>Location:</b> Limerick Gasworks	<b>Order Number:</b> 4500073063
<b>Job:</b> D_MOUCHEL_DLG-1	<b>Customer:</b> Mouchel	<b>Report Number:</b> 128147
<b>Client Reference:</b> Limerick Gasworks	<b>Attention:</b> Dave Watts	<b>Superseded Report:</b>

### Table of Results - Appendix

**REPORT KEY**

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10<sup>-7</sup>

<b>NDP</b> No Determination Possible	<b>#</b> ISO 17025 Accredited	<b>*</b> Subcontracted Test	<b>M</b> MCERTS Accredited
<b>NFD</b> No Fibres Detected	<b>PFD</b> Possible Fibres Detected	<b>»</b> Result previously reported (Incremental reports only)	<b>EC</b> 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 <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part 2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of ORO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

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**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

### Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	3376168	3376169	3376182	3376170	3376178	3376188	3376166	3376177	3376181	3376186
AGS Ref.	A3	A4	A11	C7	C11	D1	D5	E8	F11	G2
Depth	EW007	EW007	EW007	EW007	EW007	EW007	EW007	EW007	EW007	EW007
Type	2.00 - 3.00	2.00 - 3.00	1.80 - 2.30	4.00 - 6.00	1.50 - 2.00	3.00 - 4.00	1.80 - 2.40	1.50 - 2.50	4.00 - 5.00	3.50 - 4.50
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011
Anions by Kone (w)	09-May-2011	06-May-2011	06-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	06-May-2011	06-May-2011
Cyanide Comp/Free/Total/Thiocyanate	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	04-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011
Dissolved Metals by ICP-MS	04-May-2011	05-May-2011	05-May-2011	04-May-2011	05-May-2011	04-May-2011	04-May-2011	05-May-2011	05-May-2011	05-May-2011
EPH CWG (Aliphatic) Aqueous GC (W)	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	05-May-2011	06-May-2011	05-May-2011	09-May-2011	06-May-2011
EPH CWG (Aromatic) Aqueous GC (W)	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	05-May-2011	06-May-2011	05-May-2011	09-May-2011	06-May-2011
GRO by GC-FID (W)	07-May-2011	07-May-2011	07-May-2011	09-May-2011	07-May-2011	07-May-2011	07-May-2011	07-May-2011	07-May-2011	09-May-2011
Hexavalent Chromium (w)	10-May-2011	05-May-2011	05-May-2011	10-May-2011	06-May-2011	10-May-2011	10-May-2011	06-May-2011	05-May-2011	05-May-2011
Mercury Dissolved	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011
PAH Spec MS - Aqueous (W)	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011
pH Value	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011
Phenols by HPLC (W)	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011
Sulphide	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011
TPH CWG (W)	07-May-2011	07-May-2011	07-May-2011	09-May-2011	07-May-2011	07-May-2011	07-May-2011	07-May-2011	09-May-2011	09-May-2011
VOC MS (W)	09-May-2011	09-May-2011	10-May-2011	09-May-2011		10-May-2011				10-May-2011

Lab Sample No(s) Customer Sample Ref.	3376184	3376183	3376190	3376179	3376175	3376172	3376173	3376171	3376176
AGS Ref.	G3	G4	G5	G8	H12	J10	K1	K5	M3
Depth	EW007	EW007	EW007	EW007	EW007	EW007	EW007	EW007	EW007
Type	4.00 - 5.00	2.80 - 3.00	5.00 - 6.00	1.40 - 2.40	3.00 - 4.00	1.00 - 2.00	3.00 - 4.00	1.00 - 2.00	3.00 - 5.00
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	05-May-2011	06-May-2011	06-May-2011	06-May-2011
Anions by Kone (w)	09-May-2011	09-May-2011	09-May-2011	06-May-2011	09-May-2011	06-May-2011	09-May-2011	06-May-2011	06-May-2011
Cyanide Comp/Free/Total/Thiocyanate	03-May-2011	03-May-2011	04-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011
Dissolved Metals by ICP-MS	04-May-2011	04-May-2011	04-May-2011	05-May-2011	05-May-2011	05-May-2011	04-May-2011	05-May-2011	05-May-2011
EPH CWG (Aliphatic) Aqueous GC (W)	05-May-2011	09-May-2011	05-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011
EPH CWG (Aromatic) Aqueous GC (W)	05-May-2011	09-May-2011	05-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011
GRO by GC-FID (W)	07-May-2011	07-May-2011	07-May-2011	07-May-2011	07-May-2011	07-May-2011	09-May-2011	09-May-2011	08-May-2011
Hexavalent Chromium (w)	10-May-2011	10-May-2011	10-May-2011	05-May-2011	06-May-2011	05-May-2011	10-May-2011	05-May-2011	05-May-2011
Mercury Dissolved	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011	03-May-2011
PAH Spec MS - Aqueous (W)	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	06-May-2011	10-May-2011	06-May-2011
pH Value	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011	09-May-2011
Phenols by HPLC (W)	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	04-May-2011	04-May-2011	05-May-2011	05-May-2011
Sulphide	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011	05-May-2011
TPH CWG (W)	07-May-2011	09-May-2011	07-May-2011	07-May-2011	07-May-2011	07-May-2011	09-May-2011	09-May-2011	08-May-2011
VOC MS (W)		10-May-2011	10-May-2011				09-May-2011	06-May-2011	



**SDG:** 110428-57  
**Job:** D\_MOUCHEL\_DLG-1  
**Client Reference:** Limerick Gasworks

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Dave Watts

**Order Number:** 4500073063  
**Report Number:** 128147  
**Superseded Report:**

# 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. Results relate only to the items tested

13. **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. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. 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).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.

19. 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.

20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

21. 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.

22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

23. 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.

24. 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.

SOLID MATRICES EXTRACTION SUMMARY				
ANALYSIS	D/C OR VET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DOM	SOX THERM	GRAMMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOX THERM	GRAMMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DOM	SOX THERM	ATROSCAN
ELEMENTAL SULPHUR	D&C	DOM	SOX THERM	HPLC
PHENOLS BY GCMS	VET	DOM	SOX THERM	GCMS
HERBICIDES	D&C	HEXANE ACETONE	SOX THERM	GCMS
PESTICIDES	D&C	HEXANE ACETONE	SOX THERM	GCMS
EPH (DRO)	D&C	HEXANE ACETONE	END OVER END	GC FID
EPH (MINOL)	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	GCMS
POLYAROMATIC HYDROCARBONS (MS)	VET	HEXANE ACETONE	MICROWAVE TM28.	GCMS
C8-C10(C8-C10) EZ FLASH	VET	HEXANE ACETONE	SHAKER	GCEZ
POLYAROMATIC HYDROCARBONS RAPID GC	VET	HEXANE ACETONE	SHAKER	GCEZ
SEM VOLATILE ORGANIC COMPOUNDS	VET	DOM ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY			
ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
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)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DOM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DOM	SOLID PHASE EXTRACTION	HPLC
PEST CO/POPP	DOM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DOM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DOM	SOLID PHASE EXTRACTION	GCMS
TPH by INFRARED (R)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL BY R	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

**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).

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

**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 HSG 264.

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.



Mouchel  
Ground Engineering  
Rowan House  
Lloyd Drive  
Cheshire  
CH65 9HQ

**Attention:** Neil Balderstone

## CERTIFICATE OF ANALYSIS

**Date:** 04 November 2011  
**Customer:** D\_MOUCHEL\_ELE  
**Sample Delivery Group (SDG):** 111028-8  
**Your Reference:**  
**Location:** Limerick Gasworks  
**Report No:** 158057

We received 4 samples on Wednesday October 26, 2011 and 4 of these samples were scheduled for analysis which was completed on Friday November 04, 2011. 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.

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Consent of copyright owner required for any other use.

Approved By:



**Sonia McWhan**

Operations Manager





**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

### Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
4592745	A11		4.50 - 5.50	25/10/2011
4592747	D1		3.50 - 4.50	25/10/2011
4592744	F11		4.00 - 4.90	25/10/2011
4592746	G2		3.00 - 4.00	25/10/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

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Consent of copyright owner required for any other use.*





**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

Results Legend		Customer Sample R	A11	D1	F11	G2		
#	ISO17025 accredited.	<b>Depth (m)</b> <b>Sample Type</b> <b>Date Sampled</b> <b>Date Received</b> <b>SDG Ref</b> <b>Lab Sample No.(s)</b> <b>AGS Reference</b>	4.50 - 5.50	3.50 - 4.50	4.00 - 4.90	3.00 - 4.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011		
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011	26/10/2011		
diss.filt	Dissolved / filtered sample.		111028-8	111028-8	111028-8	111028-8		
tot.unfilt	Total / unfiltered sample.		4592745	4592747	4592744	4592746		
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	4.71	9.97	32.6	40.6	#	#
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	6.06	12.8	41.9	52.2	#	#
Sulphide	<0.01 mg/l	TM101	0.285	18.1	0.168	0.035	#	#
Arsenic (diss.filt)	<0.12 µg/l	TM152	4.95	14.4	11.9	23.5	#	#
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	<0.1	<0.1	#	#
Chromium (diss.filt)	<0.22 µg/l	TM152	5.9	14.7	11.1	18.3	#	#
Copper (diss.filt)	<0.85 µg/l	TM152	<0.85	1.5	<0.85	2.58	#	#
Lead (diss.filt)	<0.02 µg/l	TM152	0.518	0.092	0.136	<0.02	#	#
Nickel (diss.filt)	<0.15 µg/l	TM152	6.25	5.65	5.26	8.73	#	#
Selenium (diss.filt)	<0.39 µg/l	TM152	0.853	2.64	3.08	10.6	#	#
Zinc (diss.filt)	<0.41 µg/l	TM152	1.26	<0.41	<0.41	0.572	#	#
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	#	#
Sulphate	<2 mg/l	TM184	68.3	397	52.6	643	#	#
Cyanide, Total	<0.05 mg/l	TM227	<0.05	0.841	<0.05	1.09	#	#
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03	<0.03	<0.03	#	#
pH	<1 pH Units	TM256	7.06	7.31	7.13	7.56	#	#
Resorcinol	<0.01 mg/l	TM259	<0.01	<0.01	<0.01	<0.01	#	#
Catechol	<0.01 mg/l	TM259	<0.01	<0.01	<0.01	<0.01	#	#
Phenol	<0.002 mg/l	TM259	<0.002	0.01	0.03	1.65	#	#
Cresols	<0.006 mg/l	TM259	<0.006	0.06	0.38	4.56	#	#
Xylenols	<0.008 mg/l	TM259	<0.008	0.77	1.82	10.6	#	#
1-Naphthol	<0.01 mg/l	TM259	<0.01	0.07	<0.01	<0.01	#	#
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	<0.003	<0.003	<0.003	#	#
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006	1.56	1.61	4.86	#	#
Phenols, Total Detected 5 speciated	<0.025 mg/l	TM259	<0.025	2.4	3.84	21.7	#	#

SDG: 111028-8  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158057  
 Superseded Report:

PAH Spec MS - Aqueous (W)

Results Legend		Customer Sample R	A11	D1	F11	G2		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	4.50 - 5.50 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592745	3.50 - 4.50 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592747	4.00 - 4.90 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592744	3.00 - 4.00 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592746		
M	mCERTS accredited.							
S	Deviating sample.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units						Method	
Naphthalene (aq)	<0.1 µg/l	TM178	17.6 #	18.7 #	0.559 #	6.56 #		
Acenaphthene (aq)	<0.015 µg/l	TM178	11.4 #	54.9 #	0.0599 #	20.9 #		
Acenaphthylene (aq)	<0.011 µg/l	TM178	19.7 #	54.3 #	0.233 #	18.3 #		
Fluoranthene (aq)	<0.017 µg/l	TM178	84.4 #	110 #	0.669 #	3.78 #		
Anthracene (aq)	<0.015 µg/l	TM178	12.6 #	33.1 #	0.115 #	2.23 #		
Phenanthrene (aq)	<0.022 µg/l	TM178	37.3 #	90.9 #	0.209 #	16 #		
Fluorene (aq)	<0.014 µg/l	TM178	15.7 #	71.7 #	0.0696 #	11.9 #		
Chrysene (aq)	<0.013 µg/l	TM178	53.7 #	15.6 #	0.422 #	0.423 #		
Pyrene (aq)	<0.015 µg/l	TM178	69.5 #	67.4 #	0.583 #	2.23 #		
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	53.3 #	19.6 #	0.45 #	0.549 #		
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	81.1 #	12.9 #	0.964 #	0.218 #		
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	76.6 #	9.45 #	0.592 #	0.253 #		
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	95.1 #	13.4 #	0.819 #	0.274 #		
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	18.4 #	1.95 #	0.205 #	0.037 #		
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	59.1 #	6.98 #	0.636 #	0.0943 #		
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	53.6 #	6.81 #	0.773 #	0.097 #		
PAH, Total Detected USEPA 16 (aq)	<0.247 µg/l	TM178	759 #	587 #	7.36 #	83.8 #		

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SDG: 111028-8  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158057  
 Superseded Report:

## TPH CWG (W)

Results Legend		Customer Sample R	A11	D1	F11	G2		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	4.50 - 5.50 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592745	3.50 - 4.50 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592747	4.00 - 4.90 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592744	3.00 - 4.00 Water(GW/SW) 25/10/2011 26/10/2011 111028-8 4592746		
M	mCERTS accredited.							
S	Deviating sample.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units						Method	
GRO Surrogate % recovery**	%	TM245	95	91	94	90		
GRO >C5-C12	<50 µg/l	TM245	540	6560	994	17700		
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3	<3		
Benzene	<7 µg/l	TM245	9	654	186	4250		
Toluene	<4 µg/l	TM245	51	439	165	3200		
Ethylbenzene	<5 µg/l	TM245	7	185	18	387		
m,p-Xylene	<8 µg/l	TM245	44	547	91	1560		
o-Xylene	<3 µg/l	TM245	24	293	54	870		
Sum of detected Xylenes	<11 µg/l	TM245	68	840	145	2430		
Sum of detected BTEX	<28 µg/l	TM245	135	2120	514	10300		
Aliphatics >C5-C6	<10 µg/l	TM245	<10	12	<10	29		
Aliphatics >C6-C8	<10 µg/l	TM245	<10	103	11	236		
Aliphatics >C8-C10	<10 µg/l	TM245	54	479	74	990		
Aliphatics >C10-C12	<10 µg/l	TM245	184	2120	192	3340		
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	70	<10	<10		
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	96	<10	<10		
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	61	<10	<10		
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	227	<10	<10		
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	654	186	4250		
Aromatics >EC7-EC8	<10 µg/l	TM245	51	439	165	3200		
Aromatics >EC8-EC10	<10 µg/l	TM245	111	1340	213	3480		
Aromatics >EC10-EC12	<10 µg/l	TM245	122	1410	128	2230		
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	32	1630	475	3440		
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	21	719	21	262		
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	55	282	12	32		
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	108	2630	508	3730		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	648	9420	1500	21500		

SDG: 111028-8  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 470000740  
 Report Number: 158057  
 Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R	A11	D1	G2			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	4.50 - 5.50	3.50 - 4.50	3.00 - 4.00			
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011			
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011			
diss.filt	Dissolved / filtered sample.		111028-8	111028-8	111028-8			
tot.unfilt	Total / unfiltered sample.		4592745	4592747	4592746			
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
Dibromofluoromethane**	%	TM208	103	103	105			
Toluene-d8**	%	TM208	99.5	99.9	100			
4-Bromofluorobenzene**	%	TM208	98.2	95.2	95			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1			
Chloromethane	<1 µg/l	TM208	<1	<1	<1			
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1			
Bromomethane	<1 µg/l	TM208	<1	<1	<1			
Chloroethane	<1 µg/l	TM208	<1	<1	<1			
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
Carbon disulphide	<1 µg/l	TM208	<1	1.34	3.2			
Dichloromethane	<3 µg/l	TM208	<3	<3	<3			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1			
Chloroform	<1 µg/l	TM208	<1	<1	<1			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1			
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1			
Benzene	<1 µg/l	TM208	8.82	710	3500			
Trichloroethene	<1 µg/l	TM208	<1	<1	<1			
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Dibromomethane	<1 µg/l	TM208	<1	<1	<1			
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
Toluene	<1 µg/l	TM208	53.1	478	2690			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
1,1,2-Trichloroethane	<1 µg/l	TM208	1.92	<1	<1			
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Tetrachloroethene	<1 µg/l	TM208	<1	<1	<1			
Dibromochloromethane	<1 µg/l	TM208	<1	<1	<1			

SDG: 111028-8  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158057  
 Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R	A11	D1	G2		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	4.50 - 5.50	3.50 - 4.50	3.00 - 4.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
§	Deviating sample.		25/10/2011	25/10/2011	25/10/2011		
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011		
diss.fit	Dissolved / filtered sample.		111028-8	111028-8	111028-8		
tot.unfilt	Total / unfiltered sample.		4592745	4592747	4592746		
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
Component	LOD/Units		Method				
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Chlorobenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Ethylbenzene	<1 µg/l	TM208	6.01	192	417		
			§ #	§ #	§ #		
m,p-Xylene	<1 µg/l	TM208	41.5	582	1290		
			§ #	§ #	#		
o-Xylene	<1 µg/l	TM208	21.8	322	735		
			§ #	§ #	#		
Styrene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Bromoform	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Isopropylbenzene	<1 µg/l	TM208	<1	18.8	27.4		
			§ #	§ #	§ #		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1		
			§	§	§		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Bromobenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Propylbenzene	<1 µg/l	TM208	<1	23.9	31.3		
			§ #	§ #	§ #		
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
1,3,5-Trimethylbenzene	<1 µg/l	TM208	5.77	65.3	94.3		
			§ #	§ #	§ #		
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
1,2,4-Trimethylbenzene	<1 µg/l	TM208	16.7	213	375		
			§ #	§ #	§ #		
sec-Butylbenzene	<1 µg/l	TM208	<1	1.82	<1		
			§ #	§ #	§ #		
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
n-Butylbenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
			§	§	§		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	<1		
			§	§	§		
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
Naphthalene	<1 µg/l	TM208	121	3680	3440		
			§ #	#	#		
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
			§ #	§ #	§ #		
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
			§	§	§		

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SDG: 111028-8  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 470000740  
 Report Number: 158057  
 Superseded Report:

## Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4598959	F11	4.00 - 4.90	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4598972	A11	4.50 - 5.50	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,1,1,2-Tetrachloroethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,1,1-Trichloroethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,1,2,2-Tetrachloroethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,1,2-Trichloroethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,1-Dichloroethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,1-Dichloroethene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,1-Dichloropropene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2,3-Trichlorobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2,3-Trichloropropane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2,4-Trichlorobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2,4-Trimethylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2-Dibromo-3-chloropropane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2-Dibromoethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2-Dichlorobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2-Dichloroethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,2-Dichloropropane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,3,5-Trichlorobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,3,5-Trimethylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,3-Dichlorobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,3-Dichloropropane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	1,4-Dichlorobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	2,2-Dichloropropane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	2-Chlorotoluene	Volatile container not received

CERTIFICATE OF ANALYSIS

**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	4-Bromofluorobenzene**	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	4-Chlorotoluene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	4-iso-Propyltoluene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Benzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Bromobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Bromochloromethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Bromodichloromethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Bromoform	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Bromomethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Carbon disulphide	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Carbontetrachloride	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Chlorobenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Chloroethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Chloroform	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Chloromethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	cis-1,2-Dichloroethene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	cis-1,3-Dichloropropene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Dibromochloromethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Dibromofluoromethane**	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Dibromomethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Dichlorodifluoromethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Dichloromethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Ethylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Hexachlorobutadiene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Isopropylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	m,p-Xylene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Naphthalene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	n-Butylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	o-Xylene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Propylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	sec-Butylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Styrene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	tert-Amyl methyl ether (TAME)	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	tert-Butylbenzene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Tetrachloroethene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Toluene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Toluene-d8**	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	trans-1,2-Dichloroethene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	trans-1,3-Dichloropropene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Trichloroethene	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Trichlorofluoromethane	Volatile container not received
4598978	A11	4.50 - 5.50	LIQUID	VOC MS (W)	Vinyl chloride	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received

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## CERTIFICATE OF ANALYSIS

**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4598985	G2	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,1,2-Tetrachloroethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,1-Trichloroethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,2,2-Tetrachloroethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,2-Trichloroethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,1-Dichloroethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,1-Dichloroethene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,1-Dichloropropene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,3-Trichlorobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,3-Trichloropropane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,4-Trichlorobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,4-Trimethylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dibromo-3-chloropropane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dibromoethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dichlorobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dichloroethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dichloropropane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,3,5-Trichlorobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,3,5-Trimethylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,3-Dichlorobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,3-Dichloropropane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	1,4-Dichlorobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	2,2-Dichloropropane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	2-Chlorotoluene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	4-Bromofluorobenzene**	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	4-Chlorotoluene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	4-iso-Propyltoluene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Benzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Bromobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Bromochloromethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Bromodichloromethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Bromoform	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Bromomethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Carbon disulphide	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Carbontetrachloride	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Chlorobenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Chloroethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Chloroform	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Chloromethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	cis-1,2-Dichloroethene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	cis-1,3-Dichloropropene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Dibromochloromethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Dibromofluoromethane**	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Dibromomethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Dichlorodifluoromethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Dichloromethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Ethylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Hexachlorobutadiene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Isopropylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	m,p-Xylene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Naphthalene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	n-Butylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	o-Xylene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Propylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	sec-Butylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Styrene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	tert-Amyl methyl ether (TAME)	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	tert-Butylbenzene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Tetrachloroethene	Volatile container not received

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CERTIFICATE OF ANALYSIS

**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Toluene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Toluene-d8**	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	trans-1,2-Dichloroethene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	trans-1,3-Dichloropropene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Trichloroethene	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Trichlorofluoromethane	Volatile container not received
4598992	G2	3.00 - 4.00	LIQUID	VOC MS (W)	Vinyl chloride	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4599008	D1	3.50 - 4.50	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,1,1,2-Tetrachloroethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,1,1-Trichloroethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,1,2,2-Tetrachloroethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,1,2-Trichloroethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,1-Dichloroethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,1-Dichloroethene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,1-Dichloropropene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2,3-Trichlorobenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2,3-Trichloropropane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2,4-Trichlorobenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2,4-Trimethylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2-Dibromo-3-chloropropane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2-Dibromoethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2-Dichlorobenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2-Dichloroethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,2-Dichloropropane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,3,5-Trichlorobenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,3,5-Trimethylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,3-Dichlorobenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,3-Dichloropropane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	1,4-Dichlorobenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	2,2-Dichloropropane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	2-Chlorotoluene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	4-Bromofluorobenzene**	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	4-Chlorotoluene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	4-iso-Propyltoluene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Benzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Bromobenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Bromochloromethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Bromodichloromethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Bromoform	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Bromomethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Carbon disulphide	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Carbontetrachloride	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Chlorobenzene	Volatile container not received

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## CERTIFICATE OF ANALYSIS

**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Chloroethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Chloroform	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Chloromethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	cis-1,2-Dichloroethene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	cis-1,3-Dichloropropene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Dibromochloromethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Dibromofluoromethane**	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Dibromomethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Dichlorodifluoromethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Dichloromethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Ethylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Hexachlorobutadiene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Isopropylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	m,p-Xylene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Naphthalene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	n-Butylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	o-Xylene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Propylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	sec-Butylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Styrene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	tert-Amyl methyl ether (TAME)	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	tert-Butylbenzene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Tetrachloroethene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Toluene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Toluene-d8**	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	trans-1,2-Dichloroethene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	trans-1,3-Dichloropropene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Trichloroethene	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Trichlorofluoromethane	Volatile container not received
4599013	D1	3.50 - 4.50	LIQUID	VOC MS (W)	Vinyl chloride	Volatile container not received

Note : Test results may be compromised

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**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

### Table of Results - Appendix

**REPORT KEY**

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10<sup>-7</sup>

<b>NDP</b>	No Determination Possible	<b>#</b>	ISO 17025 Accredited	*	Subcontracted Test	<b>M</b>	MCERTS Accredited
<b>NFD</b>	No Fibres Detected	<b>PFD</b>	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	<b>EC</b>	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 <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part 2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of DRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

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**SDG:** 111028-8  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158057  
**Superseded Report:**

### Test Completion Dates

Lab Sample No(s)	4592745	4592747	4592744	4592746
Customer Sample Ref.	A11	D1	F11	G2
AGS Ref.				
Depth	4.50 - 5.50	3.50 - 4.50	4.00 - 4.90	3.00 - 4.00
Type	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Anions by Kone (w)	02-Nov-2011	02-Nov-2011	02-Nov-2011	02-Nov-2011
Cyanide Comp/Free/Total/Thiocyanate	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Dissolved Metals by ICP-MS	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
EPH CWG (Aliphatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
EPH CWG (Aromatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
GRO by GC-FID (W)	30-Oct-2011	30-Oct-2011	30-Oct-2011	30-Oct-2011
Hexavalent Chromium (w)	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
Mercury Dissolved	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
PAH Spec MS - Aqueous (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
pH Value	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Phenols by HPLC (W)	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
Sulphide	02-Nov-2011	01-Nov-2011	02-Nov-2011	01-Nov-2011
TPH CWG (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
VOC MS (W)	29-Oct-2011	31-Oct-2011		31-Oct-2011

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SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

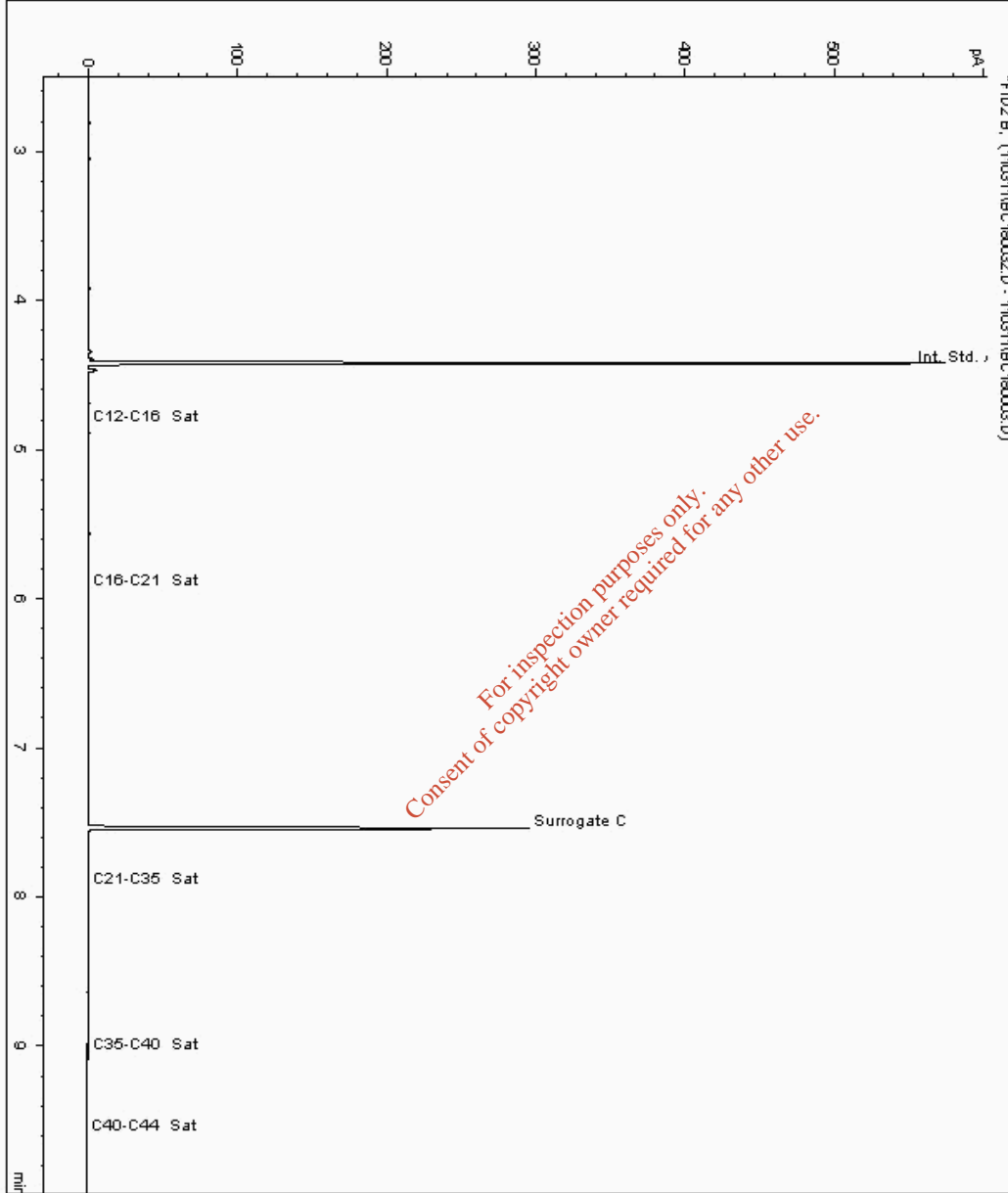
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602169  
Sample ID : G2

Depth : 3.00 - 4.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552851-4602169  
Date Acquired : 04/11/2011 03:41:09 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008







SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

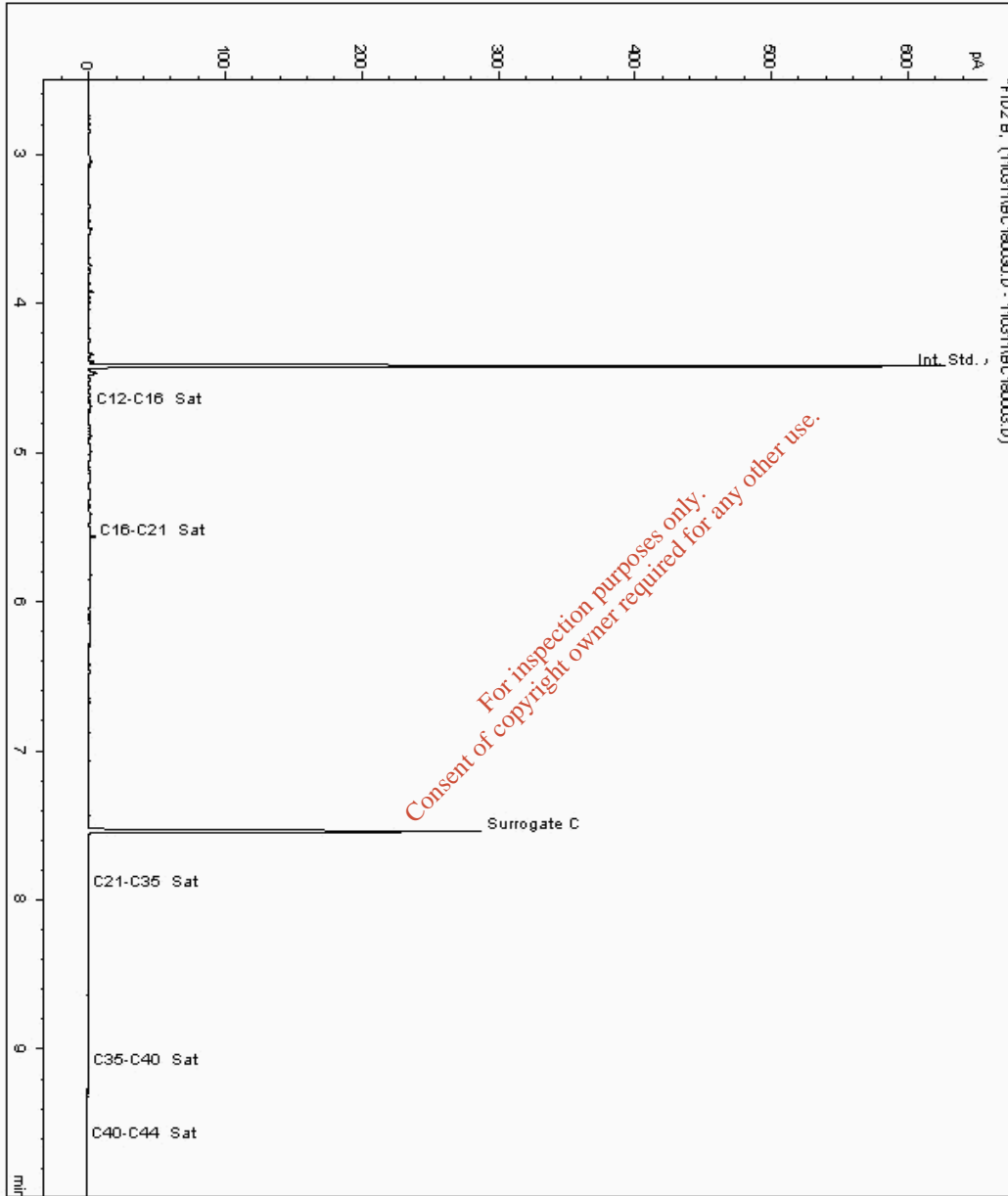
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602232  
Sample ID : D1

Depth : 3.50 - 4.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552882-4602232  
Date Acquired : 04/11/2011 03:08:42 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

# Chromatogram

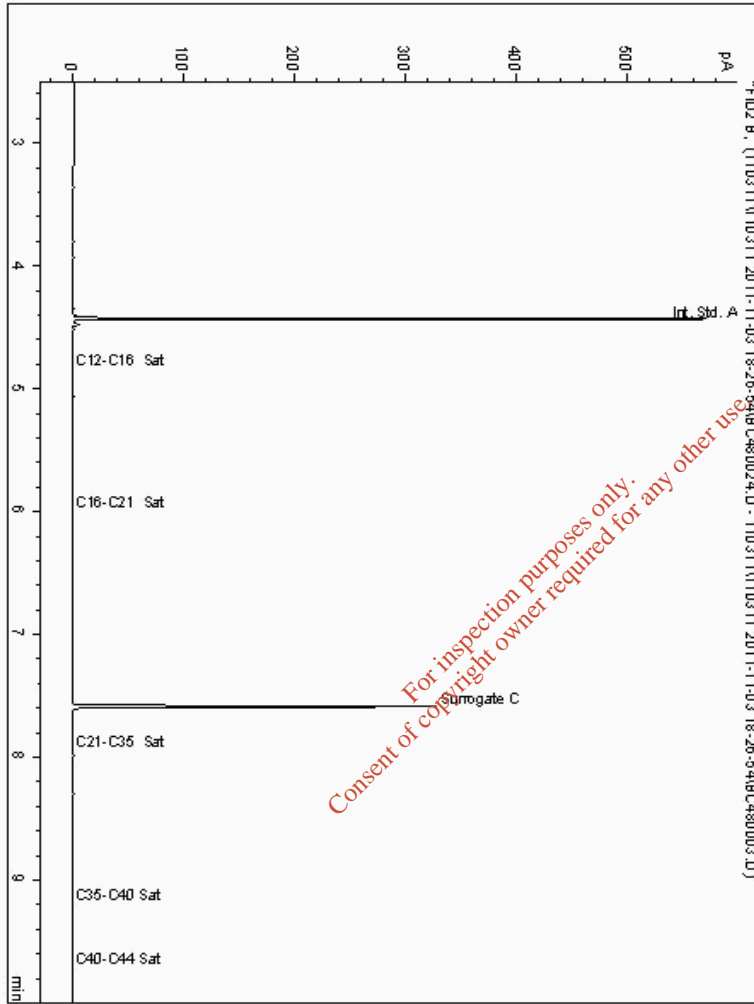
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602298  
Sample ID : F11

Depth : 4.00 - 4.90

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552793-4602298  
Date Acquired : 04/11/11 01:14:56  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

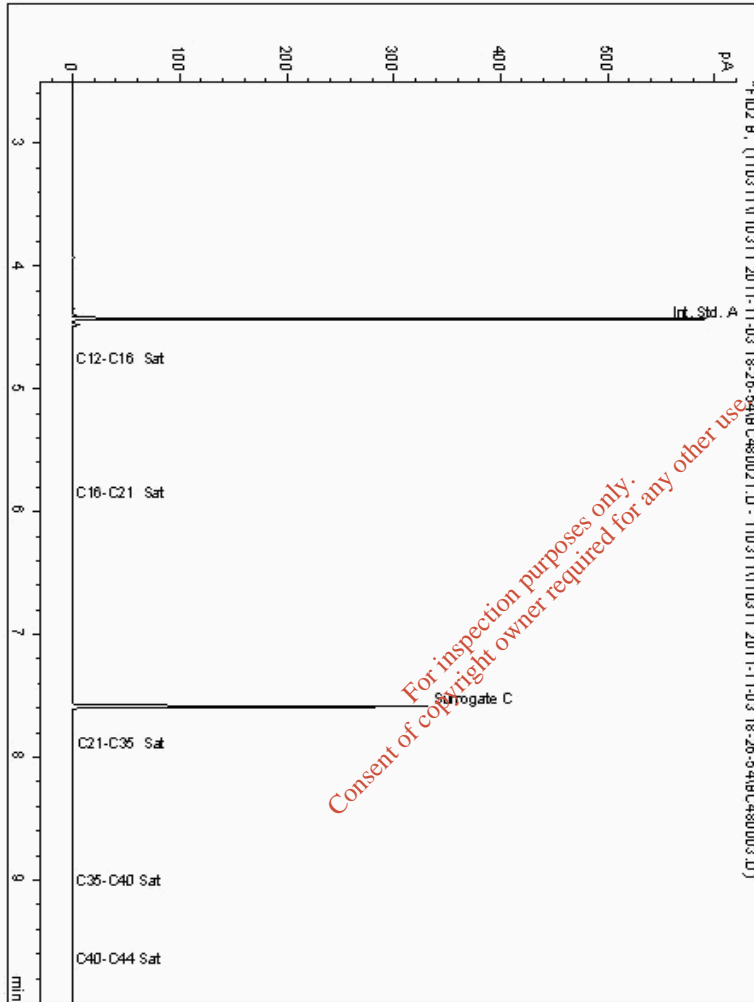
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602365  
Sample ID : A11

Depth : 4.50 - 5.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552829-4602365  
Date Acquired : 04/11/11 00:26:47  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

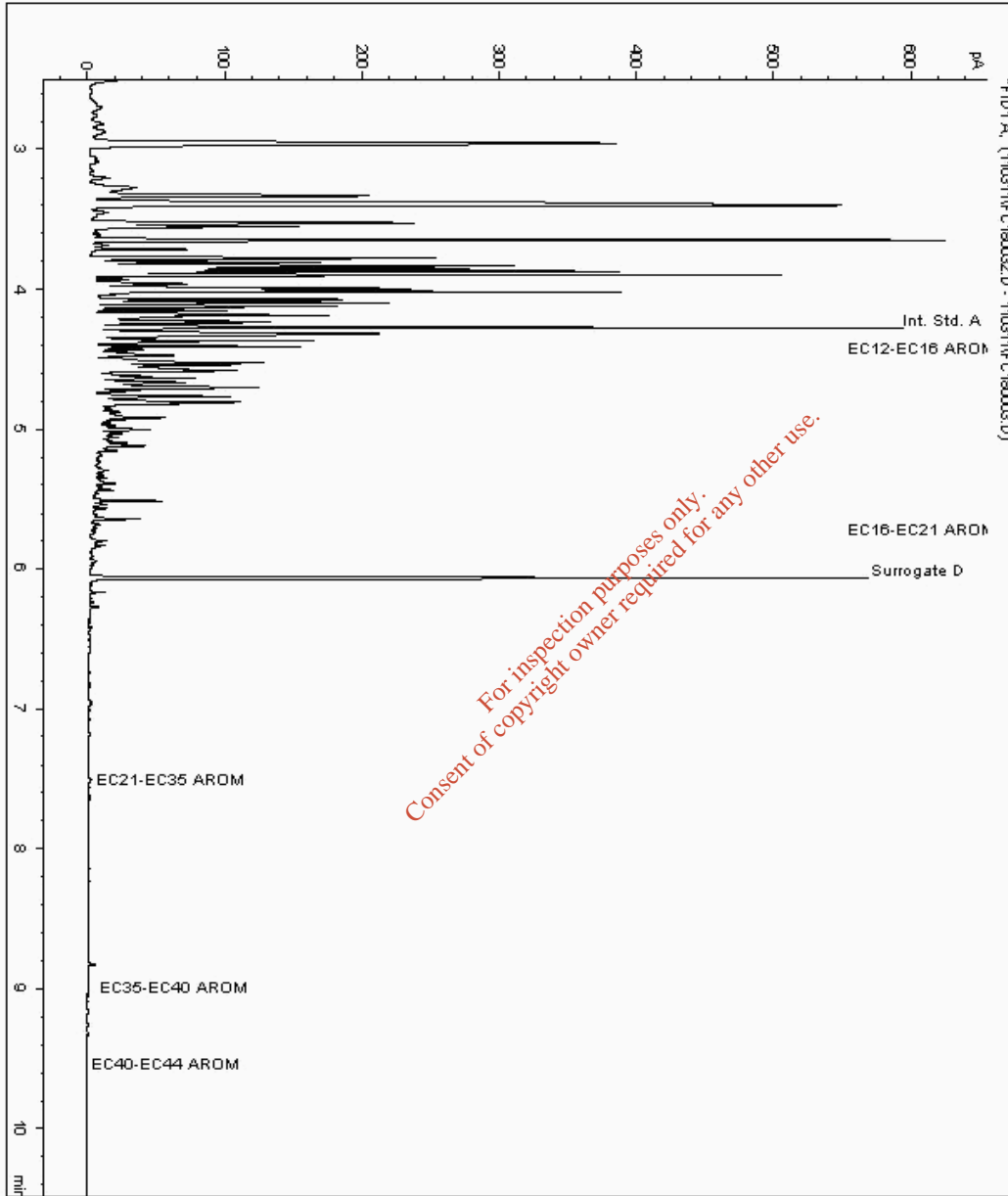
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602169  
Sample ID : G2

Depth : 3.00 - 4.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552852-4602169  
Date Acquired : 04/11/2011 03:41:09 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

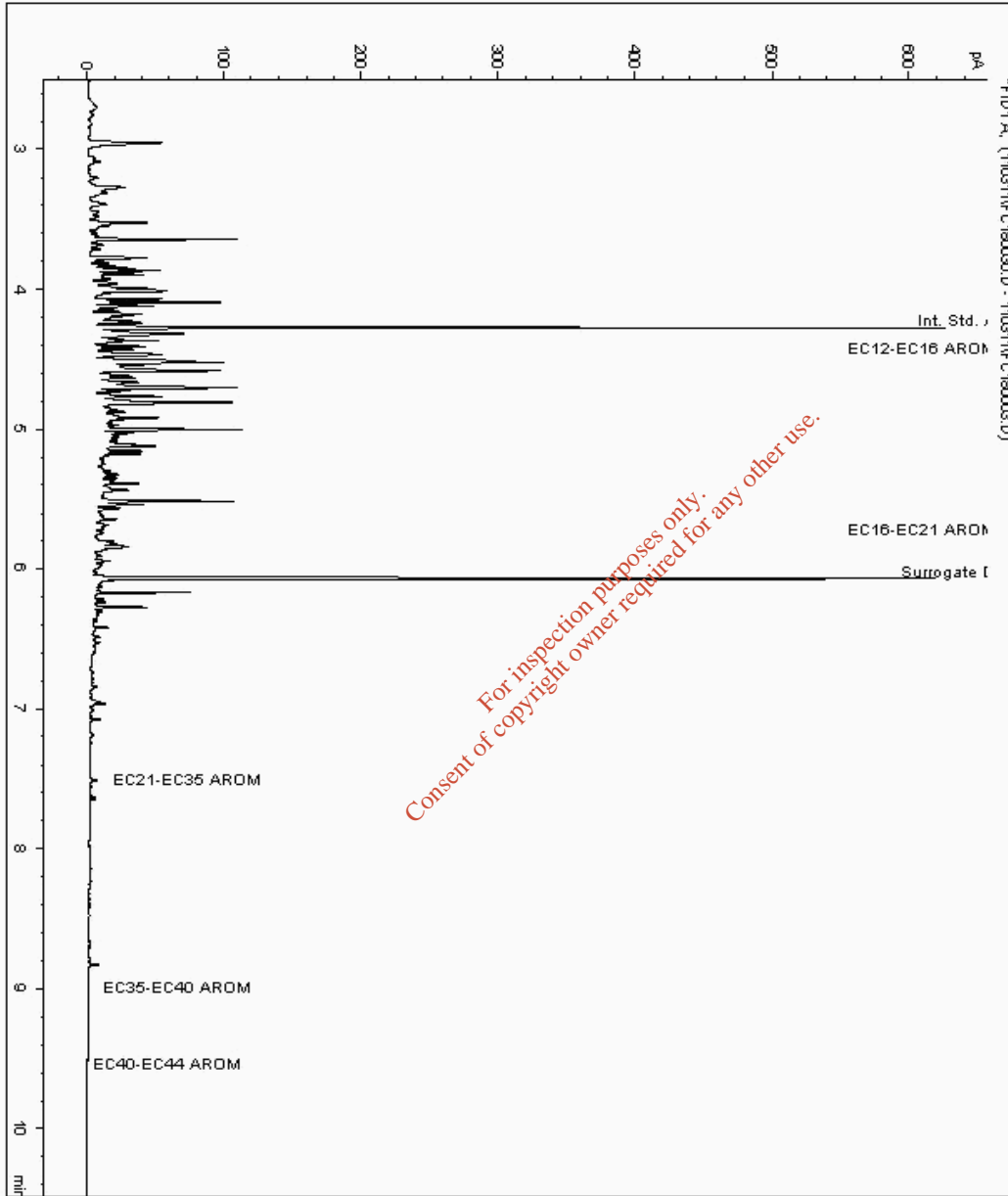
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602232  
Sample ID : D1

Depth : 3.50 - 4.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552883-4602232  
Date Acquired : 04/11/2011 03:08:42 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





CERTIFICATE OF ANALYSIS

SDG: 111028-8
Job: D\_MOUCHEL\_ELE-1
Client Reference:

Location: Limerick Gasworks
Customer: Mouchel
Attention: Neil Balderstone

Order Number: 4700000740
Report Number: 158057
Superseded Report:

Chromatogram

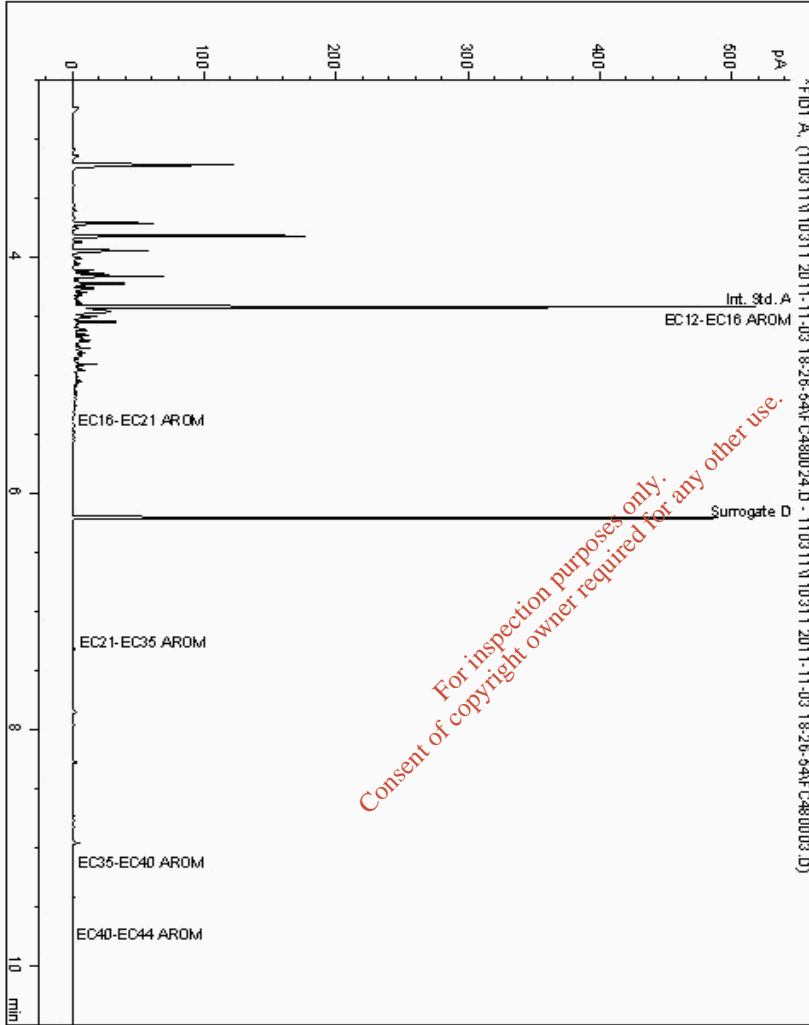
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602298
Sample ID : F11

Depth : 4.00 - 4.90

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552794-4602298
Date Acquired : 04/11/11 01:14:56
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008





CERTIFICATE OF ANALYSIS

SDG: 111028-8
Job: D\_MOUCHEL\_ELE-1
Client Reference:

Location: Limerick Gasworks
Customer: Mouchel
Attention: Neil Balderstone

Order Number: 4700000740
Report Number: 158057
Superseded Report:

Chromatogram

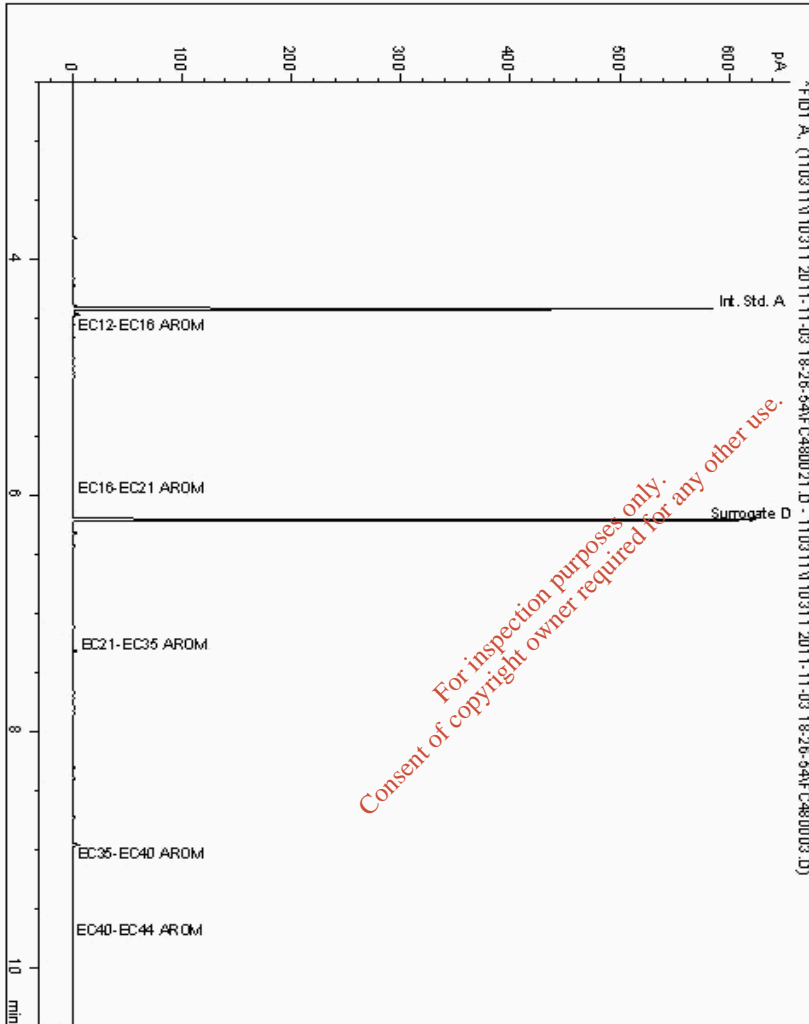
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602365
Sample ID : A11

Depth : 4.50 - 5.50

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552830-4602365
Date Acquired : 04/11/11 00:26:47
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008





SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

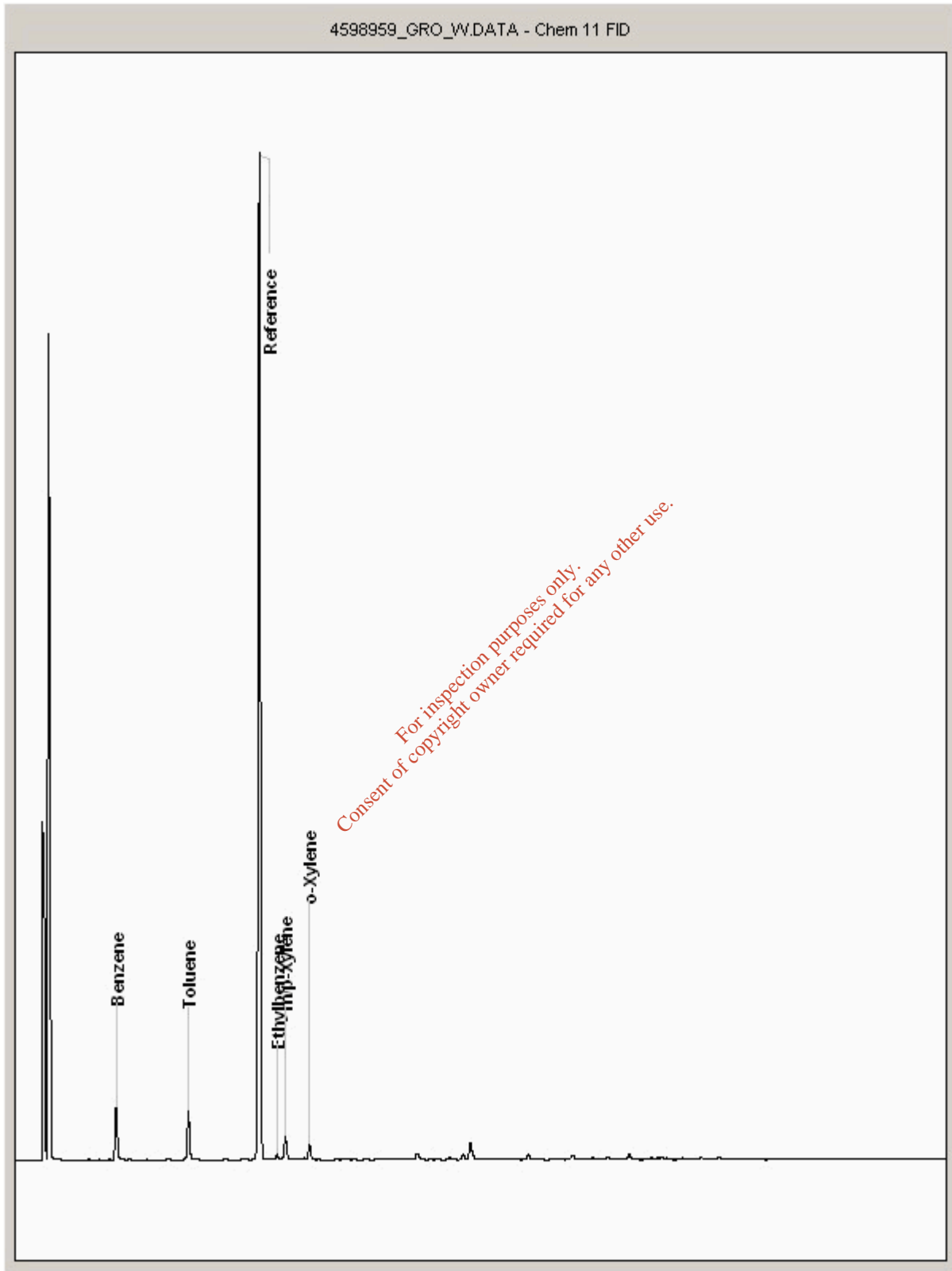
Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4598959  
Sample ID : F11

Depth : 4.00 - 4.90







SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

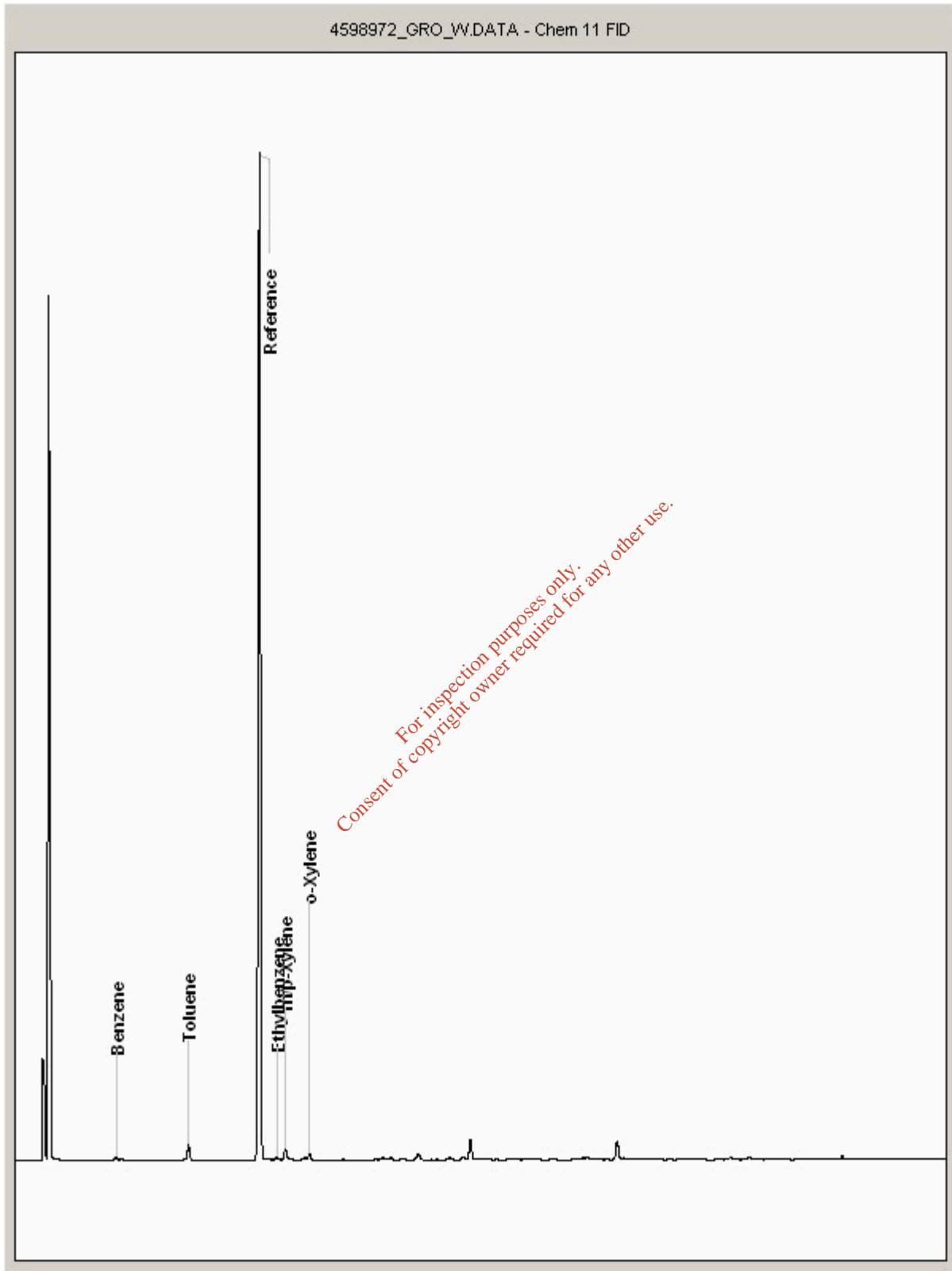
Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4598972  
Sample ID : A11

Depth : 4.50 - 5.50





SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

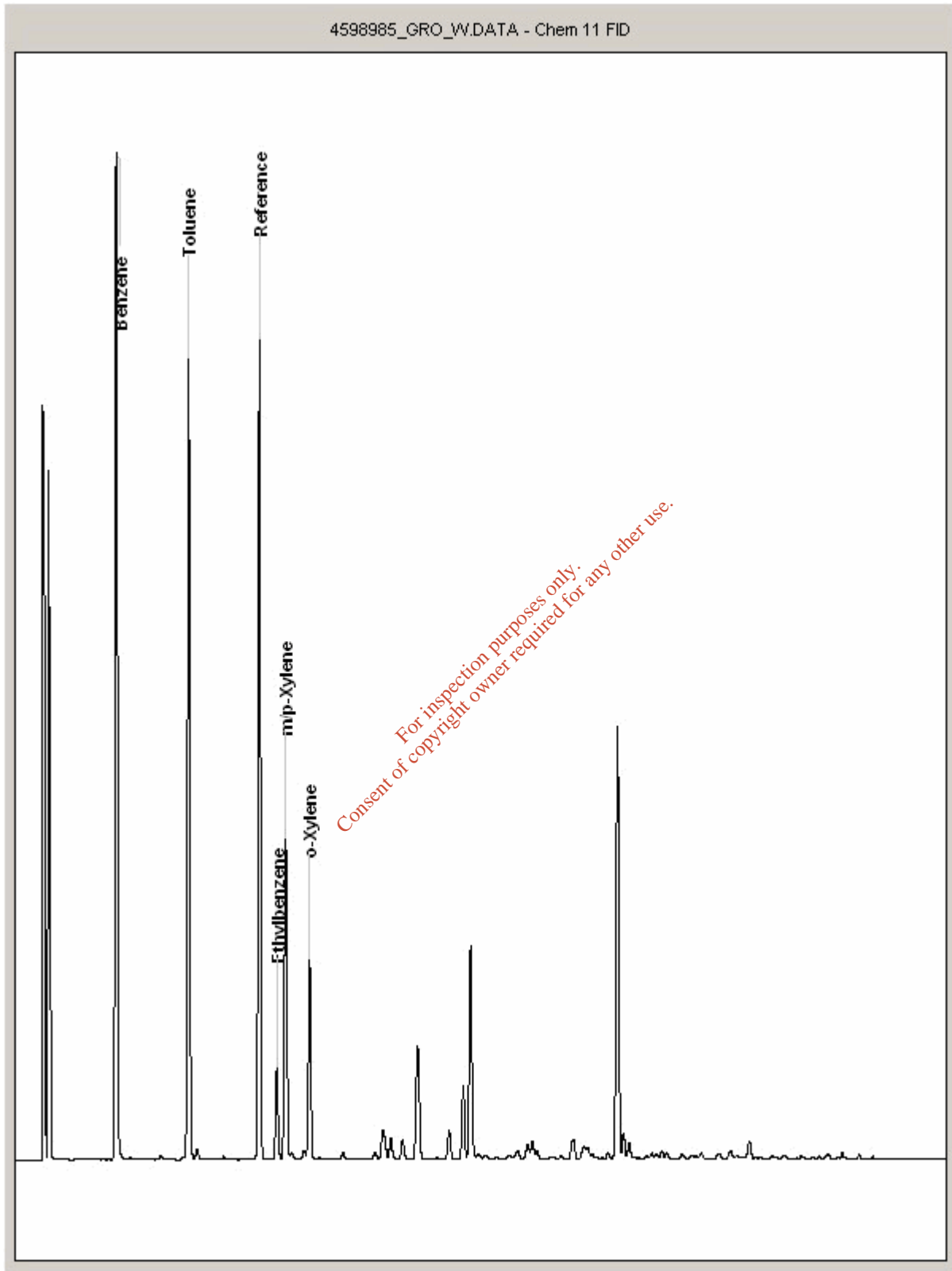
Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4598985  
Sample ID : G2

Depth : 3.00 - 4.00





SDG: 111028-8  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

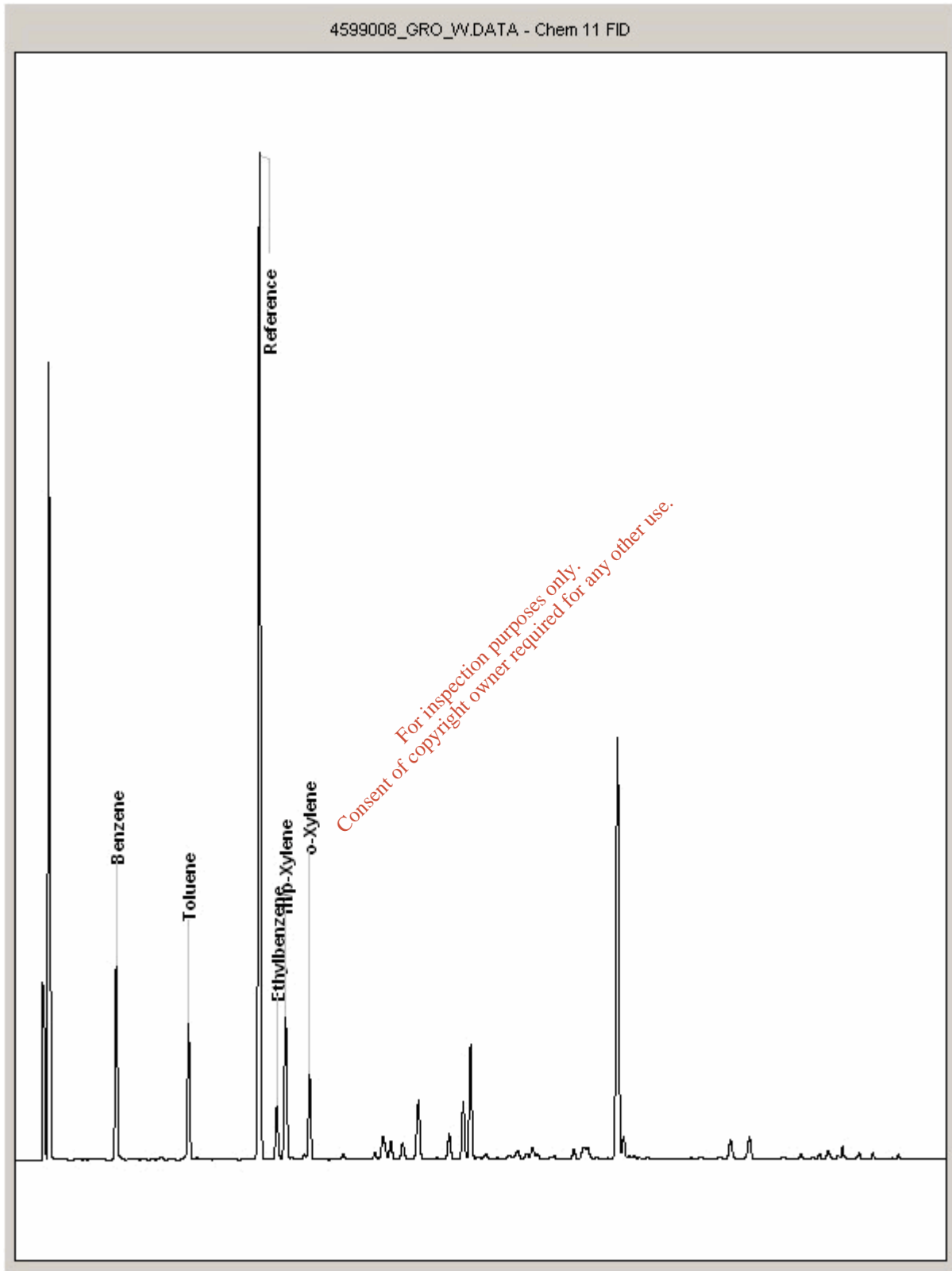
Order Number: 4700000740  
Report Number: 158057  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4599008  
Sample ID : D1

Depth : 3.50 - 4.50



SDG: 111028-8  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158057  
 Superseded Report:

## 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 asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). If asbestos is present either as asbestos containing material or loose fibres no further analysis will be undertaken. The quantity of asbestos present is not determined unless specifically requested.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery 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. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. 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).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

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.

SOLID MATRICES EXTRACTION SUMMARY				
ANALYSIS	DC OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENTEXTRACTABLE MATTER	D&C	DCM	SOXITHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXITHERM	GRAVIMETRIC
ELEMENTAL SULPHUR	D&C	DCM	SOXITHERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOXITHERM	GCMS
HERBICIDES	D&C	HEXANE/ACETONE	SOXITHERM	GCMS
PESTICIDES	D&C	HEXANE/ACETONE	SOXITHERM	GCMS
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 CWGBY GC	D&C	HEXANE/ACETONE	END OVER END	GC-FID
PCBTOT/PCB CON	D&C	HEXANE/ACETONE	END OVER END	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TM218.	GCMS
C8-C40 (C6-C40) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GC-EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE/ACETONE	SHAKER	GC-EZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DOM/ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY			
ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
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)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DCM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST CO/OPP	DCM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GCMS
TRH by INFRARED (R)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by R	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

**Identification of Asbestos in Bulk Materials & Soils**

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

**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 HSG 264.

The identification of asbestos containing materials and soils 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.

Mouchel  
Ground Engineering  
Rowan House  
Lloyd Drive  
Cheshire  
CH65 9HQ

**Attention:** Neil Balderstone

## CERTIFICATE OF ANALYSIS

**Date:** 04 November 2011  
**Customer:** D\_MOUCHEL\_ELE  
**Sample Delivery Group (SDG):** 111028-13  
**Your Reference:**  
**Location:** Limerick Gasworks  
**Report No:** 158059

We received 4 samples on Wednesday October 26, 2011 and 4 of these samples were scheduled for analysis which was completed on Friday November 04, 2011. 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.

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Approved By:



**Sonia McWhan**  
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

**SDG:** 111028-13  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158059  
**Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
4593562	C11		1.00 - 2.00	25/10/2011
4593558	G3		2.50 - 3.50	25/10/2011
4593559	G5		2.00 - 3.00	25/10/2011
4593561	G8		1.50 - 2.00	25/10/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

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SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158059  
 Superseded Report:

LIQUID Results Legend  <span style="background-color: yellow; border: 1px solid black; padding: 2px;">X</span> Test <span style="background-color: red; color: white; border: 1px solid black; padding: 2px;">N</span> No Determination Possible	Lab Sample No(s)	4593558	4593559	4593561	4593562	
	Customer Sample Reference	G3	G5	G8	C11	
	AGS Reference					
	Depth (m)	2.50 - 3.50	2.00 - 3.00	1.50 - 2.00	1.00 - 2.00	
	Container	60g VOC (ALEZ15) 11 glass bottle (D)	60g VOC (ALEZ15) 11 glass bottle (D)	60g VOC (ALEZ15) 11 glass bottle (D)	60g VOC (ALEZ15) 11 glass bottle (D)	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 4	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X	X	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4	X	X	X	X
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 4	X	X	X	X
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 4	X	X	X	X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 4	X	X	X	X
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 4	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 4	X	X	X	X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 4	X	X	X	X
pH Value	All	NDPs: 0 Tests: 4	X	X	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4	X	X	X	X
Sulphide	All	NDPs: 0 Tests: 4	X	X	X	X
TPH CWG (W)	All	NDPs: 0 Tests: 4	X	X	X	X
VOC MS (W)	All	NDPs: 0 Tests: 1		X		

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## CERTIFICATE OF ANALYSIS

SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158059  
 Superseded Report:

Results Legend		Customer Sample R	C11	G3	G5	G8		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.00	2.50 - 3.50	2.00 - 3.00	1.50 - 2.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011		
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011	26/10/2011		
diss.filt	Dissolved / filtered sample.		111028-13	111028-13	111028-13	111028-13		
tot.unfilt	Total / unfiltered sample.		4593562	4593558	4593559	4593561		
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	5.99	12.7	2.29	9.81	#	#
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	7.7	16.3	2.94	12.6	#	#
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01	0.01	<0.01	#	#
Arsenic (diss.filt)	<0.12 µg/l	TM152	7.91	3.37	1.54	10.2	#	#
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	<0.1	<0.1	#	#
Chromium (diss.filt)	<0.22 µg/l	TM152	10.8	11.5	15.4	8.89	#	#
Copper (diss.filt)	<0.85 µg/l	TM152	<0.85	4.36	8.28	0.946	#	#
Lead (diss.filt)	<0.02 µg/l	TM152	0.044	0.094	0.272	0.079	#	#
Nickel (diss.filt)	<0.15 µg/l	TM152	5.11	12.8	15.6	6.85	#	#
Selenium (diss.filt)	<0.39 µg/l	TM152	1.13	5.01	6.01	0.996	#	#
Zinc (diss.filt)	<0.41 µg/l	TM152	0.791	1.87	5.82	0.444	#	#
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	#	#
Sulphate	<2 mg/l	TM184	215	1080	1060	148	#	#
Cyanide, Total	<0.05 mg/l	TM227	0.078	3.74	1.66	0.127	#	#
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03	<0.03	<0.03	#	#
pH	<1 pH Units	TM256	7.65	7.66	7.55	7.56	#	#
Resorcinol	<0.01 mg/l	TM259	<0.01	<0.01	<0.01	<0.01	#	#
Catechol	<0.01 mg/l	TM259	<0.01	<0.01	<0.01	<0.01	#	#
Phenol	<0.002 mg/l	TM259	0.01	0.03	<0.002	<0.002	#	#
Cresols	<0.006 mg/l	TM259	0.16	0.17	<0.006	<0.006	#	#
Xylenols	<0.008 mg/l	TM259	0.57	0.82	<0.008	0.09	#	#
1-Naphthol	<0.01 mg/l	TM259	0.01	<0.01	<0.01	<0.01	#	#
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	<0.003	<0.003	<0.003	#	#
2-Isopropylphenol	<0.006 mg/l	TM259	0.58	0.46	<0.006	<0.006	#	#
Phenols, Total Detected 5 speciated	<0.025 mg/l	TM259	1.32	1.48	<0.025	0.09	#	#





CERTIFICATE OF ANALYSIS

SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158059  
 Superseded Report:

PAH Spec MS - Aqueous (W)

Results Legend		Customer Sample R	C11	G3	G5	G8		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.00	2.50 - 3.50	2.00 - 3.00	1.50 - 2.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011		
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011	26/10/2011		
diss.filt	Dissolved / filtered sample.		111028-13	111028-13	111028-13	111028-13		
tot.unfilt	Total / unfiltered sample.		4593562	4593558	4593559	4593561		
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
Naphthalene (aq)	<0.1 µg/l	TM178	1.69 #	0.688 #	<5 #	0.314 #		
Acenaphthene (aq)	<0.015 µg/l	TM178	1.14 #	0.564 #	1.31 #	0.0331 #		
Acenaphthylene (aq)	<0.011 µg/l	TM178	2.34 #	0.694 #	25 #	0.276 #		
Fluoranthene (aq)	<0.017 µg/l	TM178	13.1 #	4.08 #	59.8 #	0.735 #		
Anthracene (aq)	<0.015 µg/l	TM178	1.37 #	0.381 #	4.86 #	0.187 #		
Phenanthrene (aq)	<0.022 µg/l	TM178	3.85 #	1.11 #	8.98 #	0.594 #		
Fluorene (aq)	<0.014 µg/l	TM178	0.982 #	0.177 #	3.03 #	0.154 #		
Chrysene (aq)	<0.013 µg/l	TM178	3.71 #	2.77 #	41.9 #	0.357 #		
Pyrene (aq)	<0.015 µg/l	TM178	10.2 #	3.68 #	42.5 #	0.505 #		
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	4.06 #	2.61 #	38.1 #	0.406 #		
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	7.24 #	4.35 #	52.5 #	0.501 #		
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	6.22 #	4.16 #	64 #	0.51 #		
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	7.86 #	4.51 #	71.6 #	0.626 #		
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	1.48 #	0.964 #	14.2 #	0.0962 #		
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	4.98 #	3.58 #	47 #	0.283 #		
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	4.72 #	3.25 #	45.7 #	0.276 #		
PAH, Total Detected USEPA 16 (aq)	<0.247 µg/l	TM178	74.9 #	37.6 #	523 #	5.85 #		

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SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158059  
 Superseded Report:

TPH CWG (W)

Results Legend		Customer Sample R	C11	G3	G5	G8		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.00	2.50 - 3.50	2.00 - 3.00	1.50 - 2.00		
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011		
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011	26/10/2011		
diss.filt	Dissolved / filtered sample.		11028-13	11028-13	11028-13	11028-13		
tot.unfilt	Total / unfiltered sample.		4593562	4593558	4593559	4593561		
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
GRO Surrogate % recovery**	%	TM245	99	97	96	100		
GRO >C5-C12	<50 µg/l	TM245	2690	1230	<50	436		
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3	<3		
Benzene	<7 µg/l	TM245	91	248	<7	<7		
Toluene	<4 µg/l	TM245	56	128	<4	10		
Ethylbenzene	<5 µg/l	TM245	57	32	<5	11		
m,p-Xylene	<8 µg/l	TM245	163	100	<8	80		
o-Xylene	<3 µg/l	TM245	118	88	<3	37		
Sum of detected Xylenes	<11 µg/l	TM245	281	188	<11	117		
Sum of detected BTEX	<28 µg/l	TM245	485	596	<28	138		
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10	<10		
Aliphatics >C6-C8	<10 µg/l	TM245	20	27	<10	10		
Aliphatics >C8-C10	<10 µg/l	TM245	290	101	<10	60		
Aliphatics >C10-C12	<10 µg/l	TM245	1020	263	<10	109		
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	476	<10	<10	<10		
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	273	<10	14	<10		
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	148	<10	<10	<10		
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	897	<10	14	<10		
Aromatics >EC5-EC7	<10 µg/l	TM245	91	248	<10	<10		
Aromatics >EC7-EC8	<10 µg/l	TM245	56	128	<10	10		
Aromatics >EC8-EC10	<10 µg/l	TM245	531	287	<10	169		
Aromatics >EC10-EC12	<10 µg/l	TM245	678	175	<10	73		
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	700	74	<10	<10		
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	449	28	42	<10		
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	405	83	226	16		
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	1550	185	268	16		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	5140	1420	287	452		

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SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158059  
 Superseded Report:

## VOC MS (W)

Results Legend		Customer Sample R	G5					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.00 - 3.00 Water(GW/SW) 25/10/2011 26/10/2011 111028-13 4593559					
M	mCERTS accredited.							
S	Deviating sample.							
aq	Aqueous / settled sample.							
diss.fit	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units			Method				
Dibromofluoromethane**	%	TM208	111					
				\$				
Toluene-d8**	%	TM208	99.7					
				\$				
4-Bromofluorobenzene**	%	TM208	95.1					
				\$				
Dichlorodifluoromethane	<1 µg/l	TM208	<1					
				\$ #				
Chloromethane	<1 µg/l	TM208	<1					
				#				
Vinyl chloride	<1 µg/l	TM208	<1					
				\$ #				
Bromomethane	<1 µg/l	TM208	<1					
				\$ #				
Chloroethane	<1 µg/l	TM208	<1					
				\$ #				
Trichlorofluoromethane	<1 µg/l	TM208	<1					
				\$ #				
1,1-Dichloroethene	<1 µg/l	TM208	<1					
				\$ #				
Carbon disulphide	<1 µg/l	TM208	<1					
				\$ #				
Dichloromethane	<3 µg/l	TM208	<3					
				\$ #				
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1					
				\$ #				
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1					
				\$ #				
1,1-Dichloroethane	<1 µg/l	TM208	<1					
				\$ #				
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1					
				\$ #				
2,2-Dichloropropane	<1 µg/l	TM208	<1					
				\$ #				
Bromochloromethane	<1 µg/l	TM208	<1					
				\$ #				
Chloroform	<1 µg/l	TM208	<1					
				\$ #				
1,1,1-Trichloroethane	<1 µg/l	TM208	<1					
				\$ #				
1,1-Dichloropropene	<1 µg/l	TM208	<1					
				\$ #				
Carbontetrachloride	<1 µg/l	TM208	<1					
				\$ #				
1,2-Dichloroethane	<1 µg/l	TM208	<1					
				\$				
Benzene	<1 µg/l	TM208	<1					
				\$ #				
Trichloroethene	<1 µg/l	TM208	<1					
				\$ #				
1,2-Dichloropropane	<1 µg/l	TM208	<1					
				\$ #				
Dibromomethane	<1 µg/l	TM208	<1					
				\$ #				
Bromodichloromethane	<1 µg/l	TM208	<1					
				\$ #				
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1					
				\$ #				
Toluene	<1 µg/l	TM208	<1					
				\$ #				
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1					
				\$ #				
1,1,2-Trichloroethane	<1 µg/l	TM208	<1					
				\$ #				
1,3-Dichloropropane	<1 µg/l	TM208	<1					
				\$ #				
Tetrachloroethene	<1 µg/l	TM208	<1					
				\$ #				
Dibromochloromethane	<1 µg/l	TM208	<1					
				\$ #				

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SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158059  
 Superseded Report:

## VOC MS (W)

Results Legend		Customer Sample R	G5					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.00 - 3.00 Water(GW/SW) 25/10/2011 26/10/2011 111028-13 4593559					
M	mCERTS accredited.							
S	Deviating sample.							
aq	Aqueous / settled sample.							
diss.fit	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units			Method				
1,2-Dibromoethane	<1 µg/l	TM208	<1	\$ #				
Chlorobenzene	<1 µg/l	TM208	<1	\$ #				
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	\$ #				
Ethylbenzene	<1 µg/l	TM208	<1	\$ #				
m,p-Xylene	<1 µg/l	TM208	<1	\$ #				
o-Xylene	<1 µg/l	TM208	<1	\$ #				
Styrene	<1 µg/l	TM208	<1	\$ #				
Bromoform	<1 µg/l	TM208	<1	\$ #				
Isopropylbenzene	<1 µg/l	TM208	<1	\$ #				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	\$				
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	\$ #				
Bromobenzene	<1 µg/l	TM208	<1	\$ #				
Propylbenzene	<1 µg/l	TM208	<1	\$ #				
2-Chlorotoluene	<1 µg/l	TM208	<1	\$ #				
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	\$ #				
4-Chlorotoluene	<1 µg/l	TM208	<1	\$ #				
tert-Butylbenzene	<1 µg/l	TM208	<1	\$ #				
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	\$ #				
sec-Butylbenzene	<1 µg/l	TM208	<1	\$ #				
4-iso-Propyltoluene	<1 µg/l	TM208	<1	\$ #				
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	\$ #				
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	\$ #				
n-Butylbenzene	<1 µg/l	TM208	<1	\$ #				
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	\$				
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	\$				
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	\$ #				
Hexachlorobutadiene	<1 µg/l	TM208	<1	\$ #				
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	\$ #				
Naphthalene	<1 µg/l	TM208	<1	\$ #				
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	\$ #				
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	\$				

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SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 470000740  
 Report Number: 158059  
 Superseded Report:

## Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4605768	G3	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4605780	G5	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,1,1,2-Tetrachloroethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,1,1-Trichloroethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,1,2,2-Tetrachloroethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,1,2-Trichloroethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,1-Dichloroethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,1-Dichloroethene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,1-Dichloropropene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2,3-Trichlorobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2,3-Trichloropropane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2,4-Trichlorobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2,4-Trimethylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2-Dibromo-3-chloropropane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2-Dibromoethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2-Dichlorobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2-Dichloroethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,2-Dichloropropane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,3,5-Trichlorobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,3,5-Trimethylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,3-Dichlorobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,3-Dichloropropane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	1,4-Dichlorobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	2,2-Dichloropropane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	2-Chlorotoluene	Volatile container not received

CERTIFICATE OF ANALYSIS

**SDG:** 111028-13  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158059  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	4-Bromofluorobenzene**	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	4-Chlorotoluene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	4-iso-Propyltoluene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Benzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Bromobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Bromochloromethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Bromodichloromethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Bromoform	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Bromomethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Carbon disulphide	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Carbontetrachloride	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Chlorobenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Chloroethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Chloroform	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Chloromethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	cis-1,2-Dichloroethene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	cis-1,3-Dichloropropene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Dibromochloromethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Dibromofluoromethane**	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Dibromomethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Dichlorodifluoromethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Dichloromethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Ethylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Hexachlorobutadiene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Isopropylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	m,p-Xylene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Naphthalene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	n-Butylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	o-Xylene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Propylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	sec-Butylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Styrene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	tert-Amyl methyl ether (TAME)	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	tert-Butylbenzene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Tetrachloroethene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Toluene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Toluene-d8**	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	trans-1,2-Dichloroethene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	trans-1,3-Dichloropropene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Trichloroethene	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Trichlorofluoromethane	Volatile container not received
4605785	G5	2.00 - 3.00	LIQUID	VOC MS (W)	Vinyl chloride	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received

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**SDG:** 111028-13  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 470000740  
**Report Number:** 158059  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4605788	G8	1.50 - 2.00	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4605801	C11	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received

Note : Test results may be compromised

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<b>SDG:</b> 111028-13	<b>Location:</b> Limerick Gasworks	<b>Order Number:</b> 4700000740
<b>Job:</b> D_MOUCHEL_ELE-1	<b>Customer:</b> Mouchel	<b>Report Number:</b> 158059
<b>Client Reference:</b>	<b>Attention:</b> Neil Balderstone	<b>Superseded Report:</b>

### Table of Results - Appendix

**REPORT KEY**

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10<sup>-7</sup>

<b>NDP</b>	No Determination Possible	<b>#</b>	ISO 17025 Accredited	*	Subcontracted Test	<b>M</b>	MCERTS Accredited
<b>NFD</b>	No Fibres Detected	<b>PFD</b>	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	<b>EC</b>	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 <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part 2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of DRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

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**SDG:** 111028-13  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158059  
**Superseded Report:**

### Test Completion Dates

Lab Sample No(s)	4593562	4593558	4593559	4593561
Customer Sample Ref.	C11	G3	G5	G8
AGS Ref.				
Depth	1.00 - 2.00	2.50 - 3.50	2.00 - 3.00	1.50 - 2.00
Type	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	02-Nov-2011	02-Nov-2011	02-Nov-2011	02-Nov-2011
Anions by Kone (w)	02-Nov-2011	02-Nov-2011	02-Nov-2011	02-Nov-2011
Cyanide Comp/Free/Total/Thiocyanate	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Dissolved Metals by ICP-MS	02-Nov-2011	02-Nov-2011	02-Nov-2011	02-Nov-2011
EPH CWG (Aliphatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
EPH CWG (Aromatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
GRO by GC-FID (W)	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Hexavalent Chromium (w)	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
Mercury Dissolved	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
PAH Spec MS - Aqueous (W)	04-Nov-2011	04-Nov-2011	03-Nov-2011	04-Nov-2011
pH Value	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Phenols by HPLC (W)	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
Sulphide	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
TPH CWG (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
VOC MS (W)			02-Nov-2011	

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SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

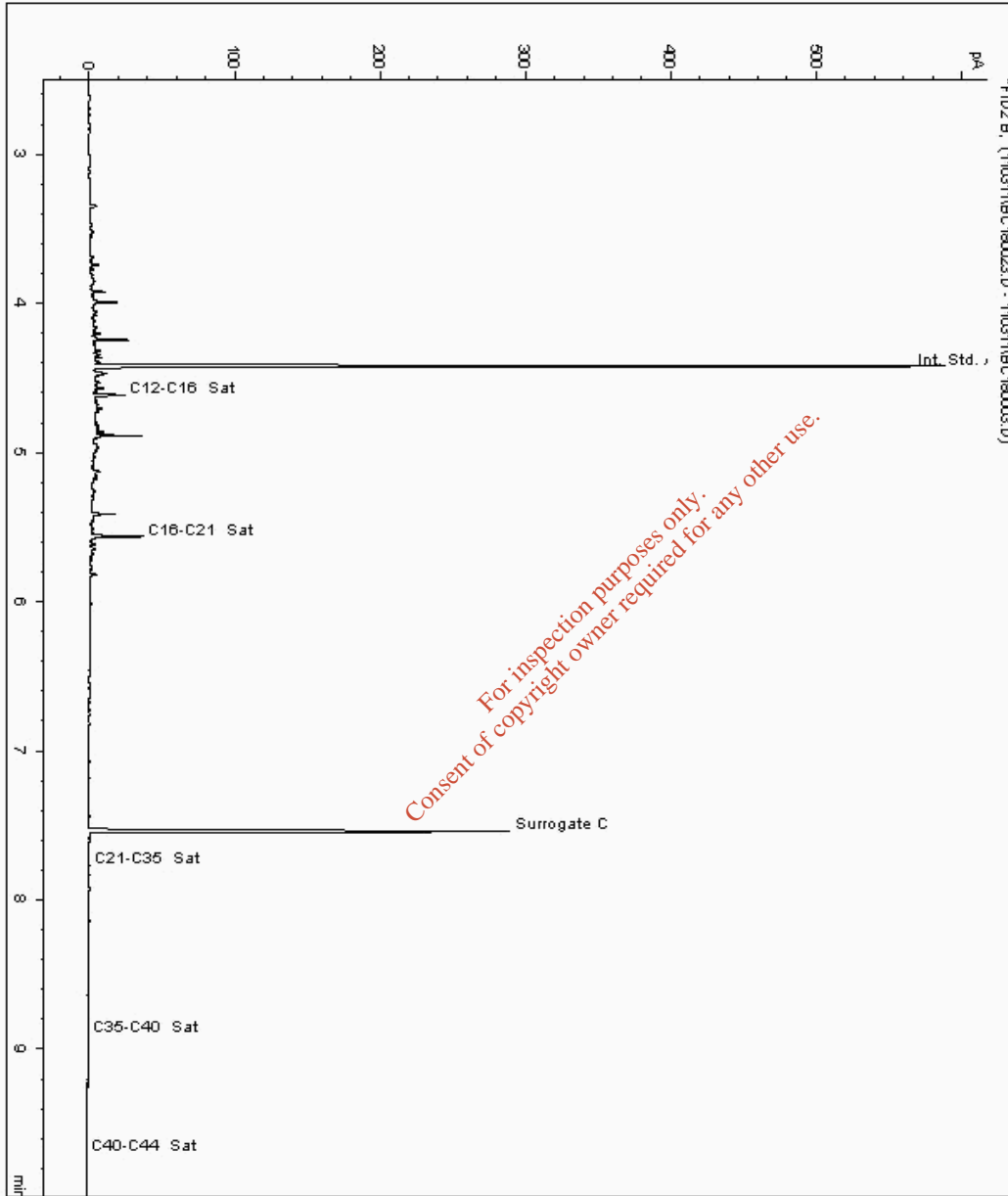
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602109  
Sample ID : C11

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4553072-4602109  
Date Acquired : 04/11/2011 01:00:14 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

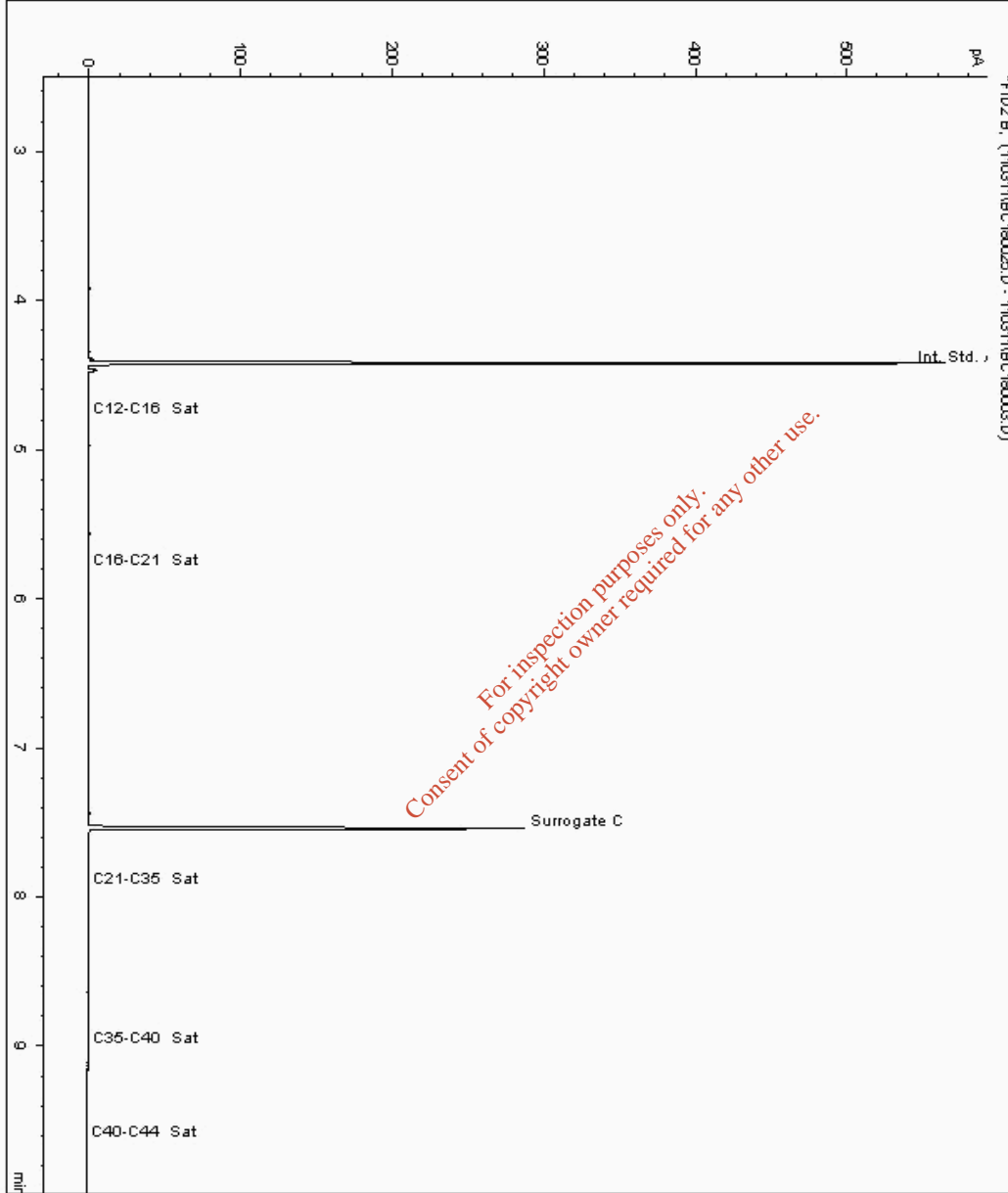
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602145  
Sample ID : G8

Depth : 1.50 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4553057-4602145  
Date Acquired : 04/11/2011 01:32:42 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

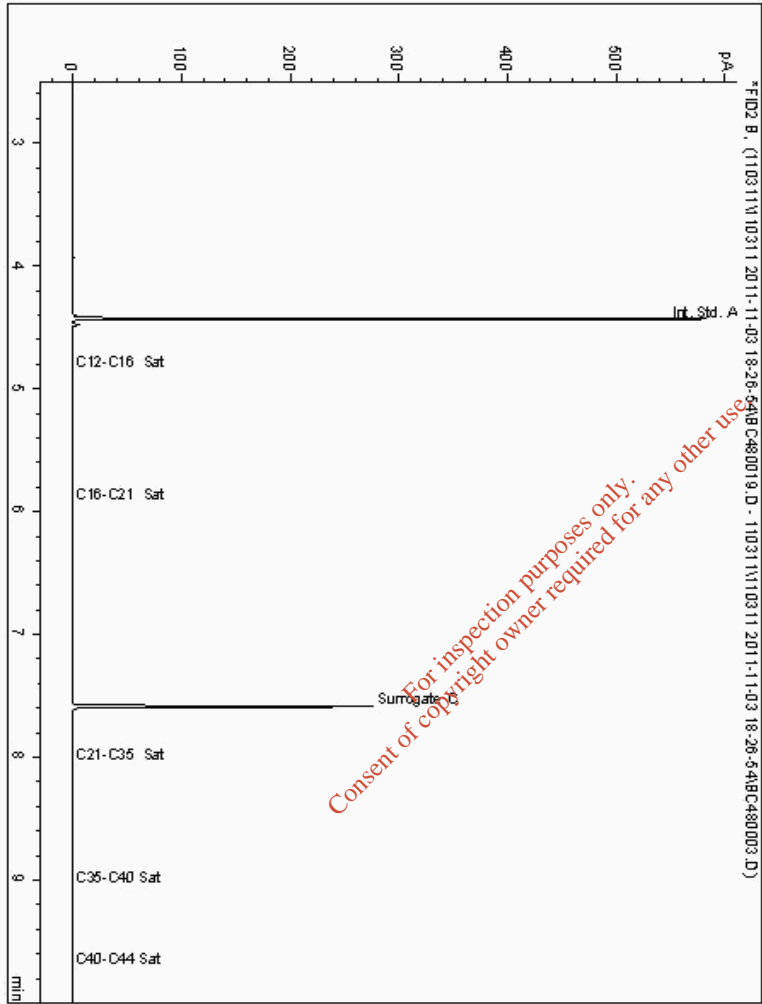
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602215  
Sample ID : G3

Depth : 2.50 - 3.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4553023-4602215  
Date Acquired : 03/11/11 23:57:52  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

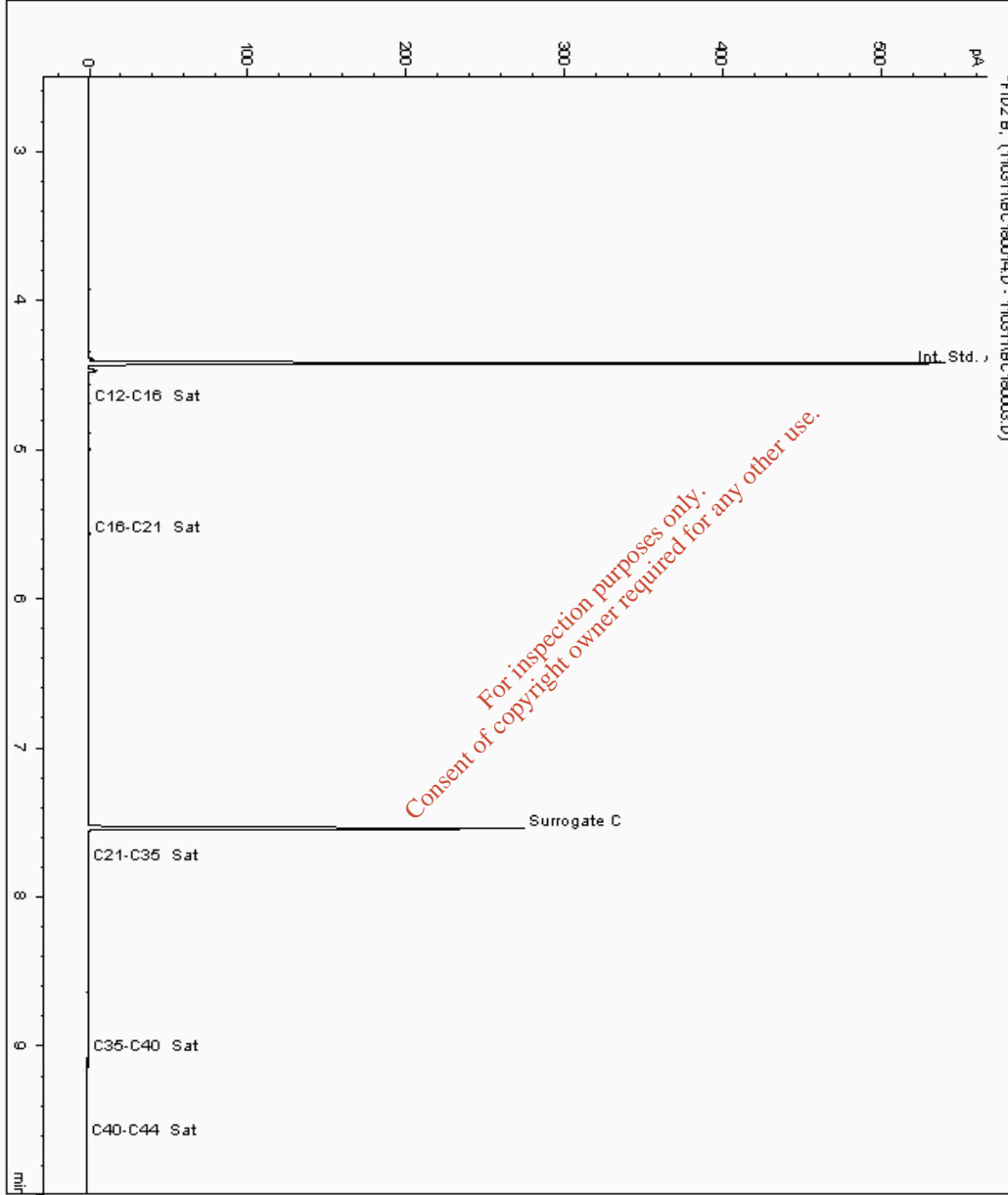
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4602432  
Sample ID : G5

Depth : 2.00 - 3.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4553041-4602432  
Date Acquired : 03/11/2011 22:19:45 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

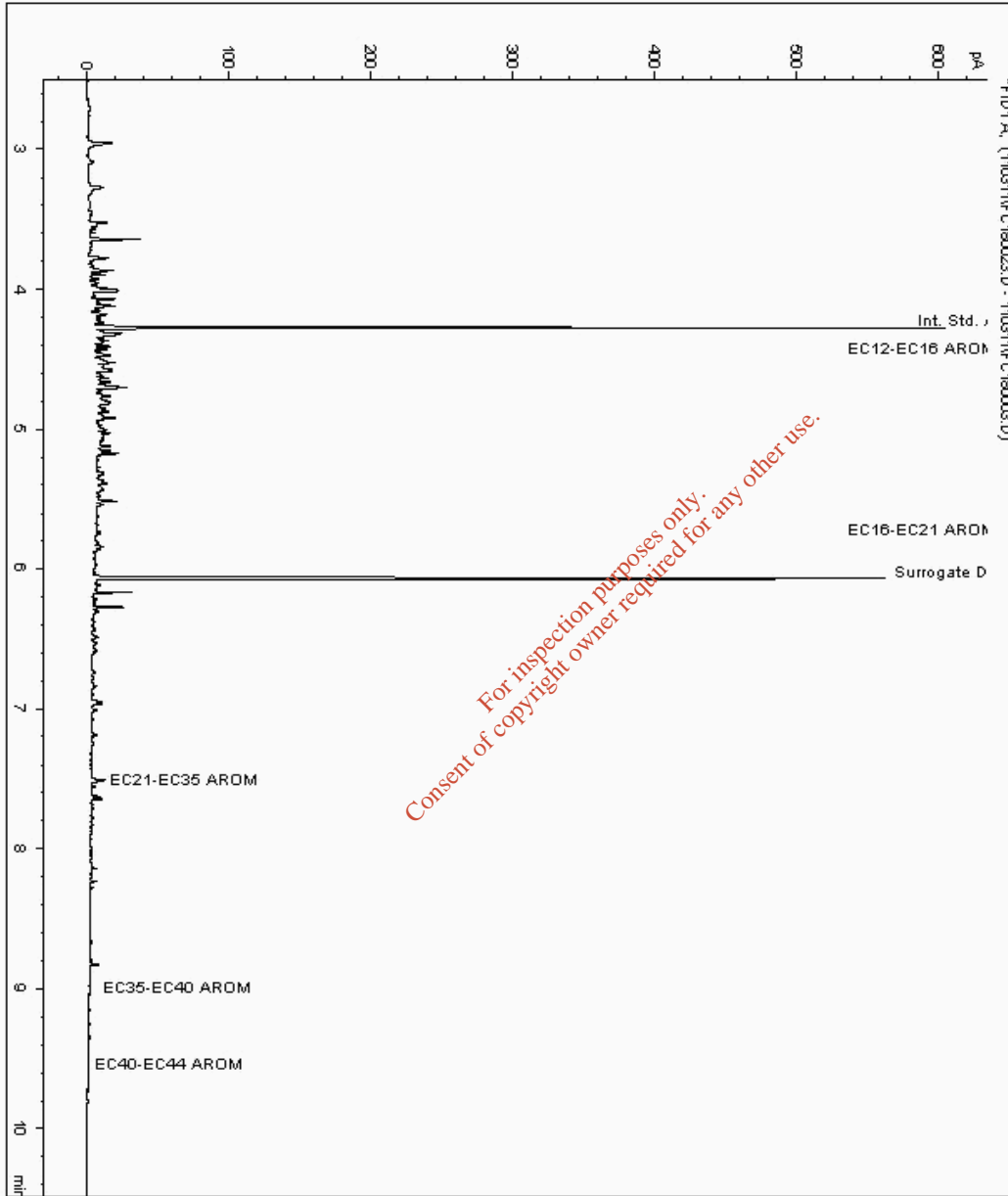
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602109  
Sample ID : C11

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4553073-4602109  
Date Acquired : 04/11/2011 01:00:14 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008



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SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

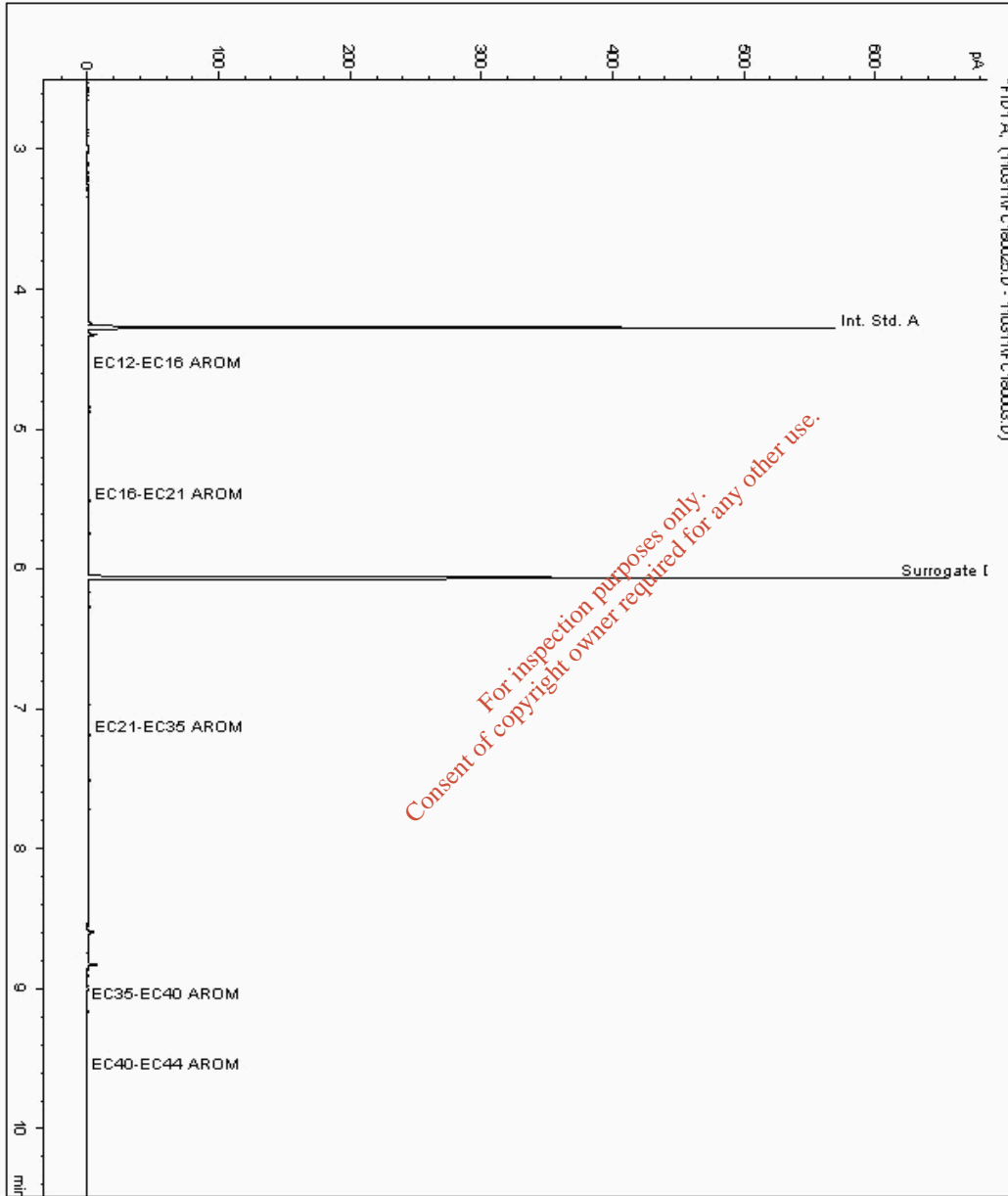
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602145  
Sample ID : G8

Depth : 1.50 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4553058-4602145  
Date Acquired : 04/11/2011 01:32:42 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

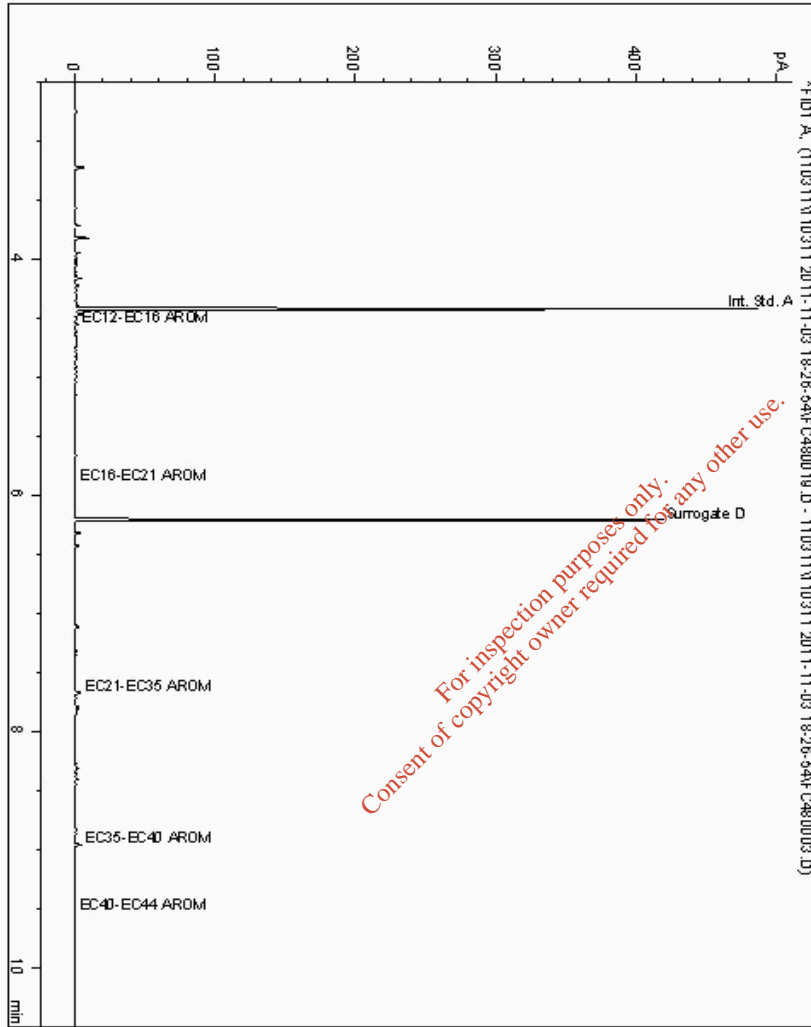
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602215  
Sample ID : G3

Depth : 2.50 - 3.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4553024-4602215  
Date Acquired : 03/11/11 23:57:52  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008







SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

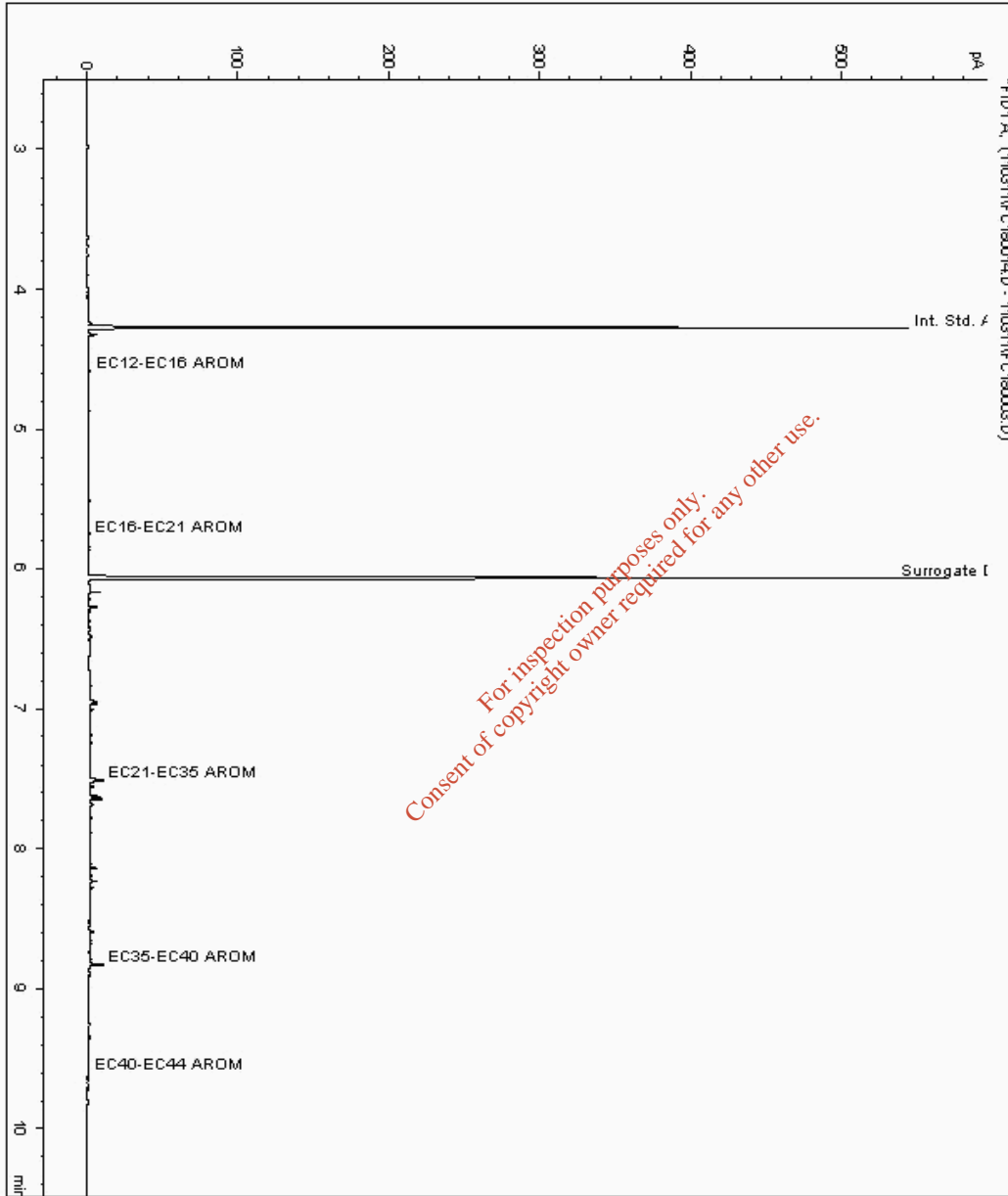
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4602432  
Sample ID : G5

Depth : 2.00 - 3.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4553042-4602432  
Date Acquired : 03/11/2011 22:19:45 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

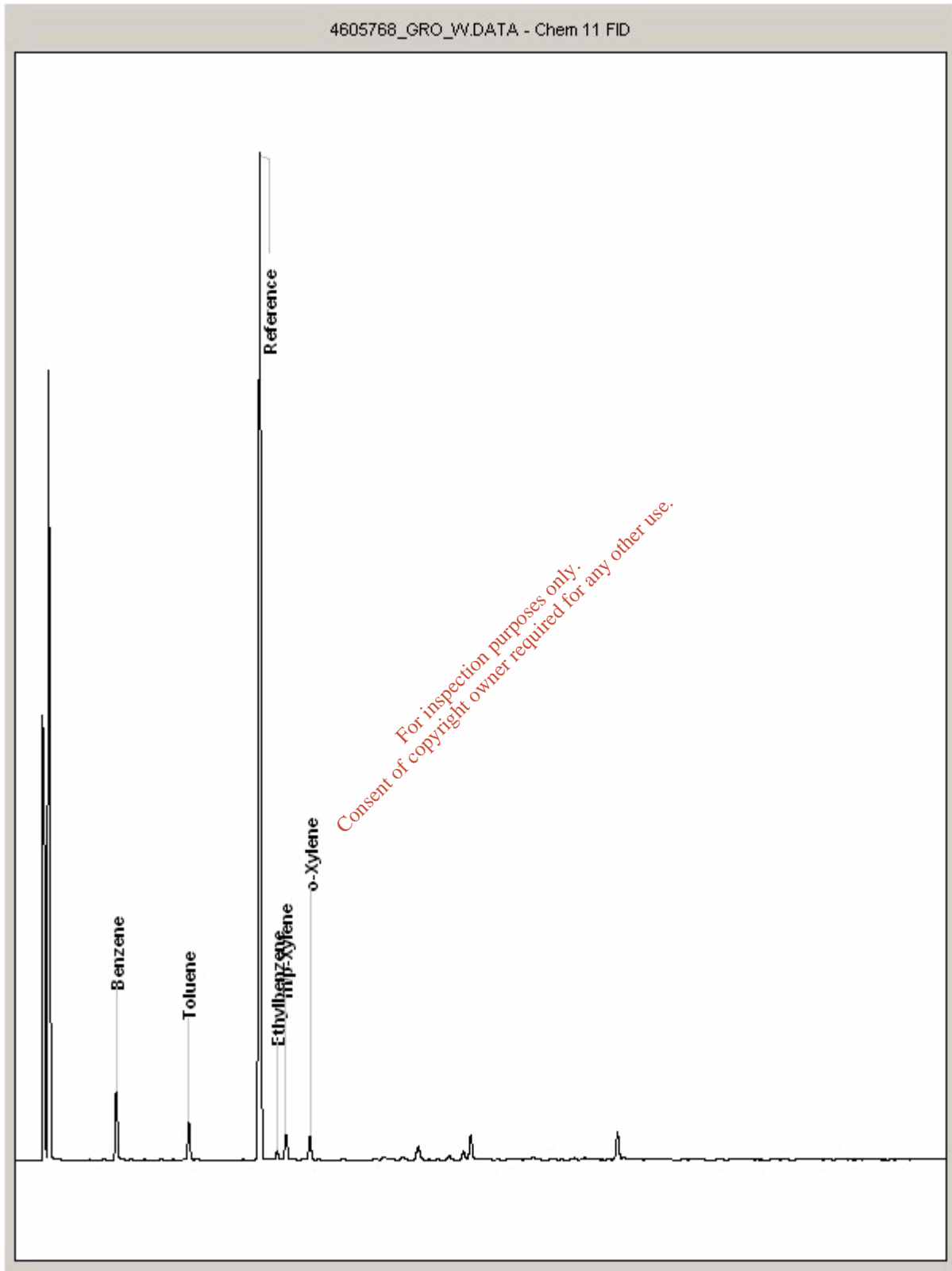
Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4605768  
Sample ID : G3

Depth : 2.50 - 3.50





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

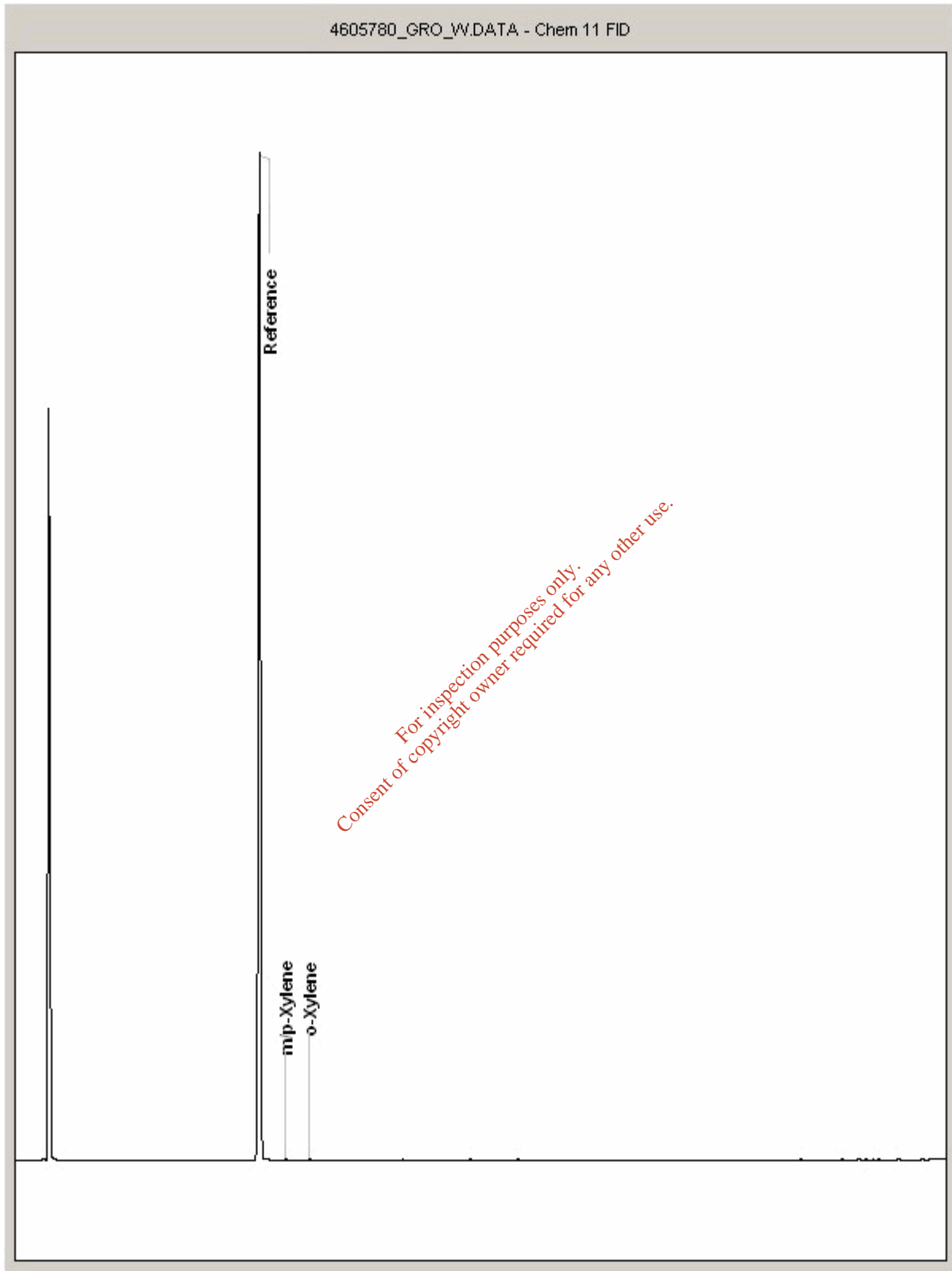
Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4605780  
Sample ID : G5

Depth : 2.00 - 3.00





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

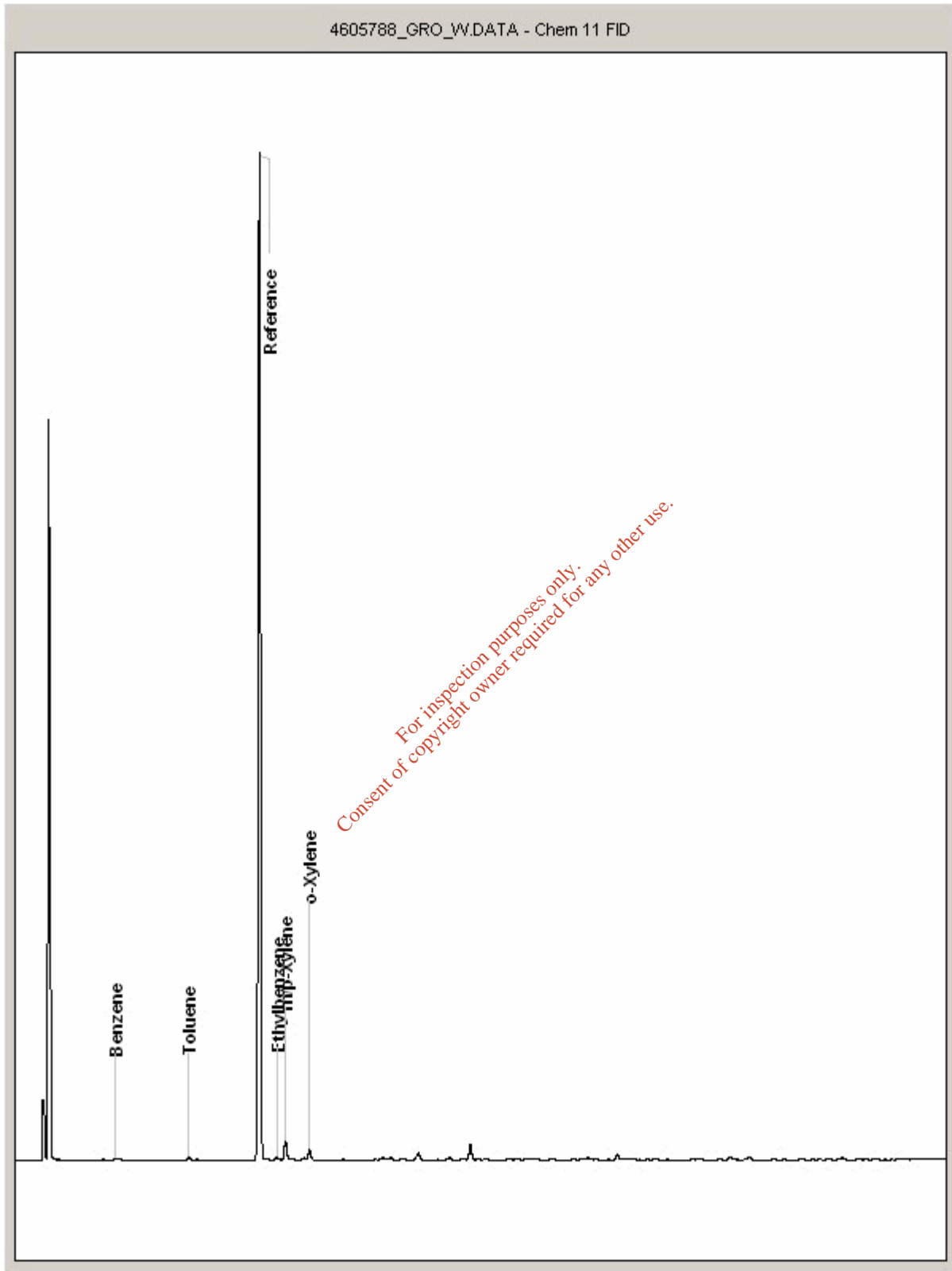
Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

# Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4605788  
Sample ID : G8

Depth : 1.50 - 2.00





SDG: 111028-13  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

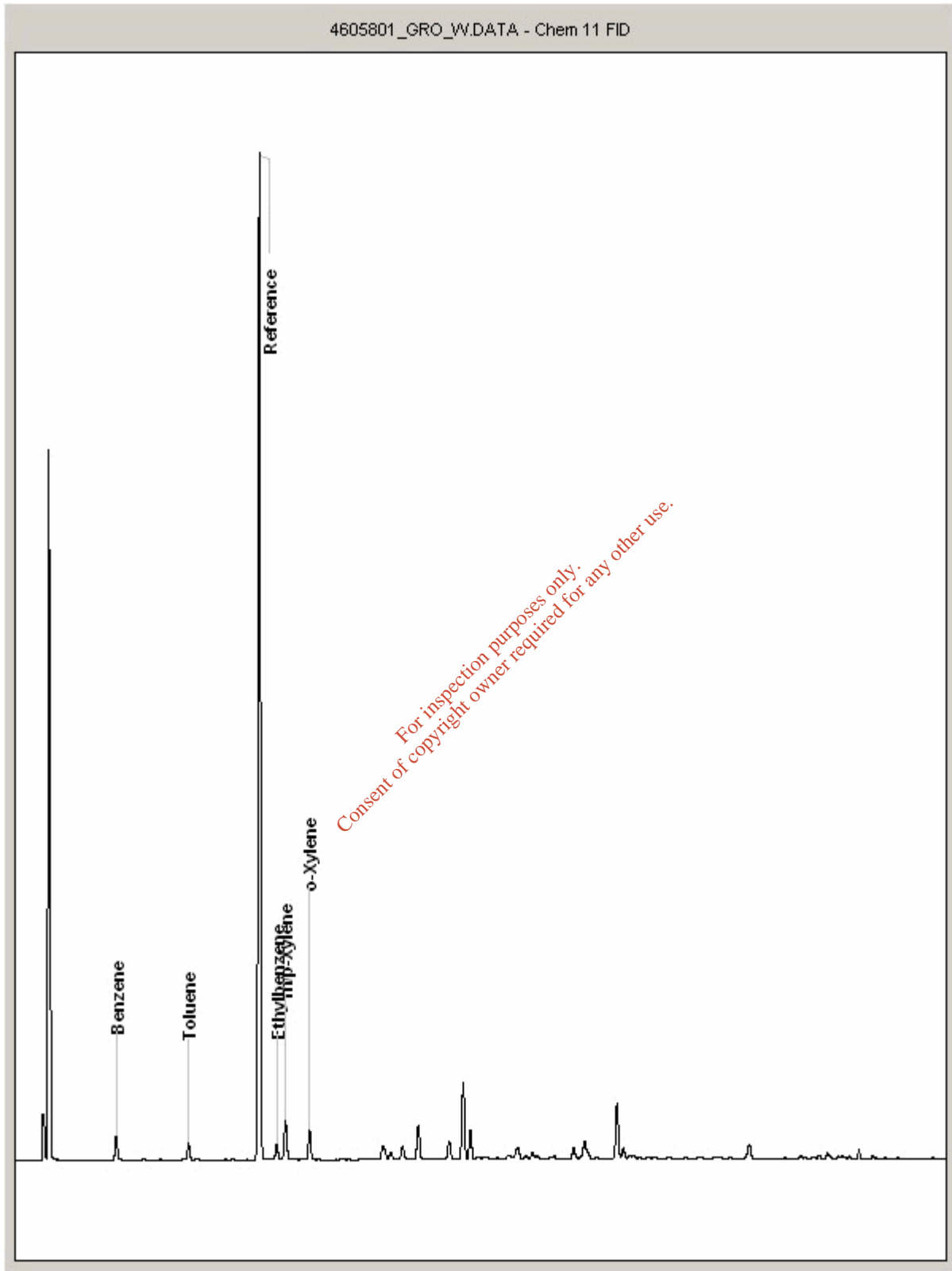
Order Number: 4700000740  
Report Number: 158059  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4605801  
Sample ID : C11

Depth : 1.00 - 2.00



SDG: 111028-13  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158059  
 Superseded Report:

# 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 asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). If asbestos is present either as asbestos containing material or loose fibres no further analysis will be undertaken. The quantity of asbestos present is not determined unless specifically requested.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery 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. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. 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).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

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.

SOLID MATRICES EXTRACTION SUMMARY				
ANALYSIS	DC OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENTEXTRACTABLE MATTER	D&C	DCM	SOXITHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXITHERM	GRAVIMETRIC
ELEMENTAL SULPHUR	D&C	DCM	SOXITHERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOXITHERM	GCMS
HERBICIDES	D&C	HEXANE/ACETONE	SOXITHERM	GCMS
PESTICIDES	D&C	HEXANE/ACETONE	SOXITHERM	GCMS
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 CWGBY GC	D&C	HEXANE/ACETONE	END OVER END	GC-FID
PCBTOT/PCB CON	D&C	HEXANE/ACETONE	END OVER END	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TM218.	GCMS
C8-C10 (C6-C4) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GC-EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE/ACETONE	SHAKER	GC-EZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DOM/ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY			
ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
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)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DCM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST CO/OPP	DCM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GCMS
TRH by INFRARED (R)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by R	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

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 HSG 264.

The identification of asbestos containing materials and soils 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.

Mouchel  
Ground Engineering  
Rowan House  
Lloyd Drive  
Cheshire  
CH65 9HQ

**Attention:** Neil Balderstone

## CERTIFICATE OF ANALYSIS

**Date:** 04 November 2011  
**Customer:** D\_MOUCHEL\_ELE  
**Sample Delivery Group (SDG):** 111027-54  
**Your Reference:**  
**Location:** Limerick Gasworks  
**Report No:** 158094

We received 5 samples on Tuesday October 25, 2011 and 5 of these samples were scheduled for analysis which was completed on Friday November 04, 2011. 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.

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Approved By:



**Sonia McWhan**

Operations Manager





**SDG:** 111027-54  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158094  
**Superseded Report:**

### Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
4587709	H12		2.50 - 3.50	25/10/2011
4587707	J10		1.00 - 2.00	25/10/2011
4587704	K1		2.00 - 3.00	25/10/2011
4587706	K5		1.00 - 2.00	25/10/2011
4587705	M3		3.00 - 4.00	25/10/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

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Consent of copyright owner required for any other use.*





SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

LIQUID Results Legend  <span style="background-color: yellow; border: 1px solid black; padding: 2px;">X</span> Test  <span style="background-color: red; color: white; border: 1px solid black; padding: 2px;">N</span> No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	
		4587704	K1		2.00 - 3.00	Vial (ALE297) 11 glass bottle (D) PLAS BOT (D)
		4587705	M3		3.00 - 4.00	Vial (ALE297) 11 glass bottle (D) PLAS BOT (D)
		4587706	K5		1.00 - 2.00	Vial (ALE297) 11 glass bottle (D) PLAS BOT (D)
		4587707	J10		1.00 - 2.00	Vial (ALE297) 11 glass bottle (D) PLAS BOT (D)
	4587709	H12		2.50 - 3.50	Vial (ALE297) 11 glass bottle (D) PLAS BOT (D)	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 5				
Anions by Kone (w)	All	NDPs: 0 Tests: 5				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5				
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5				
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 5				
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 5				
GRO by GC-FID (W)	All	NDPs: 0 Tests: 5				
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 5				
Mercury Dissolved	All	NDPs: 0 Tests: 5				
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 5				
pH Value	All	NDPs: 0 Tests: 5				
Phenols by HPLC (W)	All	NDPs: 0 Tests: 5				
Sulphide	All	NDPs: 0 Tests: 5				
TPH CWG (W)	All	NDPs: 0 Tests: 5				
VOC MS (W)	All	NDPs: 0 Tests: 2				

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SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

Results Legend		Customer Sample R	H12	J10	K1	K5	M3
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.50 - 3.50	1.00 - 2.00	2.00 - 3.00	1.00 - 2.00	3.00 - 4.00
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011
aq	Aqueous / settled sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011
diss.filt	Dissolved / filtered sample.		111027-54	111027-54	111027-54	111027-54	111027-54
tot.unfilt	Total / unfiltered sample.		4587709	4587707	4587704	4587706	4587705
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
Component	LOD/Units		Method				
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	16.6 #	0.394 #	1.94 #	137 #	1.19 #
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	21.3 #	0.507 #	2.49 #	176 #	1.53 #
Sulphide	<0.01 mg/l	TM101	<0.01 #	<0.01 #	<0.01 #	<0.05 #	<0.01 #
Arsenic (diss.filt)	<0.12 µg/l	TM152	7.41 #	2.24 #	1.56 #	162 #	3.68 #
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1 #	<0.1 #	<0.1 #	0.177 #	<0.1 #
Chromium (diss.filt)	<0.22 µg/l	TM152	12.8 #	10.3 #	5.75 #	14.1 #	2.46 #
Copper (diss.filt)	<0.85 µg/l	TM152	1.07 #	4.51 #	4.44 #	1.97 #	4.31 #
Lead (diss.filt)	<0.02 µg/l	TM152	0.599 #	0.071 #	0.483 #	0.404 #	0.425 #
Nickel (diss.filt)	<0.15 µg/l	TM152	5.88 #	6.1 #	9.93 #	28 #	5.02 #
Selenium (diss.filt)	<0.39 µg/l	TM152	3.94 #	2.64 #	2.05 #	26.2 #	2.76 #
Zinc (diss.filt)	<0.41 µg/l	TM152	0.861 #	0.723 #	2.06 #	46.2 #	2.18 #
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #	<0.01 #	0.119 #	<0.01 #
Sulphate	<2 mg/l	TM184	182 #	60.3 #	722 #	422 #	551 #
Cyanide, Total	<0.05 mg/l	TM227	<0.05 #	<0.05 #	1.05 #	8.47 #	0.845 #
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03 #	<0.03 #	<0.03 #	<0.3 #	<0.03 #
pH	<1 pH Units	TM256	7.39 #	7.6 #	7.15 #	9.57 #	7.54 #
Resorcinol	<0.01 mg/l	TM259	<0.01 #	<0.01 #	<0.01 #	<1 #	<0.01 #
Catechol	<0.01 mg/l	TM259	<0.01 #	<0.01 #	<0.01 #	<1 #	<0.01 #
Phenol	<0.002 mg/l	TM259	<0.002 #	<0.002 #	<0.002 #	307 #	<0.002 #
Cresols	<0.006 mg/l	TM259	<0.006 #	<0.006 #	<0.006 #	470 #	<0.006 #
Xylenols	<0.008 mg/l	TM259	<0.008 #	<0.008 #	<0.008 #	253 #	<0.008 #
1-Naphthol	<0.01 mg/l	TM259	<0.01 #	<0.01 #	<0.01 #	<1 #	<0.01 #
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003 #	<0.003 #	<0.003 #	<0.3 #	<0.003 #
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006 #	<0.006 #	<0.006 #	<0.6 #	<0.006 #
Phenols, Total Detected 5 speciated	<0.025 mg/l	TM259	<0.025 #	<0.025 #	<0.025 #	1030 #	<0.025 #

SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

PAH Spec MS - Aqueous (W)

Results Legend		Customer Sample R	H12	J10	K1	K5	M3
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.50 - 3.50	1.00 - 2.00	2.00 - 3.00	1.00 - 2.00	3.00 - 4.00
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011
aq	Aqueous / settled sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011
diss.filt	Dissolved / filtered sample.		111027-54	111027-54	111027-54	111027-54	111027-54
tot.unfilt	Total / unfiltered sample.		4587709	4587707	4587704	4587706	4587705
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
Component	LOD/Units		Method				
Naphthalene (aq)	<0.1 µg/l	TM178	2.5 #	0.104 #	0.161 #	9680 #	0.139 #
Acenaphthene (aq)	<0.015 µg/l	TM178	1.25 #	<0.015 #	0.0445 #	118 #	<0.015 #
Acenaphthylene (aq)	<0.011 µg/l	TM178	3.77 #	0.14 #	0.137 #	544 #	0.0673 #
Fluoranthene (aq)	<0.017 µg/l	TM178	26.8 #	0.128 #	2.09 #	240 #	1.53 #
Anthracene (aq)	<0.015 µg/l	TM178	3.01 #	0.0439 #	0.177 #	183 #	0.0867 #
Phenanthrene (aq)	<0.022 µg/l	TM178	7.64 #	0.0749 #	0.567 #	593 #	0.164 #
Fluorene (aq)	<0.014 µg/l	TM178	2.51 #	0.0258 #	0.0775 #	286 #	0.029 #
Chrysene (aq)	<0.013 µg/l	TM178	12.2 #	0.14 #	1.81 #	93.2 #	1.16 #
Pyrene (aq)	<0.015 µg/l	TM178	17.3 #	0.102 #	2.11 #	170 #	1.4 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	11.4 #	0.0994 #	1.62 #	89.2 #	0.939 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	29 #	0.233 #	3.03 #	122 #	1.76 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	26.7 #	0.314 #	3.64 #	84.9 #	2.16 #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	31 #	0.408 #	3.82 #	97.8 #	2.17 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	4.16 #	0.0497 #	0.75 #	35.6 #	0.356 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	17.2 #	0.309 #	3.56 #	83.9 #	1.96 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	15.2 #	0.204 #	2.97 #	88.3 #	1.53 #
PAH, Total Detected USEPA 16 (aq)	<0.247 µg/l	TM178	212 #	2.37 #	26.6 #	12500 #	15.5 #

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SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

TPH CWG (W)

Results Legend		Customer Sample R	H12	J10	K1	K5	M3	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.50 - 3.50	1.00 - 2.00	2.00 - 3.00	1.00 - 2.00	3.00 - 4.00	
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Deviating sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011
aq	Aqueous / settled sample.		25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011	25/10/2011
diss.filt	Dissolved / filtered sample.		111027-54	111027-54	111027-54	111027-54	111027-54	111027-54
tot.unfilt	Total / unfiltered sample.		4587709	4587707	4587704	4587706	4587705	
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM245	93	93	91	92	92	
GRO >C5-C12	<50 µg/l	TM245	<50	<50	<50	34700	<50	
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3	<15	<3	
Benzene	<7 µg/l	TM245	<7	<7	<7	12100	<7	
Toluene	<4 µg/l	TM245	<4	<4	<4	4180	<4	
Ethylbenzene	<5 µg/l	TM245	<5	<5	<5	207	<5	
m,p-Xylene	<8 µg/l	TM245	<8	<8	<8	1310	<8	
o-Xylene	<3 µg/l	TM245	<3	<3	<3	534	<3	
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11	<11	1840	<11	
Sum of detected BTEX	<28 µg/l	TM245	<28	<28	<28	18300	<28	
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10	263	<10	
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	<10	1150	<10	
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	<10	1670	<10	
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	<10	7290	<10	
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	32	<10	<10	<10	<10	
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	32	<10	<10	<10	<10	
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	<10	12100	<10	
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	<10	4180	<10	
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10	3160	<10	
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10	4860	<10	
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	185	<10	<10	<10	<10	
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	87	<10	14	<10	<10	
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	<10	50	<10	28	
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	272	<10	64	<10	28	
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	309	<10	64	34700	31	



SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

## VOC MS (W)

Results Legend		Customer Sample R	K5	M3			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.00	3.00 - 4.00			
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)			
S	Deviating sample.		25/10/2011	25/10/2011			
aq	Aqueous / settled sample.		25/10/2011	25/10/2011			
diss.fit	Dissolved / filtered sample.		111027-54	111027-54			
tot.unfilt	Total / unfiltered sample.		4587706	4587705			
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
Component	LOD/Units		Method				
Dibromofluoromethane**	%	TM208	72.1	107			
Toluene-d8**	%	TM208	89.5	99.4			
4-Bromofluorobenzene**	%	TM208	64.4	98.3			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	#	#	
Chloromethane	<1 µg/l	TM208	<1	<1	#	#	
Vinyl chloride	<1 µg/l	TM208	<1	<1	#	#	
Bromomethane	<1 µg/l	TM208	<1	<1	#	#	
Chloroethane	<1 µg/l	TM208	<1	<1	#	#	
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	#	#	
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#	
Carbon disulphide	<1 µg/l	TM208	<1	<1	#	#	
Dichloromethane	<3 µg/l	TM208	<3	<3	#	#	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	#	#	
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#	
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#	
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#	
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Bromochloromethane	<1 µg/l	TM208	<1	<1	#	#	
Chloroform	<1 µg/l	TM208	<1	<1	#	#	
1,1,1-Trichloroethane	<1 µg/l	TM208	4.3	<1	#	#	
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#	
Carbontetrachloride	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#	
Benzene	<1 µg/l	TM208	13300	<1	#	#	
Trichloroethene	<1 µg/l	TM208	8.4	<1	#	#	
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Dibromomethane	<1 µg/l	TM208	<1	<1	#	#	
Bromodichloromethane	<1 µg/l	TM208	<1	<1	#	#	
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#	
Toluene	<1 µg/l	TM208	5020	<1	#	#	
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#	
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#	
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Tetrachloroethene	<1 µg/l	TM208	<1	<1	#	#	
Dibromochloromethane	<1 µg/l	TM208	<1	<1	#	#	



## CERTIFICATE OF ANALYSIS

SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

## VOC MS (W)

Results Legend		Customer Sample R	K5	M3			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.00	3.00 - 4.00			
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)			
S	Deviating sample.		25/10/2011	25/10/2011			
aq	Aqueous / settled sample.		25/10/2011	25/10/2011			
diss.filt	Dissolved / filtered sample.		111027-54	111027-54			
tot.unfilt	Total / unfiltered sample.		4587706	4587705			
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
Component	LOD/Units		Method				
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	#	#	
Chlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	#	#	
Ethylbenzene	<1 µg/l	TM208	227	<1	#	#	
m,p-Xylene	<1 µg/l	TM208	1460	<1	#	#	
o-Xylene	<1 µg/l	TM208	644	<1	#	#	
Styrene	<1 µg/l	TM208	263	<1	#	#	
Bromoform	<1 µg/l	TM208	<1	<1	#	#	
Isopropylbenzene	<1 µg/l	TM208	9.55	<1	#	#	
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	#	#	
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Bromobenzene	<1 µg/l	TM208	<1	<1	#	#	
Propylbenzene	<1 µg/l	TM208	12	<1	#	#	
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#	
1,3,5-Trimethylbenzene	<1 µg/l	TM208	53.5	<1	#	#	
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#	
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#	
1,2,4-Trimethylbenzene	<1 µg/l	TM208	135	<1	#	#	
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#	
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	#	#	
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
n-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	#	#	
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	#	#	
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	#	#	
Naphthalene	<1 µg/l	TM208	5770	<1	#	#	
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	

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SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

## Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
4627418	J10	1.00 - 2.00	LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
4627470	K1	2.00 - 3.00	LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis



## CERTIFICATE OF ANALYSIS

**SDG:** 111027-54  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158094  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
4627490	H12	2.50 - 3.50	LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis

Note : Test results may be compromised

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SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

### Table of Results - Appendix

**REPORT KEY**

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10<sup>-7</sup>

<b>NDP</b>	No Determination Possible	<b>#</b>	ISO 17025 Accredited	*	Subcontracted Test	<b>M</b>	MCERTS Accredited
<b>NFD</b>	No Fibres Detected	<b>PFD</b>	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	<b>EC</b>	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 <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part 2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of DRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

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**SDG:** 111027-54  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158094  
**Superseded Report:**

### Test Completion Dates

Lab Sample No(s)	4587709	4587707	4587704	4587706	4587705
Customer Sample Ref.	H12	J10	K1	K5	M3
AGS Ref.					
Depth	2.50 - 3.50	1.00 - 2.00	2.00 - 3.00	1.00 - 2.00	3.00 - 4.00
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	01-Nov-2011	31-Oct-2011	31-Oct-2011	01-Nov-2011	01-Nov-2011
Anions by Kone (w)	02-Nov-2011	02-Nov-2011	02-Nov-2011	02-Nov-2011	02-Nov-2011
Cyanide Comp/Free/Total/Thiocyanate	28-Oct-2011	28-Oct-2011	28-Oct-2011	28-Oct-2011	28-Oct-2011
Dissolved Metals by ICP-MS	02-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011	02-Nov-2011
EPH CWG (Aliphatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
EPH CWG (Aromatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
GRO by GC-FID (W)	03-Nov-2011	03-Nov-2011	03-Nov-2011	31-Oct-2011	30-Oct-2011
Hexavalent Chromium (w)	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
Mercury Dissolved	31-Oct-2011	01-Nov-2011	31-Oct-2011	01-Nov-2011	31-Oct-2011
PAH Spec MS - Aqueous (W)	02-Nov-2011	03-Nov-2011	02-Nov-2011	02-Nov-2011	03-Nov-2011
pH Value	28-Oct-2011	01-Nov-2011	28-Oct-2011	31-Oct-2011	28-Oct-2011
Phenols by HPLC (W)	01-Nov-2011	01-Nov-2011	01-Nov-2011	02-Nov-2011	01-Nov-2011
Sulphide	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
TPH CWG (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
VOC MS (W)				02-Nov-2011	01-Nov-2011

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SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

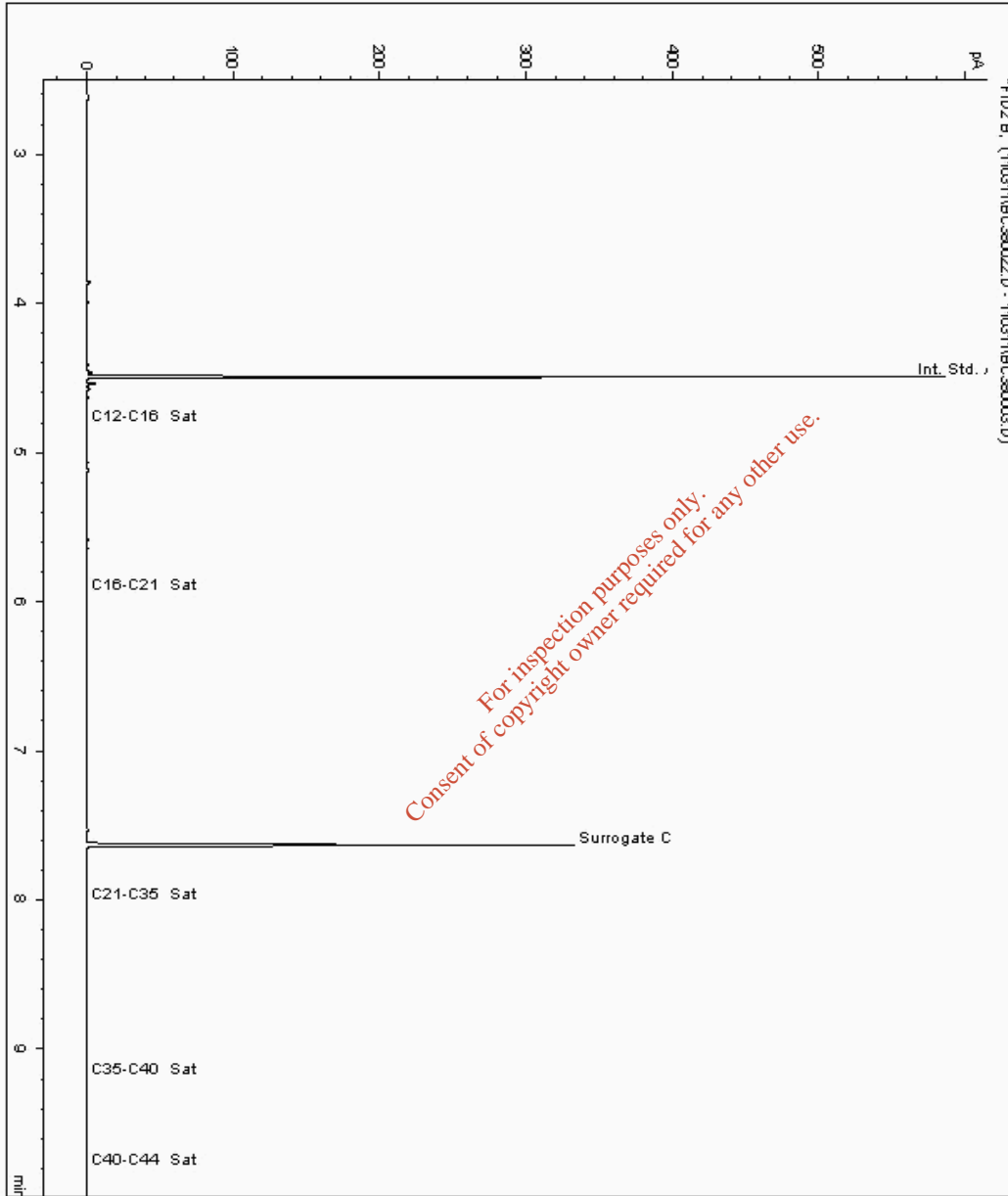
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4597197  
Sample ID : K5

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4547487-4597197  
Date Acquired : 04/11/11 13:47:27 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





CERTIFICATE OF ANALYSIS

SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

Chromatogram

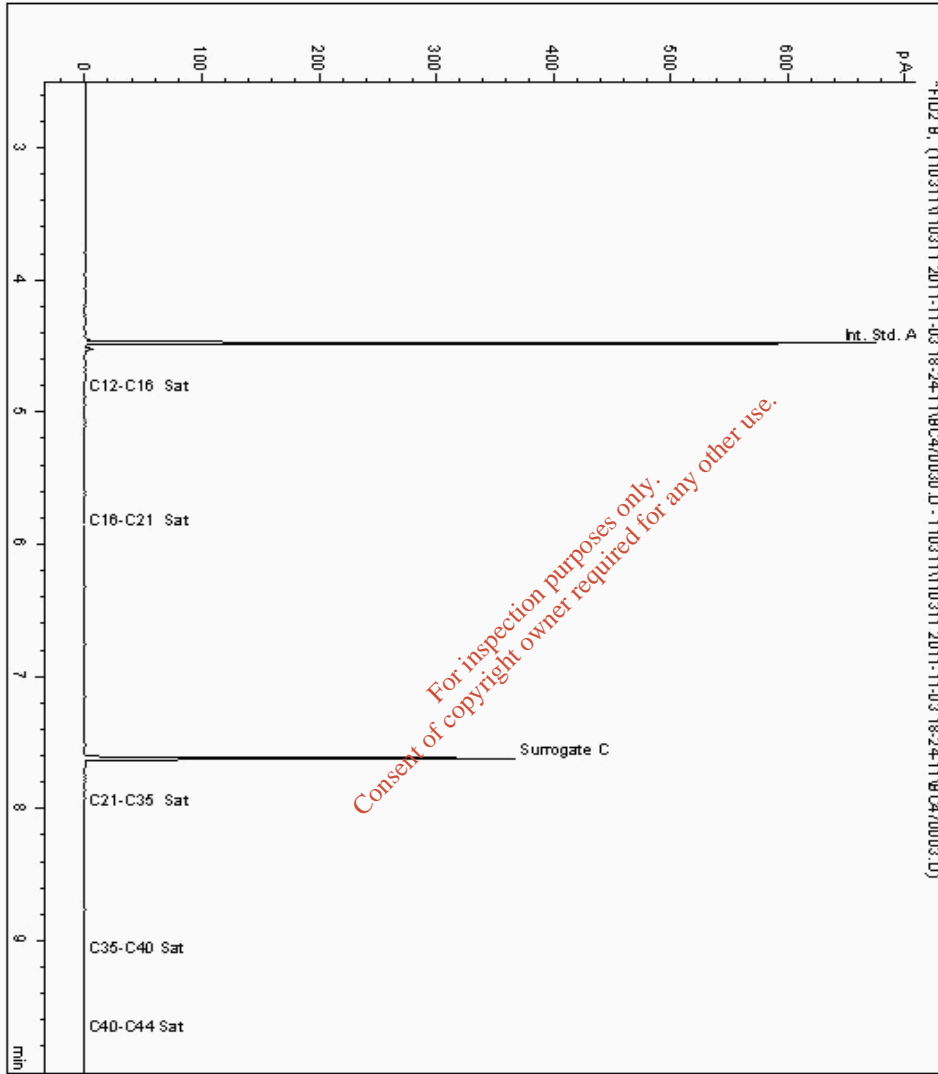
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4597259  
Sample ID : J10

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4547503-4597259  
Date Acquired : 04/11/11 03:09:45  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

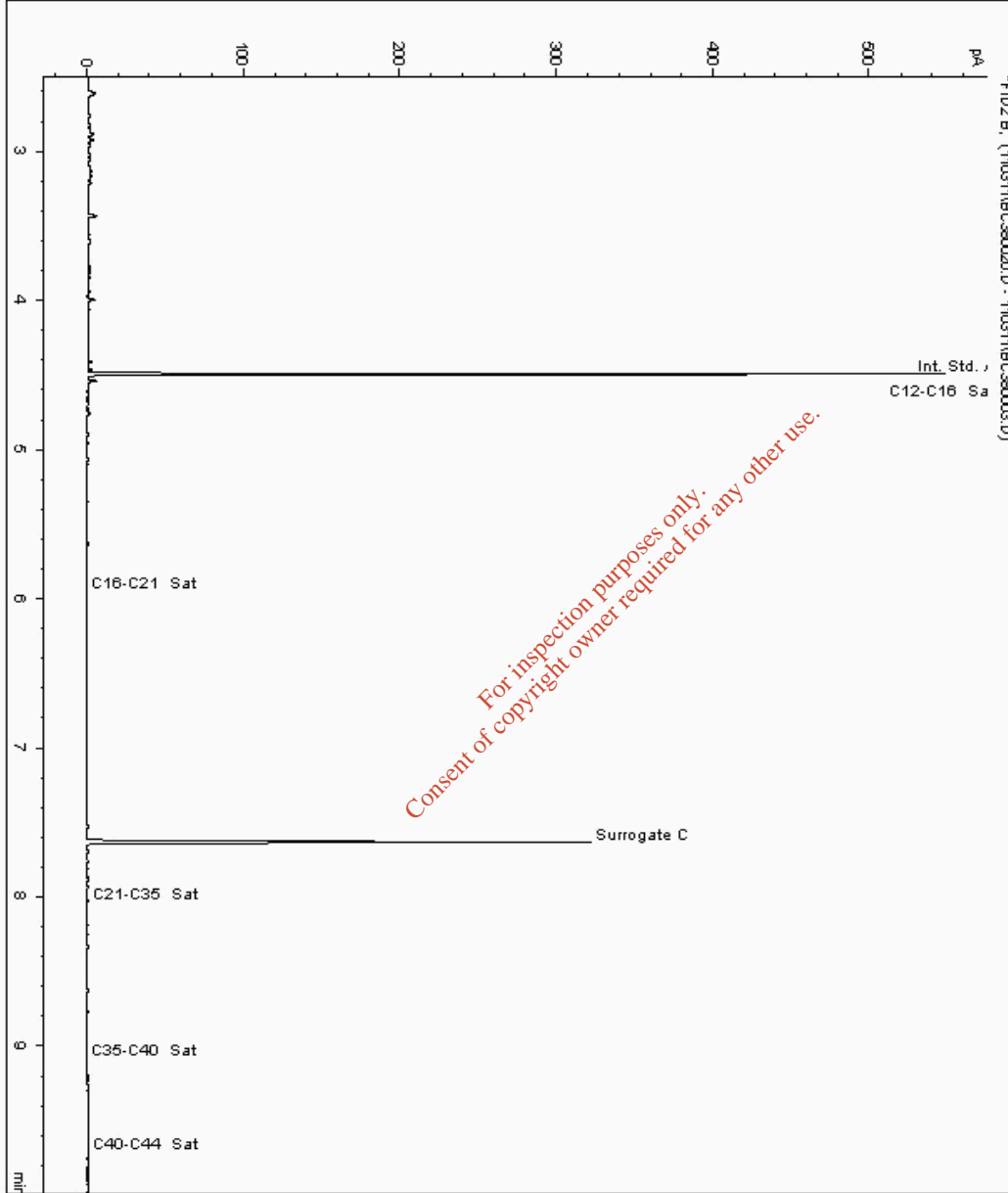
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4597321  
Sample ID : H12

Depth : 2.50 - 3.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4547518-4597321  
Date Acquired : 03/11/11 23:57:07 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





CERTIFICATE OF ANALYSIS

SDG: 111027-54
Job: D\_MOUCHEL\_ELE-1
Client Reference:

Location: Limerick Gasworks
Customer: Mouchel
Attention: Neil Balderstone

Order Number: 4700000740
Report Number: 158094
Superseded Report:

Chromatogram

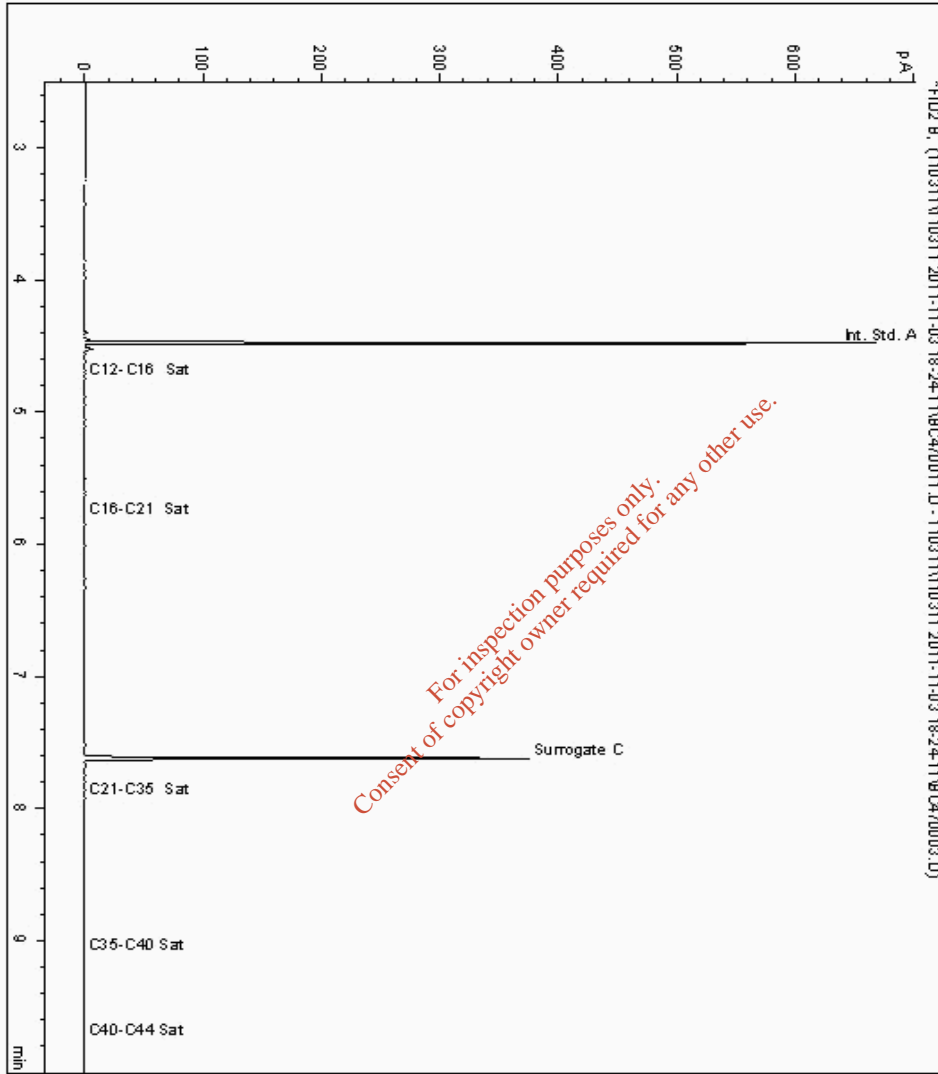
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4597361
Sample ID : K1

Depth : 2.00 - 3.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4547455-4597361
Date Acquired : 03/11/11 21:32:40
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

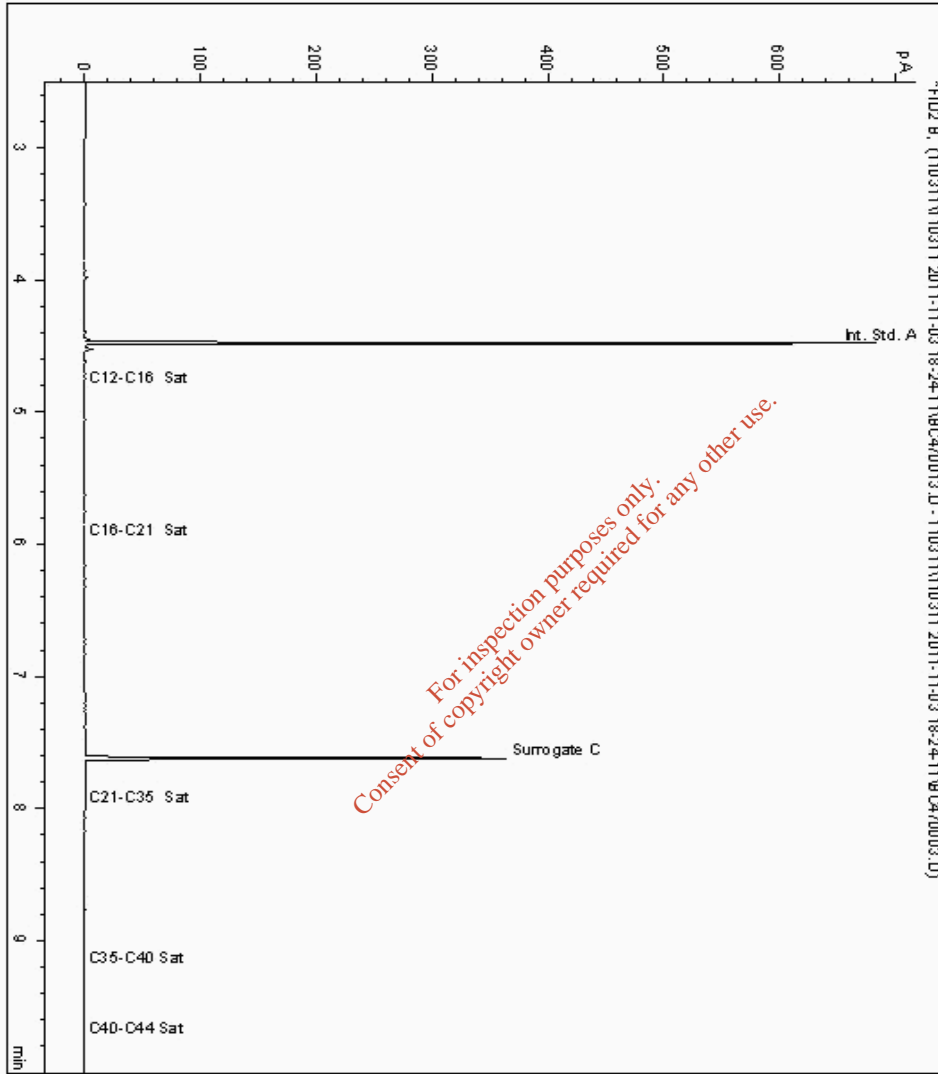
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4597378  
Sample ID : M3

Depth : 3.00 - 4.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4547471-4597378  
Date Acquired : 03/11/11 22:01:48  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

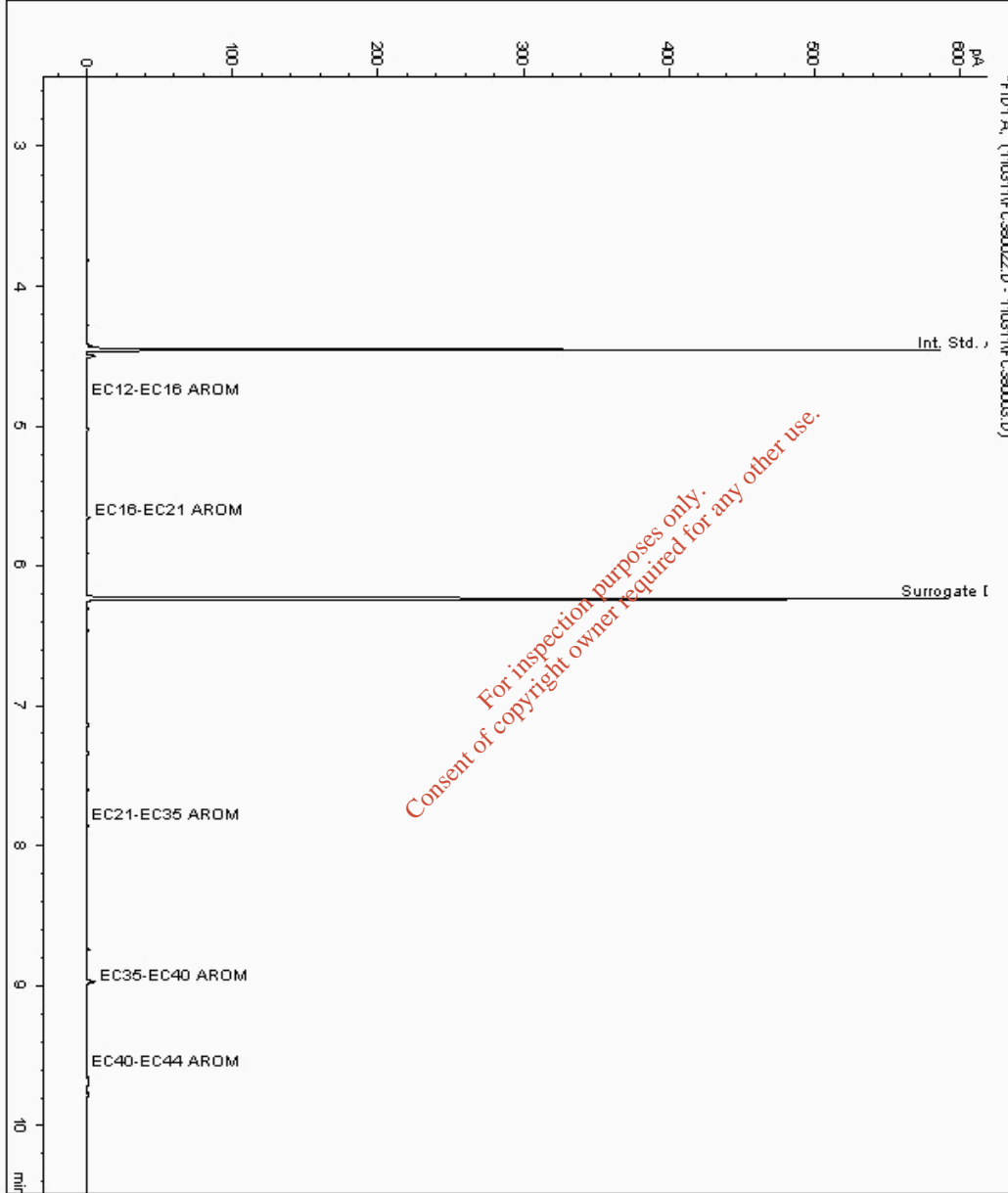
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4597197  
Sample ID : K5

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4547488-4597197  
Date Acquired : 04/11/11 13:47:26 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008







SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

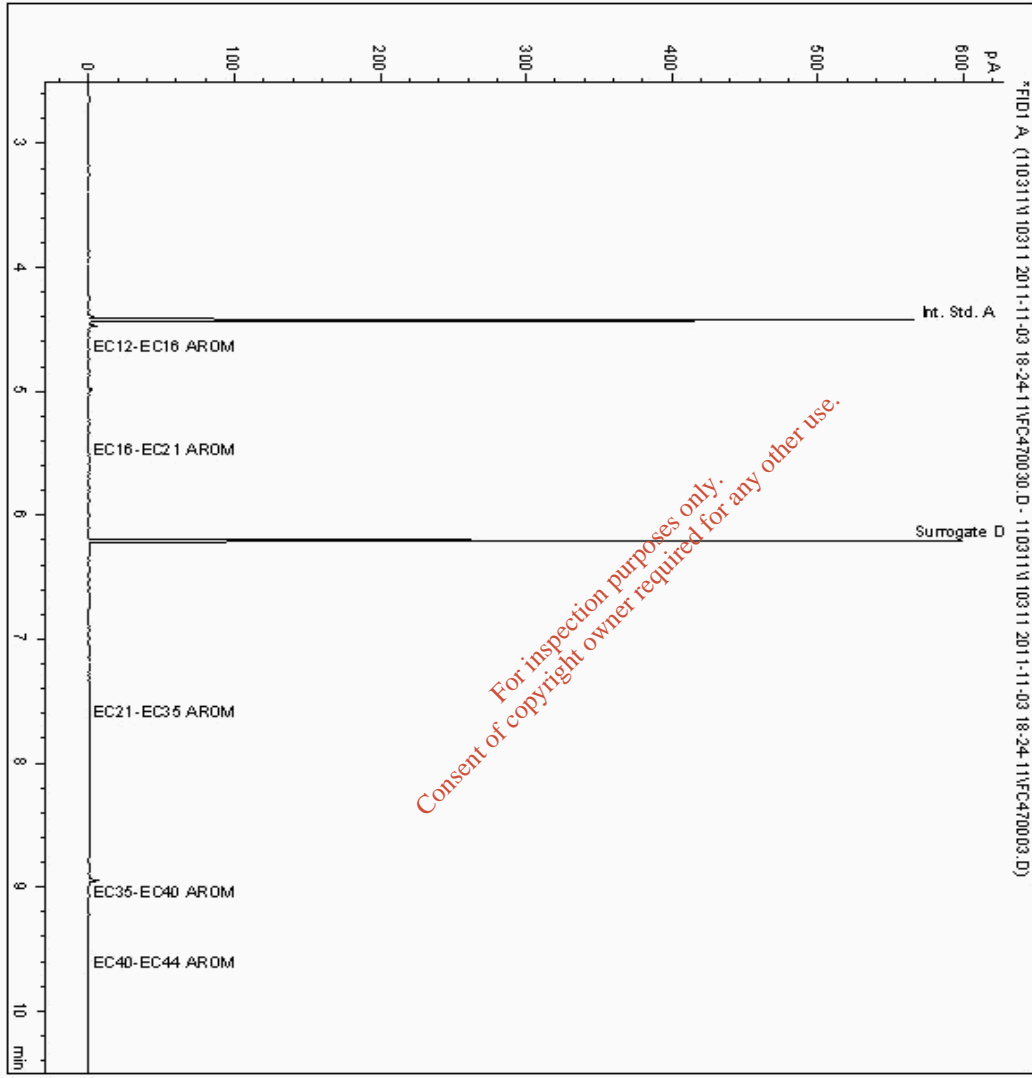
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4597259  
Sample ID : J10

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4547504-4597259  
Date Acquired : 04/11/11 03:09:45  
Units :  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

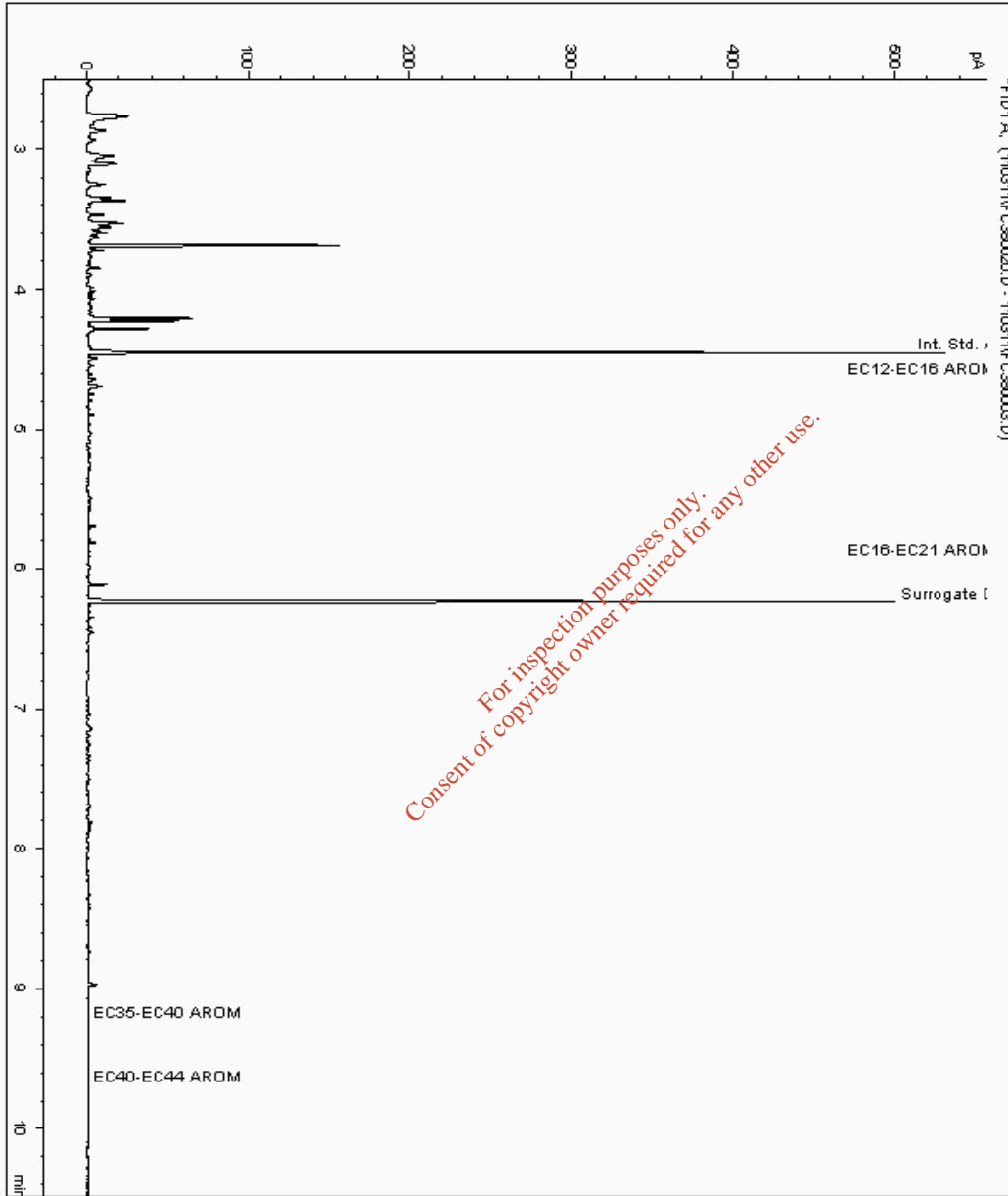
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4597321  
Sample ID : H12

Depth : 2.50 - 3.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4547519-4597321  
Date Acquired : 03/11/11 23:57:07 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

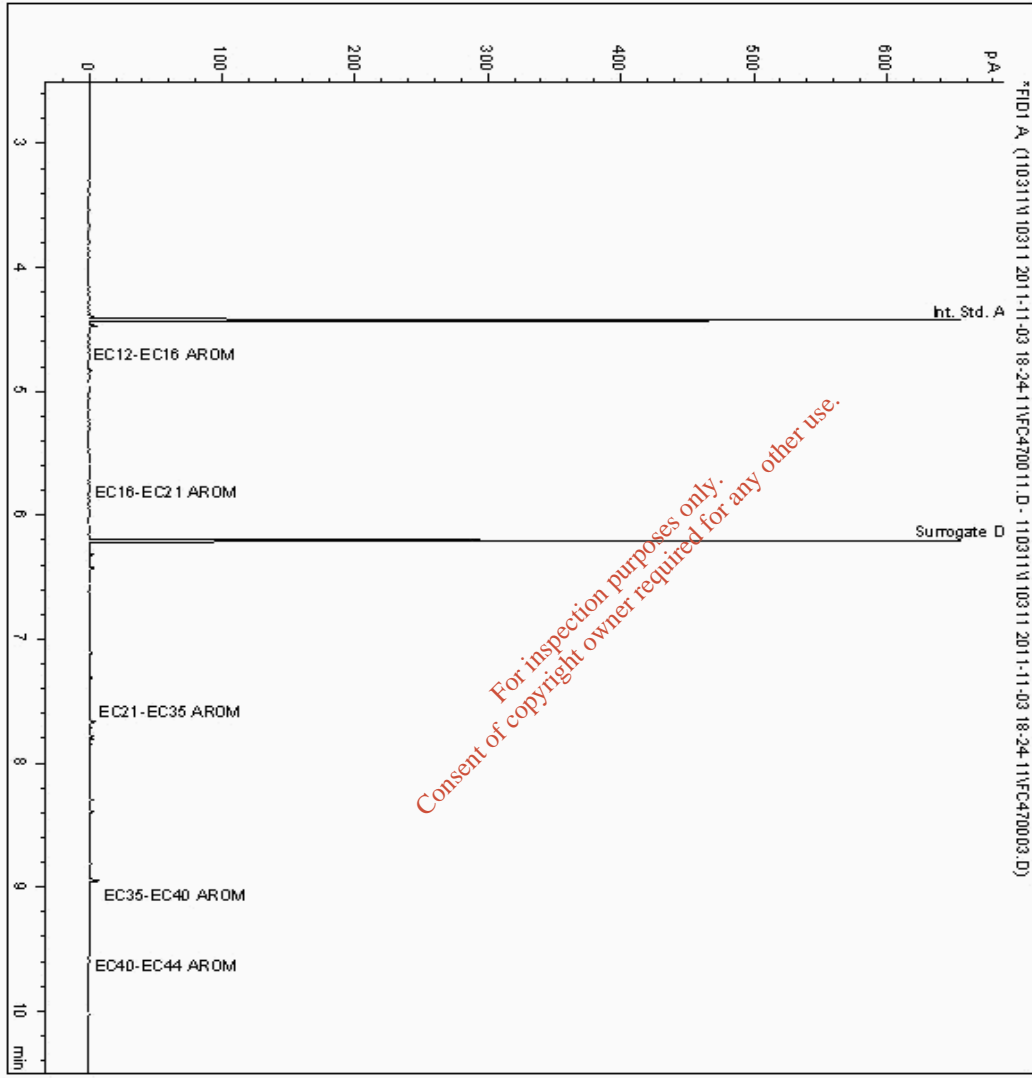
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4597361  
Sample ID : K1

Depth : 2.00 - 3.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4547456-4597361  
Date Acquired : 03/11/11 21:32:40  
Units :  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

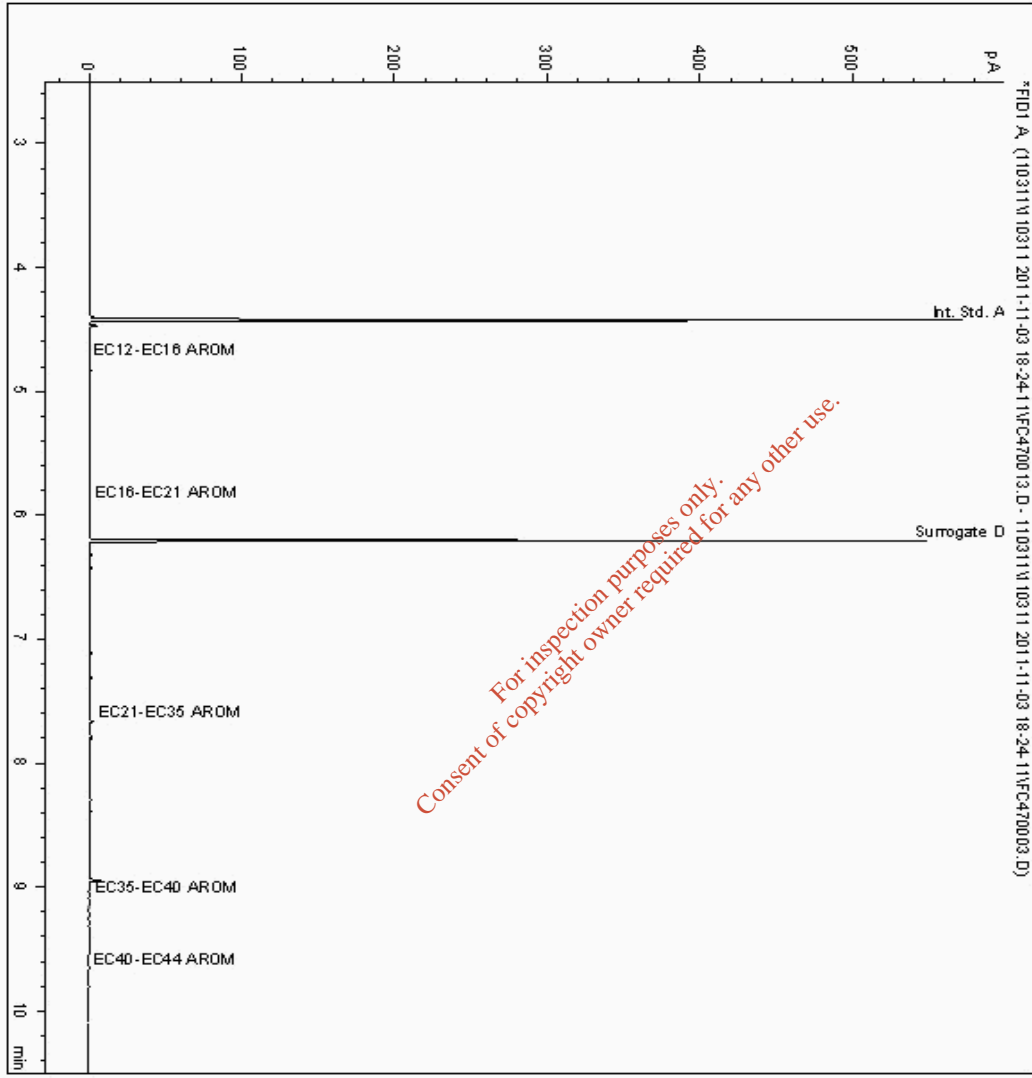
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4597378  
Sample ID : M3

Depth : 3.00 - 4.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4547472-4597378  
Date Acquired : 03/11/11 22:01:48  
Units :  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

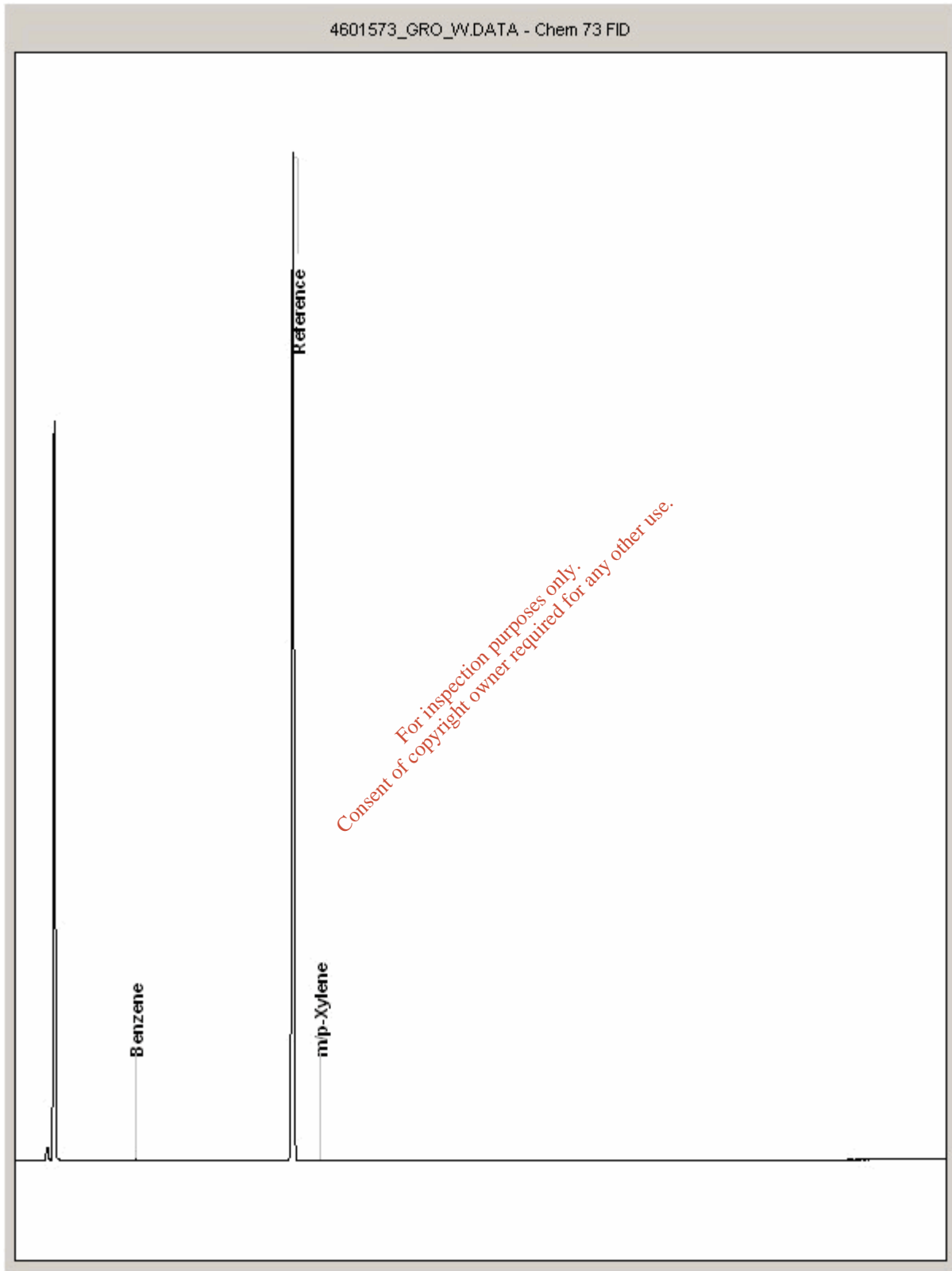
Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4601573  
Sample ID : M3

Depth : 3.00 - 4.00





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

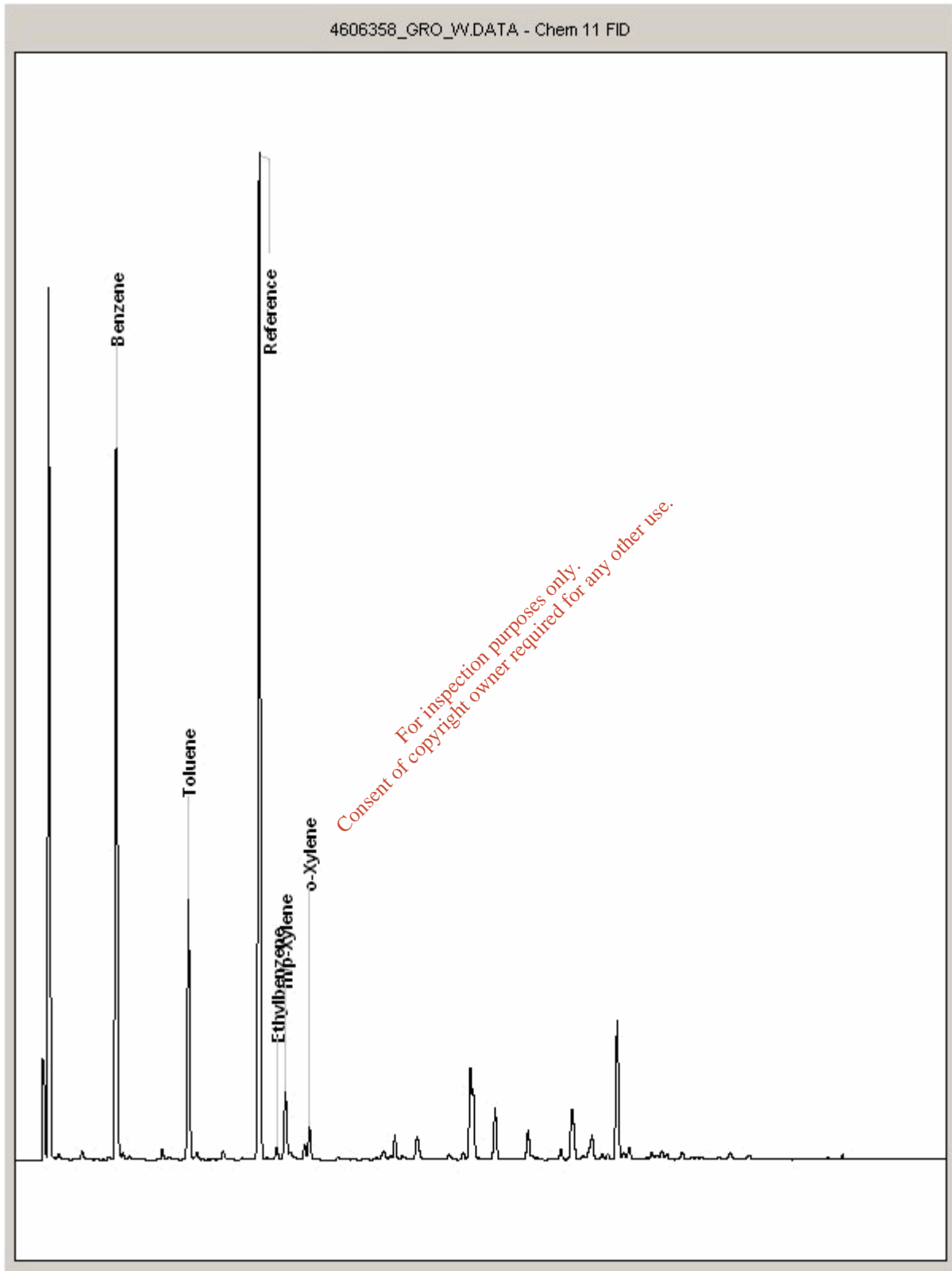
Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4606358  
Sample ID : K5

Depth : 1.00 - 2.00





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

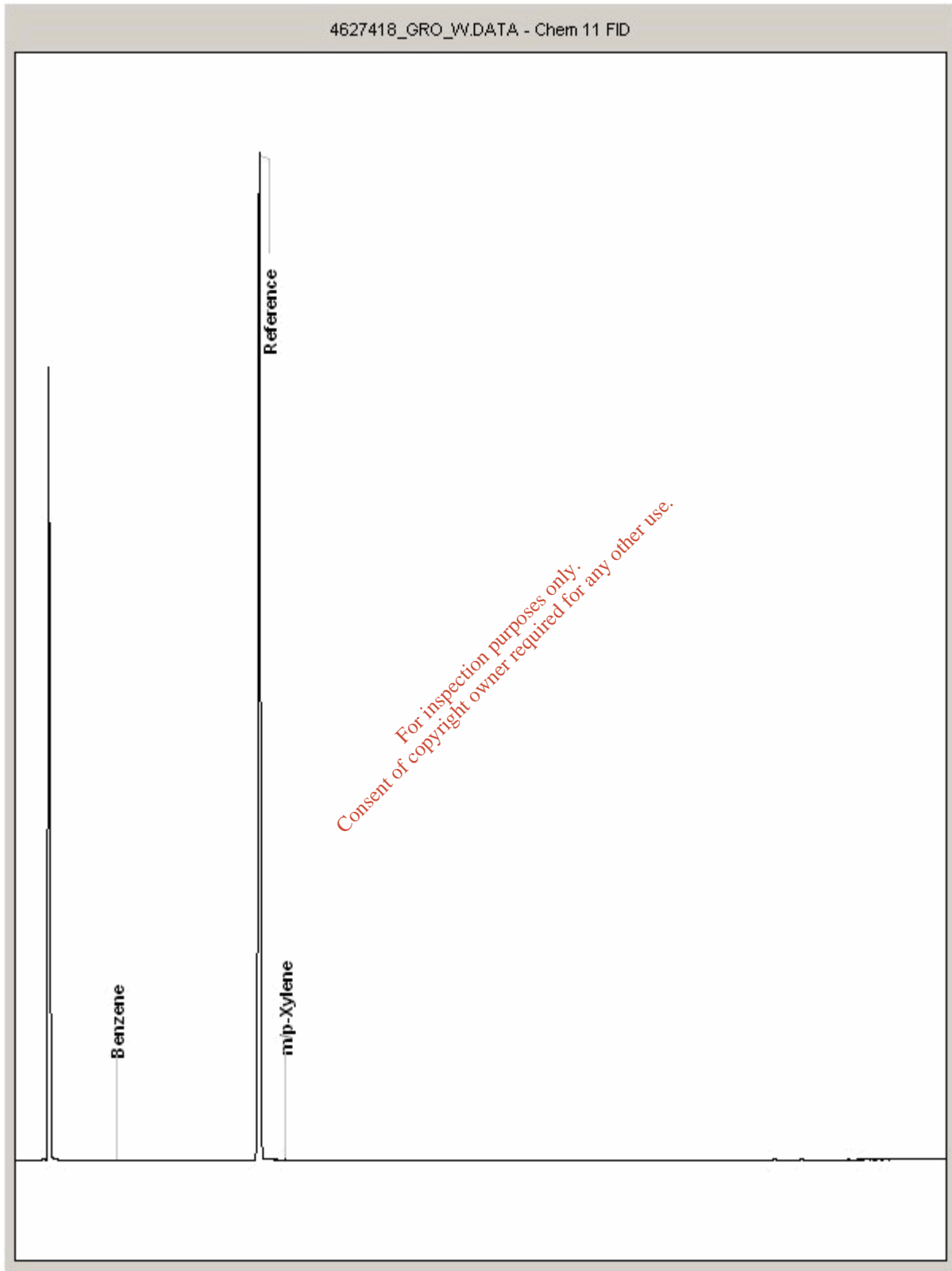
Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4627418  
Sample ID : J10

Depth : 1.00 - 2.00





SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

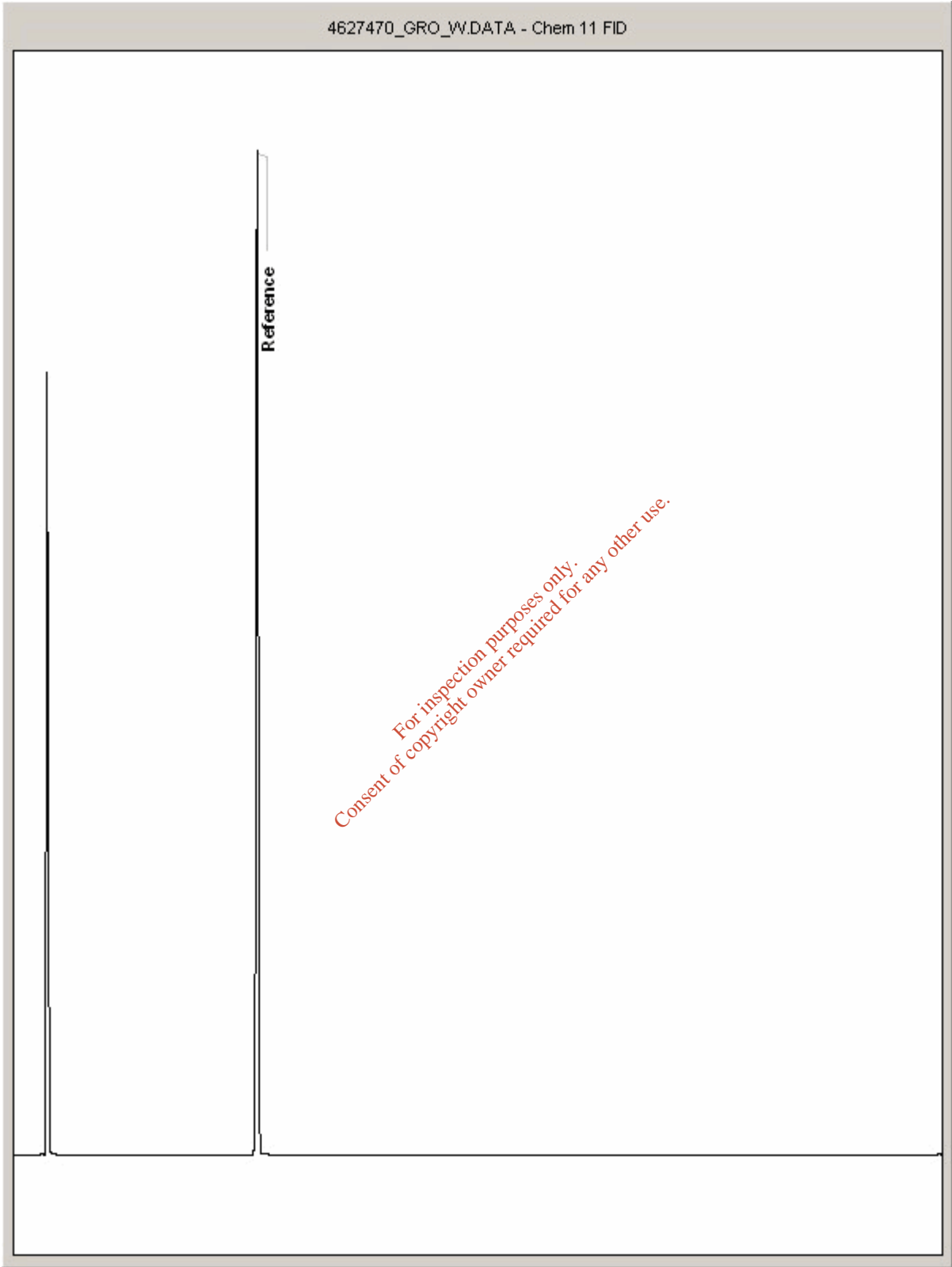
Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4627470  
Sample ID : K1

Depth : 2.00 - 3.00







SDG: 111027-54  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

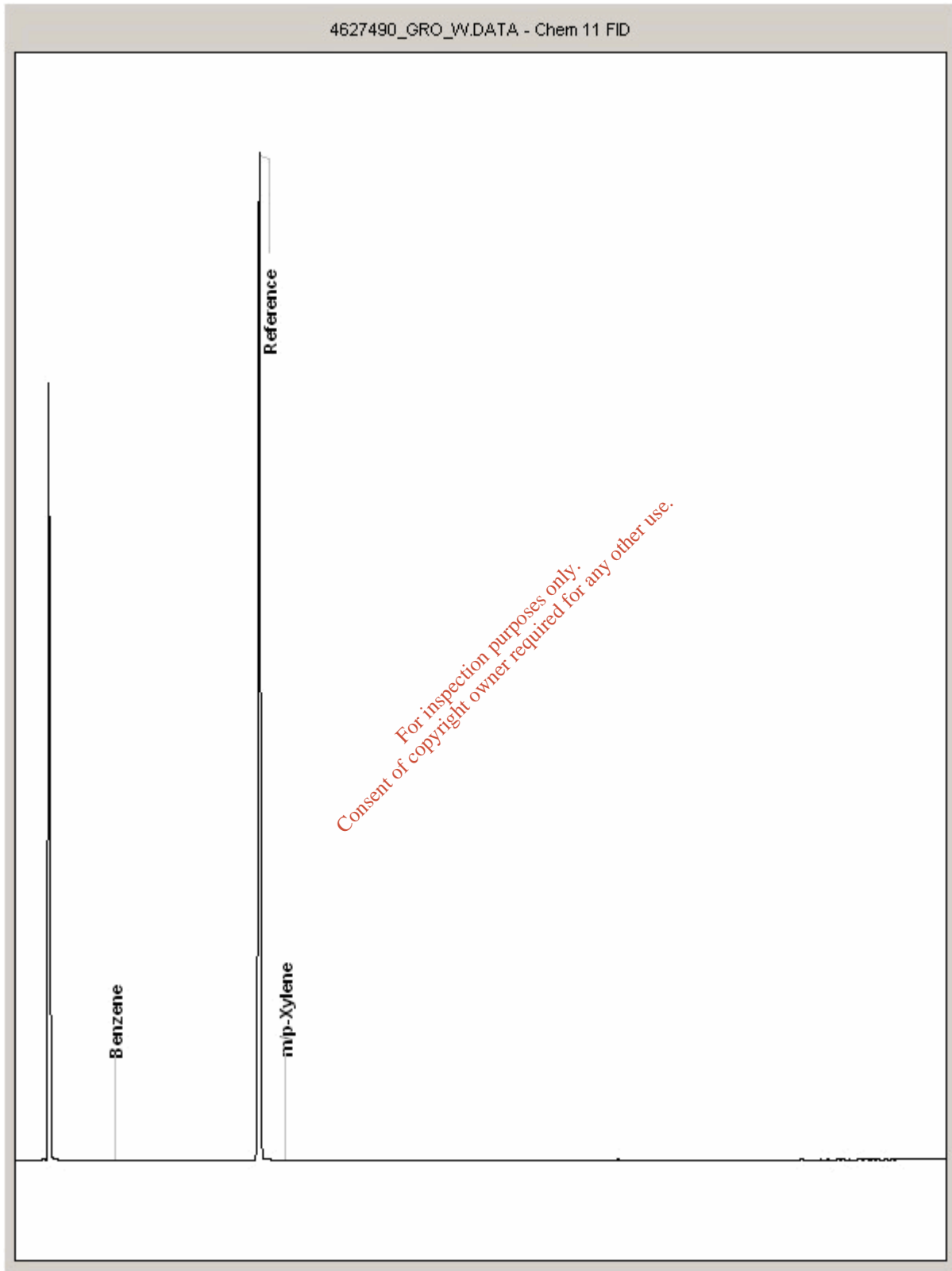
Order Number: 4700000740  
Report Number: 158094  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4627490  
Sample ID : H12

Depth : 2.50 - 3.50



SDG: 111027-54  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158094  
 Superseded Report:

## 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 asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). If asbestos is present either as asbestos containing material or loose fibres no further analysis will be undertaken. The quantity of asbestos present is not determined unless specifically requested.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery 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. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. 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).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

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.

SOLID MATRICES EXTRACTION SUMMARY				
ANALYSIS	DC OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENTEXTRACTABLE MATTER	D&C	DCM	SOXITHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXITHERM	GRAVIMETRIC
ELEMENTAL SULPHUR	D&C	DCM	SOXITHERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOXITHERM	GCMS
HERBICIDES	D&C	HEXANE/ACETONE	SOXITHERM	GCMS
PESTICIDES	D&C	HEXANE/ACETONE	SOXITHERM	GCMS
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 CWGBY GC	D&C	HEXANE/ACETONE	END OVER END	GC-FID
PCBTOT/PCB CON	D&C	HEXANE/ACETONE	END OVER END	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TM218.	GCMS
C8-C10 (C6-C40) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GC-EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE/ACETONE	SHAKER	GC-EZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DOM/ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY			
ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
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)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DCM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST CO/OPP	DCM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GCMS
TRH by INFRARED (R)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by R	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

### 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 HSG 264.

The identification of asbestos containing materials and soils 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.

Mouchel  
Ground Engineering  
Rowan House  
Lloyd Drive  
Cheshire  
CH65 9HQ

**Attention:** Neil Balderstone

## CERTIFICATE OF ANALYSIS

**Date:** 04 November 2011  
**Customer:** D\_MOUCHEL\_ELE  
**Sample Delivery Group (SDG):** 111028-6  
**Your Reference:**  
**Location:** Limerick Gasworks  
**Report No:** 158055

We received 5 samples on Wednesday October 26, 2011 and 5 of these samples were scheduled for analysis which was completed on Friday November 04, 2011. 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.

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Approved By:



**Sonia McWhan**

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

**SDG:** 111028-6  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158055  
**Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
4592388	A3		1.50 - 2.50	26/10/2011
4592385	C7		4.00 - 5.00	26/10/2011
4592387	D5		1.50 - 2.50	26/10/2011
4592390	E8		1.00 - 2.00	26/10/2011
4592389	G4		3.00 - 4.00	26/10/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

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CERTIFICATE OF ANALYSIS

SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158055  
 Superseded Report:

Results Legend		Customer Sample R	A3	C7	D5	E8	G4
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.50 - 2.50	4.00 - 5.00	1.50 - 2.50	1.00 - 2.00	3.00 - 4.00
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Deviating sample.		26/10/2011	26/10/2011	26/10/2011	26/10/2011	26/10/2011
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011	26/10/2011	26/10/2011
diss.filt	Dissolved / filtered sample.		111028-6	111028-6	111028-6	111028-6	111028-6
tot.unfilt	Total / unfiltered sample.		4592388	4592385	4592387	4592390	4592389
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
Component	LOD/Units		Method				
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	9.66	77.8	10	36.1	10.7
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	12.4	100	12.9	46.4	13.8
Sulphide	<0.01 mg/l	TM101	<0.01	0.015	<0.01	<0.01	<0.01
Arsenic (diss.filt)	<0.12 µg/l	TM152	43.9	27	4.71	134	8.35
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	0.212	<0.1	0.247	<0.1
Chromium (diss.filt)	<0.22 µg/l	TM152	17.6	11.3	8.95	3.45	10.4
Copper (diss.filt)	<0.85 µg/l	TM152	1.3	2.57	<0.85	2.02	1.42
Lead (diss.filt)	<0.02 µg/l	TM152	0.094	0.398	0.188	0.295	0.304
Nickel (diss.filt)	<0.15 µg/l	TM152	5.73	4.9	3.9	26.9	5.47
Selenium (diss.filt)	<0.39 µg/l	TM152	4.36	24.1	2.92	18.5	10.8
Zinc (diss.filt)	<0.41 µg/l	TM152	0.757	2.63	1.63	35.5	4.46
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	0.0399	<0.01	0.0179	<0.01
Sulphate	<2 mg/l	TM184	325	<40	48.3	358	235
Cyanide, Total	<0.05 mg/l	TM227	0.335	0.541	0.057	6.45	0.117
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03	<0.03	<0.03	<0.03
pH	<1 pH Units	TM256	7.63	8.55	7.97	8	7.54
Resorcinol	<0.01 mg/l	TM259	<0.01	<0.05	<0.01	<0.1	<0.01
Catechol	<0.01 mg/l	TM259	<0.01	<0.05	<0.01	<0.1	<0.01
Phenol	<0.002 mg/l	TM259	<0.002	15.8	0.06	35.7	0.03
Cresols	<0.006 mg/l	TM259	0.01	36.5	0.62	63	0.31
Xylenols	<0.008 mg/l	TM259	<0.008	44.6	1.33	37.3	1.31
1-Naphthol	<0.01 mg/l	TM259	<0.01	<0.05	<0.01	<0.1	0.04
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	<0.015	<0.003	<0.03	<0.003
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006	21	0.45	14.3	1.13
Phenols, Total Detected 5 speciated	<0.025 mg/l	TM259	<0.025	118	2.46	150	2.78



SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158055  
 Superseded Report:

## PAH Spec MS - Aqueous (W)

Results Legend		Customer Sample R	A3	C7	D5	E8	G4	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.50 - 2.50 Water(GW/SW) 26/10/2011	4.00 - 5.00 Water(GW/SW) 26/10/2011	1.50 - 2.50 Water(GW/SW) 26/10/2011	1.00 - 2.00 Water(GW/SW) 26/10/2011	3.00 - 4.00 Water(GW/SW) 26/10/2011	
M	mCERTS accredited.							
S	Deviating sample.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units							Method
Naphthalene (aq)	<0.1 µg/l	TM178	0.157	6970	7.82	2560	2.53	#
Acenaphthene (aq)	<0.015 µg/l	TM178	1.15	31.6	3.24	14.8	30.5	#
Acenaphthylene (aq)	<0.011 µg/l	TM178	1.14	245	13	96.4	56.7	#
Fluoranthene (aq)	<0.017 µg/l	TM178	3.04	59.5	63.6	7.39	12.7	#
Anthracene (aq)	<0.015 µg/l	TM178	0.674	32.9	5.19	7.65	7.5	#
Phenanthrene (aq)	<0.022 µg/l	TM178	0.902	142	14.7	30.3	7.78	#
Fluorene (aq)	<0.014 µg/l	TM178	0.535	90.9	4.45	33.4	38.3	#
Chrysene (aq)	<0.013 µg/l	TM178	1.46	17.6	38	1.11	1.02	#
Pyrene (aq)	<0.015 µg/l	TM178	9.76	42	50.2	4.66	7.51	#
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	1.54	12.1	29.6	1.16	1.09	#
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	1.05	<11.5	43.3	<1.15	0.189	#
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	2.04	<13.5	41.5	<1.35	0.342	#
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	3.19	9.86	44.3	<0.45	0.247	#
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.229	<8	6.05	<0.8	<0.08	#
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	1.17	<8	25.5	<0.8	<0.08	#
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.976	<7	22.4	<0.7	<0.07	#
PAH, Total Detected USEPA 16 (aq)	<0.247 µg/l	TM178	29	7680	413	2760	167	

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SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158055  
 Superseded Report:

TPH CWG (W)

Results Legend			Customer Sample R				
#	ISO17025 accredited.		A3	C7	D5	E8	G4
M	mCERTS accredited.						
S	Deviating sample.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
		Depth (m)	1.50 - 2.50	4.00 - 5.00	1.50 - 2.50	1.00 - 2.00	3.00 - 4.00
		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
		Date Sampled	26/10/2011	26/10/2011	26/10/2011	26/10/2011	26/10/2011
		Date Received	26/10/2011	26/10/2011	26/10/2011	26/10/2011	26/10/2011
		SDG Ref	111028-6	111028-6	111028-6	111028-6	111028-6
		Lab Sample No.(s)	4592388	4592385	4592387	4592390	4592389
		AGS Reference					
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM245	88	99	93	102	93
GRO >C5-C12	<50 µg/l	TM245	2530	41000	429	14600	9630
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<15	<3	<6	<3
Benzene	<7 µg/l	TM245	564	16200	159	6190	<7
Toluene	<4 µg/l	TM245	27	7570	63	1770	1510
Ethylbenzene	<5 µg/l	TM245	230	294	13	76	181
m,p-Xylene	<8 µg/l	TM245	54	2090	14	624	1120
o-Xylene	<3 µg/l	TM245	59	817	18	252	450
Sum of detected Xylenes	<11 µg/l	TM245	113	2910	32	876	1570
Sum of detected BTEX	<28 µg/l	TM245	934	27000	267	8910	3260
Aliphatics >C5-C6	<10 µg/l	TM245	<10	104	<10	50	11
Aliphatics >C6-C8	<10 µg/l	TM245	56	522	>10	332	2030
Aliphatics >C8-C10	<10 µg/l	TM245	168	1720	16	668	598
Aliphatics >C10-C12	<10 µg/l	TM245	749	6320	77	2490	2000
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	26	23	12	<10
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	25	95	28	<10
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	44	427	21	<10
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	95	545	61	<10
Aromatics >EC5-EC7	<10 µg/l	TM245	564	16200	159	6190	<10
Aromatics >EC7-EC8	<10 µg/l	TM245	27	7570	63	1770	1510
Aromatics >EC8-EC10	<10 µg/l	TM245	455	4350	56	1400	2150
Aromatics >EC10-EC12	<10 µg/l	TM245	500	4210	51	1660	1330
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	274	16600	409	6400	1270
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	132	1560	289	557	425
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	42	519	1120	156	101
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	448	18700	1820	7120	1800
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	2970	59700	2790	21700	11400

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## CERTIFICATE OF ANALYSIS

SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 470000740  
 Report Number: 158055  
 Superseded Report:

## VOC MS (W)

Results Legend		Customer Sample R	A3	C7	G4			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.50 - 2.50	4.00 - 5.00	3.00 - 4.00			
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
S	Deviating sample.		26/10/2011	26/10/2011	26/10/2011			
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011			
diss.filt	Dissolved / filtered sample.		111028-6	111028-6	111028-6			
tot.unfilt	Total / unfiltered sample.		4592388	4592385	4592389			
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
Dibromofluoromethane**	%	TM208	107	104	104			
Toluene-d8**	%	TM208	98.8	95.1	98.8			
4-Bromofluorobenzene**	%	TM208	95.3	78.6	92.7			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1			
Chloromethane	<1 µg/l	TM208	<1	<1	<1			
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1			
Bromomethane	<1 µg/l	TM208	<1	<1	<1			
Chloroethane	<1 µg/l	TM208	<1	<1	<1			
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1			
Dichloromethane	<3 µg/l	TM208	<3	<3	<3			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1			
Chloroform	<1 µg/l	TM208	<1	<1	<1			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1			
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1			
Benzene	<1 µg/l	TM208	627	21100	2090			
Trichloroethene	<1 µg/l	TM208	<1	<1	<1			
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Dibromomethane	<1 µg/l	TM208	<1	<1	<1			
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
Toluene	<1 µg/l	TM208	26.9	9370	1640			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1			
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Tetrachloroethene	<1 µg/l	TM208	<1	<1	<1			
Dibromochloromethane	<1 µg/l	TM208	<1	<1	<1			

SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158055  
 Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R	A3	C7	G4			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.50 - 2.50	4.00 - 5.00	3.00 - 4.00			
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
S	Deviating sample.		26/10/2011	26/10/2011	26/10/2011			
aq	Aqueous / settled sample.		26/10/2011	26/10/2011	26/10/2011			
diss.filt	Dissolved / filtered sample.		111028-6	111028-6	111028-6			
tot.unfilt	Total / unfiltered sample.		4592388	4592385	4592389			
tot.unfilt	Subcontracted test.							
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
**	Trigger breach confirmed							
(F)								
Component	LOD/Units	Method						
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
Chlorobenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
Ethylbenzene	<1 µg/l	TM208	234	327	172			
			§ #	§ #	§ #			
m,p-Xylene	<1 µg/l	TM208	52.3	2400	1230			
			§ #	#	#			
o-Xylene	<1 µg/l	TM208	60.9	979	482			
			§ #	#	§ #			
Styrene	<1 µg/l	TM208	<1	464	<1			
			§ #	§ #	§ #			
Bromoform	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
Isopropylbenzene	<1 µg/l	TM208	18.2	13.5	12			
			§ #	§ #	§ #			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1			
			§	§	§			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
Bromobenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
Propylbenzene	<1 µg/l	TM208	15.9	17.1	11.2			
			§ #	§ #	§ #			
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	5.87	98.4	89.6			
			§ #	§ #	§ #			
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	22.9	237	227			
			§ #	§ #	§ #			
sec-Butylbenzene	<1 µg/l	TM208	1.63	<1	<1			
			§ #	§ #	§ #			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	7.46	<1			
			§ #	§ #	§ #			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
n-Butylbenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
			§	§	§			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	<1			
			§	§	§			
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
Naphthalene	<1 µg/l	TM208	237	9940	3110			
			§ #	#	#			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
			§ #	§ #	§ #			
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
			§	§	§			

SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 470000740  
 Report Number: 158055  
 Superseded Report:

## Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4604538	A3	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,1,1,2-Tetrachloroethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,1,1-Trichloroethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,1,2,2-Tetrachloroethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,1,2-Trichloroethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,1-Dichloroethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,1-Dichloroethene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,1-Dichloropropene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2,3-Trichlorobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2,3-Trichloropropane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2,4-Trichlorobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2,4-Trimethylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2-Dibromo-3-chloropropane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2-Dibromoethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2-Dichlorobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2-Dichloroethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,2-Dichloropropane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,3,5-Trichlorobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,3,5-Trimethylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,3-Dichlorobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,3-Dichloropropane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	1,4-Dichlorobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	2,2-Dichloropropane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	2-Chlorotoluene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	4-Bromofluorobenzene**	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	4-Chlorotoluene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	4-iso-Propyltoluene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Benzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Bromobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Bromochloromethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Bromodichloromethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Bromoform	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Bromomethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Carbon disulphide	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Carbontetrachloride	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Chlorobenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Chloroethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Chloroform	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Chloromethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	cis-1,2-Dichloroethene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	cis-1,3-Dichloropropene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Dibromochloromethane	Volatile container not received



## CERTIFICATE OF ANALYSIS

**SDG:** 111028-6  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158055  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Dibromofluoromethane**	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Dibromomethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Dichlorodifluoromethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Dichloromethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Ethylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Hexachlorobutadiene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Isopropylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	m,p-Xylene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Naphthalene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	n-Butylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	o-Xylene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Propylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	sec-Butylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Styrene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	tert-Amyl methyl ether (TAME)	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	tert-Butylbenzene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Tetrachloroethene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Toluene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Toluene-d8**	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	trans-1,2-Dichloroethene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	trans-1,3-Dichloropropene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Trichloroethene	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Tetrachlorofluoromethane	Volatile container not received
4604544	A3	1.50 - 2.50	LIQUID	VOC MS (W)	Vinyl chloride	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,1,1,2-Tetrachloroethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,1,1-Trichloroethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,1,2,2-Tetrachloroethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,1,2-Trichloroethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,1-Dichloroethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,1-Dichloroethene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,1-Dichloropropene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2,3-Trichlorobenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2,3-Trichloropropane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2,4-Trichlorobenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2,4-Trimethylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2-Dibromo-3-chloropropane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2-Dibromoethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2-Dichlorobenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2-Dichloroethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,2-Dichloropropane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,3,5-Trichlorobenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,3,5-Trimethylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,3-Dichlorobenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,3-Dichloropropane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	1,4-Dichlorobenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	2,2-Dichloropropane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	2-Chlorotoluene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	4-Bromofluorobenzene**	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	4-Chlorotoluene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	4-iso-Propyltoluene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Benzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Bromobenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Bromochloromethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Bromodichloromethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Bromoform	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Bromomethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Carbon disulphide	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Carbontetrachloride	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Chlorobenzene	Volatile container not received

Consent of Client/owner required for any other use.  
 This inspection purposes only.

CERTIFICATE OF ANALYSIS

**SDG:** 111028-6  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158055  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Chloroethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Chloroform	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Chloromethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	cis-1,2-Dichloroethene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	cis-1,3-Dichloropropene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Dibromochloromethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Dibromofluoromethane**	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Dibromomethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Dichlorodifluoromethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Dichloromethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Ethylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Hexachlorobutadiene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Isopropylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	m,p-Xylene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Naphthalene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	n-Butylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	o-Xylene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Propylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	sec-Butylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Styrene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	tert-Amyl methyl ether (TAME)	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	tert-Butylbenzene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	tetrachloroethene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Toluene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Toluene-d8**	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	trans-1,2-Dichloroethene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	trans-1,3-Dichloropropene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Trichloroethene	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Trichlorofluoromethane	Volatile container not received
4604550	C7	4.00 - 5.00	LIQUID	VOC MS (W)	Vinyl chloride	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4604557	D5	1.50 - 2.50	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C10-C12	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C5-C6	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C6-C8	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aliphatics >C8-C10	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC10-EC12	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC5-EC7	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC7-EC8	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Aromatics >EC8-EC10	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Benzene	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Ethylbenzene	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Volatile container not received

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CERTIFICATE OF ANALYSIS

**SDG:** 111028-6  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158055  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	GRO Surrogate % recovery**	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	m,p-Xylene	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	o-Xylene	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Volatile container not received
4604561	G4	3.00 - 4.00	LIQUID	GRO by GC-FID (W)	Toluene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,1,2-Tetrachloroethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,1-Trichloroethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,2,2-Tetrachloroethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,1,2-Trichloroethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,1-Dichloroethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,1-Dichloroethene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,1-Dichloropropene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,3-Trichlorobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,3-Trichloropropane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,4-Trichlorobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2,4-Trimethylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dibromo-3-chloropropane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dibromoethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dichlorobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dichloroethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,2-Dichloropropane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,3,5-Trichlorobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,3,5-Trimethylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,3-Dichlorobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,3-Dichloropropane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	1,4-Dichlorobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	2,2-Dichloropropane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	2-Chlorotoluene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	4-Bromofluorobenzene**	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	4-Chlorotoluene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	4-iso-Propyltoluene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Benzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Bromobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Bromochloromethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Bromodichloromethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Bromoform	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Bromomethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Carbon disulphide	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Carbontetrachloride	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Chlorobenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Chloroethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Chloroform	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Chloromethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	cis-1,2-Dichloroethene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	cis-1,3-Dichloropropene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Dibromochloromethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Dibromofluoromethane**	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Dibromomethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Dichlorodifluoromethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Dichloromethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Ethylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Hexachlorobutadiene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Isopropylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	m,p-Xylene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Naphthalene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	n-Butylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	o-Xylene	Volatile container not received

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## CERTIFICATE OF ANALYSIS

Validated

**SDG:** 111028-6  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158055  
**Superseded Report:**

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Propylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	sec-Butylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Styrene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	tert-Amyl methyl ether (TAME)	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	tert-Butylbenzene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Tetrachloroethene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Toluene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Toluene-d8**	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	trans-1,2-Dichloroethene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	trans-1,3-Dichloropropene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Trichloroethene	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Trichlorofluoromethane	Volatile container not received
4604565	G4	3.00 - 4.00	LIQUID	VOC MS (W)	Vinyl chloride	Volatile container not received

Note : Test results may be compromised

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SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158055  
 Superseded Report:

### Table of Results - Appendix

**REPORT KEY**

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10<sup>-7</sup>

<b>NDP</b>	No Determination Possible	<b>#</b>	ISO 17025 Accredited	*	Subcontracted Test	<b>M</b>	MCERTS Accredited
<b>NFD</b>	No Fibres Detected	<b>PFD</b>	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	<b>EC</b>	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 <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part 2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of DRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

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**SDG:** 111028-6  
**Job:** D\_MOUCHEL\_ELE-1  
**Client Reference:**

**Location:** Limerick Gasworks  
**Customer:** Mouchel  
**Attention:** Neil Balderstone

**Order Number:** 4700000740  
**Report Number:** 158055  
**Superseded Report:**

### Test Completion Dates

Lab Sample No(s)	4592388	4592385	4592387	4592390	4592389
Customer Sample Ref.	A3	C7	D5	E8	G4
AGS Ref.					
Depth	1.50 - 2.50	4.00 - 5.00	1.50 - 2.50	1.00 - 2.00	3.00 - 4.00
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Anions by Kone (w)	02-Nov-2011	03-Nov-2011	02-Nov-2011	02-Nov-2011	02-Nov-2011
Cyanide Comp/Free/Total/Thiocyanate	31-Oct-2011	01-Nov-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Dissolved Metals by ICP-MS	01-Nov-2011	02-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
EPH CWG (Aliphatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
EPH CWG (Aromatic) Aqueous GC (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
GRO by GC-FID (W)	30-Oct-2011	31-Oct-2011	03-Nov-2011	31-Oct-2011	03-Nov-2011
Hexavalent Chromium (w)	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
Mercury Dissolved	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
PAH Spec MS - Aqueous (W)	03-Nov-2011	04-Nov-2011	03-Nov-2011	04-Nov-2011	04-Nov-2011
pH Value	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011	31-Oct-2011
Phenols by HPLC (W)	01-Nov-2011	01-Nov-2011	01-Nov-2011	03-Nov-2011	01-Nov-2011
Sulphide	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011	01-Nov-2011
TPH CWG (W)	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011	04-Nov-2011
VOC MS (W)	02-Nov-2011	02-Nov-2011			02-Nov-2011

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SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

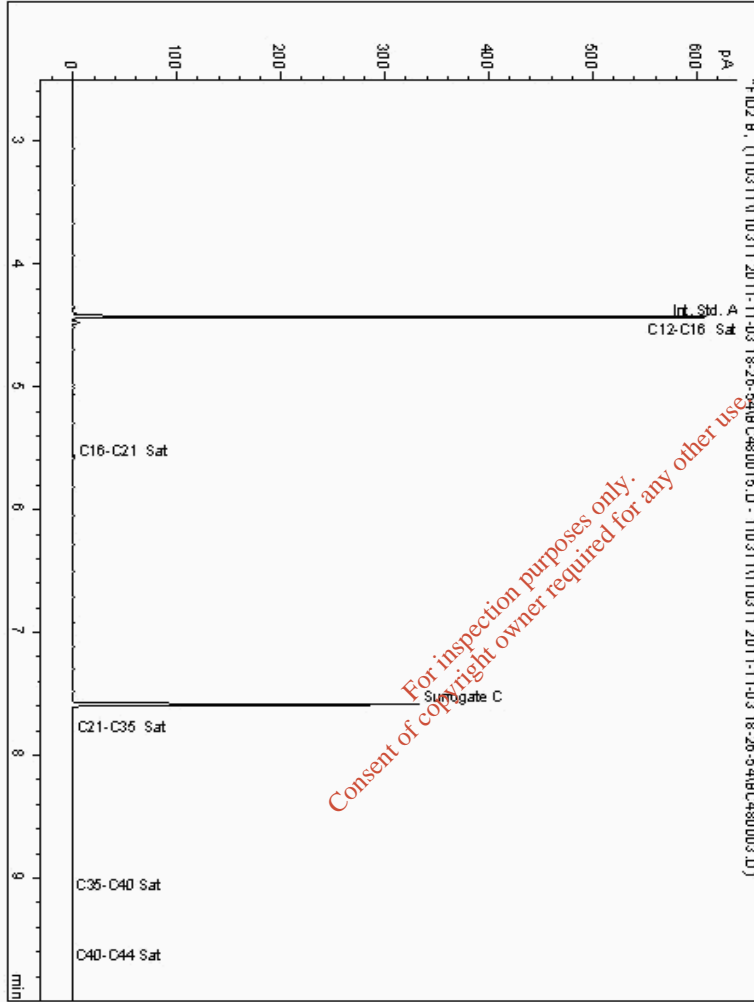
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4600379  
Sample ID : C7

Depth : 4.00 - 5.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552697-4600379  
Date Acquired : 03/11/11 22:50:25  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

# Chromatogram

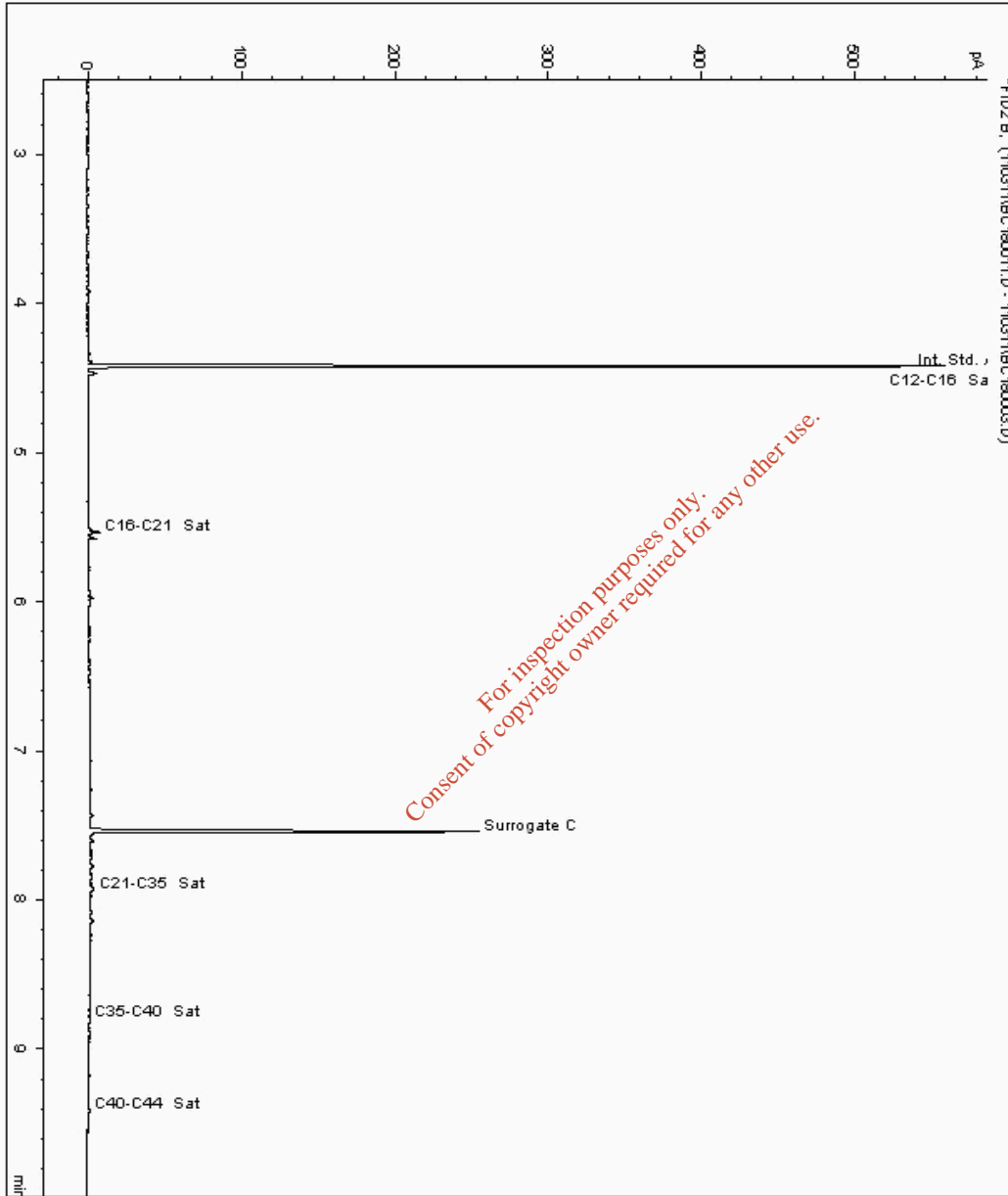
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4601486  
Sample ID : D5

Depth : 1.50 - 2.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552731-4601486  
Date Acquired : 03/11/2011 21:34:32 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

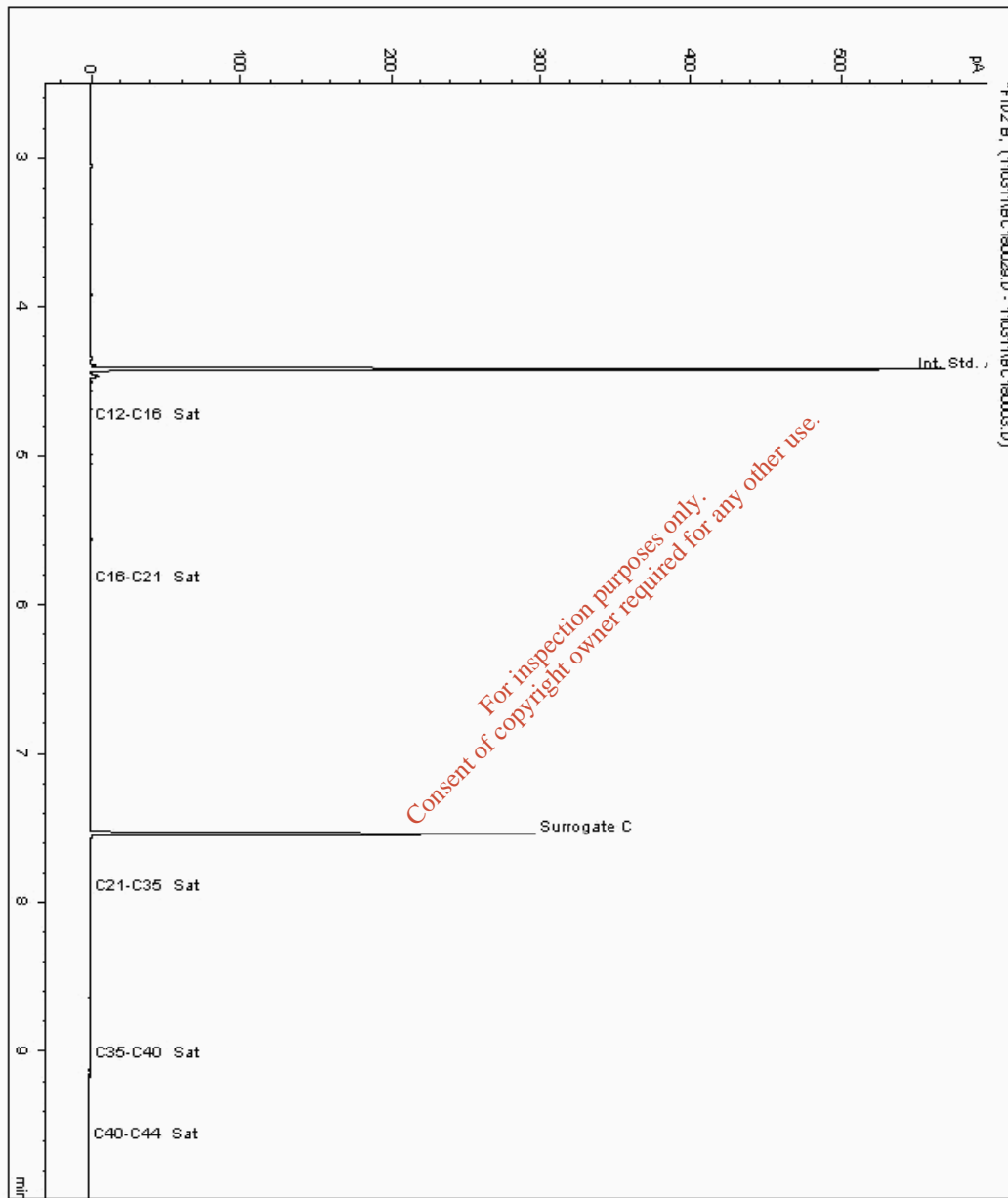
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4601543  
Sample ID : G4

Depth : 3.00 - 4.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552762-4601543  
Date Acquired : 04/11/2011 02:49:31 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

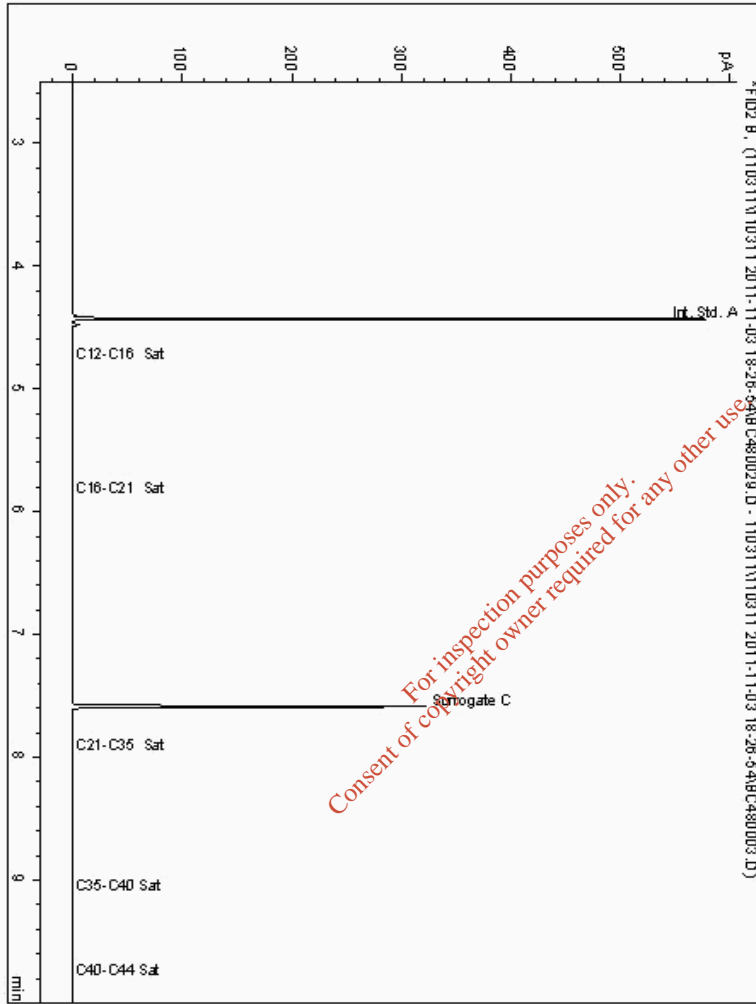
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4601600  
Sample ID : A3

Depth : 1.50 - 2.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552746-4601600  
Date Acquired : 04/11/11 02:41:49  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

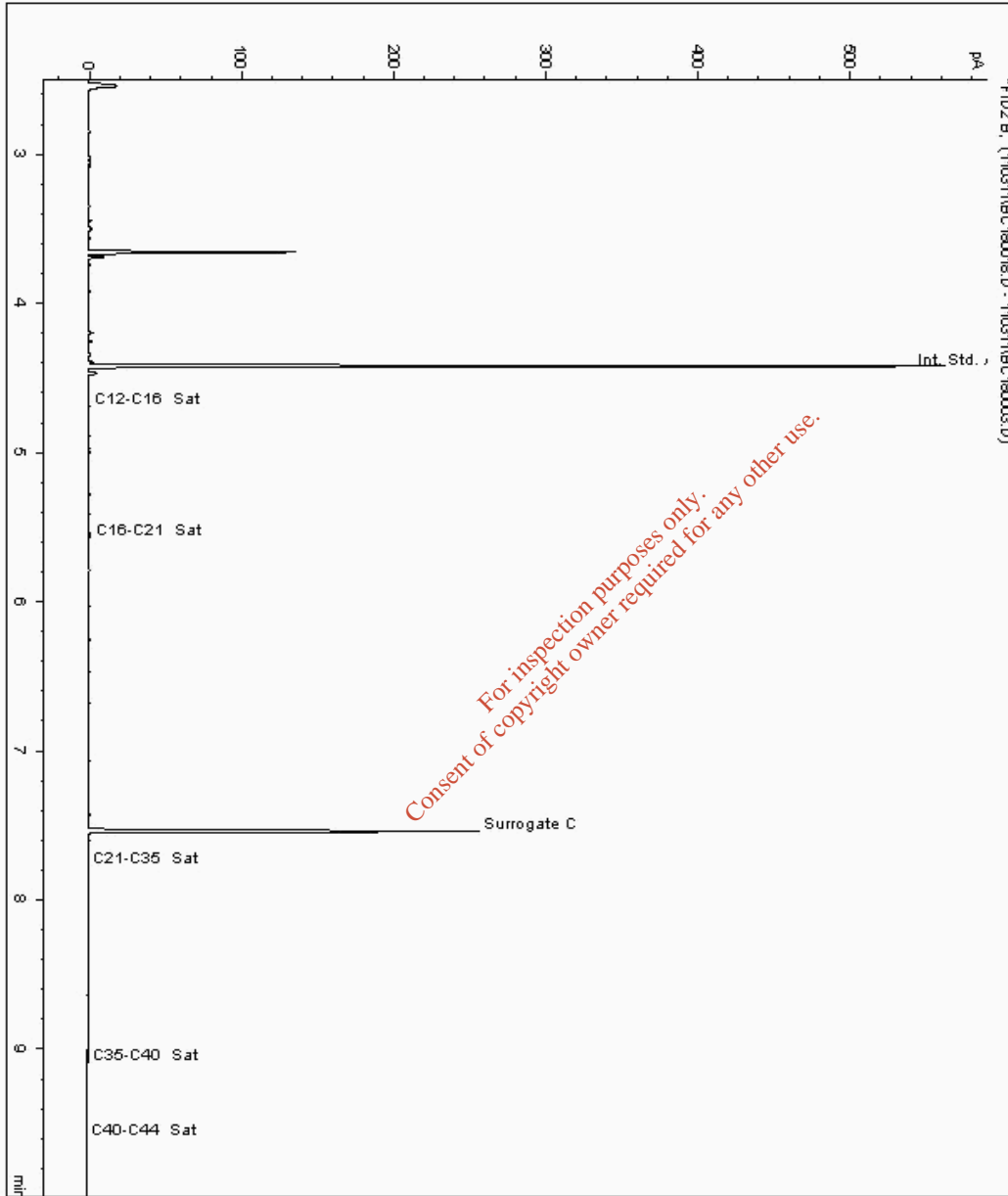
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 4601680  
Sample ID : E8

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 4552778-4601680  
Date Acquired : 03/11/2011 23:30:23 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





### CERTIFICATE OF ANALYSIS

SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

## Chromatogram

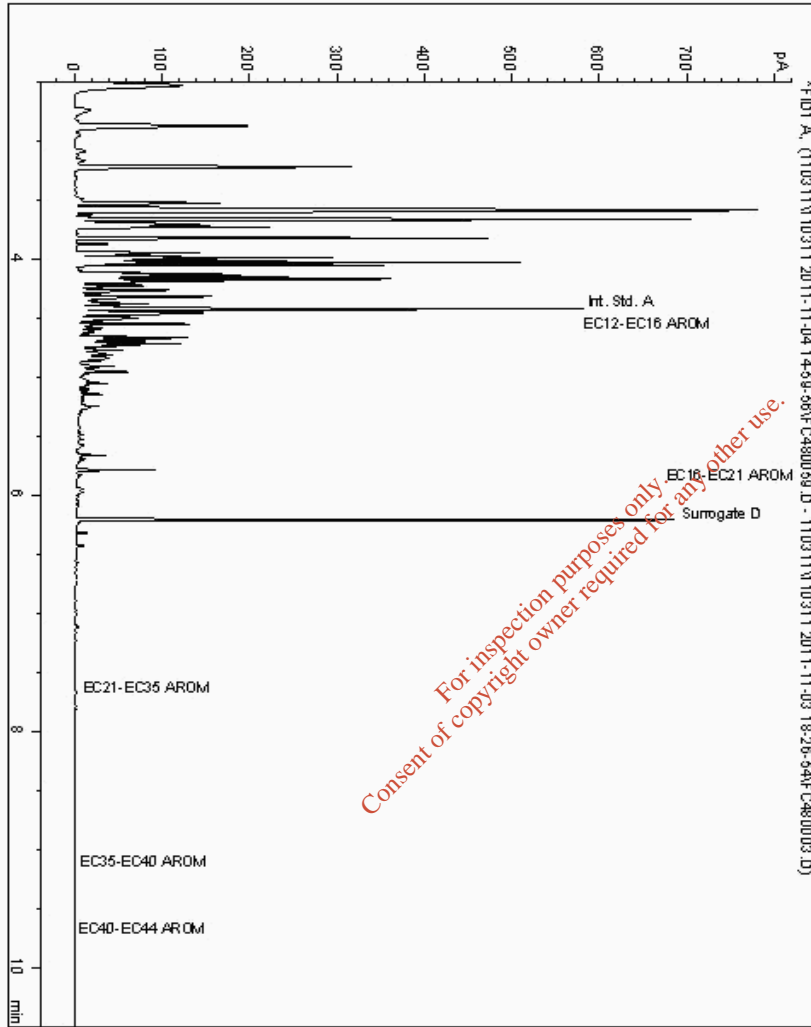
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4600379  
Sample ID : C7

Depth : 4.00 - 5.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552698-4600379  
Date Acquired : 04/11/11 15:03:16  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.042





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

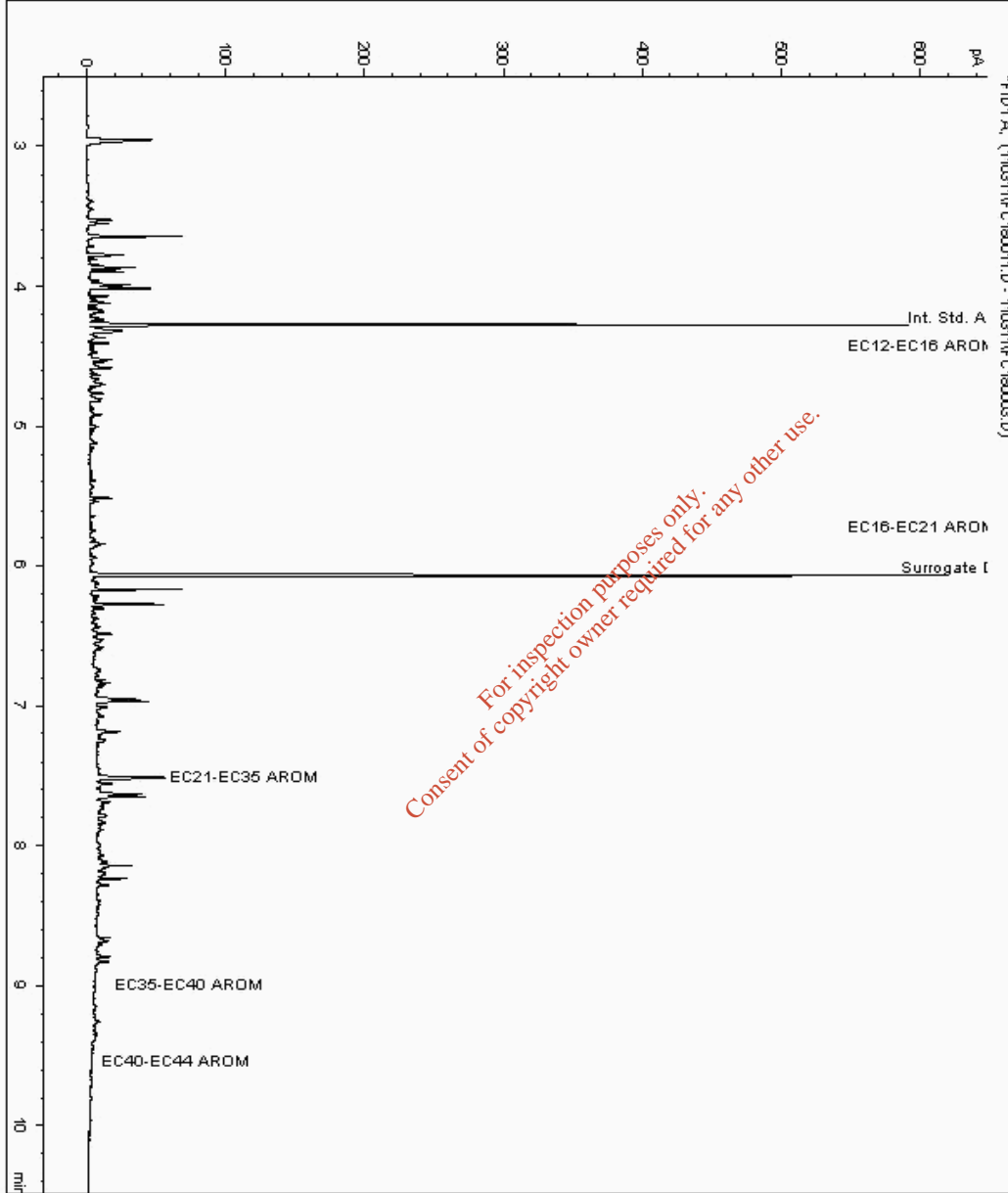
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4601486  
Sample ID : D5

Depth : 1.50 - 2.50

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552732-4601486  
Date Acquired : 03/11/2011 21:34:32 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008







SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

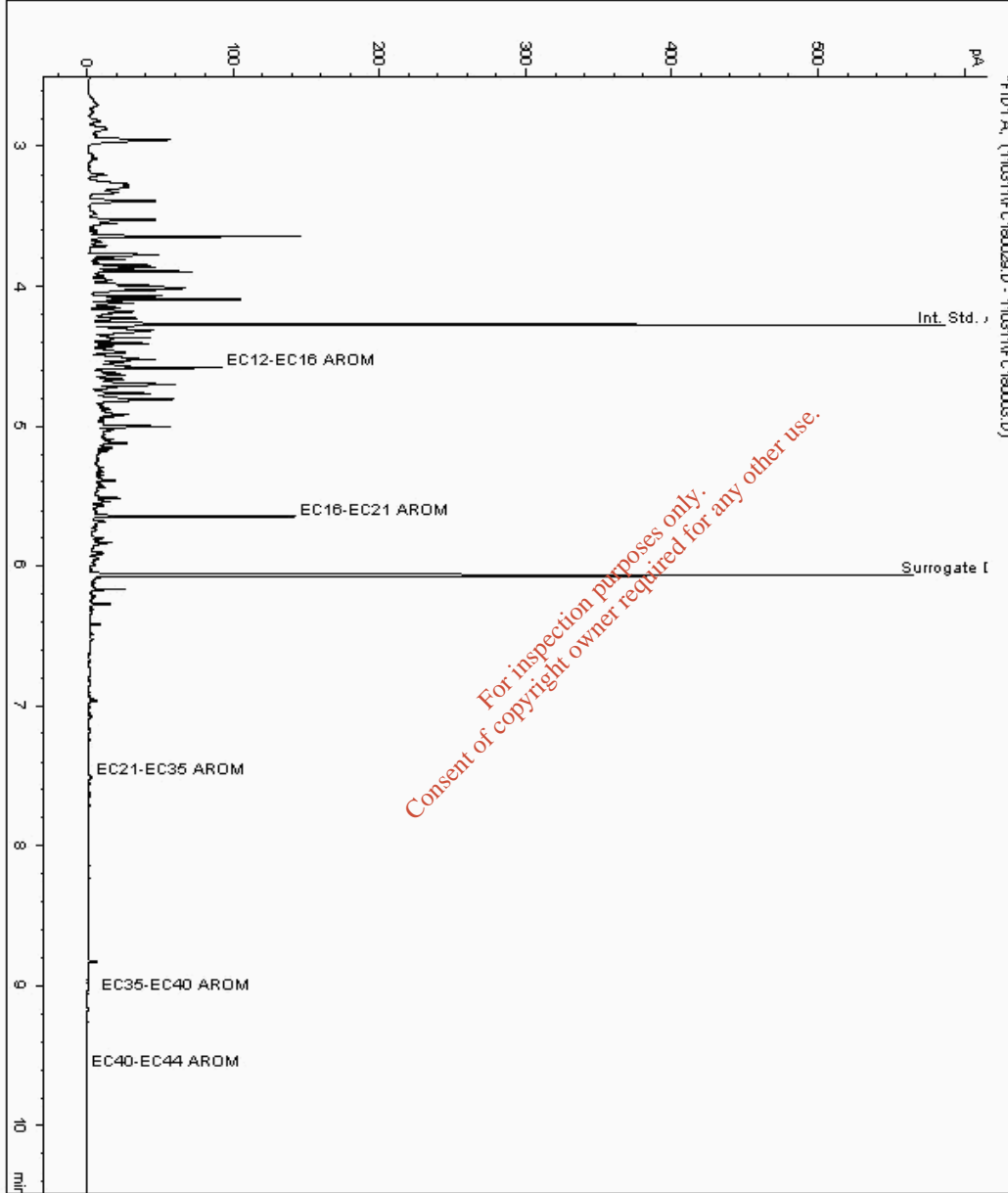
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4601543  
Sample ID : G4

Depth : 3.00 - 4.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552763-4601543  
Date Acquired : 04/11/2011 02:49:31 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.008





CERTIFICATE OF ANALYSIS

SDG: 111028-6
Job: D\_MOUCHEL\_ELE-1
Client Reference:

Location: Limerick Gasworks
Customer: Mouchel
Attention: Neil Balderstone

Order Number: 4700000740
Report Number: 158055
Superseded Report:

Chromatogram

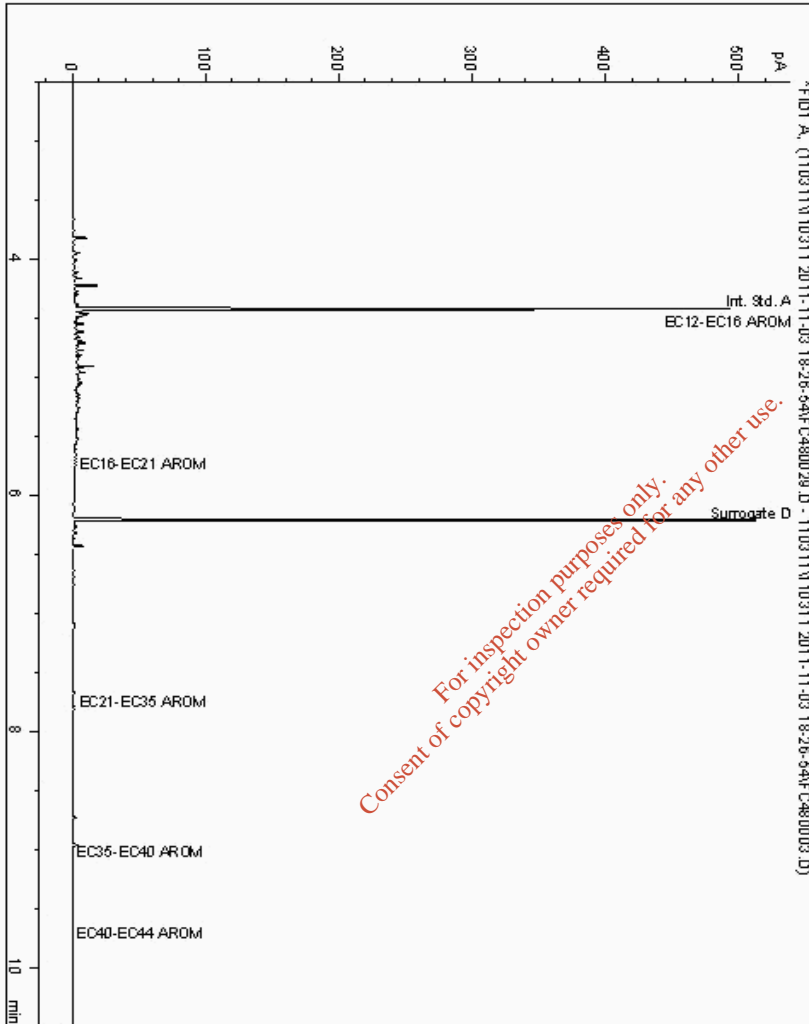
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4601600
Sample ID : A3

Depth : 1.50 - 2.50

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552747-4601600
Date Acquired : 04/11/11 02:41:49
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008





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Job: D\_MOUCHEL\_ELE-1  
Client Reference:

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Attention: Neil Balderstone

Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

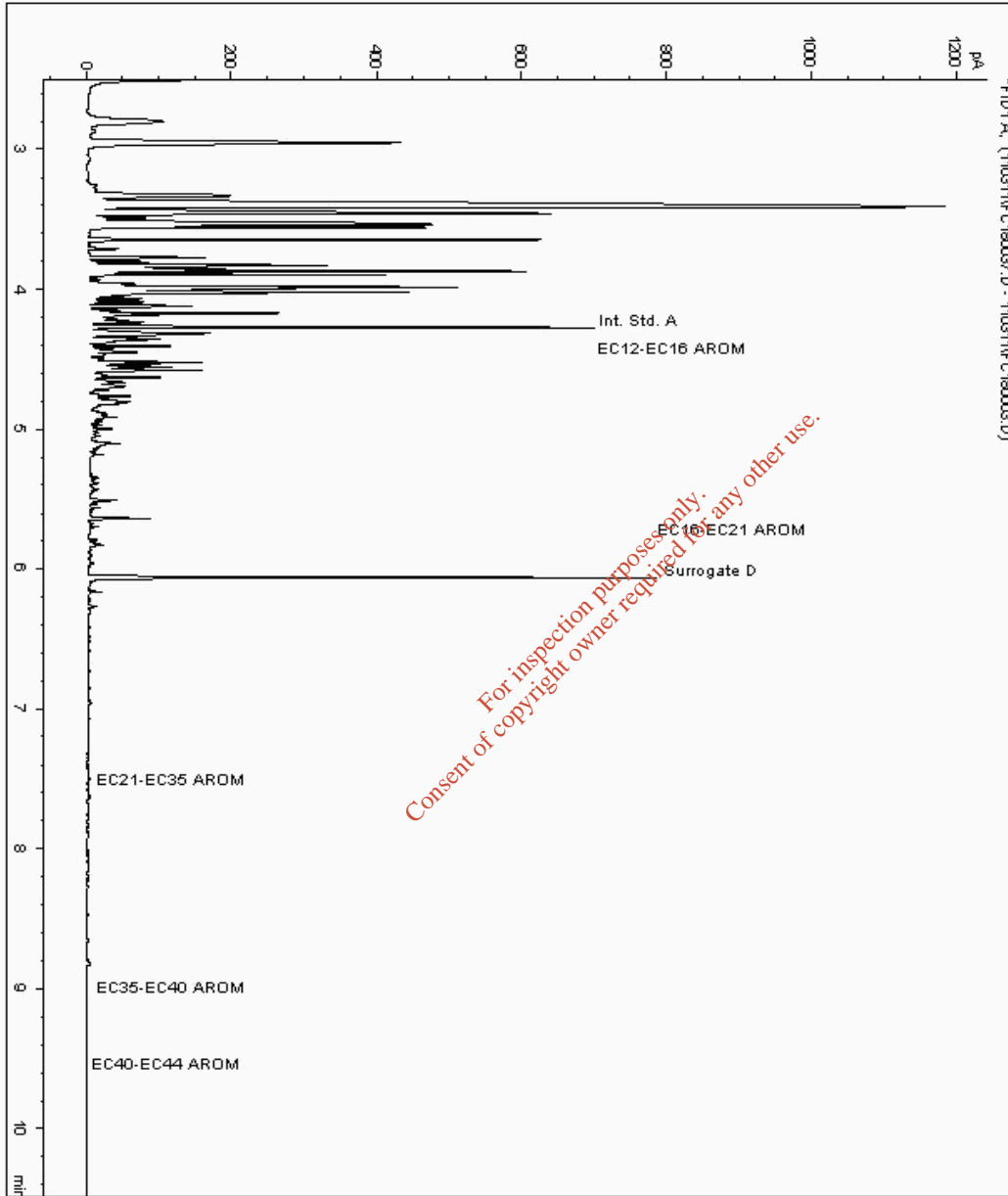
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 4601680  
Sample ID : E8

Depth : 1.00 - 2.00

Alcontrol/Geochem Analytical Services  
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 4552779-4601680  
Date Acquired : 04/11/2011 14:43:40 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.017



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SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

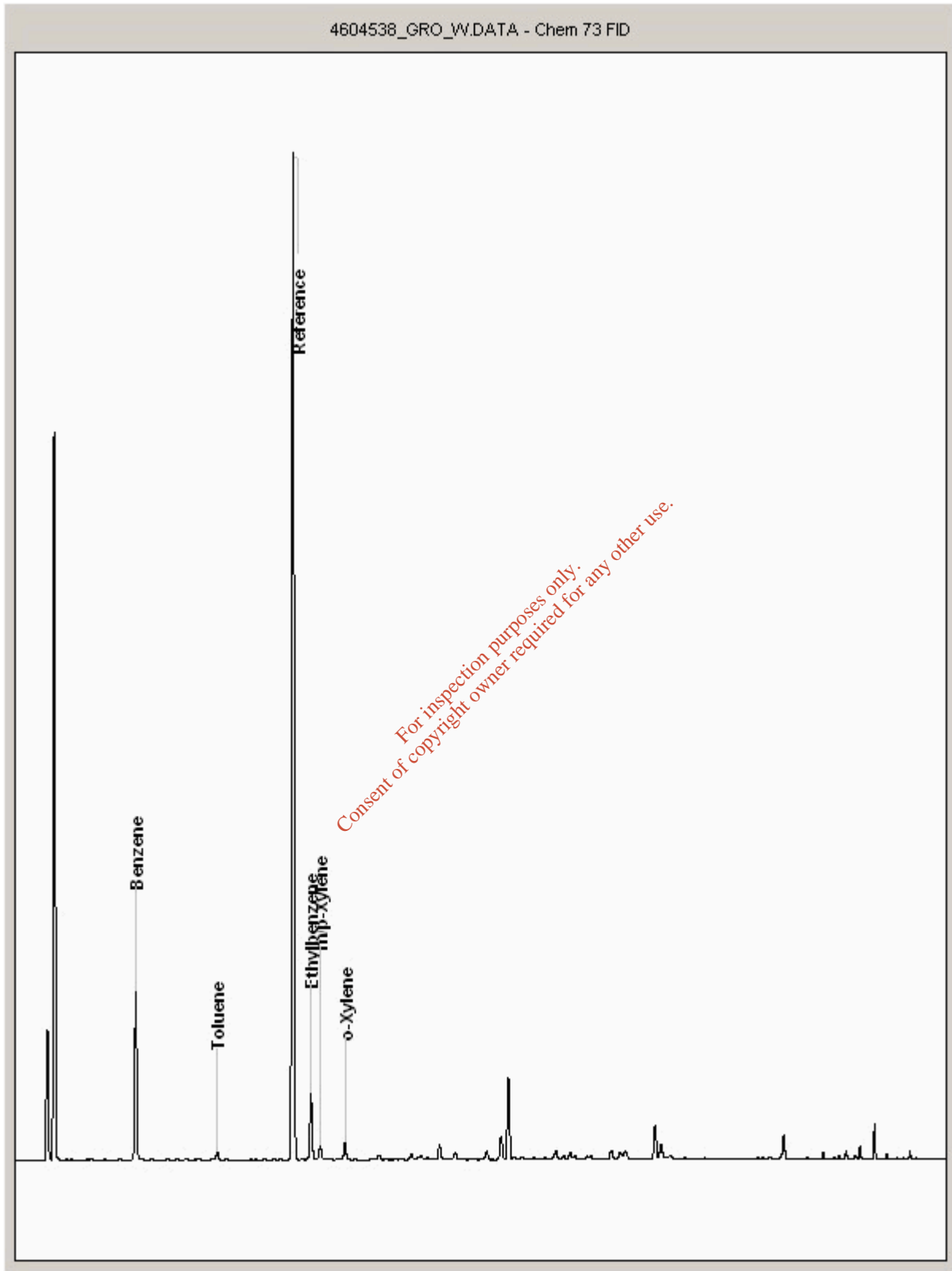
Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

# Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4604538  
Sample ID : A3

Depth : 1.50 - 2.50





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

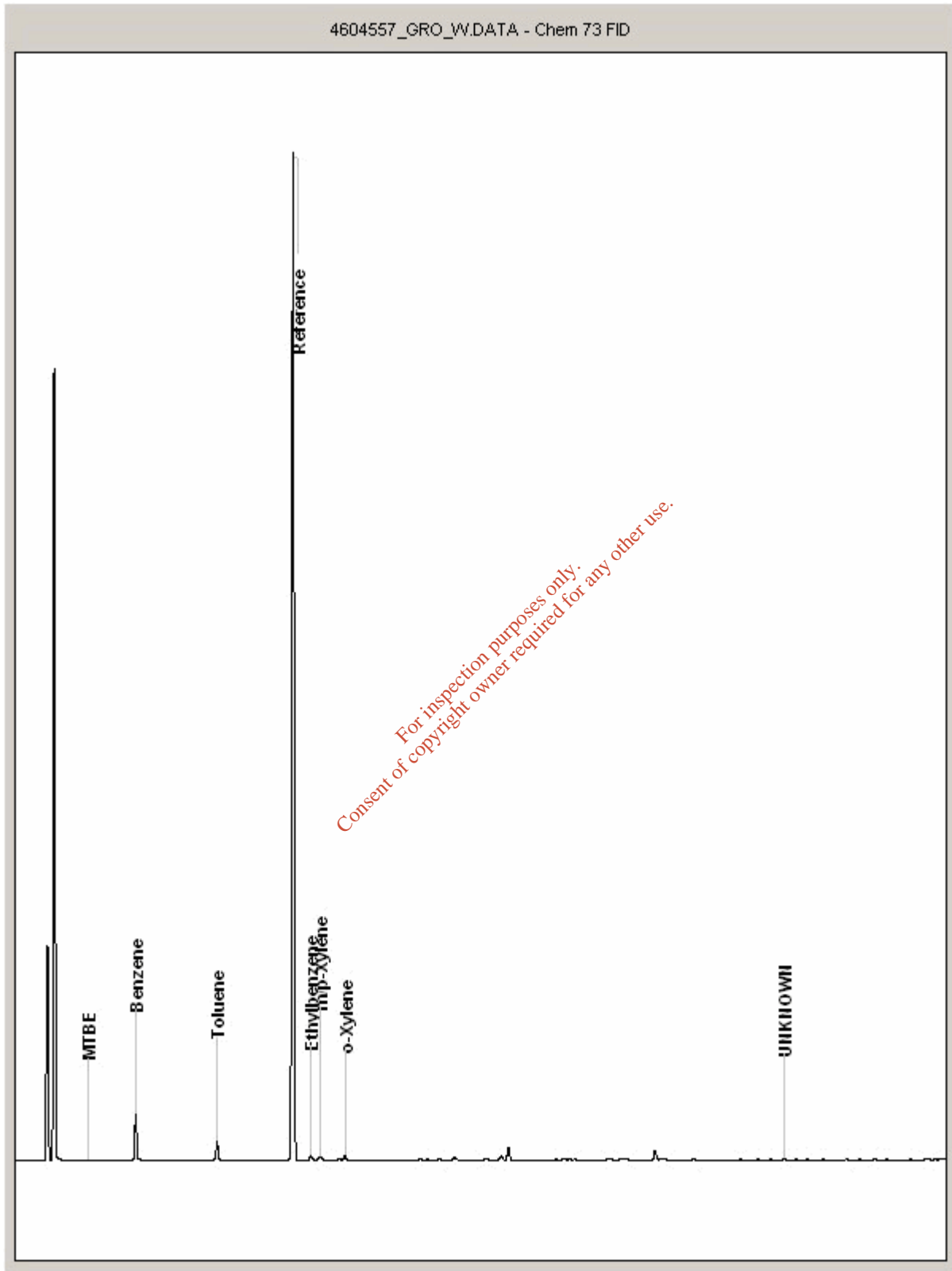
Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4604557  
Sample ID : D5

Depth : 1.50 - 2.50





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

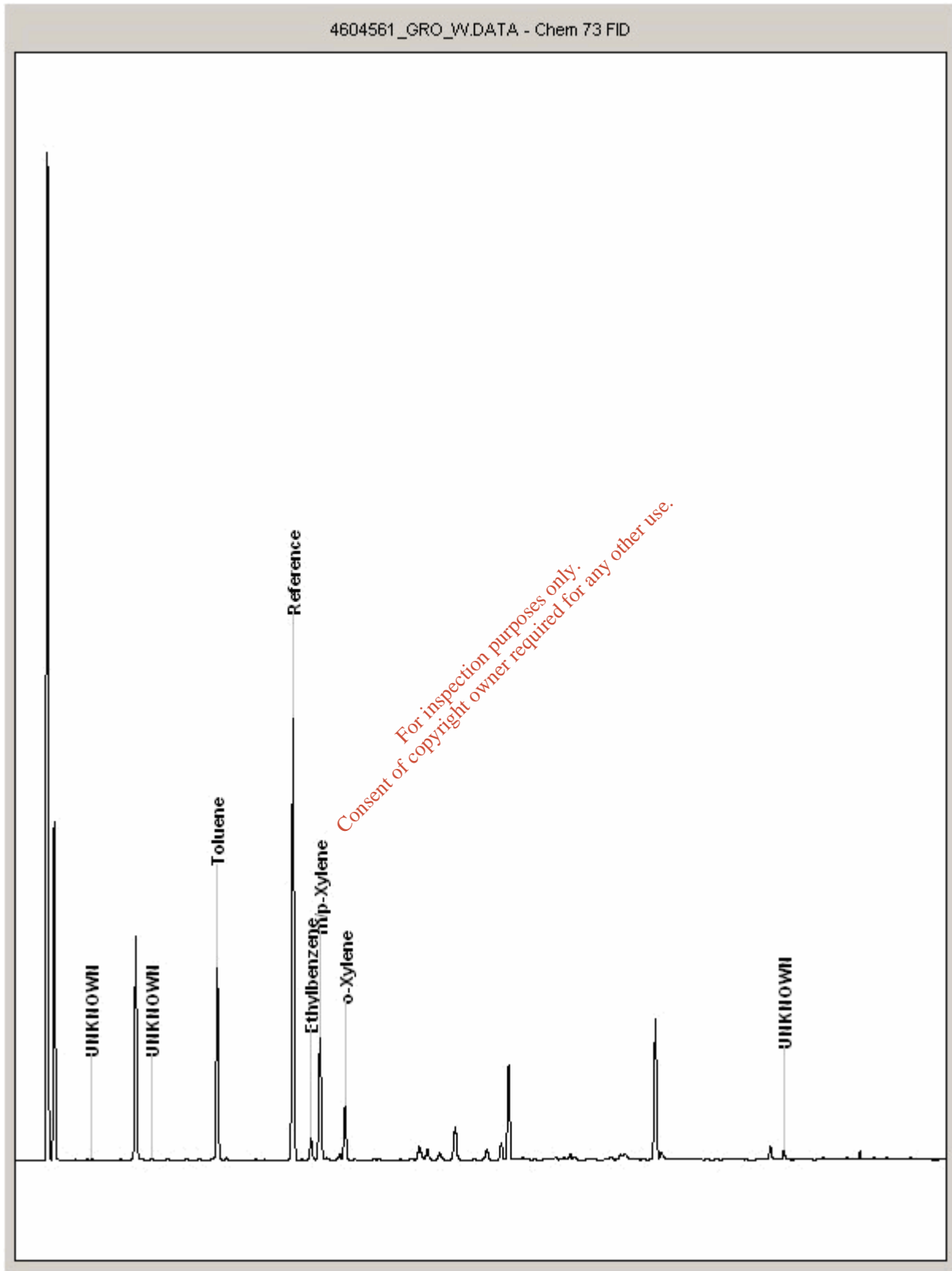
Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

# Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4604561  
Sample ID : G4

Depth : 3.00 - 4.00





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

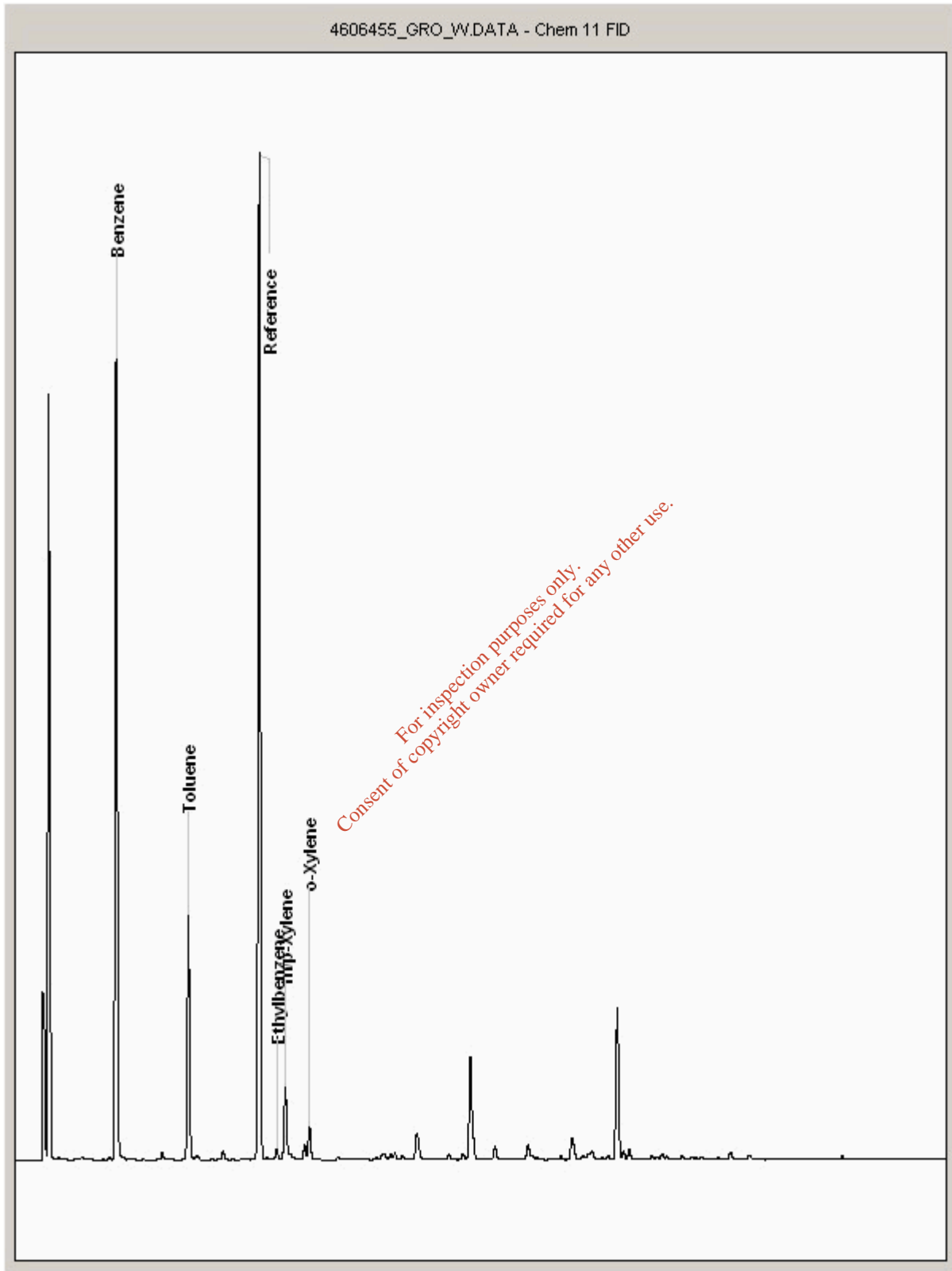
Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4606455  
Sample ID : E8

Depth : 1.00 - 2.00





SDG: 111028-6  
Job: D\_MOUCHEL\_ELE-1  
Client Reference:

Location: Limerick Gasworks  
Customer: Mouchel  
Attention: Neil Balderstone

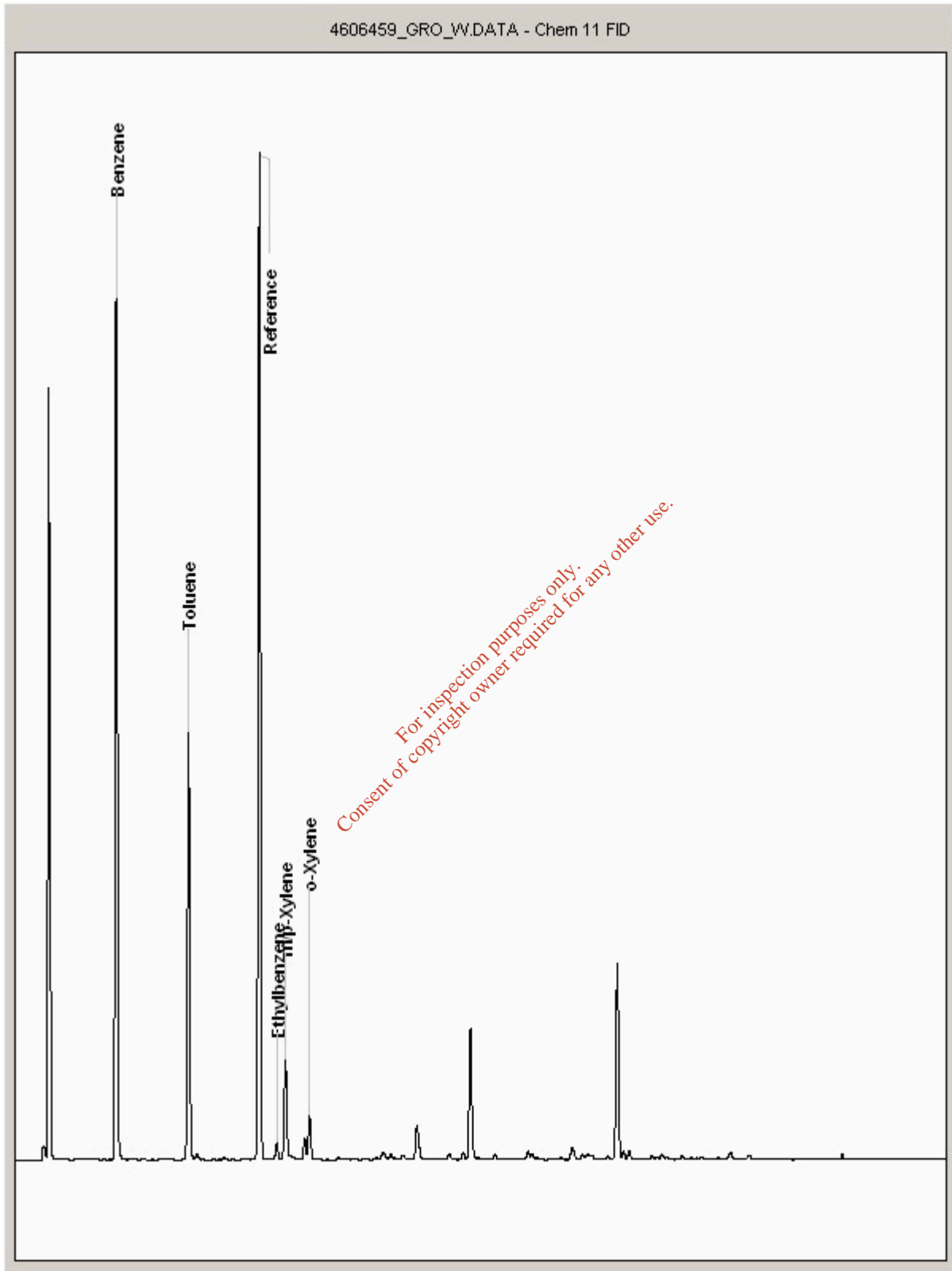
Order Number: 4700000740  
Report Number: 158055  
Superseded Report:

### Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 4606459  
Sample ID : C7

Depth : 4.00 - 5.00





SDG: 111028-6  
 Job: D\_MOUCHEL\_ELE-1  
 Client Reference:

Location: Limerick Gasworks  
 Customer: Mouchel  
 Attention: Neil Balderstone

Order Number: 4700000740  
 Report Number: 158055  
 Superseded Report:

## 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 asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). If asbestos is present either as asbestos containing material or loose fibres no further analysis will be undertaken. The quantity of asbestos present is not determined unless specifically requested.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery 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. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. 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).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

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.

SOLID MATRICES EXTRACTION SUMMARY				
ANALYSIS	DC OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENTEXTRACTABLE MATTER	D&C	DCM	SOX THERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOX THERM	GRAVIMETRIC
ELEMENTAL SULPHUR	D&C	DCM	SOX THERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOX THERM	GCMS
HERBICIDES	D&C	HEXANE/ACETONE	SOX THERM	GCMS
PESTICIDES	D&C	HEXANE/ACETONE	SOX THERM	GCMS
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 CWGBY GC	D&C	HEXANE/ACETONE	END OVER END	GC-FID
PCBTOT/PCBCON	D&C	HEXANE/ACETONE	END OVER END	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TM218.	GCMS
C8-C40 (C6-C40) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GC-EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE/ACETONE	SHAKER	GC-EZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DOM/ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY			
ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
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)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DCM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST CO/OPP	DCM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GCMS
TRH by INFRARED (R)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by R	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

**Identification of Asbestos in Bulk Materials & Soils**

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

**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 HSG 264.

The identification of asbestos containing materials and soils 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.

ANALYSIS OF GROUNDWATER - Limerick Gasworks, Monitoring Visit 6 (26th - 27th Jan 2011)

Screening Values - Drinking Water Standards

Aquifer type: Locally important aquifer  
 Typical productivity: Moderately Productive (40-100 m3/d)

Concentration exceeds screening value  
 Concentration exceeds screening value because limit of detection is greater than screening value

Determinand	Units	Screening Value (µg/l)	Source of screening value	Ground type													Borehole						
				A3	A4	A11	C7	C11	D1	D5	E8	F11	G2	G3	G4	G5	G8	H12	J10	K1	K5	M3	
				Depth (mbsl)																			
				1.50-4.50	1.50-2.30	1.00-2.50	2.00-6.50	1.50-2.50	3.00-4.50	2.00-3.00	1.50-6.00	1.00-4.00	4.00-10.00	3.50-8.50	3.00-9.50	2.50-8.50	1.00-2.00	1.50-4.00	1.00-2.00	2.50-4.40	1.00-5.00	3.50-6.00	
<b>Inorganics</b>																							
Arsenic (dissolved)	µg/l	10	SI 278/2007	31.5	4.72	4.78	6.19	10.2	17.2	1.52	145	7.32	17.9	2.29	2.95	3.93	3.27	2.65	1.39	2.36	21.6	2.8	
Cadmium (dissolved)	µg/l	5	SI 278/2007	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.392	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Chromium (dissolved)	µg/l	50	SI 278/2007	21.5	14.3	8.36	8.37	6.28	20.5	6.43	2.36	11.5	23.4	13.6	8.43	25.3	7.88	4.95	4.69	3.86	8.06	2.05	
Copper (dissolved)	µg/l	3000	SI 278/2007	1.5	1.48	1.04	<0.85	<0.85	13.8	2.47	<0.85	<0.85	3.2	6.04	2.19	17.8	0.922	<0.85	0.984	3.16	1.58	4.93	
Lead (dissolved)	µg/l	25	SI 278/2007	<0.02	0.06	0.328	0.099	0.043	<0.02	0.29	0.131	0.057	<0.02	0.058	0.051	0.251	0.033	<0.02	0.12	0.264	0.48	0.038	
Nickel (dissolved)	µg/l	30	SI 278/2007	4.64	3.98	4.59	1.74	6	4.54	2.07	48.4	4.46	6.07	9.49	4.88	12	4.84	4.96	3.95	12.7	11.9	7.33	
Selenium (dissolved)	µg/l	10	SI 278/2007	1.79	1.11	1.83	10.7	1.08	36.8	1.3	25.2	4.84	9.73	3.18	12.4	13.2	1.79	<0.39	1.72	0.911	15.7	0.544	
Zinc (dissolved)	µg/l	5000	WHO Drinking Water Quality Guideline Value	0.989	1.39	5.05	0.907	<0.41	10	12.2	42.9	0.996	1.23	3.26	3.47	15.6	0.59	<0.41	<0.41	<0.41	<0.41	<0.41	
Mercury (dissolved)	µg/l	1	SI 278/2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.021	<0.01	0.0259	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Ammonium	µg/l	300	SI 278/2007	12400	2620	3280	30500	7120	14300	1590	64000	27600	52800	11100	7480	2970	11300	17600	<300	4860	35700	1650	
Sulphate (soluble)	µg/l	250000	SI 278/2007	367000	276000	138000	18000	158000	481000	18700	467000	71500	674000	806000	425000	796000	113000	210000	70200	765000	318000	603000	
Phenols	µg/l	0.5	SI 81/1988	<25	<25	<25	71700	90	990	380	170000	16600	23800	580	3900	<25	5710	<25	<25	<25	599000	<25	
Total Cyanide	µg/l	50	SI 278/2007	280	205	<50	81	107	818	51	7900	59	1340	2090	968	989	118	<50	<50	609	1570	1230	
pH Value	µg/l	6.5	SI 278/2007	7.84	7.77	7.85	8.1	8.24	7.95	7.79	8.34	7.56	8.11	7.98	8.27	7.11	7.9	8.18	8.31	8	7.87	8.11	
pH Value	µg/l	9.5	SI 278/2007	7.84	7.77	7.85	8.1	8.24	7.95	7.79	8.34	7.56	8.11	7.98	8.27	7.11	7.9	8.18	8.31	8	7.87	8.11	
<b>BTEX</b>																							
Benzene	µg/l	1	SI 278/2007	516	<7	14	4920	54	746	<7	5520	216	4300	382	1730	<7	439	<7	<7	<7	15300	<7	
Toluene	µg/l	700	WHO Drinking Water Quality Guideline Value	15	<4	31	1870	44	538	<4	1550	144	3100	8	1890	<4	347	<4	<4	<4	5350	<4	
Ethyl benzene	µg/l	300	WHO Drinking Water Quality Guideline Value	198	<5	16	75	111	248	<5	72	6	378	10	194	<5	38	<5	<5	<5	275	<5	
Xylene	µg/l	500	WHO Drinking Water Quality Guideline Value	108	<10	75	759	411	1280	<10	783	41	2120	126	1890	<10	366	<10	<10	<10	2510	<10	
<b>Petroleum Hydrocarbons</b>																							
GRO (C4-C12)	µg/l	10	SI 81/1988	2680	<20	786	11030	4870	9980	<20	14290	630	13840	1027	12140	<20	2840	<20	<20	<20	45300	<20	
MTBE	µg/l			<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	-	-	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	
Aliphatics C5-C6	µg/l			<10	<10	<10	23	<10	15	<10	71	<10	25	<10	18	<10	<10	<10	<10	<10	188	<10	
Aliphatics C6-C8	µg/l			78	<10	17	236	45	154	<10	398	13	352	22	138	<10	40	<10	<10	<10	1480	<10	
Aliphatics C8-C10	µg/l			197	<10	77	588	541	804	<10	744	27	996	81	815	<10	201	<10	<10	<10	2410	<10	
Aliphatics C10-C12	µg/l			849	<10	301	1900	1980	3390	<10	2700	98	1170	203	2950	<10	761	<10	<10	<10	9680	<10	
Aliphatics C12-C16	µg/l			<10	415	73	40	1480	965	<50	19	<10	<10	<10	18	267	10	13	<10	<10	768	<10	
Aliphatics C16-C21	µg/l			<10	612	304	109	765	991	387	30	<10	<10	<10	22	217	52	18	<10	<10	585	<10	
Aliphatics C21-C35	µg/l			<10	352	1110	398	382	593	3750	17	<10	<10	<10	23	258	16	140	<10	<10	612	<10	
Aromatics C6-C7	µg/l			516	<10	14	4920	54	746	<10	5520	216	4300	382	1730	<10	439	<10	<10	<10	15300	<10	
Aromatics C7-C8	µg/l			15	<10	31	1870	44	538	<10	1550	144	3100	<10	1890	<10	347	<10	<10	<10	5350	<10	
Aromatics C8-C10	µg/l			438	<10	142	1230	883	2060	<10	1350	65	3160	191	2620	<10	539	<10	<10	<10	4390	<10	
Aromatics C10-C12	µg/l			566	<10	201	969	1320	2280	<10	1850	66	779	135	1970	<10	507	<10	<10	<10	6450	<10	
Aromatics C12-C16	µg/l			372	37	173	6400	2590	4860	<50	7000	847	4620	44	2720	92	580	<10	<10	<10	40800	<10	
Aromatics C16-C21	µg/l			246	156	230	1540	1580	4960	359	612	14	491	<10	935	359	201	35	<10	<10	4610	<10	
Aromatics C21-C35	µg/l			142	356	1740	2820	1890	7800	4550	4540	<10	106	15	661	2370	300	227	<10	46	4710	<10	
TPH (Aliphatics and Aromatics C5-C35)	µg/l	10	SI 81/1988	3430	1930	4410	22300	13600	30100	9090	22400	1490	19100	1090	16500	3560	4000	444	<10	46	9700	<10	
<b>PAHs</b>																							
Acenaphthene	µg/l			2.14	0.193	40.3	26.5	82.7	357	0.198	17	0.45	48.5	2.85	23	1.15	2.28	0.791	0.0183	0.164	268	<0.015	
Acenaphthylene	µg/l			1.94	2.09	173	179	22.1	942	1.23	122	0.581	76.3	4.31	107	2.05	5.69	0.323	0.252	1320	0.0386		
Anthracene	µg/l			1.09	0.601	78.6	56.1	4.09	434	0.409	16.9	0.125	5.49	1.54	11.8	0.828	6.67	1.5	0.0659	0.297	662	0.0468	
Benzo(a)anthracene	µg/l			3.33	4.87	290	52.3	0.599	155	2.94	18.1	0.228	0.575	6.12	1.41	2	16.7	4.88	0.365	2.15	408	0.473	
Benzo(a)pyrene	µg/l	0.01	SI 278/2007	4.98	11.6	441	42.4	0.263	67.1	3.07	12.9	0.222	0.265	8.75	0.661	3.2	18.6	9.42	1.35	3.74	266	0.627	
Benzo(b)fluoranthene	µg/l			2.15	8.81	413	50.2	0.236	58	3.35	13.2	0.198	<0.46	7.45	0.608	2.76	16.2	7.87	0.928	3.13	224	0.723	
Benzo(g)herylene	µg/l			2.08	6.09	307	26.9	0.143	24.6	2.19	9.45	0.152	<0.32	7.1	0.286	2.15	7.45	5.53	1.12	3.23	134	0.557	
Benzo(k)fluoranthene	µg/l			2.53	9.19	372	38.6	0.269	62.1	2.96	15	0.186	<0.54	7.82	0.8	2.94	15.9	6.82	0.771	3.11	244	0.565	
Chrysene	µg/l			2.43	4.44	285	47.7	0.817	127	3.07	15.6	0.21	<0.26	6.74	0.606	2.35	12	4.58	0.356	1.99	339	0.487	
Dibenz(a,h)anthracene	µg/l			0.419	2.03	73.4	6.69	<0.08	6.09	0.679	1.99	0.0377	<0.32	1.88	<0.16	0.45	3.41	1.62	0.28	0.833	38.7	0.115	
Fluoranthene	µg/l	4	WHO Drinking Water Quality Guideline Value	5.58	7.94	509	144	6.53	883	5.27	38.9	0.569	4.88	10.7	9.28	5.25	29.9	10.7	0.403	2.88	1250	1.46	
Fluorene	µg/l			0.966	0.325	80.3	88.7	30.5	564	0.203	42.5	0.314	37.5	1.18	41.3	0.761	5.32	1.48	0.049	0.131	829	0.029	
Indeno(1,2,3-cd)pyrene	µg/l			1.68	6.09	272	23.9	0.146	24.2	2.09	7.43	0.135	<0.28	6.38	0.233	1.87	8.39	5.1	0.945	2.85	129	0.453	
Naphthalene	µg/l																						

ANALYSIS OF GROUNDWATER - Limerick Gasworks, Monitoring visit 6 (26th - 27th Jan 2011)

Screening Values - Environmental Quality Standards

Receptor water type: Freshwater suitable for coarse fish  
 Relevant EQS Hardness Band: >100-150 mg/l

- \* Hardness related Freshwater EQS - based on cyprinid/coarse fish
- Concentration exceeds screening value
- Concentration exceeds screening value because limit of detection is greater than screening value

Determinand	Units	Screening Value (µg/l)		Source of screening value	Ground type																				
		Freshwater	Coastal/Estuary /Marine		Borehole																				
					A3	A4	A11	C7	C11	D1	D5	E8	F11	G2	G3	G4	G5	G8	H12	J10	K1	K5	M3		
					1.50-4.50	1.50-2.30	1.00-2.50	2.00-6.50	1.50-2.50	3.00-4.50	2.00-3.00	1.50-6.00	1.00-4.00	4.00-10.00	3.50-8.50	3.00-9.50	2.50-8.50	1.00-2.00	1.50-4.00	1.00-2.00	2.50-4.40	1.00-5.00	3.50-6.00		
					Depth (mbgl)																				
					Freshwater																				
					Coastal/Estuary /Marine																				
					Source of screening value																				
<b>Inorganics</b>																									
Arsenic (dissolved)	µg/l	25	20	SI 272/2009 Annual Ave	31.5	4.72	4.78	6.19	10.2	17.2	1.52	145	7.32	17.9	2.29	2.95	3.93	3.27	2.65	1.39	2.36	21.6	2.8		
Cadmium (dissolved)	µg/l	1.5	1.5	SI 272/2009 MAC	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.392	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Chromium (dissolved)	µg/l	32	32	SI 272/2009 MAC	21.5	14.3	8.36	8.37	6.28	20.5	6.43	2.36	11.5	23.4	13.6	8.43	25.3	7.88	4.95	4.69	3.86	8.06	2.05		
Copper (dissolved)	µg/l	30*	-	SI 272/2009 Annual Ave	1.5	1.48	1.04	<0.85	<0.85	13.8	2.47	<0.85	<0.85	3.2	6.04	2.19	17.8	0.922	<0.85	0.984	3.16	1.58	4.93		
Lead (dissolved)	µg/l	7.2	7.2	SI 272/2009 Annual Ave	<0.02	0.06	0.328	0.099	0.043	<0.02	0.29	0.131	0.057	<0.02	0.058	0.051	0.251	0.033	<0.02	0.12	0.264	0.48	0.038		
Nickel (dissolved)	µg/l	20	20	SI 272/2009 Annual Ave	4.64	3.98	4.69	1.74	6	4.54	2.07	46.4	4.46	6.07	9.49	4.88	12	4.84	4.96	3.95	12.7	11.9	7.33		
Selenium (dissolved)	µg/l	1	-	Guidelines for Aquatic Life (2007)	1.79	1.11	1.83	10.7	1.08	36.8	1.3	25.2	4.84	9.73	3.18	12.4	13.2	1.79	<0.39	1.72	0.911	15.7	0.544		
Zinc (dissolved)	µg/l	100	40	SI 272/2009 Annual Ave	0.969	1.39	5.05	0.907	<0.41	10	12.2	42.9	0.996	1.23	3.26	3.47	15.6	0.59	<0.41	<0.41	<0.41	<0.41	<0.41		
Mercury (dissolved)	µg/l	0.07	0.07	SI 272/2009 MAC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.021	<0.01	0.0259	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Ammoniacal Nitrogen	µg/l	1000	-	Freshwater Fish Directive	12400	2820	3280	30500	7120	14300	1580	84000	27600	52800	11100	7480	2370	11300	17600	<300	4860	35700	1650		
Sulphate (soluble)	µg/l	200000	-	EQS & IGW	357000	276000	138000	18000	158000	481000	18700	467000	71500	874000	806000	425000	796000	113000	210000	70200	765000	318000	603000		
Phenols	µg/l	46	46	SI 272/2009 MAC	<25	<25	<25	71700	90	990	380	170000	15600	23800	580	3900	<25	5710	<25	<25	599000	<25	<25		
Free Cyanide - (total CN in lab results)	µg/l	10	10	SI 272/2009 Annual Ave	280	205	<50	81	107	818	51	7900	59	1340	2060	666	959	118	<50	<50	600	1570	1230		
pH Value	µg/l	6.5	6.5	Interim Guideline Values	7.84	7.77	7.85	8.1	8.24	7.95	7.79	8.34	7.56	8.11	7.98	8.27	7.11	7.9	8.18	8.31	8	7.87	8.11		
pH Value	µg/l	9.5	9.5	Interim Guideline Values	7.84	7.77	7.85	8.1	8.24	7.95	7.79	8.34	7.56	8.11	7.98	8.27	7.11	7.9	8.18	8.31	8	7.87	8.11		
<b>BTEX</b>																									
Benzene	µg/l	50	50	SI 272/2009 MAC	516	<7	14	4920	54	746	<7	5520	216	4300	382	1730	<7	439	<7	<7	<7	15300	<7		
Toluene	µg/l	10	10	SI 272/2009 Annual Ave	15	<4	31	1870	44	538	<4	1550	144	3100	8	1890	<4	347	<4	<4	<4	5350	<4		
Ethyl benzene	µg/l	10	10	EQS & IGW	198	<5	16	75	111	248	<5	72	6	378	10	194	<5	38	<5	<5	275	<5			
Xylene	µg/l	10	10	SI 272/2009 Annual Ave	108	<10	75	759	411	1280	<10	783	41	2120	126	1890	<10	366	<10	<10	<10	2510	<10		
<b>Petroleum Hydrocarbons</b>																									
GC10 (C4-C12)	µg/l	-	-	IGV	2680	<20	786	11030	4870	9980	<20	14290	630	13840	1027	12140	<20	2840	<20	<20	<20	45300	<20		
MTBE	µg/l	30	30	IGV	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6			
Aliphatics C5-C6	µg/l	-	-	-	11	<10	<10	23	<10	15	<10	71	<10	25	<10	18	<10	<10	<10	<10	<10	188	<10		
Aliphatics C6-C8	µg/l	-	-	-	78	<10	17	236	45	154	<10	398	13	352	22	138	<10	40	<10	<10	<10	1480	<10		
Aliphatics C8-C10	µg/l	-	-	-	197	<10	77	588	541	804	<10	744	27	996	81	815	<10	201	<10	<10	<10	2410	<10		
Aliphatics C10-C12	µg/l	-	-	-	849	<10	301	1300	1980	3390	<10	2780	98	1170	203	2950	<10	761	<10	<10	<10	9680	<10		
Aliphatics C12-C16	µg/l	-	-	-	<10	415	73	40	1480	965	<50	19	<10	<10	18	267	10	13	<10	<10	768	<10			
Aliphatics C16-C21	µg/l	-	-	-	<10	612	304	109	765	991	387	30	<10	<10	22	217	52	18	<10	<10	585	<10			
Aliphatics C21-C35	µg/l	-	-	-	<10	352	1110	398	382	593	3750	17	<10	<10	23	258	16	140	<10	<10	612	<10			
Aromatics C6-C7	µg/l	-	-	-	516	<10	14	4920	54	746	<10	5520	216	4300	382	1730	<10	439	<10	<10	<10	15300	<10		
Aromatics C7-C8	µg/l	-	-	-	15	<10	31	1870	44	538	<10	1550	144	3100	<10	1890	<10	347	<10	<10	5350	<10			
Aromatics 8-10	µg/l	-	-	-	438	<10	142	1230	883	2060	<10	1350	65	3160	191	2620	<10	539	<10	<10	4390	<10			
Aromatics 10-12	µg/l	-	-	-	566	<10	201	869	1320	2260	<10	1850	66	779	135	1970	<10	507	<10	<10	6450	<10			
Aromatics 12-16	µg/l	-	-	-	372	37	173	6400	2590	4860	<50	7000	847	4620	44	2720	92	580	<10	<10	<10	40800	<10		
Aromatics 16-21	µg/l	-	-	-	246	156	230	1540	1580	4960	359	612	14	491	<10	935	359	201	35	<10	<10	4610	<10		
Aromatics 21-35	µg/l	-	-	-	142	356	1740	2820	1890	7800	4550	454	<10	106	15	661	2370	300	227	<10	46	4710	<10		
TPH (Aliphatics and Aromatics C5-C35)	µg/l	10	10	EQS & IGW	3430	1930	4410	22300	13600	30100	9090	22400	1490	19100	1090	16500	3560	4000	444	<10	46	97300	<10		
<b>PAHs</b>																									
Acenaphthene	µg/l	5.8	-	Canadian Water Quality Guidelines for Aquatic Life (2007)	2.14	0.193	40.3	26.5	82.7	357	0.138	17	0.45	48.5	2.85	23	1.15	2.28	0.791	0.0183	0.164	268	<0.015		
Acenaphthylene	µg/l	-	-	-	1.94	2.09	173	178	22.1	942	1.23	122	0.581	76.3	4.31	107	2.05	5.69	2.25	0.323	0.252	1320	0.0386		
Anthracene	µg/l	0.4	0.4	SI 272/2009 MAC	1.09	0.601	78.6	56.1	4.09	434	0.409	16.9	0.125	5.49	1.54	11.8	0.828	6.67	1.5	0.0659	0.297	662	0.0468		
Benzo(a)anthracene	µg/l	0.018	-	Guidelines for Aquatic Life (2007)	3.33	4.87	290	52.3	0.599	155	2.94	18.1	0.228	0.575	6.12	1.41	2	16.7	4.88	0.365	2.15	408	0.473		
Benzo(b)fluoranthene	µg/l	0.1	0.1	SI 272/2009 MAC	4.98	11.6	441	42.4	0.263	67.1	3.07	12.9	0.222	0.265	8.75	0.661	3.2	18.6	9.42	1.35	3.74	266	0.627		
Benzo(k)fluoranthene	µg/l	0.05	-	Interim Guideline Value	2.15	8.81	413	50.2	0.236	58	3.35	13.2	0.198	<0.46	7.45	0.608	2.76	16.2	7.87	0.928	3.13	224	0.723		
Benzo(g)herylene	µg/l	0.05	-	Interim Guideline Value	2.08	6.09	307	26.9	0.143	24.6	2.19	9.45	0.152	<0.32	7.1	0.286	2.15	7.45	5.53	1.12	3.23	134	0.557		
Benzo(i)fluoranthene	µg/l	0.05	-	Interim Guideline Value	2.53	9.19	372	38.6	0.269	62.1	2.96	15	0.186	<0.54	7.82	0.8	2.94	15.9	6.82	0.771	3.11	244	0.565		
Chrysene	µg/l	-	-	-	2.43	4.44	285	47.7	0.817	127	3.07	15.6	0.21	<0.26	6.74	0.606	2.35	12	4.58	0.356	1.99	339	0.487		
Dibenz(a,h)anthracene	µg/l	-	-	-	0.419	2.03	73.4	6.69	<0.08	6.09	0.679	3.99	0.0377	<0.32	1.88	<0.16	0.45	3.41	1.62	0.28	0.833	38.7	0.115		
Fluoranthene	µg/l	1	1	SI 272/2009 MAC																					

**ANALYSIS OF GROUNDWATER - Limerick Gasworks, Monitoring Visit 7 (26th - 27th April 2011)**

**Screening Values - Drinking Water Standards**

Aquifer type: Locally important aquifer  
 Typical productivity: Moderately Productive (40-100 m3/d)

Concentration exceeds screening value  
 Concentration exceeds screening value because limit of detection is greater than screening value

Determinand	Units	Screening Value (µg/l)	Source of screening value	Ground type Borehole Depth (m)																			
				A3	A4	A11	C7	C11	D1	D5	E8	F11	G2	G3	G4	G5	G8	H12	J10	K1	K5	M3	
<b>Inorganics</b>																							
Arsenic (dissolved)	µg/l	10	SI 278/2007	28.7	4.06	8.59	11.9	6.21	15.1	5.7	81.6	5.57	20	6.25	3.51	2.1	11.7	1.41	2.82	1.14	54.6	2.96	
Cadmium (dissolved)	µg/l	5	SI 278/2007	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.122	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Chromium (dissolved)	µg/l	50	SI 278/2007	24.6	16.2	8.28	12.3	17.7	22.4	11.8	2.6	9.29	30.7	24.5	13.3	30	11	15.2	17.2	10.6	14.1	4.24	
Copper (dissolved)	µg/l	3000	SI 278/2007	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	1.87	<0.85	1.34	1.26	<0.85	1.4	<0.85	<0.85	0.852	3.53	2.99	8.66	
Lead (dissolved)	µg/l	25	SI 278/2007	<0.02	0.039	0.121	0.219	<0.02	<0.02	0.691	1.12	0.048	<0.02	0.032	0.052	0.114	<0.02	<0.02	0.237	0.323	0.083	0.083	
Nickel (dissolved)	µg/l	30	SI 278/2007	4.84	3.56	2.47	1.51	3.65	3.79	5.1	34.4	2.98	6.82	8.05	10.9	8.04	5.23	3.34	4.18	6.95	15.2	4.1	
Selenium (dissolved)	µg/l	10	SI 278/2007	0.811	0.666	0.461	1.4	1.54	1.38	5.37	18.4	1.3	8.45	4.03	8.89	2.12	8.26	1.17	3.84	0.961	18.3	1.25	
Zinc (dissolved)	µg/l	5000	WHO Drinking Water Quality Guideline Value	2.79	1.41	0.459	1.52	<0.41	1.11	7.29	4.85	0.728	0.985	3.25	5.84	3.02	<0.41	0.756	2.38	2.81	3.69	1.27	
Mercury (dissolved)	µg/l	1	SI 278/2007	<0.01	<0.01	<0.01	0.0228	<0.01	<0.01	<0.01	0.0121	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0354	<0.01	
Ammonium	µg/l	300	SI 278/2007	9670	2270	2710	50000	5620	11300	9470	36600	13600	43900	21200	13700	9840	26000	14500	668	2570	58200	1090	
Sulphate (soluble)	µg/l	250000	SI 278/2007	408000	284000	69500	29000	73400	468000	47400	373000	97300	702000	500000	403000	605000	160000	191000	73200	580000	495000	550000	
Phenols	µg/l	0.5	SI 81/1988	<13	<13	299	129000	60	240	2640	153000	2470	45300	130	4450	<13	22200	<13	<13	<13	800000	40	
Titral Cyanide	µg/l	50	SI 278/2007	296	161	<50	<50	99	1030	209	4720	<50	990	408	85	456	119	<50	<50	948	3320	1290	
pH Value	µg/l	6.5	SI 278/2007	8.29	8.04	8.19	8.43	8.11	5.23	7.85	7.94	8.27	8.05	7.98	8.08	7.93	8.33	7.64	8.31	7.94	8.25	7.96	
pH Value	µg/l	9.5	SI 278/2007	8.29	8.04	8.19	8.43	8.11	5.23	7.85	7.94	8.27	8.05	7.98	8.08	7.93	8.33	7.64	8.31	7.94	8.25	7.96	
<b>BTEX</b>																							
Benzene	µg/l	1	SI 278/2007	258	<7	<7	15900	49	685	337	2880	410	5430	144	1750	34	1220	<7	<7	<7	12400	<7	
Toluene	µg/l	700	WHO Drinking Water Quality Guideline Value	6	<4	18	5580	25	231	79	784	153	3940	<4	1520	<4	744	<4	<4	<4	4200	<4	
Ethyl benzene	µg/l	300	WHO Drinking Water Quality Guideline Value	8	<5	5	195	119	204	16	35	13	451	11	209	<5	65	<5	<5	<5	206	<5	
Xylene	µg/l	500	WHO Drinking Water Quality Guideline Value	97	<10	28	2000	268	851	61	370	109	2950	68	2010	17	651	<10	<10	<10	1910	<10	
<b>Petroleum Hydrocarbons</b>																							
GRO (C4-C12)	µg/l	10	SI 81/1988	1780	<50	264	36200	3710	6270	802	8100	1080	21500	567	11800	295	6120	<50	<50	<50	40300	<50	
MTBE	µg/l			<3	<3	<3	<15	<3	<3	<3	<3	<3	<6	<3	<3	<3	<3	<3	<3	<3	<15	<3	
Aliphatics C5-C6	µg/l			<10	<10	<10	244	<10	11	<10	30	<10	60	<10	14	<10	10	<10	<10	<10	286	<10	
Aliphatics C6-C8	µg/l			65	<10	<10	537	30	116	14	211	13	286	18	124	18	84	<10	<10	<10	1320	<10	
Aliphatics C8-C10	µg/l			145	<10	32	1500	398	503	43	466	52	1250	50	863	40	356	<10	<10	<10	2180	<10	
Aliphatics C10-C12	µg/l			659	<10	88	5580	1530	2000	131	1810	178	3790	143	2820	92	1650	<10	<10	<10	9810	<10	
Aliphatics C12-C16	µg/l			<10	11	211	31	125	29	<10	<10	<10	<10	232	100	<10	<10	<10	<10	<10	79	<10	
Aliphatics C16-C21	µg/l			<10	21	912	32	39	74	122	<10	<10	<10	132	83	<10	<10	<10	<10	<10	63	<10	
Aliphatics C21-C35	µg/l			<10	<10	3950	34	<10	31	1180	<10	<10	<10	137	98	<10	60	<10	<10	<10	72	<10	
Aromatics C6-C7	µg/l			258	<10	<10	15900	49	685	337	2880	410	5430	144	1750	34	1220	<10	<10	<10	12400	<10	
Aromatics C7-C8	µg/l			<10	<10	18	5580	25	231	79	784	153	3940	<10	1520	<10	744	<10	<10	<10	4200	<10	
Aromatics C8-C10	µg/l			202	<10	55	3190	651	1390	106	716	157	4230	112	2800	46	954	<10	<10	<10	3570	<10	
Aromatics C10-C12	µg/l			439	<10	59	3720	1020	1330	87	1210	118	2530	95	1890	62	1100	<10	<10	<10	6540	<10	
Aromatics C12-C16	µg/l			97	<10	296	15300	406	665	331	6270	11	6130	25	3450	101	2840	16	<10	<10	45900	<10	
Aromatics C16-C21	µg/l			109	13	801	1770	287	537	269	497	<10	618	<10	2290	202	526	50	<10	<10	3210	<10	
Aromatics C21-C35	µg/l			13	13	7740	751	219	436	2800	199	<10	100	74	2860	1110	209	322	83	<10	1020	17	
TPH (Aliphatics and Aromatics C5-C35)	µg/l	10	SI 81/1988	2000	63	14200	54200	4790	8040	5500	15100	1090	28400	665	20900	1990	9700	455	87	<10	90600	18	
<b>PAHs</b>																							
Acenaphthene	µg/l			0.492	0.0233	23.7	30.9	2.74	136	2.49	7.76	0.0355	25.8	1.19	38.1	0.354	9.06	0.638	0.0736	0.0233	345	<0.015	
Acenaphthylene	µg/l			0.307	0.208	79.2	193	1.38	227	18.6	50.1	0.215	28.7	1.54	48.8	3.21	66.1	1.96	1	0.0596	1700	0.0467	
Anthracene	µg/l			0.111	0.142	46.8	68.6	0.929	75.6	7.63	6.79	0.061	4.56	0.424	88.9	1.98	11.1	1.4	0.213	0.0513	911	0.0474	
Benzo(a)anthracene	µg/l			0.228	0.319	290	34.7	2.8	19.4	48.9	1.27	0.706	0.713	3	55.6	8.07	7.15	4.77	2.12	0.481	369	0.851	
Benzo(a)pyrene	µg/l	0.01	SI 278/2007	0.363	0.694	419	29.1	4.42	8.72	63.2	0.958	0.468	0.404	4.84	48.1	13.3	6.02	12.4	5.93	0.806	226	1.41	
Benzo(b)fluoranthene	µg/l			0.17	0.695	386	28.9	4.12	11	81.6	0.919	0.845	0.393	4.6	41.2	10.2	4.95	11.5	5.14	0.741	139	1.8	
Benzo(g)herylene	µg/l			0.0965	0.237	125	14.6	1.58	2.42	27.9	0.291	0.328	0.111	2.54	17.2	7.49	1.35	4.75	1.81	0.473	84.7	0.832	
Benzo(k)fluoranthene	µg/l			0.272	0.597	434	26.5	4.41	8.5	75.4	0.969	0.751	0.41	4.78	45.5	10.4	6.05	8.95	4.11	0.85	178	1.47	
Chrysene	µg/l			0.193	0.347	267	29.8	2.36	18.9	59	0.921	0.412	0.566	2.99	46.4	8.05	5.09	4.93	1.63	0.436	451	0.823	
Dibenz(a,h)anthracene	µg/l			0.0269	0.0788	47.9	5.62	0.622	1.52	11.6	0.127	0.0948	0.0471	0.907	7.32	2.62	0.701	1.83	1	0.132	27.7	0.205	
Fluorene	µg/l	4	WHO Drinking Water Quality Guideline Value	0.466	0.756	294	128	8.42	146	85.8	5.82	0.649	6.25	4.14	182	16.3	19.1	8.37	1.94	0.64	1660	1.26	
Fluorene	µg/l			0.114	0.0554	51	126	0.907	164	5.49	20	0.0492	20.8	0.313	121	1	34.1	1.27	0.21	0.0289	1130	0.0199	
Indeno(1,2,3-cd)pyrene	µg/l			0.0902	0.26	118	14.6	1.97	2.41	29.6	0.345	0.306	0.12	2.72	19.5	7.63	1.77	5.4	2.19	0.451	92.3	0.779	
Naphthalene	µg/l			0.142	0.101	135	64.7	1.11	2590	23.8	135	0.42	19.1	1.21	31.1	0.721	35.6	1.35	0.172	0.145	11000	0.114	
Phenanthrene	µg/l			0.248	0.153	125	173	2.81	336	24.9	21.4	0.16	30	1.19	1								



ANALYSIS OF GROUNDWATER - Limerick Gasworks, Monitoring visit 7 (26th - 27th April 2011)

Screening Values - Environmental Quality Standards

Receptor water type: Freshwater suitable for coarse fish  
 Relevant EQS Hardness Band: >100-150 mg/l

- \* Hardness related Freshwater EQS - based on cyprinid/coarse fish
- Concentration exceeds screening value
- Concentration exceeds screening value because limit of detection is greater than screening value

Determinand	Units	Screening Value (µg/l)		Source of screening value	Ground type																		
		Freshwater	Coastal/Estuary /Marine		Borehole																		
					A3	A4	A11	C7	C11	D1	D5	E8	F11	G2	G3	G4	G5	G8	H12	J10	K1	K5	M3
<b>Inorganics</b>					2.00-3.00	2.00-3.00	1.80-2.30	4.00-6.00	1.50-2.00	3.00-4.00	1.80-2.40	1.50-2.50	4.00-5.00	3.50-4.50	4.00-5.00	2.80-3.00	5.00-6.00	1.40-2.40	3.00-4.00	1.00-2.00	3.00-4.00	1.00-2.00	3.00-5.00
Arsenic (dissolved)	µg/l	25	20	SI 272/2009 Annual Ave	28.7	4.06	8.59	11.9	6.21	15.1	5.7	81.6	5.57	20	6.25	3.51	2.1	11.7	1.41	2.82	1.14	54.6	2.96
Cadmium (dissolved)	µg/l	1.5	1.5	SI 272/2009 MAC	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.122	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (dissolved)	µg/l	32	32	SI 272/2009 MAC	24.6	16.2	8.28	12.3	17.7	22.4	11.8	2.6	9.29	30.7	24.5	13.3	30	11	15.2	17.2	10.6	14.1	4.24
Copper (dissolved)	µg/l	30*	30*	SI 272/2009 Annual Ave	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	1.87	<0.85	1.34	1.26	<0.85	1.4	<0.85	<0.85	0.852	3.53	2.99	8.66
Lead (dissolved)	µg/l	7.2	7.2	SI 272/2009 Annual Ave	<0.02	0.039	0.121	0.219	<0.02	<0.02	0.691	0.12	0.048	<0.02	0.032	0.052	0.114	<0.02	<0.02	<0.02	0.237	0.323	0.083
Nickel (dissolved)	µg/l	20	20	SI 272/2009 Annual Ave	4.84	3.56	2.47	1.51	3.65	3.79	5.1	34.4	2.98	6.82	8.05	10.9	8.04	5.23	3.34	4.18	6.95	15.2	4.1
Selenium (dissolved)	µg/l	1	-	Guidelines for Aquatic Life (2007)	0.811	0.666	0.461	14	1.54	1.38	5.37	18.4	1.3	8.45	4.03	8.89	2.12	8.26	1.17	3.84	0.961	18.3	1.25
Zinc (dissolved)	µg/l	100	40	SI 272/2009 Annual Ave	2.79	1.41	0.459	1.52	<0.41	1.11	7.29	4.85	0.728	0.985	3.25	5.84	3.02	<0.41	0.756	2.38	2.81	3.69	1.27
Mercury (dissolved)	µg/l	0.07	0.07	SI 272/2009 MAC	<0.01	<0.01	<0.01	0.0228	<0.01	<0.01	<0.01	0.0121	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0354	<0.01
Ammoniacal Nitrogen	µg/l	1000	-	Freshwater Fish Directive	9670	2270	2710	50000	5620	11300	9470	36600	13600	43900	21200	13700	9840	28000	14500	668	2570	58200	1090
Sulphate (soluble)	µg/l	200000	-	EQS & IGV	408000	264000	69500	29000	73400	468000	47400	373000	97300	702000	500000	403000	605000	160000	191000	73200	580000	495000	550000
Phenols	µg/l	46	46	SI 272/2009 MAC	<13	<13	230	129000	60	240	2640	153000	2470	45300	130	4450	<13	22200	<13	<13	<13	800000	40
Free Cyanide - (total CN in lab results)	µg/l	10	10	SI 272/2009 Annual Ave	296	161	<50	<50	99	1030	209	4720	<50	990	408	85	458	119	<50	<50	848	3320	1290
pH Value	µg/l	6.5	6.5	Interim Guideline Values	8.29	8.04	8.19	8.43	8.11	5.23	7.85	7.94	8.27	8.05	7.98	8.08	7.93	8.33	7.64	8.31	7.94	8.25	7.96
pH Value	µg/l	9.5	9.5	Interim Guideline Values	8.29	8.04	8.19	8.43	8.11	5.23	7.85	7.94	8.27	8.05	7.98	8.08	7.93	8.33	7.64	8.31	7.94	8.25	7.96
<b>BTEX</b>																							
Benzene	µg/l	50	50	SI 272/2009 MAC	258	<7	<7	15900	49	685	337	2880	410	5430	144	1750	34	1220	<7	<7	<7	12400	<7
Toluene	µg/l	10	10	SI 272/2009 Annual Ave	6	<4	18	5580	25	231	79	784	153	3940	<4	1520	<4	744	<4	<4	<4	4200	<4
Ethyl benzene	µg/l	10	10	EQS & IGV	8	<5	5	195	119	204	16	35	13	451	11	209	<5	65	<5	<5	206	<5	
Xylene	µg/l	10	10	SI 272/2009 Annual Ave	97	<10	28	2000	268	851	61	370	109	2950	68	2010	17	651	<10	<10	<10	1910	<10
<b>Petroleum Hydrocarbons</b>																							
GC/C (C4-C12)	µg/l	-	-	-	1780	<50	264	36200	3710	6270	802	8100	1080	21500	567	11800	295	6120	<50	<50	<50	40300	<50
MTBE	µg/l	30	30	IGV	<3	<3	<3	<15	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<15	<3	
Aliphatics C5-C6	µg/l	-	-	-	<10	<10	<10	244	<10	11	<10	30	<10	60	<10	14	<10	<10	<10	<10	<10	266	<10
Aliphatics C6-C8	µg/l	-	-	-	65	<10	<10	537	30	116	14	211	13	285	18	124	18	84	<10	<10	<10	1320	<10
Aliphatics C8-C10	µg/l	-	-	-	145	<10	32	1500	398	503	43	466	52	1250	50	863	40	356	<10	<10	<10	2180	<10
Aliphatics C10-C12	µg/l	-	-	-	659	<10	88	5580	1530	2000	131	1810	178	3790	143	2820	92	1650	<10	<10	<10	9810	<10
Aliphatics C12-C16	µg/l	-	-	-	<10	11	211	31	125	29	<10	<10	<10	<10	232	100	<10	<10	<10	<10	79	<10	
Aliphatics C16-C21	µg/l	-	-	-	<10	21	912	32	39	74	122	<10	<10	<10	132	83	<10	<10	<10	<10	63	<10	
Aliphatics C21-C35	µg/l	-	-	-	<10	<10	3950	34	<10	31	1180	<10	<10	<10	137	98	<10	<10	<10	<10	72	<10	
Aromatics C6-C7	µg/l	-	-	-	258	<10	<10	15900	49	685	337	2880	410	5430	144	1750	34	1220	<10	<10	<10	12400	<10
Aromatics C7-C8	µg/l	-	-	-	<10	<10	18	5580	25	231	79	784	153	3940	<10	1520	<10	744	<10	<10	<10	4200	<10
Aromatics 8-10	µg/l	-	-	-	202	<10	55	3190	651	1390	106	716	157	4230	112	2800	46	954	<10	<10	<10	3570	<10
Aromatics 10-12	µg/l	-	-	-	439	<10	59	3720	1020	1330	87	1210	118	2530	95	1880	62	1100	<10	<10	<10	6540	<10
Aromatics 12-16	µg/l	-	-	-	97	<10	296	15300	406	665	331	6270	11	6130	25	3450	101	2840	16	<10	<10	45900	<10
Aromatics 16-21	µg/l	-	-	-	109	13	801	1770	287	537	269	497	<10	618	<10	2290	202	526	50	<10	<10	3210	<10
Aromatics 21-35	µg/l	-	-	-	13	13	7740	751	219	436	2800	199	<10	10	74	2860	1110	209	322	83	<10	1020	17
TPH (Aliphatics and Aromatics C5-C35)	µg/l	10	10	EQS & IGV	2000	63	14200	54200	4790	8040	5500	15100	1090	28400	665	20900	1990	9700	455	87	<10	90600	18
<b>PAHs</b>																							
Acenaphthene	µg/l	5.8	-	Canadian Water Quality Guidelines for Aquatic Life (2007)	0.422	0.0233	23.7	30.9	2.74	136	2.43	7.76	0.0355	25.8	1.19	38.1	0.354	9.06	0.638	0.0736	0.0233	345	<0.015
Acenaphthylene	µg/l	-	-	-	0.307	0.208	79.2	193	1.38	227	18.6	50.1	0.215	28.7	1.54	48.8	3.21	66.1	1.96	1	0.0596	1700	0.0467
Anthracene	µg/l	0.4	0.4	SI 272/2009 MAC	0.111	0.142	46.8	68.6	0.929	75.6	7.63	6.79	0.061	4.56	0.424	88.9	1.98	11.1	1.4	0.213	0.0513	911	0.0474
Benzo(a)anthracene	µg/l	0.018	-	Guidelines for Aquatic Life (2007)	0.228	0.319	290	34.7	2.8	19.4	48.9	1.27	0.406	0.713	3	55.6	8.07	7.15	4.77	2.12	0.481	369	0.851
Benzo(a)pyrene	µg/l	0.1	0.1	SI 272/2009 MAC	0.363	0.694	419	29.1	4.42	8.72	63.2	0.958	0.768	0.404	4.84	48.1	13.3	6.02	12.4	5.93	0.806	226	1.41
Benzo(b)fluoranthene	µg/l	0.5	-	Interim Guideline Value	0.17	0.895	386	28.9	4.12	11	81.6	0.919	0.845	0.393	4.6	41.2	10.2	4.95	11.5	5.14	0.741	139	1.8
Benzo(g)hperylene	µg/l	0.05	-	Interim Guideline Value	0.0965	0.237	125	14.6	1.58	2.42	27.9	0.291	0.328	0.111	2.54	17.2	7.49	1.35	4.75	1.81	0.473	84.7	0.832
Benzo(k)fluoranthene	µg/l	0.05	-	Interim Guideline Value	0.272	0.597	434	26.5	4.41	8.5	75.4	0.969	0.751	0.41	4.78	45.5	10.4	6.05	8.95	4.11	0.85	178	1.47
Chrysene	µg/l	-	-	-	0.193	0.347	267	29.8	2.36	18.9	59	0.924	0.412	0.566	2.99	46.4	8.05	5.09	4.93	1.63	0.436	451	0.823
Dibenz(a,h)anthracene	µg/l	-	-	-	0.0269	0.0788	47.9	5.62	0.622	1.52	11.6	0.487	0.0946										

ANALYSIS OF GROUNDWATER - Limerick Gasworks, Monitoring Visit 8 (25 - 26th October 2011)

Screening Values - Drinking Water Standards

Aquifer type: Locally important aquifer  
 Typical productivity: Moderately Productive (40-100 m3/d)

Concentration exceeds screening value  
 Concentration exceeds screening value because limit of detection is greater than screening value

Determinand	Units	Screening Value (µg/l)	Source of screening value	Ground type Borehole Depth (mbgl)																		
				A3	A11	C7	C11	D1	D5	E8	F11	G2	G3	G4	G5	G8	H12	J10	K1	KS	M3	
<b>Inorganics</b>																						
Arsenic (dissolved)	µg/l	10	SI 278/2007	43.9	4.95	27	7.91	14.4	4.71	134	11.9	23.5	3.37	8.35	1.54	10.2	7.41	2.24	1.56	162	3.68	
Cadmium (dissolved)	µg/l	5	SI 278/2007	<0.1	<0.1	0.212	<0.1	<0.1	0.247	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.177	<0.1
Chromium (dissolved)	µg/l	50	SI 278/2007	17.6	5.9	11.3	10.8	14.7	8.95	3.45	11.1	18.3	11.5	10.4	15.4	8.89	12.8	10.3	5.75	14.1	2.46	4.31
Copper (dissolved)	µg/l	3000	SI 278/2007	1.3	<0.85	2.57	<0.85	1.5	<0.85	2.02	<0.85	2.58	4.36	1.42	8.28	0.946	1.07	4.51	4.44	1.97	4.31	4.31
Lead (dissolved)	µg/l	25	SI 278/2007	0.094	0.518	0.398	0.044	0.932	0.188	0.295	0.136	<0.02	0.094	0.304	0.272	0.079	0.599	0.071	0.483	0.404	0.425	0.425
Nickel (dissolved)	µg/l	30	SI 278/2007	5.73	6.25	4.9	5.11	5.95	3.9	26.9	5.26	8.73	12.8	5.47	15.6	6.85	5.88	6.1	9.93	28	5.02	2.76
Selenium (dissolved)	µg/l	10	SI 278/2007	4.36	0.853	24.1	1.13	2.64	2.92	18.5	3.08	10.6	5.01	10.8	6.01	0.996	3.94	2.64	2.05	26.2	2.76	2.76
Zinc (dissolved)	µg/l	5000	WHO Drinking Water Quality Guideline Value	0.757	1.26	2.63	0.791	<0.41	1.63	35.5	<0.41	0.572	1.87	4.46	5.82	0.444	0.861	0.723	2.06	46.2	2.18	2.18
Mercury (dissolved)	µg/l	1	SI 278/2007	<0.01	<0.01	0.0399	<0.01	<0.01	<0.01	0.0179	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.119	<0.01
Ammonium	µg/l	300	SI 278/2007	12400	6060	100000	7700	12800	12900	46400	41900	52200	16300	13800	2940	12600	21300	507	2490	176000	1530	1530
Sulphate (soluble)	µg/l	250000	SI 278/2007	325000	68300	<40000	215000	397000	48300	358000	52600	643000	1080000	235000	1060000	148000	182000	60300	72000	422000	551000	551000
Phenols	µg/l	0.5	SI 81/1988	<25	<25	118000	1320	2400	2460	150000	3840	21700	1480	2780	<25	90	<25	<25	<25	1030000	<25	<25
Total Cyanide	µg/l	50	SI 278/2007	335	<50	541	78	841	57	6450	<50	1090	3740	117	1868	187	<50	<50	1890	8470	845	845
pH Value	µg/l	6.5	SI 278/2007	7.63	7.06	8.55	7.65	7.31	7.97	8	7.13	7.56	7.66	7.54	7.55	7.56	7.39	7.6	7.15	9.57	7.54	7.54
pH Value	µg/l	9.5	SI 278/2007	7.63	7.06	8.55	7.65	7.31	7.97	8	7.13	7.56	7.66	7.54	7.55	7.56	7.39	7.6	7.15	9.57	7.54	7.54
<b>BTEX</b>																						
Benzene	µg/l	1	SI 278/2007	564	9	16200	91	654	159	6190	186	4250	248	<7	<7	<7	<7	<7	<7	12100	<7	<7
Toluene	µg/l	700	WHO Drinking Water Quality Guideline Value	27	51	7570	56	439	63	1770	165	3200	128	1510	<4	10	<4	<4	<4	4180	<4	<4
Ethyl benzene	µg/l	300	WHO Drinking Water Quality Guideline Value	230	7	294	57	185	13	76	18	387	32	181	<5	11	<5	<5	<5	207	<5	<5
Xylene	µg/l	500	WHO Drinking Water Quality Guideline Value	113	68	2910	281	840	32	876	145	2430	188	1570	<11	117	<11	<11	<11	1840	<11	<11
<b>Petroleum Hydrocarbons</b>																						
GRO (C4-C12)	µg/l	10	SI 81/1988	2530	540	41000	2690	6560	429	14600	994	17700	1230	9630	<50	436	<50	<50	<50	34700	<50	<50
MTBE	µg/l			<3	<3	<15	<3	<3	<3	<6	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Aliphatics C5-C6	µg/l			<10	<10	104	<10	12	<10	50	<10	29	<10	11	<10	<10	<10	<10	<10	<10	263	<10
Aliphatics C6-C8	µg/l			56	<10	522	20	103	<10	332	31	236	27	2030	<10	10	<10	<10	<10	<10	1150	<10
Aliphatics C8-C10	µg/l			168	54	1720	290	479	16	668	74	990	101	598	<10	60	<10	<10	<10	<10	1670	<10
Aliphatics C10-C12	µg/l			749	184	6320	1020	2120	77	2490	192	3340	263	2000	<10	109	<10	<10	<10	<10	7290	<10
Aliphatics C12-C16	µg/l			<10	<10	26	476	70	23	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatics C16-C21	µg/l			<10	<10	25	273	96	95	28	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatics C21-C35	µg/l			<10	<10	44	148	61	427	21	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics C6-C7	µg/l			564	<10	16200	91	654	159	6190	186	4250	248	<10	<10	<10	<10	<10	<10	<10	12100	<10
Aromatics C7-C8	µg/l			27	51	7570	56	439	63	1770	165	3200	128	1510	<10	10	<10	<10	<10	4180	<10	<10
Aromatics C8-C10	µg/l			455	111	4350	531	1340	56	1400	213	3480	287	2150	<10	169	<10	<10	<10	3160	<10	<10
Aromatics C10-C12	µg/l			500	122	4210	678	1410	51	1660	128	2230	175	1330	<10	73	<10	<10	<10	4860	<10	<10
Aromatics C12-C16	µg/l			274	32	16600	700	1630	409	6400	475	3440	74	1270	<10	185	<10	<10	<10	<10	<10	<10
Aromatics C16-C21	µg/l			132	21	1560	449	719	289	557	21	262	28	425	<10	87	<10	<10	<10	14	<10	<10
Aromatics C21-C35	µg/l			42	55	519	405	282	1120	156	12	32	83	101	226	16	<10	<10	<10	50	<10	<10
TPH (Aliphatics and Aromatics C5-C35)	µg/l	10	SI 81/1988	2970	648	59700	5140	9420	2790	21700	1500	21500	1420	11400	287	452	309	<10	64	34700	31	31
<b>PAHs</b>																						
Acenaphthene	µg/l			1.15	11.4	31.6	1.14	54.9	3.24	14.8	0.0599	20.9	0.564	30.5	1.31	0.0331	1.25	<0.015	0.0445	118	<0.015	<0.015
Acenaphthylene	µg/l			1.14	19.7	245	2.34	54.3	13	96.4	0.233	18.3	0.694	56.7	25	0.276	3.77	0.14	0.137	544	0.0673	0.0673
Anthracene	µg/l			0.674	12.6	32.9	1.37	33.1	5.19	7.65	0.115	2.23	0.381	7.5	4.86	0.187	3.01	0.0439	0.177	183	0.0867	0.0867
Benzo(a)anthracene	µg/l			1.54	53.3	12.1	4.06	19.6	29.6	1.16	0.45	0.549	2.61	1.09	38.1	0.406	11.4	0.0994	1.62	89.2	0.939	0.939
Benzo(a)pyrene	µg/l	0.01	SI 278/2007	3.19	95.1	9.86	7.86	13.4	44.3	<0.45	0.819	0.274	4.51	0.247	71.6	0.626	31	0.408	3.82	97.8	2.17	2.17
Benzo(b)fluoranthene	µg/l			1.05	81.1	<11.5	7.24	12.9	43.3	<1.15	0.964	0.218	4.35	0.189	52.5	0.501	29	0.233	3.03	122	1.76	1.76
Benzo(g)herylene	µg/l			1.17	59.1	<8	4.98	6.98	25.5	<0.8	0.636	0.0943	3.58	<0.08	47	0.283	17.2	0.307	3.56	83.9	1.96	1.96
Benzo(k)fluoranthene	µg/l			2.04	76.6	<13.5	6.22	9.45	41.5	<1.35	0.592	0.253	4.16	0.342	64	0.51	26.7	0.314	3.64	84.9	2.16	2.16
Chrysene	µg/l			1.46	53.7	17.6	3.71	15.6	38	1.11	0.422	0.423	2.77	1.02	41.9	0.357	12.2	0.14	1.81	93.2	1.16	1.16
Dibenz(a,h)anthracene	µg/l			0.229	18.4	<8	1.48	1.95	6.05	<0.8	0.205	0.037	0.964	<0.08	14.2	0.0962	4.16	0.0497	7.55	35.6	0.356	0.356
Fluoranthene	µg/l	4	WHO Drinking Water Quality Guideline Value	3.04	84.4	59.5	13.1	110	63.6	7.39	0.669	3.78	4.08	12.7	59.8	0.735	26.8	0.128	2.09	240	1.53	1.53
Fluorene	µg/l			0.535	15.7	90.9	0.982	71.7	4.45	33.4	0.0696	11.9	0.177	38.3	3.03	0.154	2.51	0.0258	0.0775	286	0.029	0.029
Indeno(1,2,3-cd)pyrene	µg/l			0.976	53.6	<7	4.72	6.81	22.4	<0.7	0.773	0.097	3.25	<0.07	45.7	0.276	15.2	0.204	2.97	88.3	1.53	1.53
Naphthalene	µg/l			0.157	17.6	6970	1.69	18.7	7.82	2560	0.559	6.56	0.888	2.53	<5	0.314	2.5	0.104	0.161	9680	0.139	0.139
Phenanthrene	µg/l			0.902	37.3	142	3.85	90.9	14.7	30.3	0.209	16	1									

