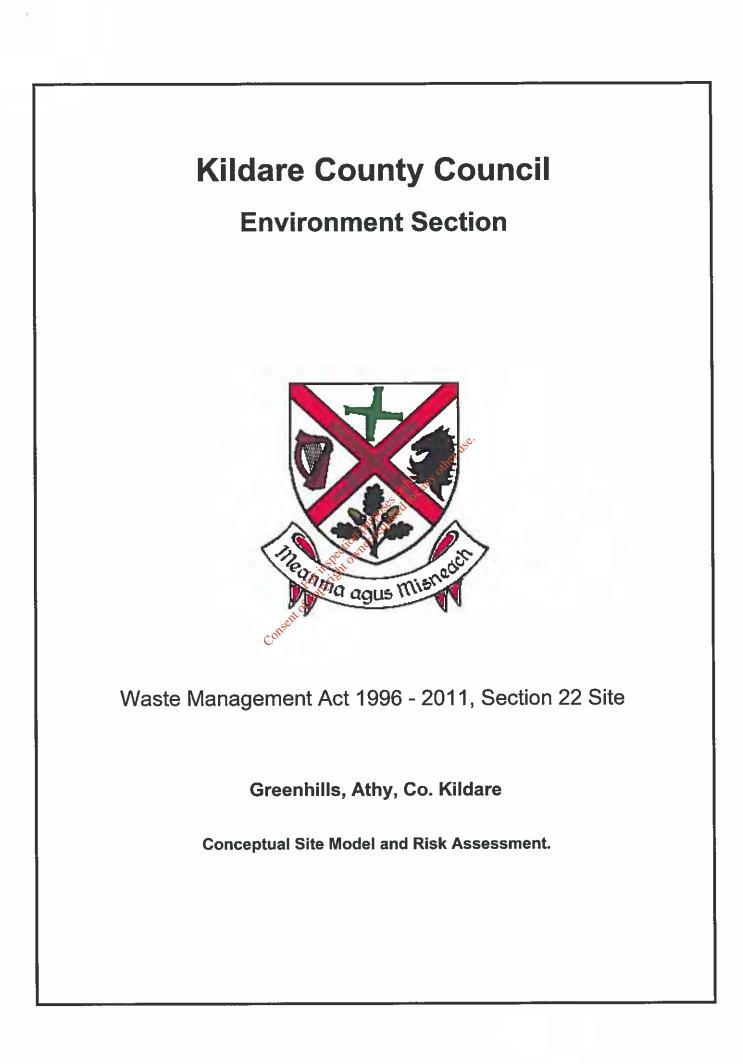
APPENDICES

Consent of conviction purposes only, and other use.

APPENDIX A

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Index

Site Summary

Background

- Conceptual Site Model, Risk Screening and Prioritisation Section 1:
- Appendix 1: **Site Location Map**
- Log inspection purposes only: any other use. Appendix 2: Ground Water Protection Map
- Appendix 3: Subsoil Map
- NHA, SAC Appendix 4:
- Photographs of site Appendix 5: Con
- Appendix 6: **Cost Estimate**
- Appendix 7: Walkover Survey

Kildare County Council, Environment Section



Greenhills Refuse Depot, Athy, Co. Kildare

Site Summary

Relevant Risk Screening Parameters.

Name: Greenhills Refuse Depot, Athy, Co. Kildare, S. Source: Municipal Waste 1st January '80 to 31st December '85. Geology: Milford Formation Peloidal Calcatentic Limestone Groundwater: Inner Source Protection Area, Extreme Vulnerability (SI/E). Surface Water: The River Barrow adjoins the waste site, The Grand Canal is 335m from the waste site Human Presence: Nearest dwellings 15m west of the landfill site and the pool is on the landfill site. Protected Areas: The River Barrow adjoins the waste site. The river Barrow is an SAC. SPR Linkage: SPR8 score of 70% for leachate migration to Surface Water Body i.e. the River Barrow. SPR9 Score of 70%leachate migration to a protected area (SWDTE) SPR10 Score of 70% for landfill gas migration affecting humans as there is a swimming pool on the site and dwellings within 15m of the landfill site.

Risk Classification: High Risk

Background

Location Appendix 1: Site Location Map

Greenhill Refuse Depot is located adjacent to a residential area of Athy Town. A swimming pool was built on the landfill site and large residential areas are located to the west of east of the landfill site. The River Barrow separates the waste body and the housing estate to the east.

The River Barrow adjoins the Greenhills Refuse Depot along the eastern boundary of the site.

There are 2 public ground water wells located to the north of the site.

Desk Top Study

Kildare County Council's files on the Greenhills Refuse Depot do not indicate the nature of the waste material deposited at the site.

The site was used as a refuse depot for the period 1st January 1980 to 31st December 1985 approx.

The site has been capped with clay.

Walkover Survey (Appendix 7)

The exact extent of the Greenhills Refuse Depot in Athy, Co. Kildare is estimated to match the footprint of the area outlined in red, on the maps in Appendix 1.

The plan area is approximately 4 hectares. Not of

The current land use of the site consists of a swimming pool development and its associated car park with green open space to the north and south of the site. There is a slightly raised grass area to the west of the site.

The area to the west of the landfill is residential.

There is a slight slope from the swimming pool development to the River Barrow to the east.

There is no sign of surface ponding of leachate or leachate seepage from the waste body.

There are no landfill odours.

Geology

The GSI groundwater vulnerability mapping identifies the site of the Greenhills Refuse Depot as being located within an Inner Source Protection Area and has an extreme vulnerability SI/ E zone

The Rock Type is Milford Formation Peloidal Calcarenitic Limestone.

Tier 1 Risk Assessment Findings.

Following the Tier 1 Risk Assessment carried out on the site of the Greenhills Refuse Depot a risk rating of 70% was assigned for: SPR8: A risk rating of 70 % was assigned for leachate migration to a surface water body i.e. the River Barrow

SPR9: A risk rating 70% was assigned for leachate migration to a protected area (SWDTE).

SPR10: A risk rating of 70% for landfill gas migration affecting humans as there is a swimming pool on the waste body and dwellings within 15m of the waste body.

Accordingly this historic unregulated waste disposal site is categorised as a High Risk site.

Access to site. The portion of the site containing the Athy swimming pool development is accessible when the facility is open.

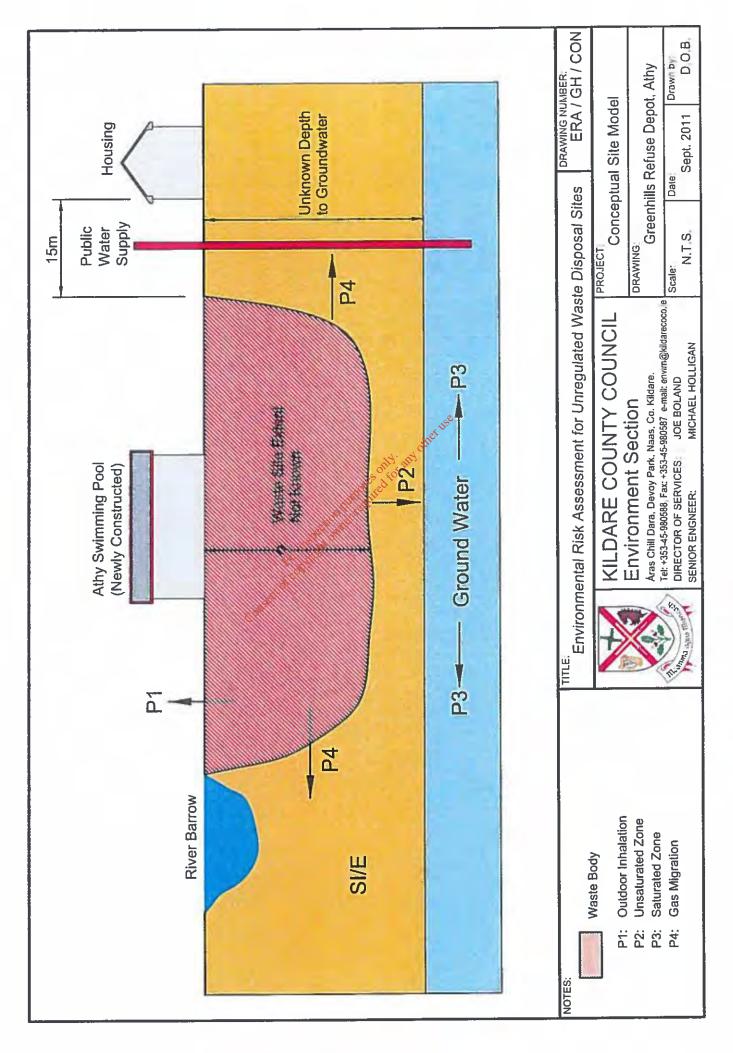
The areas outside the swimming pool development to the north, south and west of the site are accessible from the residential area.

Ciara Corrigan,

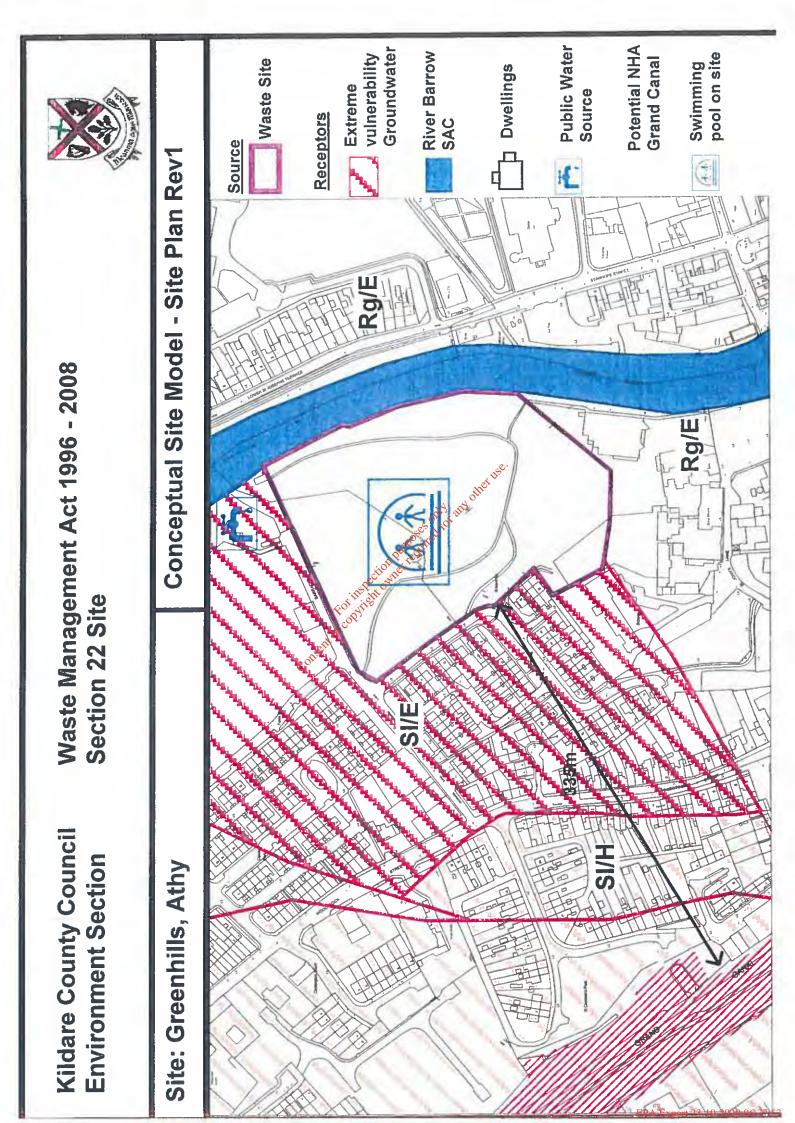
Assistant Environmental Scientist. Environment Section.

Michael Holligan, Senior Engineer, Environment Section Section 1: Conceptual Site Models Risk Screening and Prioritisation

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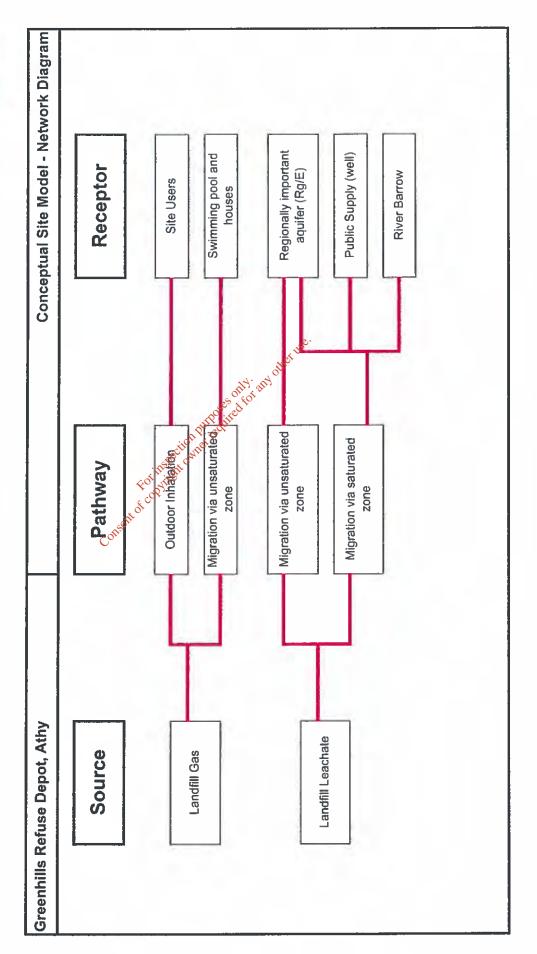
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Kildare County Council Environment Section

Waste Management Act 1996-2008 Section 22 Sites





Site :	Greenhills, Athy		
	Table	Score	Rationale
	1a: Leachate Hazard	7	Municipal waste in an area of approx 3.7ha
	1b: Landfill Gas Hazard	7	Municipal waste in an area of approx 3.7ha
	2a: Leachate Migration - GW Vulnerability	3	Extreme Vulnerability
	2b: Leachate Migration - GW Flow Regime	2	Gravel ground water bodies (Rg)
	2C: Leachate Migration - SW Drainage	2	River runs beside the site
	2d: Landfill Gas - Laterial Migration	3	Receptor located within 250m of source and in a gravel area
	2e: Landfill Gas - Vertical Migration	0	Prior to current swimming pool development there was no receptor above source
	3a: Leachate Migration - Human Presence	3	Receptor within 50m ³⁰
	3b: Leachate Migration - Protected Area	3	SAC runs along the boundary
	3c: Leachate Migration - Aquifier Category	5	Regionally Important Aquifer
	3d: Leachate Migration - Public Water Supply	7	Public well withiun 100m of source
	3e: Leachate Migration - Surface Watewr Bobied	3 00 3 00	River runs beside the site
	3f: Landfill Gas - Human Presence	Conset	Receptor within 50m

SPR (Source Pathway Receptor) Linkage

SPR 1= 1a X (2a + 2b + 2c) X 3e SPR 2= 1a X (2a + 2b + 2c) X 3b (SWDTE) SPR 3= 1a X (2a + 2b) X 3a SPR 4= 1a X (2a + 2b) X 3b SPR 5= 1a X (2a + 2b) X 3c SPR 6= 1a X (2a + 2b) X 3d SPR 7= 1a X (2a + 2b) X 3d SPR 7= 1a X (2a + 2b) X 3e SPR 8= 1a X 2c X 3e SPR 2= 1a X 2c X 3b (SWDTE) SPR 10= 1b X 2d X 3f SPR 11= 1b X 2e X 3f

	Site score	Max score	%
SPR 1:	147	300	49.00%
SPR 2:	147	300	49.00%
SPR 3:	105	240	43.75%
SPR 4:	105	240	43.75%
SPR 5:	175	400	43.75%
SPR 6:	245	560	43.75%
SPR 7:	105	240	43.75%
SPR 8:	42	60	THE PARTY OF
SPR 9:	42	60	TO GAR
SPR 10:	105	150	
SPR 11:	0	250	0.00%



Site: Greenhills Athy

Table 1a:	LEACHAR	RE: SOURCE/	HAZARD SCO	ORING
	WASTE F	OOTPRINT (h	a)	
WASTE TYPE	≤1 ha	>1 <u><</u> 5 ha	> 5 ha	
C&D ²⁰	0.5	1	1.5	
Municipal ²¹	5	1.5	10	
Industrial ²²	5	7	10	
Pre 1977 sites ²³	1	2	3	
		Max	10	

1a 7

7

3

1b

2a

Table 1b: LANDFILL GAS: SOURCE/HAZARD SCORING MATRIX

	WASTE F	WASTE FOOTPRINT (ha)		
WASTE TYPE	< 1 ha	>1≤5 ha	> 5 ha	
C&D ²⁰	0.5	1	1.5	
Municipal ²¹	5	1	10	
Industrial ²²	5	7	10	
Pre 1977 sites ²³	1	2	3	
		Max	10	

Parameter		Points available	therus
GROUNDWATER FLOW REGIME Pathway)	(Vertical	e only.	any other use.
Extreme Vunerability		1	
High Vunerability		21 Juli	
Moderate Vunerability	Dati	8 kr	
Low Vunerability	oect -	0.5	
High - Low Vunerability	instat	2	

Table 2b: LEACHATE Parameter	MIGRATION: PATH		Points
	Cor		available
GROUNDWATER FLOW REGIN	ME (Horizontal Path	way)	
Karstified Groundwater bodies (F	Rk)		5
Productive Fissured Bedrock Gro	oundwater Bodies	(Rf	
and Lm)			3
Gravel Groundwater bodies (Rg	and Lg)		1000
Poorley Productive Bedrock Grou	und Water Bodies	(LI,	
PI, PU)			1

Parameter	Points available
	available
SURFACE WATER DRAINAGE (surface water pathway)	
Is there a direct connection between drainage ditches associated with the waste body and adjacent surface water	2
body? Yes	
If no direct connection	



2c		2

Table 2d: LANDFILL GAS. PATHWAY assun		50m or source
Parameter	Points	
	available	
LANDFILL GAS LATERIAL MIGRATION		
POTENTIAL		
Sand and gravel, Made ground, urban, Karst	125 C	
Bedrock	2	
All other Tills (including limestone, sandstone etc -	1.5	
moderate Permeability		
All Namurian or Irish Sea Tills (low permeability)	1	
Clay, Alluvium, Peat	1	2d

 Table 2e:
 LANDFILL GAS: PATHWAY assuming receptor located above source

Parameter	Points	
	available	
LANDFILL GAS LATERIAL MIGRATION		
POTENTIAL		
Sand and gravel, Made ground, urban, Karst	5	
Bedrock	3	
All other Tills (including limestone, sandstone etc -	2	
moderate Permeability		
All Namurian or Irish Sea Tills (low permeability)	1	
Clay, Alluvium, Peat	1	<u>ي</u> و. 2e
		there
Table 3a: LEACHATE MIGRATION RECEP	TORS MY	involter use. 2e
Parameter	Points	

Table 3a: Parameter	LEACHATE MIGRATION	the second se	Points 50
HUMAN PRES	ENCE (presence of a house in	ndicates	rede
potential private	e well)	tione	۶.'
On or within 50	m of waste body	2 P 0 7	40
Greater than 50	m but less than 250m of the v	vaste body 2	2
Greater than 25	50m but less than 1km of the w	vaste body 1	
	m of the waste body	5000)
	P (0)	sent	
Table 2h	LEACHATE MICRATION	I- DECEDTODS	

Table 3b: LEACHATE MIGRATION: RECEPTOR	S
Parameter	Points available
PROTECTED AREAS (SWDTE or GWDTE)	
On or within 50m of waste body	11-
Greater than 50m but less than 250m of the waste body	2
Greater than 250m but less than 1km of the waste body	1
Greater than 1km of the waste body	0
Undesignated sites within 50m of waste body	1
Undesignated sites greater than 50m but less than 250m of the waste body	0.5
Undesignated sites greater than 250m of the waste body	0

3

0

3a	3

3b 3

Table 3c: LEACHAT	LEACHATE MIGRATION: RECEPTORS	
Parameter	Points available	
AQUIFIER CATEGORY (resou	urce potential)	
Regionally Important Aquifier (Rk, Rf, Rg)	
Locally Important Aquifier (LI, L		
Poor Aquifier (PI, Pu)	1	

3c 5

7

3

5

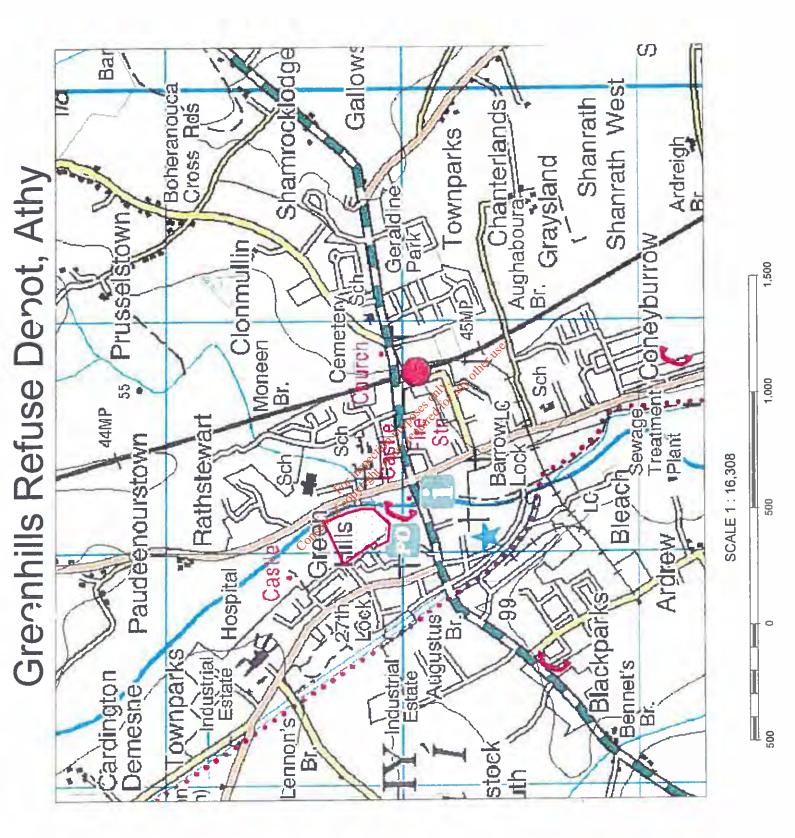
3f

Parameter	Points available
PUBLIC WATER SUPPLY (other than private wells)	
Within 100m of site boundary	1
Greater than 100m but less than 300m or within Inner SPA (SI) for GW supplies	5
Greater than 300m but less than 1km or wilhin Outer SPA (SO) for GW supplies	3
Greater than 1km (karst aquifier)	3
Greater than 1km (no karst aquifier)	0

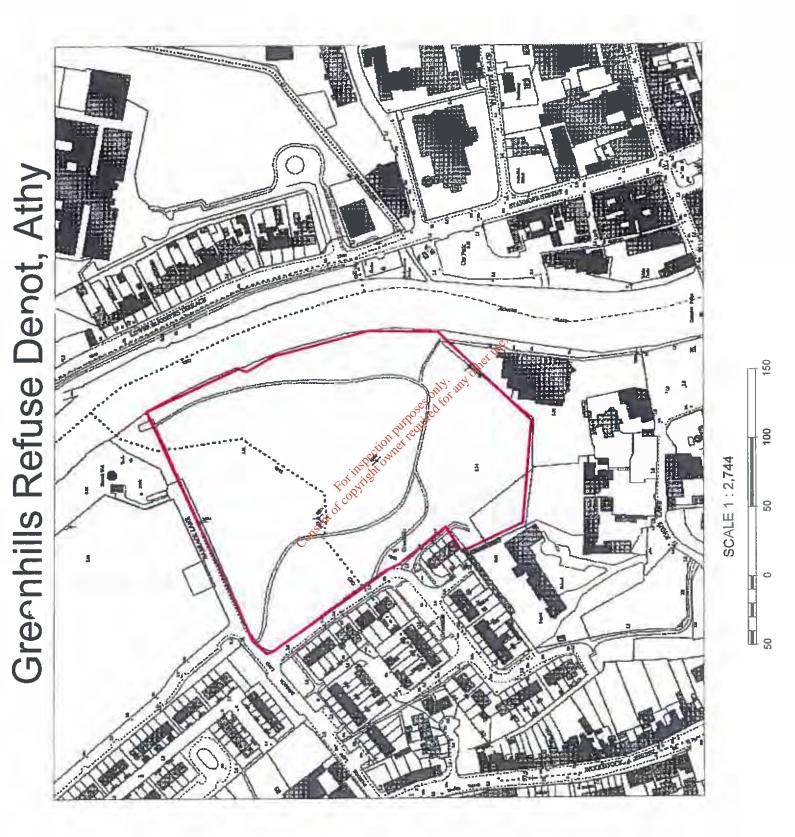
Points available	other use.
	otti
a la constante de la constante	
2 5	
1 to ite	
	3e
CEPTORS In State of the state	
Points	
	CEPTORS ^{INSCIONDEL}

Parameter	of copy	Points available
HUMAN PRESENCE	ent	
On site or within 50m of site boundary	COUS	10.000
Greater than 50m but less than 150m		3
Greater than 150m but less than 250m		1
Greater than 250m		0.5

Appendix 1: Site Location Map.

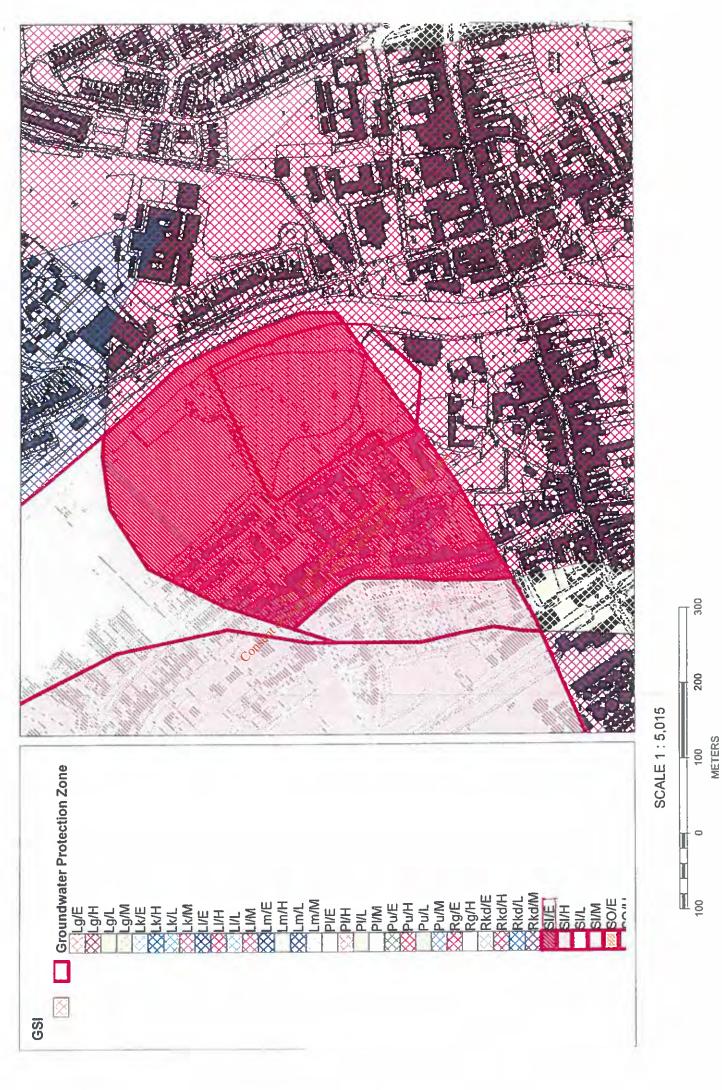


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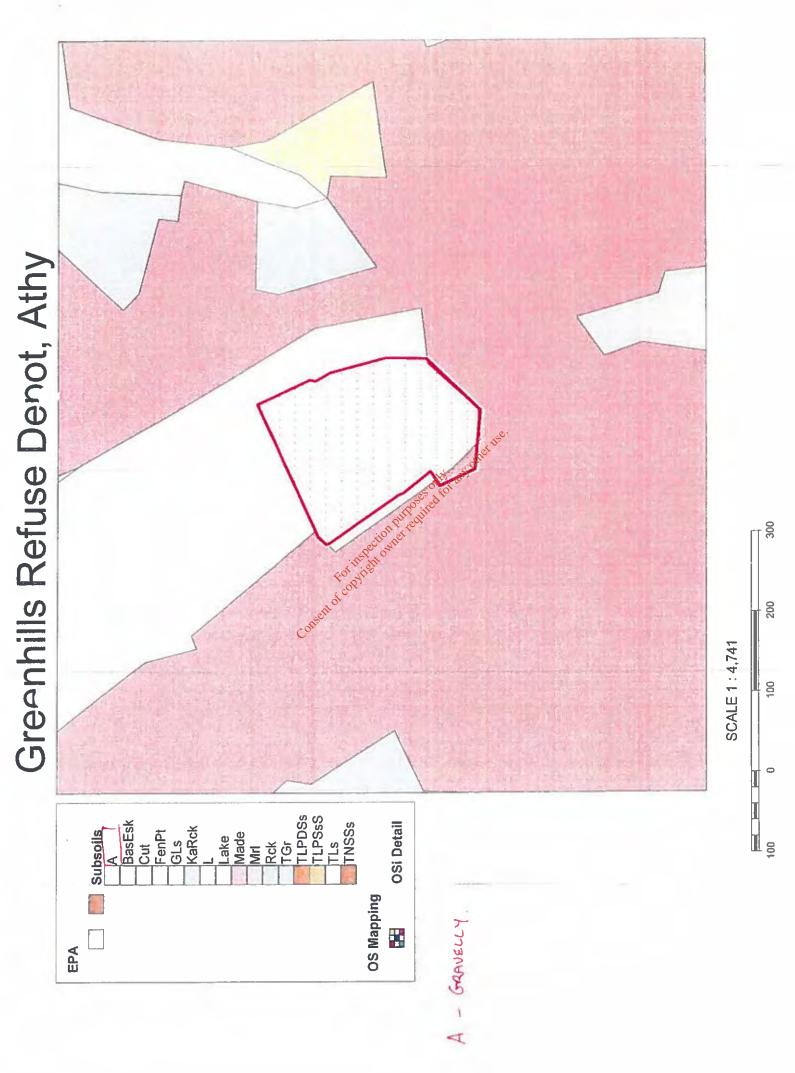


Appendix 2: Ground Water Protection Map.

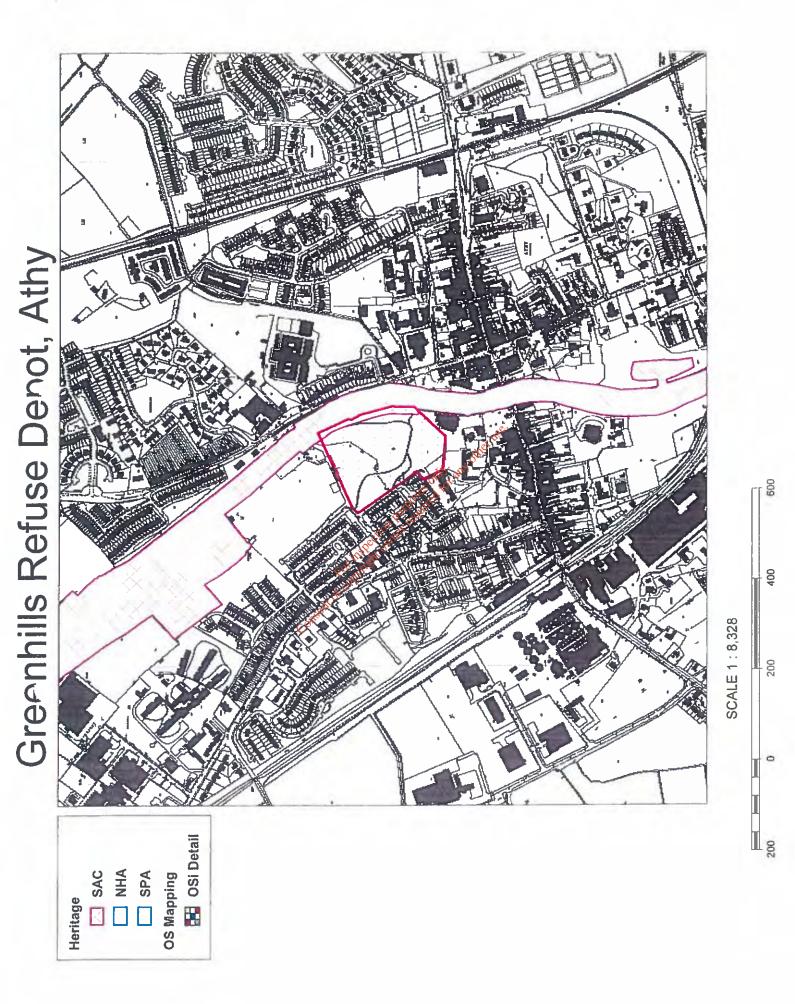
Greenhills Refuse Denot, Athy

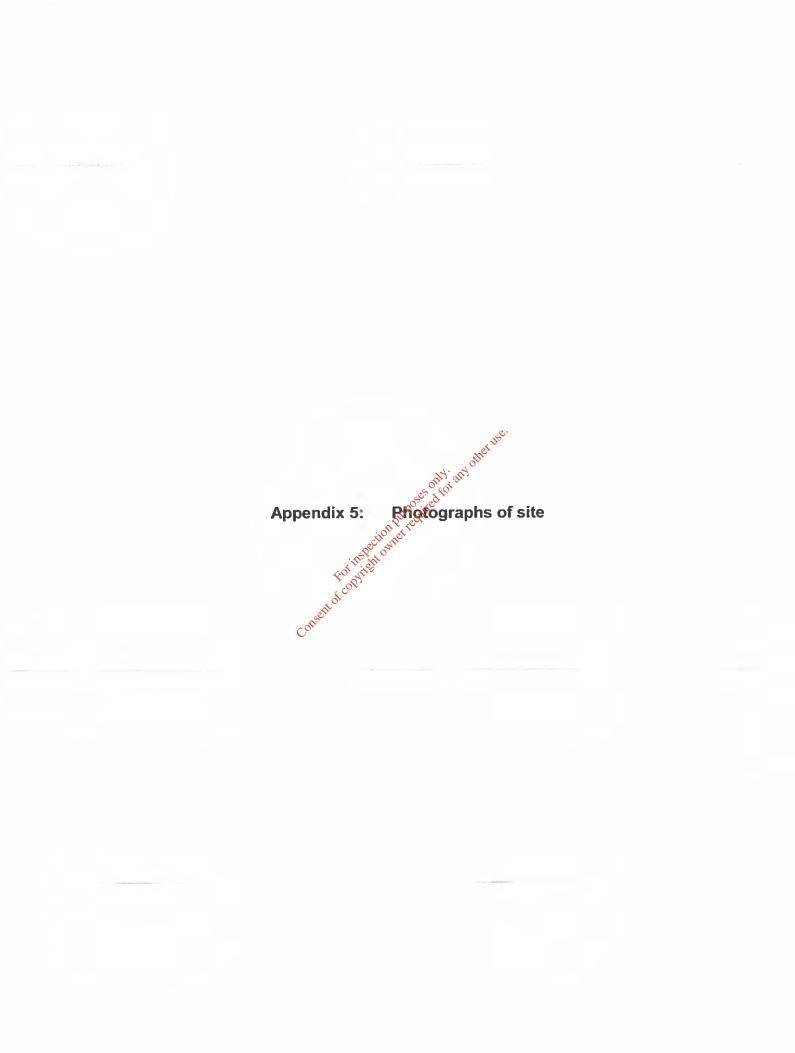


Appendix 3: Subsoil Map.

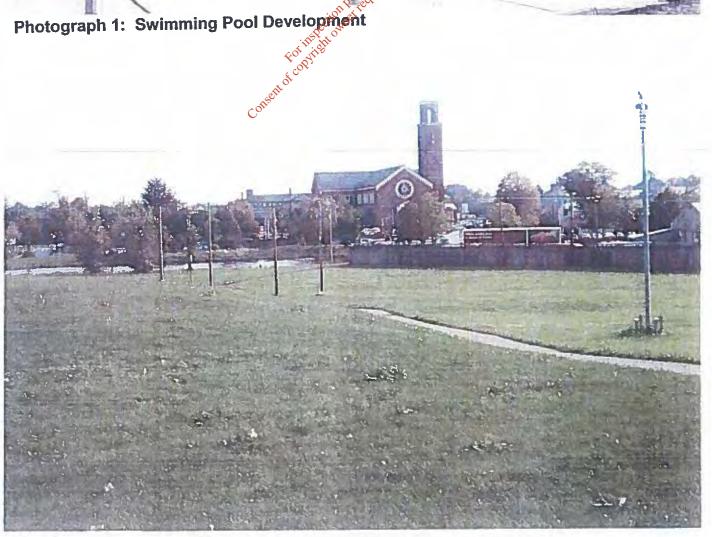


Appendix 4: NHA, SAC.









Photograph 2: View of River Barrow and grass area











Photograph 6: Public Water Supply north of site





Walkover Survey Checklist

Section 22 - Waste Management Act 1996-2011

Location: Greenhills Refuse Depot

Information	Checked	Comment (include distances from site boundary)
1. What is the current land use?		Swimming Pool Development and grass area
2. What are the neighbouring land uses?		Green area open space, residential areas 15 metres from the landfill site. The River Barrow adjoins the waste site
3. What is the size of the site?		The site is approximately 3.7 hectares in size
4. What is the topography?	stinspection purpose of	A It slopes towards the River Barrow. The land is flat close to the river Barrow
5. Are there potential receptors (if yes give details)?	inspection for read	
Houses	of the	Yes
Surface water featyres (if yes to distance and direction of flow)		The River Barrow adjoins the landfill site
Public Water Supplies		There are 2 public wells beside the site.
Private Wells		
Services		
Other Buildings		Swimming pool development
Other		
6. Are there any potential sources of contamination (if yes give details)?		
Surface waste (if yes what type)		No surface water visible
Surface ponding of leachate		No
Leachate seepage		No

Landfill gas odours		No
7. Are there any outfalls to surface water? (If so are there discharges and what is the nature of the discharge)		None visible
8. Are there any signs of impact on the environment? (If yes take photographic evidence)		
Vegetation die off bare ground		No
Leachage seepages		No
Odours		No
Litter		No litter on site
Gas bubbling through water		No
Signs of settlement, subsidence, water logged areas		No settlement visible
Drainage of hydraulic issues	, and a second se	Not tested
Downstream water quality appears poorer than upstream quality	of insection purpose required	Not tested
9. Are there any indication of remedial measures	of institute	
Capping Negative	3	Clay Cap
Landfill gas collection		No
Leachate collection		No
10. Describe fences and security features (if any)		The swimming pool development has fencing around it. The rest of the landfill site is in a public grass area.
Any other relevant information		

APPENDIX B

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Table 1a: Leachate: Source/hazard Scoring Matrix

Waste Type	Waste Footprint (ha)		
	≤ 1 ha	> 1 ≤ 5 ha	>5
C&D ¹	0.5	1	1.5
Municipal ²	5	7	10
Industrial ³	5	7	10
Pre 1977 sites ⁴	1	2	3
		Max	10
		Result (1a)	7

Table 1b: Landfill Gas: Source/hazard Scoring Matrix

Waste Type	Waste Footprint (ha)		
	≤ 1 ha	> 1 ≤ 5 ha	>5
C&D ¹	0.5	0.75	1
Municipal ²	5	7	10
Industrial ³	3	5	7
Pre 1977 sites ⁴	0.5	0.75	1
		Max	10
		Result (1b)	7

Table 2a: Leachate Migration: Pathways

Parameters			Points Available
		<u></u>	_
Groundwater Vulnerability		of N.	
(Vertical Pathway)		othe	
Extreme Vulnerability		-111 any	3
High Vulnerability		at a for	2
Moderate Vulnerability	4	Positiet.	1
Low Vulnerability	n Pr	reor	0.5
High – Low Vulnerability	ection net		2
	inspinor	Max	3
	FOLVING	Result (2a)	1
	FOTINS		

Table 2b: Leachate Migration: Pathways

Parameters Conser		Points Available
Groundwater Flow Regime		
(Horizontal Pathway)		
Karstified Groundwater Bodies (Rk) ⁵		5
Productive Fissured Bedrock Groundwater Bodies		3
(Rf and Lm)⁵		
Gravel Groundwater Bodies (Rg and Lg) ⁵		2
Poorly Productive Bedrock Groundwater Bodies		1
(Li, Pl, Pu)⁵		
	Max	5
	Result (2b)	5

¹ Predominantly inert waste with low biodegradable fraction and/or small industrial waste fraction.

² Typically non-hazardous domestic waste (highly biodegradable) with potentially small hazardous waste fraction and/or small industrial waste fraction, e.g. town dump.

³ Generally industrial waste where hazardous waste was known to have been deposited or there is a strong likelihood that hazardous waste was deposited due to the close proximity of such industries.
⁴ Pre 1977 wastes would have been substantially degraded within the landfill.

⁵ Refer to DEHLG/EPA/GSI 1999, Groundwater Protection Scheme.

Table 2c: Leachate Migration: Pathways

Parameters		Points Available
Surface Water Drainage ⁶		
(surface water pathway)		
Is there a direct connection between drainage ditches associated		2
with the waste body and adjacent surface water body? Yes		
If no direct connection		0
	Max	2
	Result (2c)	2

Table 2d: Landfill Gas: Pathways (assuming receptor within 250m of source)

Parameters		Points Available
Landfill Gas Lateral Migration Potential		
Sand and Gravel, Made ground, urban, karst		3
Bedrock		2
All other tills (including limestone, sandstone etc – moderate permeability)		1.5
All Namurian or Irish Sea Tills (low permeability)		1
Clay, Alluvium, Peat		1
	Max	3
	Result (2d)	3
	, 1 ⁵⁰ .	

Table 2e: Landfill Gas: Pathways (assuming receptor located above source)

any any	Points Available
Landfill Gas Vertical (upwards) Potential	
Sand and Gravel, Made ground, urban, karst with	
Bedrock	
All other tills (including limestone, sandstone etc - moderate	
permeability)	
All Namurian or Irish Sea Tills (low permeability)	
Clay, Alluvium, Peat	
Max	5
Result (2e)	1
	ne etc – moderate) <i>Max</i>

Table 3a: Leachate Migration: Receptors

Parameters		Points Available
Human Presence (presence of a house indicates potential private wells)		
On or within 50m of the waste body		3
Greater than 50m but less than 250m of the waste body		2
Greater than 250m but less than 1km of the waste body		1
Greater than 1km of the waste body		0
	Max	3
	Result (3a)	3

⁶ This element needs to be determined during the site inspection (including walkover survey). The presence of a direct link between surface water drainage from the waste body and any adjacent surface water body implies the existence of a pathway.

Table 3b: Leachate Migration: Receptors

Parameters		Points Available
Protected Areas (SWDTE or GWDTE)		
Within 50m of the waste body		3
Greater than 50m but less than 250m of the waste body		2
Greater than 250m but less than 1km of the waste body		1
Greater than 1km of the waste body		0
Undesignated sites ⁷ within 50m of site of the waste body		1
Undesignated sites ⁷ greater than 50m but less than 250m of the waste body		0.5
Undesignated sites ⁷ greater than 250m of the waste body		0
	Max	3
	Result (3b)	3

Table 3c: Leachate Migration: Receptors

Parameters		Points Available
Aquifer Category ⁸ (resource potential)		
Regionally Important Aquifers (Rf, Rk, Rg)		5
Locally Important Aquifers (Li, Lm, Rg)		3
Poor Aquifers (PI, Pu)		1
	Max	5
	Result (3¢)	5

- Rk
- Rf
- Regionally Important Karstified Aquifers Regionally Important Fissured Bedrock Aquifers Regionally Important Extensive Sand/Creations Rg
- LI
- Lm Locally Important Bedrock Aquifers Cenerally Moderately productive
- Lg Locally Important Bedrock Aquifers - Generally productive only in local zones
- ΡĪ Poor Bedrock Aquifers - Generally unproductive except in local zones
- Pu Poor Bedrock Aquifers - Generally unproductive

Table 3d: Leachate Migration: Receptors

Public Water Supplies (other than private wells)		
Within 100m of site boundary		7
Greater than 100m but less than 300m or within Inner SPA (SI) for		5
GW supplies		
Greater than 300m but less than 1km or within Outer SPA (SO) for		3
GW supplies		
Greater than 1km (karst aquifer)		3
Greater than 1km (no karst aquifer)		0
	Max	7
	Result (3d)	7

⁷ The term "Undesignated sites" refers to wetland sites that are not designated under the Habitats or Bird Directive or Wildlife Act but are considered on a local scale. Consultation with NPWS is required to identify such sites.

⁸ (DOHLG/EPA/GSI 1999) Groundwater Protection Scheme

Table 3e: Leachate Migration: Receptors

Parameters		Points Available
Surface Water Bodies		
Within 50m of site boundary		3
Greater than 50m but less than 250m		2
Greater than 250m but less than 1km		1
Greater than 1km		0
	Max	3
	Result (3e)	3

Table 3f: Leachate Gas: Receptors

Parameters		Points Available
Human Presence		
On site or within 50m of site boundary		5
Greater than 50m but less than 150m		3
Greater than 150m but less than 250m		1
Greater than 250m		0.5
	Max	5
	Result (3f)	5

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Table 1a: Leachate: Source/hazard Scoring Matrix

Waste Type	Waste Footprint (ha)		
	≤ 1 ha	> 1 ≤ 5 ha	>5
C&D ¹	0.5	1	1.5
Municipal ²	5	7	10
Industrial ³	5	7	10
Pre 1977 sites ⁴	1	2	3
		Max	10
		Result (1a)	7

Table 1b: Landfill Gas: Source/hazard Scoring Matrix

Waste Type	Waste Footprint (ha)		
	≤ 1 ha	> 1 ≤ 5 ha	>5
C&D ¹	0.5	0.75	1
Municipal ²	5	7	10
Industrial ³	3	5	7
Pre 1977 sites ⁴	0.5	0.75	1
		Max	10
		Result (1b)	7

Table 2a: Leachate Migration: Pathways

Parameters			Points Available
		<u>e</u> .	
Groundwater Vulnerability		of No.	
(Vertical Pathway)		othe	
Extreme Vulnerability		-117 any	3
High Vulnerability		es to	2
Moderate Vulnerability		19° ilec	1
Low Vulnerability	A P	100t	0.5
High – Low Vulnerability	ectione	>	2
	inspint or	Max	3
	FOLVILO	Result (2a)	3
	Formstell		

Table 2b: Leachate Migration: Pathways

Parameters Conser		Points Available
Groundwater Flow Regime		
(Horizontal Pathway)		
Karstified Groundwater Bodies (Rk) ⁵		5
Productive Fissured Bedrock Groundwater Bodies		3
(Rf and Lm)⁵		
Gravel Groundwater Bodies (Rg and Lg) ⁵		2
Poorly Productive Bedrock Groundwater Bodies		1
(Li, Pl, Pu) ⁵		
	Max	5
	Result (2b)	2

¹ Predominantly inert waste with low biodegradable fraction and/or small industrial waste fraction.

² Typically non-hazardous domestic waste (highly biodegradable) with potentially small hazardous waste fraction and/or small industrial waste fraction, e.g. town dump.

³ Generally industrial waste where hazardous waste was known to have been deposited or there is a strong likelihood that hazardous waste was deposited due to the close proximity of such industries.
⁴ Pre 1977 wastes would have been substantially degraded within the landfill.

⁵ Refer to DEHLG/EPA/GSI 1999, Groundwater Protection Scheme.

Table 2c: Leachate Migration: Pathways

Parameters		Points Available
Surface Water Drainage ⁶		
(surface water pathway)		
Is there a direct connection between drainage ditches associated		2
with the waste body and adjacent surface water body? Yes		
If no direct connection		0
	Max	2
	Result (2c)	0

Table 2d: Landfill Gas: Pathways (assuming receptor within 250m of source)

Parameters		Points Available
Landfill Gas Lateral Migration Potential		
Sand and Gravel, Made ground, urban, karst		3
Bedrock		2
All other tills (including limestone, sandstone etc – moderate permeability)		1.5
All Namurian or Irish Sea Tills (low permeability)		1
Clay, Alluvium, Peat		1
	Max	3
	Result (2d)	1
	, 1 ⁵⁰ .	

Table 2e: Landfill Gas: Pathways (assuming receptor located above source)

any any	Points Available
ses dio	
FP UIT	5
Bedrock	
All other tills (including limestone, sandstone etc - moderate	
permeability)	
All Namurian or Irish Sea Tills (low permeability)	
Clay, Alluvium, Peat	
Max	5
Result (2e)	1
	ne etc – moderate) <i>Max</i>

Table 3a: Leachate Migration: Receptors

Parameters		Points Available
Human Presence (presence of a house indicates potential private wells)		
On or within 50m of the waste body		3
Greater than 50m but less than 250m of the waste body		2
Greater than 250m but less than 1km of the waste body		1
Greater than 1km of the waste body		0
	Max	3
	Result (3a)	3

⁶ This element needs to be determined during the site inspection (including walkover survey). The presence of a direct link between surface water drainage from the waste body and any adjacent surface water body implies the existence of a pathway.

Table 3b: Leachate Migration: Receptors

Parameters		Points Available
Protected Areas (SWDTE or GWDTE)		
Within 50m of the waste body		3
Greater than 50m but less than 250m of the wa	ste body	2
Greater than 250m but less than 1km of the was	ste body	1
Greater than 1km of the waste body		0
Undesignated sites ⁷ within 50m of site of the waste body		1
Undesignated sites ⁷ greater than 50m but less than 250m of the waste body		0.5
Undesignated sites ⁷ greater than 250m of the waste body		0
Max		3
	Result (3b)	3

Table 3c: Leachate Migration: Receptors

Parameters		Points Available
Aquifer Category ⁸ (resource potential)		
Regionally Important Aquifers (Rf, Rk, Rg)		5
Locally Important Aquifers (Li, Lm, Rg)		3
Poor Aquifers (PI, Pu)		1
	Max	5
	Result (3¢)	5

- Rk
- Rf
- Regionally Important Karstified Aquifers Regionally Important Fissured Bedrock Aquifers Regionally Important Extensive Sand/Creations Rg
- LI
- Lm Locally Important Bedrock Aquifers Cenerally Moderately productive
- Lg Locally Important Bedrock Aquifers Generally productive only in local zones
- ΡĪ Poor Bedrock Aquifers - Generally unproductive except in local zones
- Pu Poor Bedrock Aquifers - Generally unproductive

Table 3d: Leachate Migration: Receptors

Public Water Supplies (other than private wells)		
Within 100m of site boundary		7
Greater than 100m but less than 300m or with	hin Inner SPA (SI) for	5
GW supplies		
Greater than 300m but less than 1km or within	n Outer SPA (SO) for	3
GW supplies		
Greater than 1km (karst aquifer)		3
Greater than 1km (no karst aquifer)		0
	Max	7
	Result (3d)	7

⁷ The term "Undesignated sites" refers to wetland sites that are not designated under the Habitats or Bird Directive or Wildlife Act but are considered on a local scale. Consultation with NPWS is required to identify such sites.

⁸ (DOHLG/EPA/GSI 1999) Groundwater Protection Scheme

Table 3e: Leachate Migration: Receptors

Parameters	Points Available	
Surface Water Bodies		
Within 50m of site boundary	3	
Greater than 50m but less than 250m		2
Greater than 250m but less than 1km		1
Greater than 1km		0
	Max	3
	Result (3e)	3

Table 3f: Leachate Gas: Receptors

Parameters		Points Available
Human Presence		
On site or within 50m of site boundary		5
Greater than 50m but less than 150m		3
Greater than 150m but less than 250m		1
Greater than 250m		0.5
	Max	5
	Result (3f)	5

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APPENDIX C

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REPORT ON THE

GEOPHYSICAL INVESTIGATION

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Ατ

GREENHILS LANDFILL

ATHY, CO. KILDARE,

For

MALONE O'REGAN





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THE FINDINGS OF THIS REPORT ARE THE RESULT OF A GEOPHYSICAL SURVEY USING NON-INVASIVE SURVEY TECHNIQUES CARRIED OUT AT THE GROUND SURFACE. INTERPRETATIONS CONTAINED IN THIS REPORT ARE DERIVED FROM A KNOWLEDGE OF THE GROUND CONDITIONS, THE GEOPHYSICAL RESPONSES OF GROUND MATERIALS AND THE EXPERIENCE OF THE AUTHOR. APEX GEOSERVICES LTD. HAS PREPARED THIS REPORT IN LINE WITH BEST CURRENT PRACTICE AND WITH ALL REASONABLE SKILL, CARE AND DILIGENCE IN CONSIDERATION OF THE LIMITS IMPOSED BY THE SURVEY TECHNIQUES USED AND THE RESOURCES DEVOTED TO IT BY AGREEMENT WITH THE CLIENT. THE INTERPRETATIVE BASIS OF THE CONCLUSIONS CONTAINED IN THIS REPORT SHOULD BE TAKEN INTO ACCOUNT IN ANY FUTURE USE OF THIS REPORT.

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PROJECT NUMBER	AGL18194		
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1. EXECUTIVE SUMMARY

APEX Geoservices Limited was requested by Malone O'Regan to carry out a geophysical investigation at the site of Greenhills Landfill in Athy, Co. Kildare. The purpose of the investigation is to assess the nature of a historical landfill on site.

Greenhills Landfill site is in a residential area in Athy, the site is c. 4Ha in extents and topography ranges from c. 52 – 60 m OD.

The Geological Survey of Ireland (GSI) maps for the area indicate the site is underlain by undifferentiated alluvial deposits with some limestone gravels in the south-west of the site and the bedrock type across the site is the Milford Formation which is described as peloidal calcarenitic limestone.

The objectives of the investigation are to aid in determination of the extent of the waste body, the thickness of the waste, the presence of anomalous features, a volume calculation and depth to bedrock (if within limits of survey).

The geophysical investigation was conducted on the 5th of November 2018 and consisted of EM Ground Conductivity mapping, Electrical Resistivity Tomography (ERT), Seismic Refraction surveying and Multi-Channel Analysis of Surface Waves (MASW) across accessible parts of the site (areas around the existing building were not surveyed).

A suite of 2019 direct investigation information consisting of trial pits, leachate monitoring wells and groundwater wells, was supplied by the client form corporation into this report. The trial pits encountered made ground of gravelly clay, bricks, metal, plastic, wood and cloths to depths 1.1 - 4.4m below ground level (BGL). While one pit terminates in made ground at 4.4m BGL the remaining four pits terminate in sandy gravelly clay and sand & gravel at depths of 2.2 - 4.3m BGL.

Soils consisting of sandy gravelly clay and silty clay are interpreted across the site. Where **MADE GROUND / WASTE** is interpreted the capping / topsoil of silty clay which 0.5 – 2.2m thick.

One type of waste is interpreted on site;

• MADE GROUND/WASTE (municipal, including minor organic, mixed with C&D & CLAY). Where present this material is c. 0.2 – 5.6m thick with the thickest areas east and south of the main building on site.

In total **MADE GROUND / WASTE** covers approximately 1.62 Ha. The volume of waste is estimated as **48,600 cu.m** and tonnage is estimated at **68,040 tonnes**.

The **MADE GROUND / WASTE** is underlain by sandy gravelly clay, silty clay and limestone bedrock. Depth to bedrock across the site varies form 3.7 - >16.0m BGL.

The geophysical report should be reviewed after the completion of any further direct investigation.



2. INTRODUCTION

APEX Geoservices Limited was requested by Malone O'Regan to carry out a geophysical investigation at the site of Greenhills Landfill in Athy, Co. Kildare. The purpose of the investigation is to determine the extent, thickness and type of waste that may be buried across the site.

The geophysical investigation was conducted on the 5th November 2018 and consisted of EM Ground Conductivity mapping, Electrical Resistivity Tomography (ERT), Seismic Refraction surveying and Multi-channel Analysis of Surface Wave (MASW) across accessible parts of the site.

2.1 **Survey Objectives**

The objective of the investigation is to aid in determination of:

- The extent of the waste body,
- The thickness of the waste body,
- A volume calculation,
- Depth to bedrock (if within limits of survey).

2.2 Site Background & Topography

Greenhills Landfill site is within a residential area in Athy 🔅 Kildare and is bounded to the east by the River Barrow. The area under investigation covers c. 4Ha and there is a leisure centre located within the site. The topography ranges from c. 52 – 60 m OD. N°

The site location is shown in Fig. 2.1.



Fig 2.1: Location map (site marked in red).



2.2.1 Soils and Bedrock

The Teagasc soils map for the site primarily describes the soil as undifferentiated alluvial deposits with some limestone gravels in the south-west of the site (Fig. 2.2).

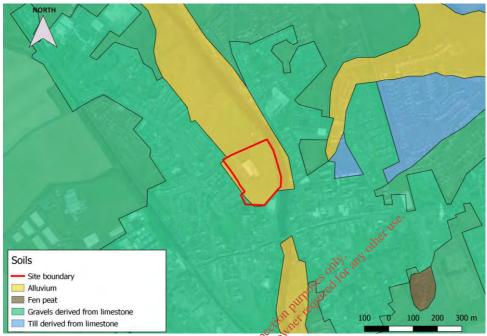


Fig 2.2: The Teagasc soils map (site marked in red), for the former of t Formation which is described as peloid calcarenitic limestone.



Fig 2.3: The GSI bedrock map (site marked in red).



2.2.2 Groundwater vulnerability and aquifer classification

The area under investigation lies within an area of moderate groundwater vulnerability (Fig. 2.4). Bedrock within the site has been classified as "Regionally Important Aquifer - Karstified (diffuse)" (Fig. 2.5).

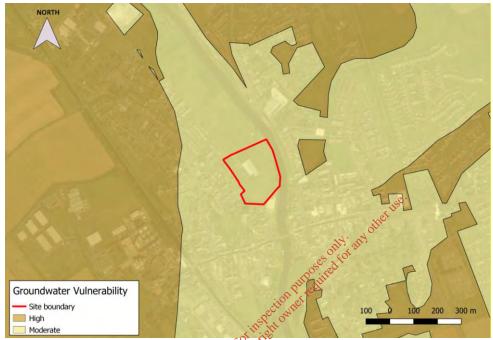


Fig 2.4: The GSI vulnerability map (site marked in red).



Fig 2.5: The GSI aquifer map (site marked in red).



2.2.3 Historical Data

The historical 6 inch map shows limestone gravel in the vicinity of the site.

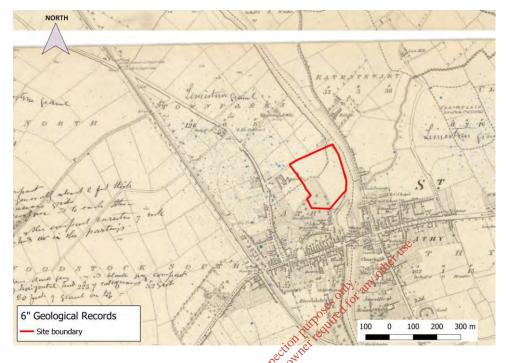


Fig 2.6: The historical 6inch map (site marked in red) of copyr

2.2.4 Direct Investigation Data

A suite of 2019 direct investigation information, consisting of trial pits, leachate monitoring wells and groundwater wells, was supplied by the client for incorporation into this report.

Five trial pits acquired across the site encountered made ground of gravelly clay, bricks, metal, plastic, wood and cloths to depths 1.1 - 4.4m below ground level (BGL). While one pit terminates in made ground at 4.4m BGL the remaining four pits terminate in sandy gravelly clay and sand & gravel at depths of 2.2 - 4.3m BGL.

Three leachate monitoring wells encountered made ground to depths of 2.5 – 6.7m BGL with the made ground overlying clay in two of the wells.

Three groundwater wells encountered a sequence of gravelly clay, silty clay, clayey sand and clayey gravel to depths of 5.4 – 7.9m BGL overlying weathered bedrock. The logs describe the rock as grey/black slightly clayey weathered limestone. GW2-GH encountered rock at 5.9m BGL with the rock between 10.9 and 13.0m BGL described as karstified.

The GSI online Geotechnical viewer shows ten boreholes across the site. The boreholes encountered thin topsoil 0.2 - 0.3 m thick overlying clayey gravel, gravelly clay and made ground of sandy gravelly clay / silt with bricks, plastic, timber, cables, metal and concrete. The boreholes terminate at depths of 1.7 - 9.7m and did not encounter bedrock. The location of these trial pits is shown on Drawing AGL18194_01.



2.3 Survey Rationale

The following techniques have been employed to achieve the objectives of the investigation:

- Electromagnetic ground conductivity mapping has been carried out across the site in order to map the extent of the fill and variations in the fill, and also to screen for any leachate plumes and obtain background values for the soils and rock.
- Electrical Resistivity Tomography (ERT) has been carried out across the site to investigate variations in the thickness and extent of the fill material and leachate, as well as to investigate the overburden and bedrock geology.
- Seismic refraction was carried out at selected locations. The results of the seismic survey have been used to outline the fill/soil boundary.
- Multi-Channel Analysis of Surface Waves (MASW) was carried out on the seismic refraction profiles. The
 results of the MASW have been used to indicate base of waste material. The MASW method is used to
 estimate shear-wave (S-wave) velocities in the ground material to indicate possible soft zones. Soil / fill
 material with an S-wave velocity of <175 m/s is generally classified as soft/loose.

25 offor

As with all geophysical methods the results are based on indirect readings of the subsurface properties. The effectiveness of the proposed approach will be affected by variations in the ground properties. By combining a number of techniques it is possible to provide chigher quality interpretation and reduce any ambiguities which may otherwise exist. Further information on the detailed methodology of each geophysical method employed in this investigation is given in **APPENDIX B: DEFAILED GEOPHYSICAL METHODOLOGY**.

6



3. RESULTS

The investigation was carried out on the 5^{th} of November 2018 and involved the collection of 780 EM conductivity data points, 5 ERT profiles and 3 seismic refraction profiles (3 x 46m) and associated MASW across the site.

3.1 EM Electromagnetic Conductivity Mapping

The EM ground conductivity survey locations are shown on Drawing AGL18194_01. The recorded EM conductivity values are contoured on Drawing AGL18194_02. The conductivity values range from 4-63 milliSiemens/metre (mS/m).

The conductivity values have been interpreted as follows:

Conductivity (mS/m)	Interpretation use	
4-16	Sandy Gravelly CLAY with Silts CLAY	
16-63	MADE GROUND / WASTE (Municipal, including minor organic, mixed with C&D & CLAY)	

3.2 ERT

Five ERT profiles were recorded across the site (Profiles R1 to R5). The locations are shown on Drawing AGL18194_01. Interpreted cross sections were compiled for the profiles and are presented on Drawings AGL18194_R1 to AGL18195_R5.

In determining the various types of imported material present from the resistivity sections R1-R5 it should be noted that:

a) typical resistivities of Irish soils range from 20 Ohm-m (clays) to around 3000 Ohm-m (dry gravel),

b) the resistivity generally increases as the sand/gravel content increases,

c) silt/clay typically has values in the range 30-50 Ohm-m,

d) silty gravelly clay typically has resistivity values in the range 50-100 Ohm-m,

e) deposits of predominantly organic waste such as those occurring in municipal landfills typically have resistivities in the range 5-30 Ohm-m.

f) leachate saturated soils originating from predominantly organic waste have a similar resistivity range to organic waste, but will be influenced by the resistivities of the host material and the degree of dilution and dispersion of the leachate,

g) inert construction and demolition (C&D) waste such as concrete, brick and mixed rock fill, stone and clay will usually have resistivities similar to gravelly material (50-500 Ohm-m).



The resistivity values recorded at this site have been interpreted on the following basis:

	Resistivity (Ohm-m)	Interpretation
Waste	14 - 80	MADE GROUND / WASTE (Municipal, including minor organic, mixed with C&D & CLAY)
Natural	< 80	Silty CLAY
Ground	80 - 260	Sandy Gravelly CLAY
	120 - 260	Highly - Moderately Weathered LIMESTONE
	260 - 3451	Moderately - Slightly Weathered - Fresh LIMESTONE

3.3 **Seismic Refraction Profiling**

150. Three seismic refraction profiles (S1-S3) were recorded across the site. The locations are shown on Drawing AGL18194_01 and the results are included on the interpreted cross sections in Drawings AGL18194_R1, up of the contraction AGL18194_R4 & AGL18194_R5 in Appendix A.

The P-wave seismic velocities (Vp) have been interpreted as follows:

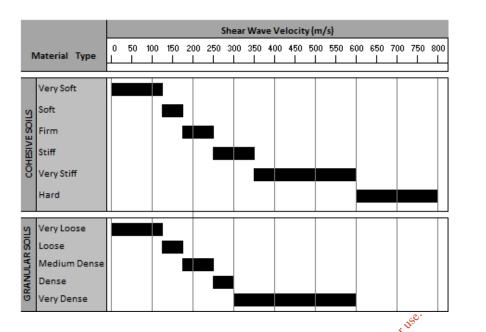
The P-wave seismic velocities (vp) have been interpreted as follows.			
Layer	Average P-Wave Seismic Velocity (m/s)	for the pretation	Stiffness/Rock Quality
1	278 - 500	MADE GROUND / WASTE / SOIL	Soft / Loose
2	500 - 1000	MADE GROUND / WASTE / SOIL	Firm / Medium Dense
3	1000 - 1800	SOIL	Stiff / Dense
4	1800 - 2500	Weathered LIMESTONE	Fair – Good
5	2500 - 4203	Slightly Weathered – Fresh LIMESTONE	Good

3.4 MASW

Three 1D MASW soundings were recorded across the site at the centre of each seismic refraction profile. Shear wave (S-wave) velocity (Vs) values were determined for the made ground/waste and underlying soil material.

Vs velocities and corresponding soil cohesion ranges are summarised in Figure 3.1.

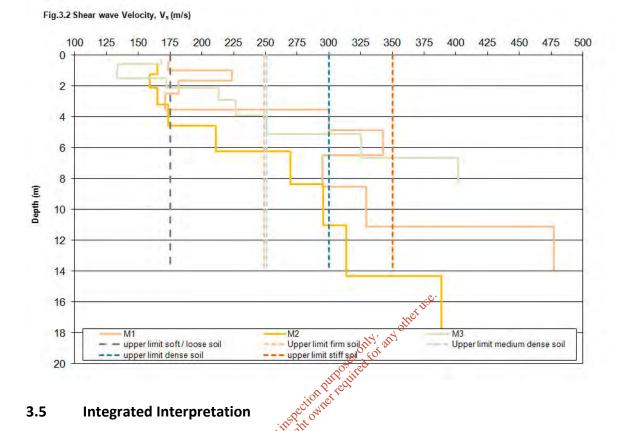




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Fig 3.1: Vs velocities and corresponding soil cohesion ranges.				
The veloci	ties from this site hav	e been interpreted as follows;		
		and the second		
Layer	S-Wave Seismic Velocity (m/s)	of Interpretation		
1	133 - 175	Conserved Construction MADE GROUND / WASTE		
2	211 - 400	SOIL		

The Vs seismic velocities and stiffness ranges are shown below in Figure 3.2.





3.5 Integrated Interpretation

The interpretation of the geophysical data is plotted on Drawings AGL18194_03 and AGL18194_R1 to 800 AGL18194_R6.

Consent 3.5.1 Extent of the waste

Client supplied trial pit data, leachate and monitoring well logs are combined with areas of elevated EM conductivity readings (16 - 63 mS/m) and reduced electrical resistivity readings (14 - 80 Ohm-m) to indicate areas of MADE GROUND / WASTE. The MADE GROUND / WASTE covers part of the site only (see Drawing AGL18194_03.)

Away from the MADE GROUND / WASTE the soil layers consist of predominantly sandy gravelly clay and silty clay. The seismic refraction data indicates the upper 4.0m of soil is soft - firm / loose - medium dense becoming stiff - very stiff / dense - very dense with depth.

3.5.2 Type of waste

The EM Conductivity and the ERT profiles in conjunction with the intrusive data have outlined one type of waste present across the site:

MADE GROUND/WASTE (municipal, including minor organic, mixed with C&D & CLAY) has been interpreted based on EM conductivity values of 16 - 63 mS/m) and ERT resistivity values (14 - 80 Ohm-m).

The trial pit data indicates this material is dominated by clay with the waste material mixed in.



3.5.3 Thickness of waste

Where MADE GROUND / WASTE is interpreted it is present beneath a thin capping layer of silty clay which ranges in thickness from 0.5 – 2.2m.

Across the site MADE GROUND/WASTE (municipal, including minor organic, mixed with C&D & CLAY) is c. 0.2 -5.6m thick with the thickest areas east and south of the main building (see Drawings AGL18194_R1, AGL18194_R4 & AGL18194_R5).

Electrical contrasts between the MADE GROUND / WASTE and underlying silty clay are poor where the waste is thick (see Drawings AGL18194_R1, AGL18194_R4 & AGL18194_R5) and the best thickness information comes from the trial pit and MASW data.

ERT profiles R1, R4 and R5 show the low resistivity zone to extend between 0.1 and 8.8m below the bottom of the waste as found on the trial pit logs. This has been interpreted as a zone of low model resistivity silty clay beneath the waste body. These areas correlate with the areas of alluvium shown on the Teagasc Soils map (see Figure 2.2) and with a layer of clay on trial pit TP4-GH and L1-GH. The nature of this clay could be further other investigated by a borehole to c. 10m BGL.

The seismic refraction and the MASW datasets indicate the MADE GROUND / WASTE is soft / loose as Vp and Vs velocities within the waste range from 278 - 500 m/s and 33 - 175 m/s respectively.

3.5.4 Volume Calculation

oppression owner The volume of waste calculated across the site is as follows;

Extent (Ha.)	Average Thickness (m)	Volume (cu. m)	Tonnes (@ 1.4 tonnes/cu.m)
1.62	3.0	48,600	68,040
TOTAL		48,600	68,040

3.5.5 Depth to Bedrock

Bedrock across the site is interpreted as limestone. Areas of low model resistivity values, 120 - 260 Ohm-m, and Vp velocities of 1800 – 2500m/s indicate weathering of the bedrock. This correlates with the logs for GW1-GH – GW3-GH. At a depth of 10.9 – 13.0m on GW2-GH the log describes the rock as karstified. The weathered rock overlies moderately - slightly-fresh Limestone with model resistivity values of 260 - 3451 Ohm-m and Vp velocities of 2500 – 4203m/s. The depth to weathered limestone across the site varies form 3.7 - >16.0m BGL.



4. **RECOMMENDATIONS**

The geophysical report should be reviewed after the completion of any further direct investigation.

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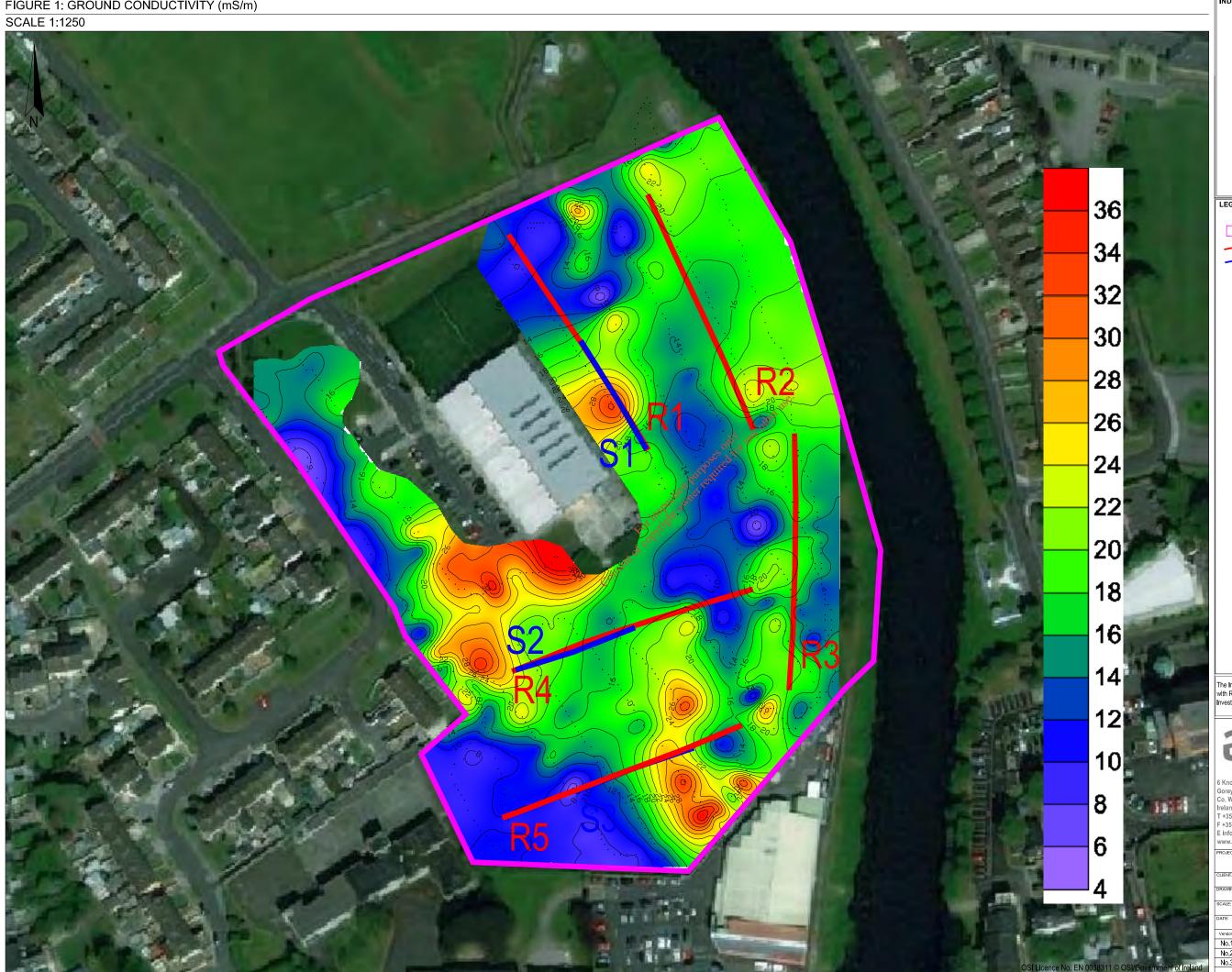
6. APPENDIX A: DRAWINGS

The information derived from the geophysical investigation as well as correlation with the available direct investigation is presented in the following drawings:

AGL18194_01	Geophysical Investigation Locations	Scale 1:1250 @ A3
AGL18194_02	EM Ground Conductivity Map	Scale 1:1250 @ A3
AGL18194_03	Summary Interpretation	Scale 1:1250 @ A3
AGL18194_R1	ERT R1 & Seismic S1 Results & Interpretation	Scale 1:500 @ A4
AGL18194_R2	ERT R2 Results & Interpretation	Scale 1:500 @ A4
AGL18194_R3	ERT R3 Results & Interpretation	Scale 1:500 @ A4
AGL18194_R4	ERT R4 & Seismic S2 Results & Interpretation	Scale 1:500 @ A4
AGL18194_R5	ERT R5 & Seismic S3 Results & Interpretation	Scale 1:500 @ A4

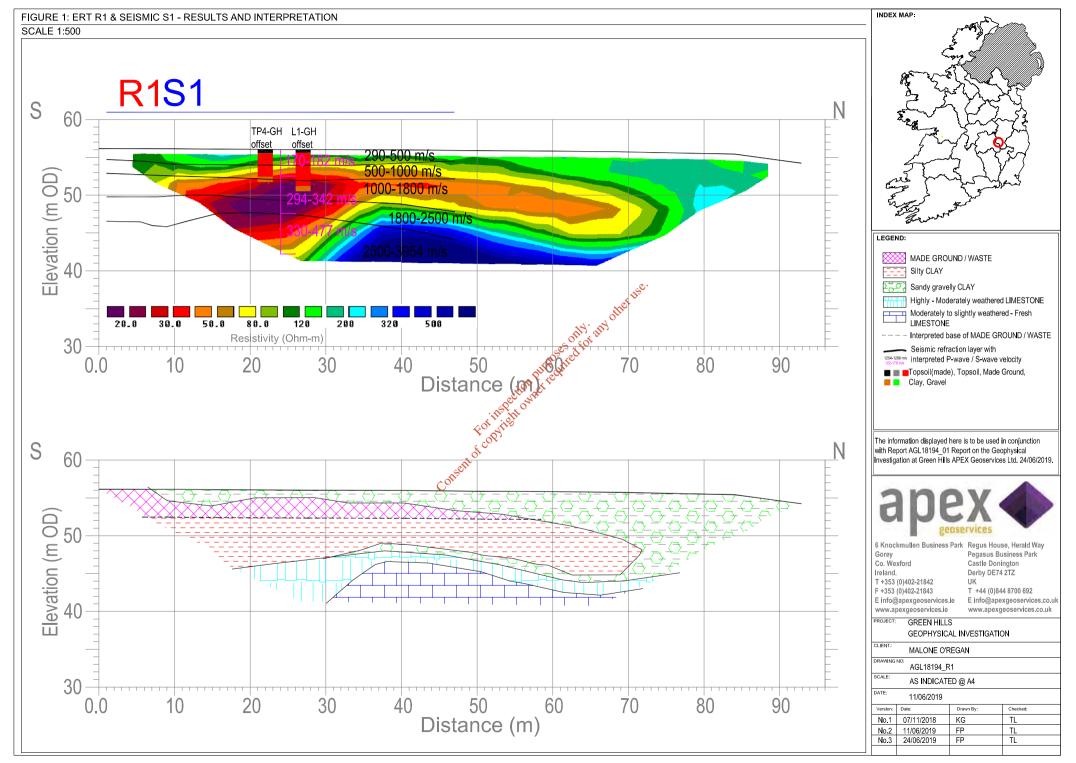
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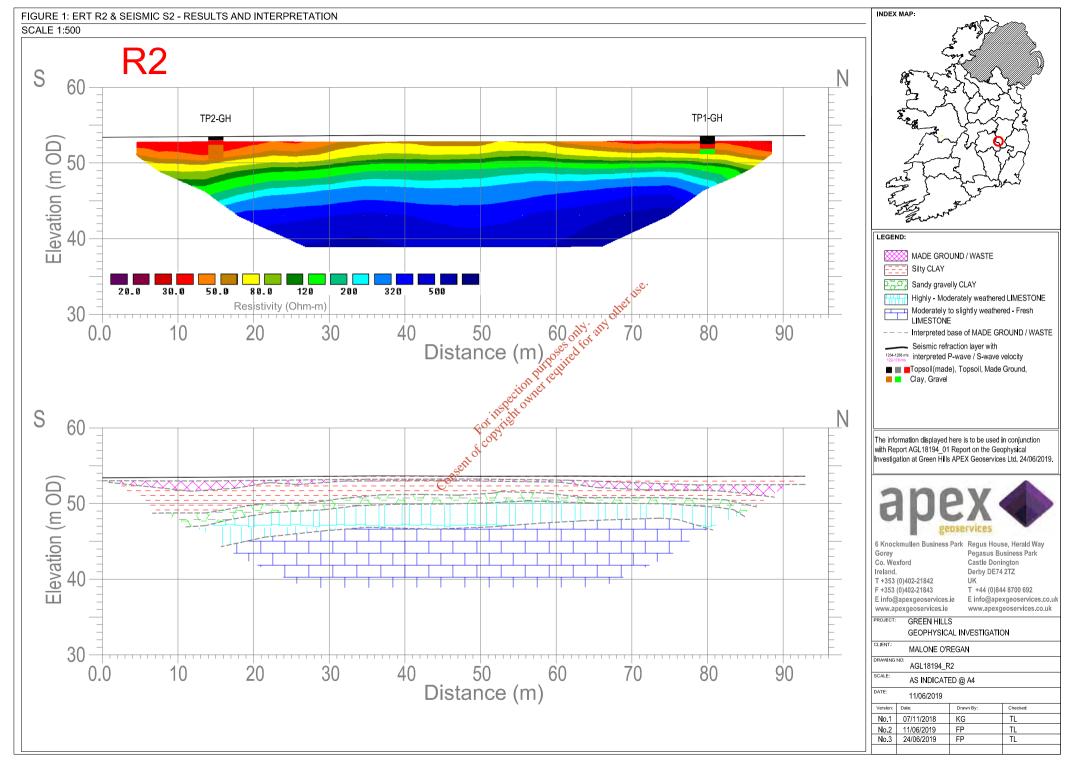




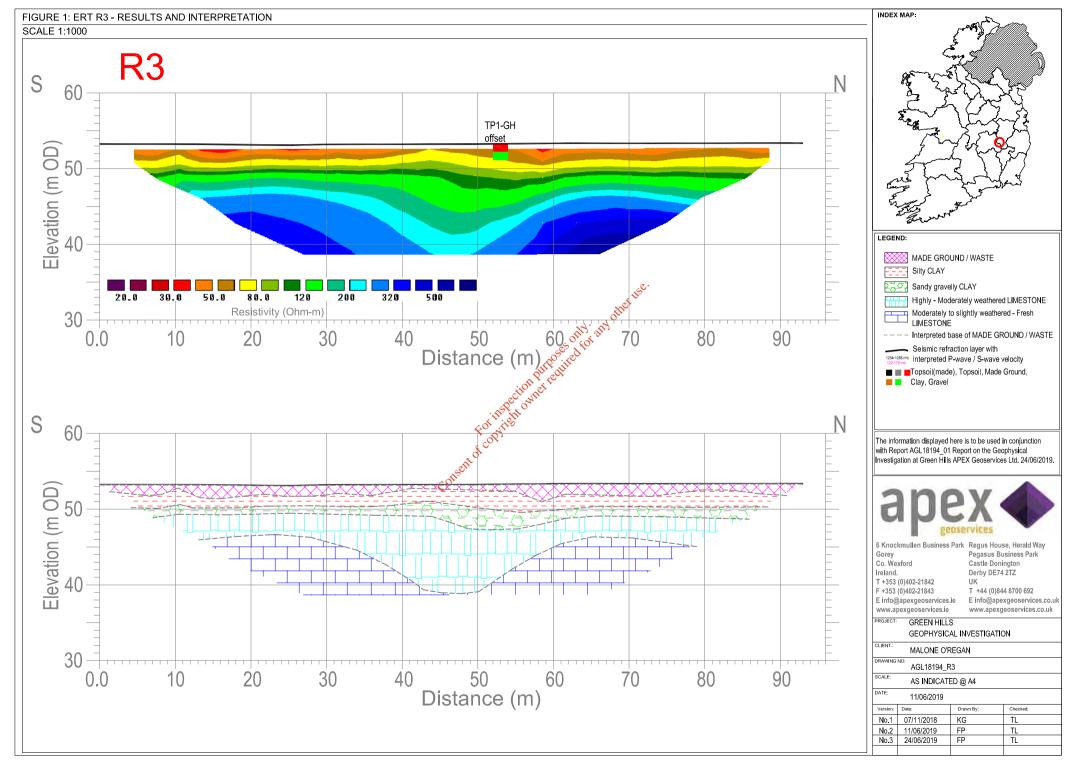
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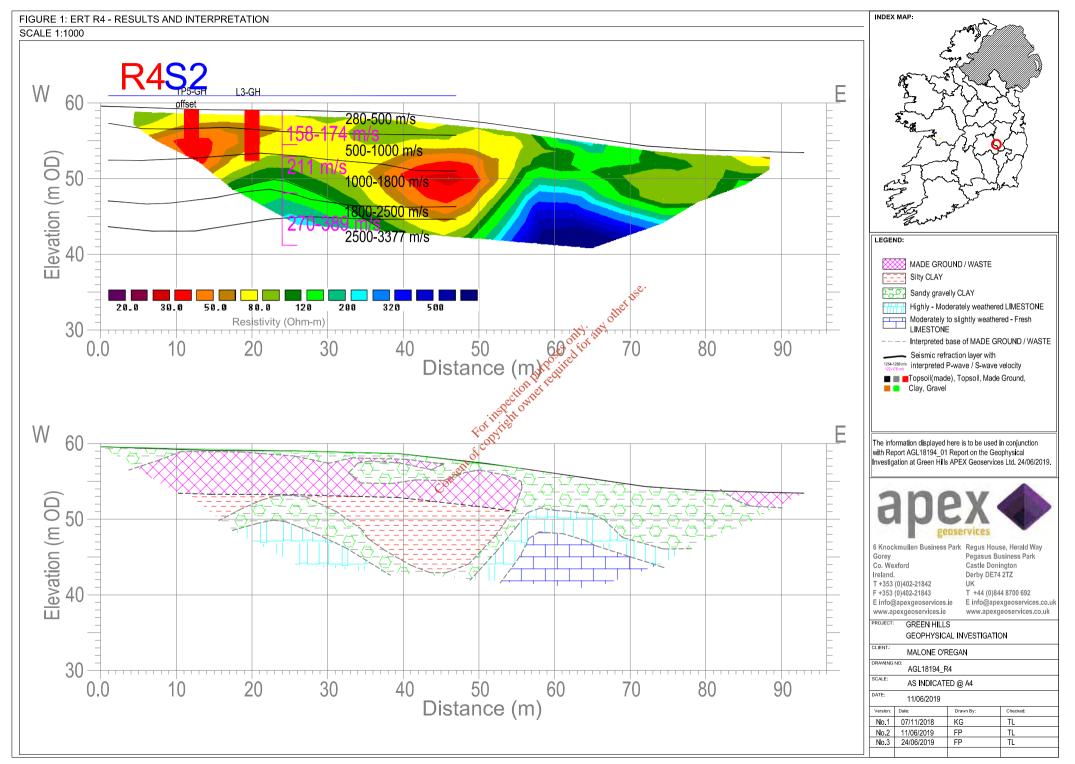


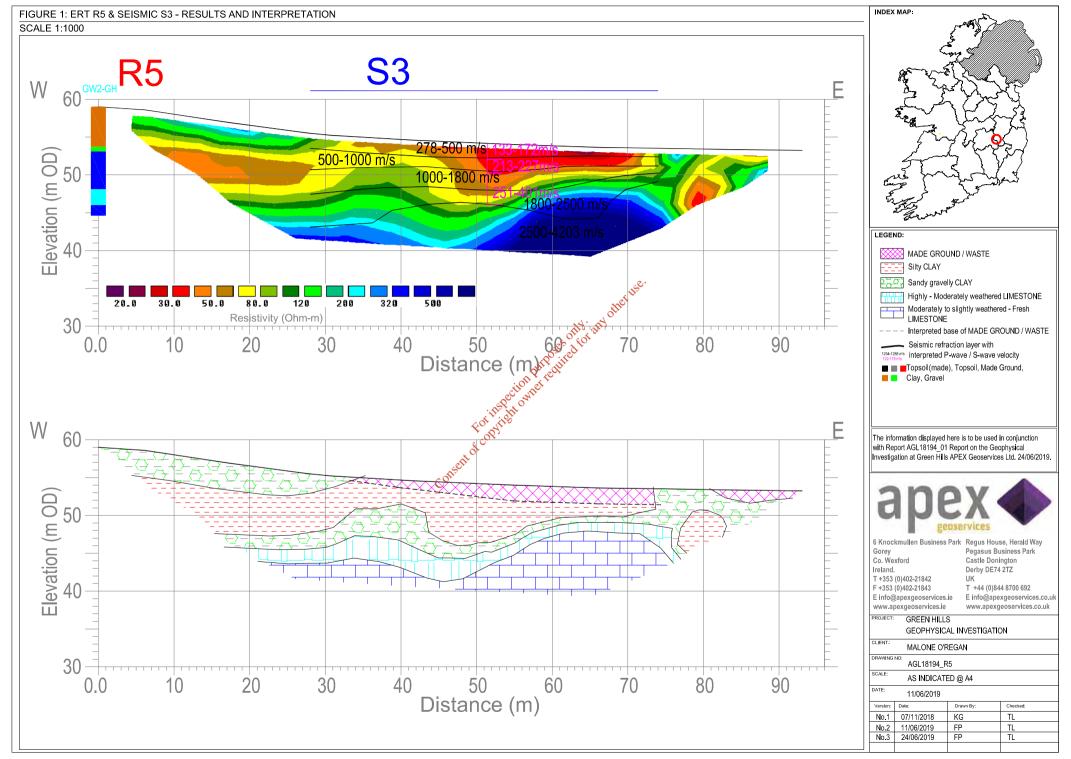




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7. APPENDIX B: DETAILED GEOPHYSICAL METHODOLOGY

A combination of a number of geophysical techniques was used to provide the high quality interpretation and reduce any ambiguities, which may otherwise exist.

7.1 EM ground conductivity mapping

7.1.1 Principles

This method operates on the principle of inducing currents in conductive substrata and measuring the resultant secondary electro-magnetic field. The strength of this secondary EM field is calibrated to give apparent ground conductivity in milliSiemens/metre (mS/m). Readings over material such as organic waste and peat give high conductivity values while readings over dry materials with low clay mineral content such as gravels, limestone or quartzite give low readings.

The EM ground conductivity survey technique determines the apparent conductivity of the ground material from 0-6m bgl depending on the dipole mode used. otheruse

7.1.2 Data collection

The EM equipment used was a GF CMD-4 conductivity meter equipped with data logger. This instrument features a real time graphic display of the previous 20 measurement points to monitor data quality and results. Conductivity and in-phase values were recorded across the site. Local conditions and variations were recorded.

7.1.3 Data processing

The conductivity and in-phase field readings were downloaded, contoured and plotted using the SURFER 12 FOT program (Golden Software, 2015). Assignation of material types and possible anomaly sources was carried out, with cross-reference to other data.

7.1.4 Relocation

All data were referenced using a GPS system and all positions are given in Irish Tranverse Mercator coordinates.

7.2 Electrical Resistivity Tomography (ERT)

Electrical Resistivity Tomography was carried out to provide information on lateral variations in the overburden material as well as on the underlying overburden and bedrock.

7.2.1 Principles

This surveying technique makes use of the Wenner resistivity array. The 2D-resistivity profiling method records a large number of resistivity readings in order to map lateral and vertical changes in material types. The 2Dresistivity profiling method involves the use of 64 electrodes connected to a resistivity meter, using computer software to control the process of data collection and storage.



7.2.2 Data Collection

Profiles were recorded using a Tigre resistivity meter, imaging software, two 32 takeout multicore cables and up to 64 stainless steel electrodes. Saline solution was used at the electrode/ground interface in order to gain a good electrical contact required for the technique to work effectively. The recorded data were processed and viewed immediately after surveying.

7.2.3 Data Processing

The field readings were stored in computer files and inverted using the RES2DINV package (Campus Geophysical Instruments, 1997) with up to 5 iterations of the measured data carried out for each profile to obtain a 2D-Depth model of the resistivities.

The inverted 2D-Resistivity models and corresponding interpreted geology are displayed on the accompanying drawings alongside the processed seismic sections. Distance is indicated along the horizontal axis of the profiles. Profiles have been contoured using the same contour intervals and colour codes.

7.3 Seismic refraction profiling

7.3.1 Principles

only any other us This method measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities.

Seismic profiling measures the p-wave velocity (Vp) of refracted seismic waves through the overburden and rock material and allows an assessment of the thekness and quality of the materials present to be made. Stiffer and stronger materials usually have higher \sqrt{p} velocities while soft, loose or fractured materials have lower Vp velocities. Readings are taken using geophones connected via multi-core cable to a seismograph.

7.3.2 Data Collection

A Geode high resolution 24 channel digital seismograph, 24 10HZ vertical geophones and a 10 kg hammer were used to provide first break information, with a 24 take-out cable (2m spacing). Equipment was carried was operated by a two-person crew.

Readings are taken using geophones connected via multi-core cable to a seismograph. The depth of resolution of soil/bedrock boundaries is determined by the length of the seismic spread, typically the depth of resolution is about one third the length of the profile.(eg. 69m profile ~23m depth, 46m profile ~ 15m depth)

Shots from seven different positions were taken (2 x off-end, 2 x end, 3 x middle) to ensure optimum coverage of all refractors. All profiles were surveyed to Irish National Grid using a ProXR dGPS system.

7.3.3 Data Processing

The recorded data was processed and interpreted using ray-tracing along with time term inversion and tomographic inversion methods, to acquire depths to boundaries and the P-wave velocities of these layers, using the SeisImager/2D programme from Geometrics.



SeisImager/2D interprets seismic refraction data as a laterally varying layered earth structure. The programme includes three methods for data analysis, time-term inversion, the reciprocal method and tomography.

The tomography method creates an initial velocity model, then traces rays through the model, comparing the calculated and measured traveltimes. The model is then modified and the process repeated to minimise the difference between the calculated and measured times.

Approximate errors for Vp velocities are estimated to be +/- 10%. Errors for the calculated layer thicknesses are of the order of +/-20%. Possible errors due to the "hidden layer" and "velocity inversion" effects may also occur (Soske, 1959).

7.4 Multichannel Analysis of Surface Waves (MASW)

MASW profiling was carried out to provide shear wave velocity profiles with depth.

7.4.1 Principles

The Multi-channel Analysis of Surface Waves (MASW) (Park et al., 1998, 1999) utilizes Surface waves (Rayleigh waves) to determine the elastic properties of the shallow subsurface (<15m). Surface waves carry up to two/thirds of the seismic energy but are usually considered as noise in conventional body wave reflection and refraction seismic surveys.

The penetration depth of surface waves changes with wavelength, i.e. longer wavelengths penetrate deeper. When the elastic properties of near surface materials vary with depth, surface waves then become dispersive, i.e. propagation velocity changes with frequency. The propagation (or phase) velocity is determined by the average elastic property of the medium within the penetration depth. Therefore the dispersive nature of surface waves may be used to investigate changes in elastic properties of the shallow subsurface.

The MASW method employs the multi-channel recording and processing techniques (Sheriff and Geldart, 1982) that have similarities to those used in a seismic reflection survey and which allow better waveform analysis and noise elimination. To produce a shear wave velocity (Vs) profile and a stiffness profile of the subsurface using Surface waves the following basic procedure is followed:

(i)A point source (eg. a sledgehammer) is used to generate vertical ground motions,

(ii)The ground motions are measured using low frequency geophones, which are disposed along a straight line directed toward the source,

(iii)the ground motions are recorded using either a conventional seismograph, oscilloscope or spectrum analyzer,

(iv)a dispersion curve is produced from a spectral analysis of the data showing the variation of Surface wave velocity with wavelength,

(v)the dispersion curve in inverted using a modeling and least squares minimization process to produce a subsurface profile of the variation of Surface wave and shear wave velocity with depth.



7.4.2 Data Collection

A Geode high resolution 24 channel digital seismograph, 24 10HZ vertical geophones and a 10 kg hammer were used, with a 24 take-out cable (2m spacing). Equipment was carried was operated by a two-person crew.

7.4.3 Data Processing

MASW processing was carried out using the SURFSEIS processing package developed by Kansas Geological Survey (KGS, 2010). SURFSEIS is designed to generate a shear wave (Vs) velocity profile.

SURFSEIS data processing involves three steps:

- (i) Preparation of the acquired multichannel record. This involves converting data file into the processing format.
- (ii) Production of a dispersion curve from a spectral analysis of the data showing the variation of Raleigh wave phase velocity with wavelength. Confidence in the dispersion curve can be estimated through a measure of signal to noise ratio (S/N); which is obtained from a coherency analysis. Noise includes both body waves and higher mode surface waves. To obtain an accurate dispersion curve the spectral content and phase velocity characteristics are examined through an overtone analysis of the data.
- (iii) Inversion of the dispersion curve is then carried out to produce a subsurface profile of the variation of shear wave velocity with depth? Forth

7.5

All the geophysical investigation locations were acquired using Trimble Geo 7X high-accuracy GNSS handheld using the settings listed below. This system allows collecting GPS data with sub-meter accuracy.

Coordinate zone:	ITM (Republic of Ireland)	
Datum:	Ordnance	
Coordinate units:	Meters	
Altitude units:	Meters	
Survey altitude reference:	MSL	
Geoid model:	Republic of Ireland	

Geophysical Investigation, Greenhills Landfill, Athy For Malone O'Regan



8. **APPENDIX C: SEISMIC REFRACTION PLATES**

For seismic refraction profile S1, S2 and S3 the tomographic inversions are shown below. The locations of the profiles are shown in **Appendix A: Drawings**.

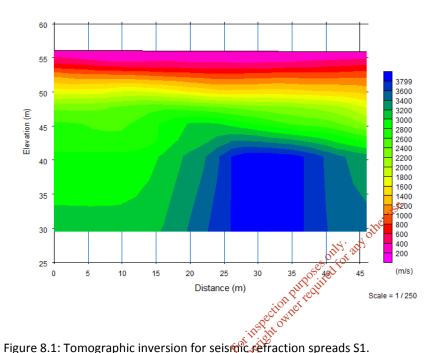


Figure 8.1: Tomographic inversion for seismic refraction spreads S1.

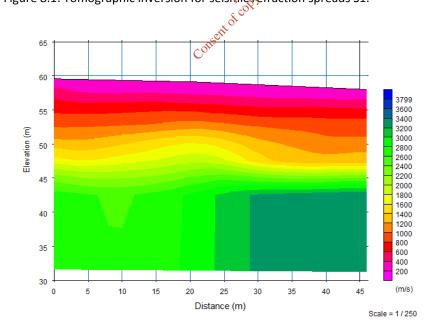
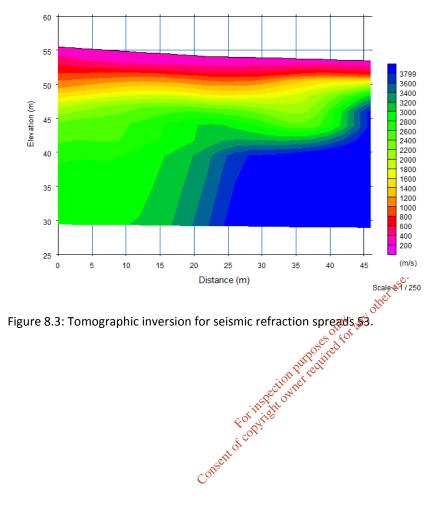
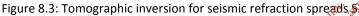


Figure 8.2: Tomographic inversion for seismic refraction spreads S2.

Geophysical Investigation, Greenhills Landfill, Athy For Malone O'Regan







APPENDIX D

Consent of copyright on the required for any other use.

TRIA	L PIT LOG	MALONE O'REGAN	Ground Floor - Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 V32Y		
Project Num	ber: E1506	Client: Kildare County Council		TRIAL PIT NO:	
Project Title:	E1506-Kildare Legacy Landfills	Site Location: Greenhills, Athy, Co. I	Site Location: Greenhills, Athy, Co. Kildare		
	SUBSURFACE	CONDITIONS		SAM	IPLE
Depth (mbgl) SYMBOL	DESCRIPTION	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)
тумвоц трани	MADE GROUND. Brown, gravelly, CLAY. Dry. No odour. MADE GROUND. Dark brown, CLAY and rare plastic. Slight hydrocarbon odour. No odour. Dry. SAND AND GRAVEL. Light grey, sand and gravel with cobbles. Wet. No odour. At 1.8mbgl inflow of water.	EOH at 2.4mbgl every contribution of the terminatural ground Terrinsfering of the terminatural ground Terrinsfering of the terminatural ground terrinsfering of the terminatural ground	(mbgi)		
	nod: 13 tonne excavator	Reference Datum: Elevation: 0		Water Strike: Strike: ☑ Lev	el: T
Excavated By: D Logged By: NM	Dunne Ltd.	Easting: 668058.2		Revision: FINAL	-
Checked By: TV	M	Northing: 694329.3		Revision: FINAL	Page 1 of 1

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Trial Pit - TP1



T	RIAL	PIT LOG		MALONE O'REGAN	Ground Floor - Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 V32Y	
Proj	ect Numbe	er: E1506	Client: Kildare County Council			
Proj	ect Title: E	1506-Kildare Legacy Landfills	Site Location: Greenhills, Athy, Co. Kildar	TRIAL PIT NO:	TP2-GH	
		SUBSURFACE CO	NDITIONS		SAM	IPLE
Depth (mbgl)	SYMBOL	DESCRIPTION	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)
0 - -		MADE GROUND. Brown, gravelly, CLAY and rare plastic. Dry. No odour.				
- - 1-		MADE GROUND. Dark brown, CLAY and rare metal. Slight hydrocarbon odour. Dry.				
-		CLAY. Light grey, very sandy, CLAY with gravels and cobbles Wet - Inflow of water at approx. 2.5mbgl. No odour.				
- 2 -			For inspection purposes only any other use.			
		Ś	For inspection owner t For inspection owner t of OP inspection owner t of OP inspection owner to of OP inspection of OP insp			
-	-	Conser				
4	-					
- 5-	-					
-						
Excav	ration Date: · ration Metho rated By: Dur	d: 13 tonne excavator	Reference Datum: Elevation: 0		Water Strike: Strike: ☑ Lev	rel: T
Logge	ed By: NM ced By: TVM		Easting: 668086.9 Northing: 694270.4	BIG 51 1 1 1	Revision: FINAL R: This log is for enviror	Page 1 of 1

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Trial Pit – TP2



mbol intermediation Construction (mbol) (mbol) (mbol) (mbol) 0 Image: Construction Moder (FECUND) Image: Construction Image: Construction Image: Construction Image: Construction 1 Image: Construction Moder (FECUND) Image: Construction Image: Construction Image: Construction Image: Construction 1 Image: Construction Moder (FECUND) Image: Construction Image: Construction Image: Construction 1 Image: Construction Mode (FECUND) Image: Construction Image: Construction Image: Construction 2 Image: Construction Mode (FECUND) Image: Construction Image: Construction Image: Construction 3 Image: Construction Image: Construction Image: Construction Image: Construction Image: Construction 3 Image: Construction Image: Construction Image: Construction Image: Construction Image: Construction 3 Image: Construction Image: Construction Image: Construction Image: Construction Image: Construction 3 Image: Construction Image: Construction Image: Construction Image: Construction Image: Construction 3 Image: Construling Image: Construction<	TRIA	L PIT LOG		MALONE C'REGAN S	Ground Floor - Unit 3 racken Business Park racken Road, andyford rublin 18, D18 V32Y			
Project THE: E150-R04 log Log 2011 SUBSURFACE CONTON'S Contention Attraction Attraction Contention Attraction Attracting Attraction Attraction Attraction Attraction Attractin	Project Num	ber: E1506	Client: Kildare County Council					
State of the second s	Project Title	: E1506-Kildare Legacy Landfills	Site Location: Greenhills, Athy, Co. Kilda	TRIAL PIT NO: 1	P3-GH			
mission instance Constant is an operation of the red biolog. 0		SUBSURFACE CON	NDITIONS		SAMF	PLE		
Prove C. A. ² And graves and new not brids. 0.8-1.11 kg/d Prove C. A. ² And GROUND. Data was a black CAV with garees and new not brids. Prove C. A. ² And GROUND. Data was a black CAV with garees and new not brids. Prove C. A. ² And GROUND. Data was a black CAV with garees and new not brids. Prove C. A. ² And GROUND. Data was a black CAV with garees and new not brids. Prove C. A. ² And GROUND. Data was a black CAV with garees and new not brids. Prove C. A. ² And GROUND. Data was a black CAV with coables. Prove C. A. ² And GROUND. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And GROUND. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And GROUND. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And GROUND. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And GROUND. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And GROUND. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And And CAV Phone CAVE. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And CAVE. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And CAVE. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And CAVE. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And CAVE. ECOH of 2 200gl cas in upfield phoned Prove C. A. ² And CAVE. ECOH of 2 200gl c	Depth (mbgl) SYMBOI	DESCRIPTION	COMMENTS		Depth (mbgl)			
Excavation Date: 16/01/2019 Reference Datum: Water Strike: Excavation Method: 13 tonne excavator Elevation: 0 Strike: \[\vee \neq \neq \neq \neq \neq \neq \neq \n		MADE GROUND. Brown, CLAY with gravels and rare red bricks. Dry. No odour. MADE GROUND. Dark brown / black CLAY with gravels and rare red bricks. No odour. Dry. SAND AND GRAVEL. Light grey, SAND and GRAVEL with cobbles.		(mbgl)	(mbgl)			
Logged By: NM Easting: 00037.1 Revision: FINAL Page 1 of 1	Excavation Date Excavation Met	hod: 13 tonne excavator Dunne Ltd.			Strike: 🕎 Leve	*		

Trial Pit – TP3





TRIA	L PIT LOG		MALONE O'REGAN	Ground Floor - Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 V32Y		
Project Num	ber: E1506	Client: Kildare County Council				
Project Title	: E1506-Kildare Legacy Landfills	Site Location: Greenhills, Athy, Co. Kildar	e	TRIAL PIT NO: TP4-GH		
	SUBSURFACE CO	IDITIONS	SAN	IPLE		
Depth (mbgl) SYMBO	DESCRIPTION	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	
0-	MADE GROUND. Brown, gravelly, CLAY with cobbles and terram (weed control geotextile). Dry. No odour.					
	MADE GROUND. Brown, gravelly, CLAY with cobbles some plastic, metal and red bricks. Dry. Slight hydrocarbon odour.	For inspection purpose only any other use.		1.0-2.0mbgl		
3	CLAY Light grey, CLAY with some sand and gravels. Dry at first - wet after (water seeping in slowly). No odour.	€OH at 4.3mbgl due to natural ground				
5	- 16/01/2019					
	hod: 13 tonne excavator	Reference Datum: Elevation: 0		Water Strike: Strike: ∑ Lev	vel: T	
Logged By: NM Checked By: T		Easting: 668035.3 Northing: 694265.4		Revision: FINAL	Page 1 of 1	
Checkeu By: IN				R: This log is for enviror	montal nurnaceae anhy	

DISCLAIMER: This log is for environmental purposes only.

Trial Pit – TP4



T	RIAI	PIT LOG		MALONE O'REGAN	Ground Floor - Unit 3 Bracken Business Park Bracken Road, Sandyford Dublin 18, D18 V32Y	
Proj	ect Numb	er: E1506	Client: Kildare County Council		TRIAL PIT NO:	
Proj	ect Title: E	E1506-Kildare Legacy Landfills	Site Location: Greenhills, Athy, Co. Kilda	TRIAL PIT NU:	IP5-GR	
		SUBSURFACE CO	NDITIONS		SAM	IPLE
Depth (mbgl)	SYMBOL	DESCRIPTION	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)
0		MADE GROUND. Brown, gravelly, CLAY and rare plastic, wood, cloths and terram. Dry. No odour.				
- - 1		MADE GROUND. Brown, gravelly, CLAY and rare red bricks, plastic, wood, cloths and a piece of hard black plastic. Dry. No odour.				
-		MADE GROUND. Dark grey, gravelly, CLAY with cobbles and occasional wood, plastic. No odour. Wet.	- net ^{use}			
2		Conse	For inspection purposes only, any other use.		2.0-2.5mbgl	
			EOH at 4.4mbgl due to natural ground			
Excav Excav		od: 13 tonne excavator	Reference Datum: Elevation: 0	•	Water Strike: Strike: ☑ Lev	rel: 🔻
	ated By: Du ed By: NM	inne Ltd.	Elevation: 0 Easting: 668018.1			*
	ed By: TVM	1	Northing: 694165.5		Revision: FINAL R: This log is for enviror	Page 1 of 1

Trial Pit – TP5



APPENDIX E

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	ect Number	1506-Kildare Legacy Landfills		Idare County Council ition: Greenhills, Athy, Co. Kildare		BOREHOLE NO: GW1-G		
-1		SUBSURFACE CON		, ,,		SAMPLE		.7mbgl)
Depth (mbgl)	SYMBOL	DESCRIPTION	Elev (mAOD)	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	INSTALLATION D ; AILS
0		CLAY Dark to very brown, CLAY with gravels and some roots.Occasional coarse gravel with depth. Earthy odour. Dry.	0.0	No evidence of contamination (0.0-9.8mbgl)	«Water Strike (WS) (0.85mbg)			over Plain P
- 1		CLAY Dark grey/brown, very slightly gravelly, CLAY. From 1.3 to 1.7mbgl getting more CLAY with occasional gravels. No odour. Dry at first - Wet after 0.85mbgl (Water Strike).	-0.8		."Water S			Concrete and Flushed C
- 2 - - -		GRAVEL Black/beige, slightly clayey, sandy (fine to coarse), rounded to subrounded, fine to medium, GRAVEL. No odour. Wet.	-1.7 1.7		19 (3.80mbgl)			
3— - - 4— -		SAND Black/beige, slightly clayey, slightly gravelly (subrounded/fine), SAND (subrounded/subangular, fine to coarse). No odour. Wet.	3.0	on puposes only any other use.	*Water Level-08/04/19 (3.80mbg)			
- 5 - - - 6 - -		GRAVEL Black/beige, very sandy, GRAVEL with some proportion of clay. From 5.2, Increasing proportion of gravel (subrounded, fine to medium) with depth - slightly clayey, sandy, GRAVEL to slightly sandy, GRAVEL No odour.	430 Fotosting					Gravel Pack (0.5-9.8mbgl)
- 7— -		GRAVEL Black/beige, subrounded, fine to medium, GRAVEL. Increasing proportion of clay with depth from 7.5mbgl. Slight foul odour. Wet. GRAVEL Slightly clayey, slightly sandy, GRAVEL (fine to	-6.7 6.7 -7.5 7.5					
8		medium). Slight foul odour. Wet. WEATHERED BEDROCK Black, subangular, fine to medium, LIMESTONE, some iron and calcite pieces. Slight foul odour. Wet. Possible Fracture at 9.1mbgl. Possible Fracture at 9.7mbgl.	7.9		-WS (9.7mbgl) -™VS (9.1mbgl)			
- - 10-			-9.8 9.8	EOH at 9.8mbgl	SW**			
Drill M	ate: 08/04/20 lethod: Air Ro l By: Causewa		Reference Elevation:	0		Water S Strike:	Strike: (W	S) Level:
Logge	ed By: NM and By: TVM		Easting: 20	68122.689 194318.345		Revisio	on: Fina	Page: 1 of 1

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Project Number: E1506	Client: Ki	Client: Kildare County Council			BOREHOLE NO: GW2-GH			
Project Title: E1506-Kildare Legacy Landfills	Site Loca	tion: Greenhills, Athy, Co. Kildare		BORE	HOLE	: NO: GW2-GH		
SUBSURFACE CON	IDITIONS			SAN	IPLE			
Depth (mbgl) SYMBOL DESCRIPTION	Elev (mAOD)	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	INSTALLATION DETAILS		
Black, clayey, GRAVEL (subangular/subrouted, fine to medium) No odour. Dry from 5.7mbgl. WEATHERED BEDROCK Black, slightly clayey, LIMESTONE. From 6.8 to 7.1 approx slight foul odour. At 8.0mbgl - rotten (eggy) odour. From 8.2mbgl - slight foul odour. Wet from 6.3mbgl (Water Strike) / Dry from 7.1mbgl. Possible fracture at 9.0mbgl - wet.	-5.9	No evidence of contamination (0.0-14.4mbgl)	-4WS (9.0mbgl) -4.0mbgl) -4.0mbgl) -4.0mbgl) -4.0mbgl) -4.0mbgl	Water	Strike: (W	Bentonite Seal (2.5-3.0mbgl) Concrete and Flushed Cover Gravel Pack (3.0-14.4mbgl) - - -<		
Drill Date: 06-09/04/2019 Reference Datum: Drilled By: Causeway Geotech Ltd Elevation: 0 Data Bus NM Easting: 268070.675						Level:		
Logged By: NM Checked By: TVM	-	68070.675 194064.633		Revisio	on: Fina	al Page: 1 of 2		

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Project Number: E1506		Client: Kildare County Council			BOREHOLE NO: GW2-GH			
Project Title: E	1506-Kildare Legacy Landfills	Site Loca	tion: Greenhills, Athy, Co. Kildare		BORE	EHOLE	: NO: GW2-GH	
	SUBSURFACE COM	DITIONS			SAN	IPLE		
Depth (mbgl) SYMBOL	DESCRIPTION	Elev (mAOD)	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	INSTALLATION DETAILS	
	KARSTIFIED BEDROCK Black/grey, karstified LIMESTONE. No odour. Fracture at 10.9mbgl.	-10.9 10.9		."WS (10.9mbgl)				
	COMPETENT BEDROCK Black, LIMESTONE with some calcite and iron pieces. No odour. Wet.	-13.0 13.0	on purposes only, any other use. Dependent of the any other use.					
- - - 15- - - - - - - - - - - - - - - -	Consen	-14.4 14.4 ec Foi mar	Sequerat 14.4mbgl				¥ tira	
- 18 - - - 19								
20- Drill Date: 08-09/0 Drill Method: Air R Drilled By: Causev Logged By: NM Checked By: TVM	totary vay Geotech Ltd	Reference Elevation: Easting: 2	0		Water S Strike:		Level: T	

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Project Number: E1506	Client: Ki	Client: Kildare County Council				BOREHOLE NO: GW3-GH			
Project Title: E1506-Kildare Legacy Landfills	Site Loca	ation: Greenhills, Athy, Co. Kildare							
SUBSURFACE CON	DITIONS			SAN	IPLE				
Depth (mbgl) SYMBOL DESCRIPTION	Elev (mAOD)	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	INSTALLATION DETAILS			
CLAY 0	(mAOD) 0.0 0.0 -1.0 1.0 -1.6 1.6	COMMENTS No evidence of contamination (0.0-9.8mbgl)	"WL (05/04/19)-4.6mbgl			Bentonite Saal (2.0.2.5mbgl) Concrete and Flushed Cover			
5 CLAY Grey, very gravelly, slightly sandy, CLAY. Gravely, sig grey/beige. Moist at first. No odour. Water strike at 5.4mbgl. POSSIBLE WEATHERED BEDROCK Beige/grey, slightly clayey, slightly sandy, LIMESTONE. Wet. No odour. Wet. No adour. Wet. No adour. Wet. Water strike at 9.2mbgl. 8 9	-5.4 5.0 -5.4 5.4 -6.5 6.5 6.5 -9.3 9.3		-«Water Strike (9.2mbgl)			Gravel Pack (2.5.9.8mbgl)			
COMPETENT BEDROCK Black, LIMESTONE.	-9.8 9.8	EOH at 9.8mbgl							
Drill Date: 04-05/04/2019 Drill Method: Air Rotary Drilled By: Causeway Geotech Ltd	Reference Elevation:			Water Strike:		Level: T			
	Easting: 2			1		-			



Project Number: E1506 Project Title: E1506-Kildare Legacy Landfills		Client: Kildare County Council			BOREHOLE NO: L1-GH			
		ation: Greenhills, Athy, Co. Kildare		BURI		ENO: L1-GH		
SUBSURFACE C	ONDITIONS			SAMPLE				
Depth (mbgl) SYMBOL DESCRIPTION	Elev (mAOD)	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)			
0 MADE GROUND. Brown, CLAY. Terram at 0.4mbgl. No odour. Dry. MADE GROUND. Brown, slightly sandy, gravelly, CLAY, with frequent cobbles and rare red bricks, metal and wood. Turning to grey, gravelly, cobbly, CLAY. Slight hydrocarbon odour with depth. Dry. 2 	0.0 0.0 -0.4 0.4					Ombgl)		
MADE GROUND. Dark grey, slightly sandy, CLAY and rare coal, ree		End of Borehole at 5.5mbgl due to natural ground				A Gravel Pack (0.5.4.0mbgl) A A A A A A A A		
G G G G G G G G G G G G G G	Fot Broker Fot Broker Sent of Code -5.5 5.5	End of Borehole at 5.5mbgl due to natural ground				Bentonite Seal (4.0-5.5mbgl)		
7								
9								
10	Reference			Water				
Drilled By: O'Connell Byrne Logged By: NM	Elevation Easting: 2	: 0 268097.743		Strike: Revisio		Level: Tale: 1 of 1		



Project Number: E1506 Project Title: E1506-Kildare Legacy Landfills		Client: Kildare County Council Site Location: Greenhills, Athy, Co. Kildare			BOREHOLE NO: L2-GH		
	SUBSURFACE CO		ation: Greennilis, Atny, Co. Kildare		SAN	IPLE	
Depth (mbgl) SYMBOL	DESCRIPTION	Elev (mAOD)	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	INSTALLATION DETAILS
	MADE GROUND. Brown, CLAY. Terram at 0.5mbgl. No odour. Dry. MADE GROUND. Brown, slightly sandy, CLAY, with gravels and cobles and rare red bricks, plastic, bitumen and concrete. Slight hydrocarbon odour. Dry at first - water at approx. 1.7mbgl. MADE GROUND. Light grey sludge (sandy, slightly gravelly, CLAY). No odour. Wet.	0.0 0.0 0.5 0.5 -2.1 2.1 -2.5	End of Borehole at 2.5mblg due to obstruction				Gravel Pack (0.5-1.85mbg) Correte and Flushed Cover Concrete and Flushed Cover Cover Concrete and Flushed Cover Cover Concrete and Flushed Cover Cove
Drill Date: 14-15/01 Drill Method: Shell Drilled By: O'Conne Logged By: NM	and Auger	Reference Elevation: Easting: 0	0		Water Strike:		Level: 🗴



Proj	Project Number: E1506		Client: K	Client: Kildare County Council			BOREHOLE NO: L3-GH			
Proj	ect Title: E	1506-Kildare Legacy Landfills	Site Loca	ation: Greenhills, Athy, Co. Kildare		BURI		NO: L3-GH		
		SUBSURFACE CON	IDITIONS			SAN	IPLE	INSTALLATION DETAILS		
Depth (mbgl)	SYMBOL	DESCRIPTION	Elev (mAOD)	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	INSTALLATION DETAILS		
Drill M	ate: 09/01/22	some pieces of tiles and cloths. Slight hydrocarbon odour - hydrocarbon sheen at 5.8mbgl. Wet. CLAY. Light grey, CLAY with gravel turning to clayey, GRAVEL. No odour. Wet. 19 and Auger	-6.7 6.7			Water		Bentonite Seal (6.2-6.8mbgl) Bentonite Seal (6.2-6.8mbgl) Bentonite Seal (0.1-0.5mbgl) Bentonite Seal (0.1-0.5mbgl) Bentonite Seal (0.1-0.5mbgl) Bentonite Seal (0.1-0.5mbgl)		
Drilled	By: O'Conne d By: NM		Elevation: Easting: 2			Strike:	-	Level:		
	ed By: TVM		-	194137.241			on: Fina	al Page: 1 of 1		

APPENDIX F

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MATRIX:- S=Soil, GW=GroundWate	er, SW=Su	InfaceW	ater, L/E=	-Leachate	Effluent, OV	V=OtherWater, P=	=Product	(Oil)			E													effluents are accredited for some tests, please
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Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780

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Exova Jones Environmental Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780 Reg Office: Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian EH28 BPL Company Reg No: SC070429

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APPENDIX G

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	Unit 3 Deeside Point
	Zone 3
	Deeside Industrial Park
	Deeside
	CH5 2UA
Malone O'Regan Ground Floor - Unit 3 Bracken Business Park Bracken Road	Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781
Sandyford Dublin 18 D18 V4K6	Hac-MRA UKAS
Attention :	Thomas Vainio-Mattila
Date :	13th February, 2019
Your reference :	E1506
Our reference :	Test Report 19/1584 Batch 1
Location :	Test Report 19/1584 Batch 1 Athy Kildare County Greenhills ^{het} 1st February, 2019 of the art
Date samples received :	1st February, 2019 05 5
Status :	Final report pure quite
Issue :	Athy Kildare County Greenhills
	* <u>.</u> 0]

Three samples were received for analysis on 1st February, 2019 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and ported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

1. luce

Bruce Leslie Project Co-ordinator

Client Name: Malone O'Regan Report : Solid E1506 Reference: Location: Athy Kildare County Greenhills Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub Thomas Vainio-Mattila Contact: JE Job No.: 19/1584 J E Sample No 1-3 4-6 7-9 тр3 TP4 Sample ID TP5 0.50-1.10 Depth 1.00-2.00 2.00-2.50 Please see attached notes for all abbreviations and acronyms COC No / mise VIT VIT VIT Containers Sample Date 16/01/2019 16/01/2019 16/01/2019 Sample Type Soil Soil Soil Batch Number 1 1 Method LOD/LOR Units No. Date of Receipt 01/02/2019 01/02/2019 01/02/2019 TM30/PM1 Antimony 2 <1 mg/kg TM30/PM1 Arsenic * 7.6 <0.5 mg/kg TM30/PM1 Barium * 630 <1 mg/kg TM30/PM18 2.4 <0.1 Cadmium¹ mg/kg TM30/PM18 Chromium # 86.8 <0.5 mg/kg TM30/PM18 21 Copper[#] <1 mg/kg TM30/PM18 ead* 28 <5 mg/kg ally and the use. TM30/PM18 <0.1 Mercurv⁴ <0.1 mg/kg TM30/PM18 2.8 <0.1 Molybdenum mg/kg Nickel[#] TM30/PM18 39.6 <0.7 ma/ka TM30/PM18 Selenium[#] For inspection Purposes & mg/kg 3 <1 971 <50 mg/kg TM50/PM29 Total Sulphate as SO4 # TM74/PM32 mg/kg Water Soluble Boron # 1.3 <0.1 TM30/PM15 Zinc[#] mg/kg 222 <5 mg/kg TM30/PM62 <1 <1 Antimony 1 12.5 Arsenic 8.3 <0.5 mg/kg TM30/PM62 TM30/PM62 Barium 71 132 <1 mg/kg TM30/PM62 Cadmium 1.0 1.0 <0.1 mg/kg onsentof TM30/PM62 Chromium 17.4 11.9 <0.5 mg/kg 28 27 TM30/PM62 Copper <1 mg/kg TM30/PM62 Lead 98 68 <5 mg/kg 0.2 <0.1 TM30/PM6 Mercury <0.1 mg/kg 1.2 TM30/PM6 Molybdenum 1.0 <0.1 mg/kg Nickel 24.4 21.7 <0.7 mg/kg TM30/PM6 <1 <1 TM30/PM6 Selenium <1 mg/kg Total Sulphate as SO4 698 582 <50 TM50/PM29 mg/kg Water Soluble Boron 1.0 2.0 <0.1 TM74/PM6 mg/kg Zinc 140 185 <5 mg/kg TM30/PM62

Client Name: Malone O'Regan Report : Solid E1506 Reference: Athy Kildare County Greenhills Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub Location: Thomas Vainio-Mattila Contact: JE Job No.: 19/1584 J E Sample No 1-3 4-6 7-9 TP4 Sample ID ТР3 TP5 0.50-1.10 1.00-2.00 2.00-2.50 Depth Please see attached notes for all abbreviations and acronyms COC No / mise VIT VIT Containers VIT Sample Date 16/01/2019 16/01/2019 16/01/2019 Sample Type Soil Soil Soi Batch Number 1 1 Method LOD/LOR Units No. Date of Receipt 01/02/2019 01/02/2019 01/02/2019 PAH MS TM4/PM8 Naphthalene [#] < 0.04 <0.04 <0.04 < 0.04 mg/kg TM4/PM8 < 0.03 < 0.03 0.08 < 0.03 Acenaphthylene mg/kg TM4/PM8 < 0.05 < 0.05 < 0.05 < 0.05 Acenaphthene mg/kg Fluorene # TM4/PM8 < 0.04 < 0.04 0.05 < 0.04 mg/kg TM4/PM8 < 0.03 0.10 < 0.03 Phenanthrene⁴ 0.24 mg/kg TM4/PM8 <0.04 <0.04 mg/kg Anthracene * < 0.04 0.13 ATT BY OTEL USE. TM4/PM8 Fluoranthene * 0.05 0.28 <0.03 mg/kg 0.71 TM4/PM8 Pyrene # < 0.03 <0.03 mg/kg 0.23 0.62 TM4/PM8 Benzo(a)anthracene # <0.06 <0.06 mq/kg 0.21 0.46 0.05 <0.02 TM4/PM8 0.14 0.38 mg/kg Chrysene # Top inspection purposes <0.07 TM4/PM8 Benzo(bk)fluoranthene # 0.34 0.82 <0.07 mg/kg TM4/PM8 Benzo(a)pyrene # < 0.04 0.16 0.43 < 0.04 ma/ka Indeno(123cd)pyrene# TM4/PM8 < 0.04 0.12 0.27 < 0.04 ma/ka Dibenzo(ah)anthracene # TM4/PM8 < 0.04 < 0.04 0.11 < 0.04 ma/ka <0.04 0.10 0.26 <0.04 mg/kg TM4/PM8 Benzo(ghi)perylene # Coronene <0.04 <0.04 0.06 <0.04 mg/kg TM4/PM8 PAH 6 Total[#] <0.22 1.00 2.49 <0.22 mg/kg TM4/PM8 onsentof PAH 17 Total <0.64 1.68 4.62 <0.64 mg/kg TM4/PM8 TM4/PM8 Benzo(b)fluoranthene <0.05 0.24 0.59 <0.05 mg/kg TM4/PM8 Benzo(k)fluoranthene <0.02 0.10 0.23 <0.02 mg/kg TM4/PM8 Benzo(j)fluoranthene <1 <1 <1 mg/kg <1 TM4/PM8 PAH Surrogate % Recovery 100 97 103 <0 % Mineral Oil (C10-C40) <30 <30 <30 <30 TM5/PM8/PM1 mg/kg TPH CWG Aliphatics <0.1 <0.1 <0.1 <0.1 mg/kg TM36/PM12 >C5-C6# >C6-C8# <0.1 <0.1 <0.1 <0.1 mg/kg TM36/PM12 >C8-C10 <0.1 <0.1 <0.1 <0.1 TM36/PM12 mg/kg >C10-C12# <0.2 <0.2 <0.2 <0.2 TM5/PM8/PM1 mg/kg >C12-C16# <4 <4 <4 <4 mg/kg TM5/PM8/PM1 >C16-C21# <7 <7 <7 <7 mg/kg TM5/PM8/PM1 >C21-C35# <7 <7 <7 <7 mg/kg TM5/PM8/PM1 >C35-C40 <7 <7 <7 <7 mg/kg TM5/PM8/PM1 Total aliphatics C5-40 <26 <26 <26 <26 mg/kg >C6-C10 <0.1 <0.1 <0.1 <0.1 mg/kg TM36/PM1: >C10-C25 <10 <10 <10 <10 mg/kg TM5/PM8/PM1 >C25-C35 <10 <10 <10 <10 mg/kg TM5/PM8/PM1

Client Name: Malone O'Regan Report : Solid E1506 Reference: Athy Kildare County Greenhills Location: Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub Thomas Vainio-Mattila Contact: JE Job No.: 19/1584 J E Sample No 1-3 4-6 7-9 TP4 Sample ID ТР3 TP5 0.50-1.10 1.00-2.00 2.00-2.50 Depth Please see attached notes for all abbreviations and acronyms COC No / mise VIT VIT Containers VIT Sample Date 16/01/2019 16/01/2019 16/01/2019 Sample Type Soil Soil Soi Batch Number 1 1 Method LOD/LOR Units No. Date of Receipt 01/02/2019 01/02/2019 01/02/2019 TPH CWG Aromatics >C5-EC7# TM36/PM1: <0.1 <0.1 <0.1 <0.1 mg/kg TM36/PM1 >FC7-FC8[#] <0.1 <0.1 <0.1 <0.1 mg/kg TM36/PM12 >EC8-EC10# <0.1 <0.1 <0.1 <0.1 mg/kg >EC10-EC12# TM5/PM8/PM1 < 0.2 <0.2 <0.2 < 0.2 mg/kg TM5/PM8/PM1 >EC12-EC16# mg/kg <4 <4 <4 <4 ally and the use. >EC16-EC21 # TM5/PM8/PM1 <7 mg/kg <7 <7 <7 >EC21-EC35# TM5/PM8/PM1 63 <7 <7 <7 mg/kg >EC35-EC40 TM5/PM8/PM1 <7 <7 <7 <7 ma/ka <26 <26 Total aromatics C5-40 <26 63 Top inspection purposes mg/kg Total aliphatics and aromatics(C5-40) <52 <52 63 <52 mg/kg >EC6-EC10# <0.1 <0.1 TM36/PM1 <0.1 <0.1 ma/ka >EC10-EC25 TM5/PM8/PM1 <10 <10 <10 <10 ma/ka >EC25-EC35 TM5/PM8/PM1 <10 <10 50 <10 mg/kg TM31/PM12 MTBE # <5 <5 <5 ug/kg <5 TM31/PM12 Benzene # <5 <5 ug/kg <5 <5 onsentof TM31/PM12 Toluene # <5 <5 <5 <5 ug/kg Ethylbenzene # <5 <5 <5 <5 ug/kg TM31/PM12 m/p-Xylene [#] <5 <5 <5 <5 ug/kg TM31/PM12 TM31/PM12 o-Xylene # <5 <5 <5 <5 ug/kg <5 <5 <5 <5 TM17/PM8 PCB 28 # ug/kg PCB 52# <5 <5 <5 TM17/PM8 <5 ug/kg PCB 101 # <5 <5 <5 <5 TM17/PM8 ug/kg PCB 118[#] <5 <5 <5 <5 TM17/PM8 ug/kg <5 <5 <5 <5 ug/kg TM17/PM8 PCB 138# PCB 153[#] <5 <5 <5 <5 ug/kg TM17/PM8 PCB 180 # <5 <5 <5 <5 TM17/PM8 ug/kg Total 7 PCBs[#] <35 <35 <35 <35 TM17/PM8 ug/kg <0.01 <0.01 <0.01 <0.01 mg/kg TM26/PM2 Phenol # Natural Moisture Content 55.8 16.6 18.8 <0.1 % PM4/PM0 Moisture Content (% Wet Weight) 35.8 14.2 15.8 <0.1 % PM4/PM0 Hexavalent Chromium # <0.3 <0.3 <0.3 <0.3 mg/kg TM38/PM2 Chromium III 86.8 <0.5 mg/kg NONE/NON Chromium III 17.4 11.9 <0.5 mg/kg NONE/NON Total Cyanide [#] <0.5 <0.5 <0.5 <0.5 mg/kg TM89/PM45 Total Organic Carbon[#] TM21/PM2 2.20 NDP NDP < 0.02 %

	Malone O E1506	'Regan					Report :	Solid					
		re County	Greenhills				Solids: V=	60g VOC ia	r .l=250a al	ass jar, T=p	lastic tub		
		′ainio-Matti					Condo. V	00g 700 ju	i, oʻzoog gi	uoo jui, i p			
JE Job No.:	19/1584												
J E Sample No.	1-3	4-6	7-9										
Sample ID	TP3	TP4	TP5										
Denth	0 50 4 40	1.00-2.00	2.00-2.50										
Depth COC No / misc	0.50-1.10	1.00-2.00	2.00-2.50									e attached n ations and a	
	VIT	VIT	V 1 T										
Containers		VJT	VJT										
Sample Date													
Sample Type		Soil	Soil										1
Batch Number	1	1	1								LOD/LOR	Units	Method No.
Date of Receipt													
Sulphide	<10	<10	<10								<10	mg/kg	TM107/PM119
Elemental Sulphur	11	-	-								<1	mg/kg	TM108/PM114
Elemental Sulphur	-	20	23								<1	mg/kg	TM108/PM8
рН#	7.65	7.94	7.89								<0.01	pH units	TM73/PM11
Maga of row toot	0 1000	0.1073	0.1095				alty and					k-	NONE/PM17
Mass of raw test portion Mass of dried test portion	0.1283	0.1073	0.1095									kg kg	NONE/PM17
	0.00	0.00	0.00					r USC.				Ng	HOILE, I MIT
							0	net					
							MY any						
						Ses	dior						
						aurponin	<u></u>						
					i do	and tool							
					O	WIT							
					N III ight								
				×	OR'								
				NOT									
				onser									
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Client Name:
Reference:
Location:
Contact:
JE Job No.:

E1506 Athy Kildare County Greenhills Thomas Vainio-Mattila 19/1584

Malone O'Regan

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9									
Sample ID	TP3	TP4	TP5									
Depth	0.50-1.10	1.00-2.00	2.00-2.50							Please se	e attached n	otes for all
COC No / misc											ations and a	
Containers	VJT	VJT	VJT									
Sample Date	16/01/2019	16/01/2019	16/01/2019									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt		01/02/2019	01/02/2019							LOD/LOR	Units	Method No.
Dissolved Antimony [#]	< 0.002	0.003	0.006							<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) [#]	<0.002	0.003	0.06							<0.02	mg/kg	TM30/PM17
Dissolved Arsenic [#]	<0.0025	<0.0025	0.0053							<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) [#]	<0.025	<0.025	0.053							<0.025	mg/kg	TM30/PM17
Dissolved Barium [#]	0.055	0.033	0.019							<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) [#]	0.55	0.33								< 0.03	mg/kg	TM30/PM17
Dissolved Boron [#]	0.035	0.020	0.050	Consent of						<0.012	mg/l	TM30/PM17
Dissolved Boron (A10) [#]	0.35	0.20	0.50					Ø1.		<0.12	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005					at USC		<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005				ć	ner		<0.005	mg/kg	TM30/PM17
Dissolved Chromium [#]	<0.0015	<0.0015	<0.0015				AT. M			<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) [#]	<0.015	<0.015	<0.015			2	at for a			<0.015	mg/kg	TM30/PM17
Dissolved Copper [#]	<0.007	<0.007	<0.007			005.00	, O			<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) [#]	<0.07	<0.07	<0.07			Dilledin				<0.07	mg/kg	TM30/PM17
Dissolved Lead [#]	<0.005	<0.005	<0.005		di ⁰	l of the				<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) [#]	<0.05	<0.05	<0.05		- 2 ⁰ 0	MI				<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	0.005	0.016		the fit					<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) *	<0.02	0.05	0.16	÷.	Plin					<0.02	mg/kg	TM30/PM17
Dissolved Nickel [#]	<0.002	<0.002	0.002	\$						<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) [#]	<0.02	<0.02	<0.02	ent						<0.02	mg/kg	TM30/PM17
Dissolved Selenium [#]	<0.003	<0.003	<0.003	ORSE						<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03							<0.03	mg/kg	TM30/PM17
Dissolved Zinc [#]	<0.003	<0.003	-0.000							<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) [#]	<0.03	<0.03	<0.03							<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001							<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001							<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01							<0.01	mg/l	TM26/PM0
Phenol	<0.01	<0.01	<0.01							<0.01	mg/kg	TM26/PM0
i nenoi	-0.1	-0.1	-0.1							-0.1	iiig/kg	110/20/11010
Fluoride	<0.3	<0.3	<0.3							<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	<3							<3	mg/kg	TM173/PM0
											00	
Sulphate as SO4 #	13.8	25.3	20.9							<0.5	mg/l	TM38/PM0
Sulphate as SO4 [#]	138	253	209							<5	mg/kg	TM38/PM0
Chloride [#]	0.8	<0.3	<0.3							<0.3	mg/l	TM38/PM0
Chloride [#]	8	<3	<3							<3	mg/kg	TM38/PM0
Ammoniacal Nitrogen as N [#]	0.09	0.07	0.30							<0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N [#]	0.9	0.7	3.0							<0.3	mg/kg	TM38/PM0
Dissolved Organic Carbon	5	3	4							<2	mg/l	TM60/PM0
Dissolved Organic Carbon	50	30	40							<20	mg/kg	TM60/PM0
Total Dissolved Solids [#]	188	194	216							<35	mg/l	TM20/PM0
Total Dissolved Solids [#]	1880	1940	2160							<350	mg/kg	TM20/PM0

EN-12457-2 Result Report

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =		84.0	
Mass of dry sample (kg) =	0.09	Leachant Volume (I)		-	
Particle Size <4mm =	>95%	Eluate Volume (I)		0.8	
JEFL Job No		19/1584	Land	fill Waste Ac	ceptance
Sample No		6		Criteria Lin	nits
Client Sample No		TP4			
Depth/Other		1.00-2.00			
Sample Date		16/01/2019	Inert	Stable Non-reactive	Hazardous
Batch No		1			
Solid Waste Analysis					
Total Organic Carbon (%)	NDP		3	5	6
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg)	<30		500	-	-
PAH Sum of 6 (mg/kg)	1.00		-	-	-
PAH Sum of 17 (mg/kg)	1.68		100	-	-
		يد.			
Eluate Analysis	concn leached	-12 - 12 - 12 - 12 - 12 - 12 - 12 - 12		values for co eaching test	-
	A10	or set for	BS EN	12457-2 at	
	A10 mg/kg	a puposes of for	BS EN		
Arsenic		action purposes of for	BS EN 0.5	12457-2 at	
	mg/kg	inspection purposes of for		12457-2 at mg/kg	L/S 10 l/kg
Arsenic	mg/kg <0.025	For inspection purposes of for	0.5	12457-2 at mg/kg 2	L/S 10 I/kg
Arsenic Barium	mg/kg <0.025 0.33	For inspection purposes of for	0.5	12457-2 at mg/kg 2 100	L/S 10 I/kg 25 300
Arsenic Barium Cadmium	mg/kg <0.025 0.33 <0.005	For inspection purposes of for	0.5 20 0.04	mg/kg 2 100 1	L/S 10 I/kg 25 300 5
Arsenic Barium Cadmium Chromium Copper	mg/kg <0.025	Consent of copyright owner performed for	0.5 20 0.04 0.5	mg/kg 2 100 1 10	L/S 10 I/kg 25 300 5 70
Arsenic Barium Cadmium Chromium Copper Mercury	mg/kg <0.025	Consent of copyright owner required for	0.5 20 0.04 0.5 2	mg/kg 2 100 1 10 50	25 300 5 70 100
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum	mg/kg <0.025	Consent of copyright owned required for any other ase.	0.5 20 0.04 0.5 2 0.01	mg/kg 2 100 1 0 50 0.2	25 300 5 70 100 2
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum	mg/kg <0.025	Consent of copyright owner portion of the section of copyright owner portion of the section of t	0.5 20 0.04 0.5 2 0.01 0.5	mg/kg 2 100 1 50 0.2 10	L/S 10 I/kg 25 300 5 70 100 2 30
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel Lead	mg/kg <0.025	Consent of copyright owner required for	0.5 20 0.04 0.5 2 0.01 0.5 0.4	mg/kg 2 100 1 50 0.2 10 10	25 300 5 70 100 2 30 40
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel	mg/kg <0.025	Consent of convinsition net required for	0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5	mg/kg 2 100 1 0 0.2 10 10 10 10 10 10 10 10 10 10 10 10 10	25 300 5 70 100 2 30 40 50
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony	mg/kg <0.025	Consent of copyright owner pour ed tot	0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06	mg/kg 2 100 1 0 0.2 10 0.2 10 0.2 10 0.2 10 0.7	L/S 10 I/kg 25 300 5 70 100 2 30 40 50 5
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium	mg/kg <0.025	Consent of copyright owner pointed for	0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1	mg/kg 2 100 1 0.2 10 10 50 0.2 10 10 0.2 10 10 10 10 10 10 0.5	L/S 10 I/kg 25 300 5 70 100 2 30 40 50 5 7 7
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc	mg/kg <0.025	Consent of constrained to a consent of constrained to a constrained constrained constrained consent of constrained consent of consen	0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4	mg/kg 2 100 1 0 0 0.2 10 10 0.2 10 0.2 10 0.2 50 0.2 50 50	L/S 10 I/kg 25 300 5 70 100 2 30 40 50 5 7 200
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc Chloride	mg/kg <0.025	Consent of copyinght owner required for	0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800	mg/kg 2 100 1 0.2 10 0.2 10 0.2 10 10 50 0.2 10	L/S 10 I/kg 25 300 5 70 100 2 30 40 50 5 7 200 25000
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc Chloride Fluoride	mg/kg <0.025	Consent of copyright owner point of the consent of copyright owner point of the copyright owner point	0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800 10	mg/kg 2 100 1 0 0 0.2 10 10 0.2 10	L/S 10 I/kg 25 300 5 70 100 2 30 40 50 5 7 200 25000 500
Arsenic Barium Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc Chloride Fluoride Sulphate as SO4	mg/kg <0.025	Consent of copyright owner required for	0.5 20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800 10 1000	mg/kg 2 100 1 0 0 0 0 0 0 0 0 10 0 0 0 0 0 0.7 0.5 50 15000 150 20000	L/S 10 I/kg 25 300 5 70 100 2 30 40 50 5 7 200 25000 500 500 5000

EN-12457-2 Result Report

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =		81.9	
Mass of dry sample (kg) =	0.09	Leachant Volume (I)		-	
Particle Size <4mm =	>95%	Eluate Volume (I)		0.77	
JEFL Job No		19/1584	Land	fill Waste Ac	•
Sample No		9		Criteria Lin	nits
Client Sample No		TP5			
Depth/Other		2.00-2.50			
Sample Date		16/01/2019	Inert	Stable Non-reactive	Hazardous
Batch No		1			
Solid Waste Analysis					
Total Organic Carbon (%)	NDP		3	5	6
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg)	<30		500	-	-
PAH Sum of 6 (mg/kg)	2.49		-	-	-
PAH Sum of 17 (mg/kg)	4.62		100	-	-
		<u>د.</u>			
Eluate Analysis	concn leached A10	Consent of copyright owner required for any other ase.	le	values for co eaching test I 12457-2 at l	using
	mg/kg	Purequit		mg/kg	
Arsenic	0.053	actionnet	0.5	2	25
Barium	0.19	JEST CON	20	100	300
Cadmium	<0.005	FOLLING	0.04	1	5
Chromium	<0.015	S CON	0.5	10	70
Copper	<0.07	ento	2	50	100
Mercury	<0.0001	Const	0.01	0.2	2
Molybdenum	0.16	•	0.5	10	30
Nickel	<0.02		0.4	10	40
Lead	<0.05		0.5	10	50
Antimony	0.06		0.06	0.7	5
	_		0.06 0.1	0.7 0.5	5 7
Selenium	0.06				
Selenium Zinc	0.06 <0.03		0.1	0.5	7
Selenium Zinc Chloride	0.06 <0.03 <0.03		0.1 4	0.5 50	7 200
Selenium Zinc Chloride Fluoride	0.06 <0.03 <0.03 <3		0.1 4 800	0.5 50 15000	7 200 25000
Antimony Selenium Zinc Chloride Fluoride Sulphate as SO4 Total Dissolved Solids	0.06 <0.03 <0.03 <3 <3 <3		0.1 4 800 10	0.5 50 15000 150	7 200 25000 500
Selenium Zinc Chloride Fluoride Sulphate as SO4	0.06 <0.03 <0.03 <3 <3 209		0.1 4 800 10 1000	0.5 50 15000 150 20000	7 200 25000 500 50000

EN-12457-2 Result Report

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =		70.4	
Mass of dry sample (kg) =	0.09	Leachant Volume (I)		-	
Particle Size <4mm =	>95%	Eluate Volume (I)		0.59	
JEFL Job No		19/1584	Land	fill Waste Ac	ceptance
Sample No		3		Criteria Lin	-
Client Sample No		TP3			
Depth/Other		0.50-1.10			
Sample Date		16/01/2019	Inert	Stable Non-reactive	Hazardous
Batch No		1		Non-reactive	
Solid Waste Analysis					
Total Organic Carbon (%)	2.20		3	5	6
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg)	<30		500	-	-
PAH Sum of 6 (mg/kg)	<0.22		-	-	-
PAH Sum of 17 (mg/kg)	<0.64		100	-	-
		ي. م			
Eluate Analysis	10:1 concn leached A10	TOPSE OILS. BAY OF	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		using
	mg/kg	- Pure dur		mg/kg	
Arsenic	<0.025	actionnet	0.5	2	25
					20
Barium	0.55	HSP HOM	20	100	300
Barium Cadmium	0.55 <0.005	Fortington			-
	_	For instead	20	100	300
Cadmium	<0.005	For inspector	20 0.04	100 1	300 5
Cadmium Chromium Copper	<0.005 <0.015	Consett of copyright on	20 0.04 0.5	100 1 10	300 5 70
Cadmium Chromium Copper Mercury	<0.005 <0.015 <0.07	Consent of copyright or	20 0.04 0.5 2	100 1 10 50	300 5 70 100
Cadmium Chromium Copper Mercury Molybdenum	<0.005 <0.015 <0.07 <0.0001	Consert of copyright owner required for any other ase.	20 0.04 0.5 2 0.01	100 1 10 50 0.2	300 5 70 100 2
Cadmium Chromium	<0.005	Consent of copyright or	20 0.04 0.5 2 0.01 0.5	100 1 10 50 0.2 10	300 5 70 100 2 30
Cadmium Chromium Copper Mercury Molybdenum Nickel	<0.005 <0.015 <0.07 <0.0001 <0.02 <0.02	Consent of copyright on	20 0.04 0.5 2 0.01 0.5 0.4	100 1 10 50 0.2 10 10	300 5 70 100 2 30 40
Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony	<0.005 <0.015 <0.007 <0.0001 <0.02 <0.02 <0.05	Consent of copyright on	20 0.04 0.5 2 0.01 0.5 0.4 0.5	100 1 10 50 0.2 10 10 10	300 5 70 100 2 30 40 50
Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium	<0.005	Consent of copyright on	20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06	100 1 10 50 0.2 10 10 10 0.2	300 5 70 100 2 30 40 50 5
Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc	<0.005	Consent of copyright on	20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1	100 1 10 50 0.2 10 10 10 0.7 0.5	300 5 70 100 2 30 40 50 5 7
Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc Chloride	<0.005	Consent of copyright on	20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4	100 1 10 50 0.2 10 10 10 0.7 0.5 50	300 5 70 100 2 30 40 50 5 7 200
Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc Chloride	<0.005	Consent of copyright on	20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800	100 1 10 50 0.2 10 10 0.7 0.5 50 15000	300 5 70 100 2 30 40 50 5 7 7 200 25000
Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc Chloride	<0.005	Consent of copyright on	20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800 10	100 1 10 50 0.2 10	300 5 70 100 2 30 40 50 5 7 200 25000 500
Cadmium Chromium Copper Mercury Molybdenum Nickel Lead Antimony Selenium Zinc Chloride Fluoride Sulphate as SO4	<0.005	Consent of conviettors	20 0.04 0.5 2 0.01 0.5 0.4 0.5 0.06 0.1 4 800 10 1000	100 1 10 50 0.2 10 10 10 0.7 0.5 50 15000 20000	300 5 70 100 2 30 40 50 5 7 200 25000 500

Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy Kildare County Greenhills
Contact:	Thomas Vainio-Mattila

EPH Interpretation Report

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
19/1584	1	TP3	0.50-1.10	1-3	No interpretation possible
19/1584	1	TP4	1.00-2.00	4-6	No interpretation possible
19/1584	1	TP5	2.00-2.50	7-9	Trace of possible PAH's
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					all'ally or
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				<i>.</i>	

Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy Kildare County Greenhills
Contact:	Thomas Vainio-Mattila

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/1584	1	TP3	0.50-1.10	2	06/02/2019	General Description (Bulk Analysis)	soil-stones
					06/02/2019	Asbestos Fibres	NAD
					06/02/2019	Asbestos ACM	NAD
					06/02/2019	Asbestos Type	NAD
					06/02/2019	Asbestos Level Screen	NAD 5 150
							atter
19/1584	1	TP4	1.00-2.00	5	06/02/2019	General Description (Bulk Analysis)	soil-stones
					06/02/2019	General Description (Bulk Analysis) - Asbestos Fibres Asbestos ACM Asbestos Type Asbestos Level Screen Total ACM Gravingtre Quantification (% Asb) Total Detailed Gavingtre Quantification (% Asb)	NAD NAD USE Softstones Fibre Bundles
					06/02/2019	Asbestos ACM	NAD
					06/02/2019	Asbestos Type pulle qui	Chrysotile
					06/02/2019	Asbestos Level Screen	less than 0.1%
					13/02/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					13/02/2019	Total Detailed Gravingeric Quantification (% Asb)	<0.001 (mass %)
					13/02/2019	Total Gravinetric quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					13/02/2019	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					13/02/2019	Aspestos Gravimetric & PCOM Total	<0.001 (mass %)
					~		
19/1584	1	TP5	2.00-2.50	8	06/02/2019	General Description (Bulk Analysis)	soil-stones
					06/02/2019	Asbestos Fibres	Fibre Bundles
					06/02/2019	Asbestos ACM	NAD
					06/02/2019	Asbestos Type	Chrysotile
					06/02/2019	Asbestos Level Screen	less than 0.1%
					13/02/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					13/02/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					13/02/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					13/02/2019	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					13/02/2019	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)

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Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy Kildare County Greenhills
Contact:	Thomas Vainio-Mattila

19/1584 1 TP4 1.00-2.00 4-6 TM21/PM24 Asbestos detected in sample 19/1584 1 TP5 2.00-2.50 7-9 TM21/PM24 Asbestos detected in sample 19/1584 1 TP5 2.00-2.50 7-9 TM21/PM24 Asbestos detected in sample 19/1584 1 TP5 2.00-2.50 7-9 TM21/PM24 Asbestos detected in sample 19/1584 1 TP5 2.00-2.50 7-9 TM21/PM24 Asbestos detected in sample 19/1584 1 TP5 2.00-2.50 7-9 TM21/PM24 Asbestos detected in sample 19/1584 1 TP5 2.00-2.50 7-9 TM21/PM24 Asbestos detected in sample 19/1584 1 1 1 1 1 1 1 19/1584 1 1 1 1 1 1 1 19/1584 1 1 1 1 1 1 1 1 19/1584 1 1 1 1 1 1 1 19/1584 1	
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Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy Kildare County Greenhills
Contact:	Thomas Vainio-Mattila

19/1584 1 TP4 1.00-2.00 4-6 Cyanide, EPH, GRO, PAH, PCB, Phenols Sample holding time exceeded prior to	J E Job Batch No.	ch Sample ID	Depth	J E Sample No.	Analysis	Reason
10/1594 1 TP5 2.00.2.50 7.0 Cranida EDU CRO DALL DCP Decreta	19/1584 1	TP3	0.50-1.10	1-3	Cyanide, EPH, GRO, PAH, PCB, Phenols	Sample holding time exceeded prior to receipt
19/1584 1 TP5 2.00-2.50 7-9 Cyanide, EPH, GRO, PAH, PCB, Phenols Sample holding time exceeded prior to 1 <th1< th=""> 1 <th1< th=""> <th1< th=""></th1<></th1<></th1<>	19/1584 1	TP4	1.00-2.00	4-6	Cyanide, EPH, GRO, PAH, PCB, Phenols	Sample holding time exceeded prior to receipt
Image: Constraint of the second of the se	19/1584 1	TP5	2.00-2.50	7-9	Cyanide, EPH, GRO, PAH, PCB, Phenols	Sample holding time exceeded prior to receipt
Image: Section of the section of th					Consent of constrained for any other type.	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

Matrix : Solid

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

19/1584 JE Job No.:

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is guoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation. S for

As surface waters require different sample preparation to groundwaters the additory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40. inst.

DEVIATING SAMPLES

For Samples must be received in a condition appropriate to the received analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report. Cos

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BI ANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other guality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
#	ISO17025 (SANAS Ref No. T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
	No Asbestos Detected.
NAD	None Detected (usually refers to VOC and/SVOC TICs).
ND	
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample 01000 Blank Sample 01000 Client Sample 0000 Trip Blank Sample 00000 Outside Calibration Range 00000
LB	Blank Sample
Ν	Client Sample
ТВ	Trip Blank Sample
OC	Outside Calibration Range
	Trip Blank Sample purported to purport of the second secon

Appendix - Methods used for WAC (2003/33/EC)

JE Job No.:

19/1584

10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and
ol/kg, 4mm	filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
За	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Чg	I.S. EN 13370 rec. EN 1483 (CVAAS)
No	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
luoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometic methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
rds	I.S. EN 15216
Compositional	analysis
ГОС	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Vineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Vetals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP OES)
	et all
Other	DUIDOUTES
	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fisch
Dry matter	titration and either volumetric or coulometric election.
	and the second se
_01	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amouns of acid or base needed to cover the pH range
lotoc:	A CONTRACT OF
Notes:	15ett of Col
	ue to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS

***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.

Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into all phatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	Reperting of analysis required racionation into aliphatic and aromatic fractions using a Reperting of analysis required racions using a			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	Control Con	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
ТМЗО	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
ТМЗО	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of the d and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
ТМЗО	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	18	water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	× cox	ς Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (oPhosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is billed with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	is then analysed.			AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	- N	is then analysed			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PMO1 COT	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM108	Determination of Elemental Sulphur by Reversed Phase High Performance Liquid Chromatography with Ultra Violet spectroscopy.	PM114	End over end extraction of dried and crushed soil samples for organic analysis. The solvent mix varies depending on analysis required			AD	Yes
TM108	Determination of Elemental Sulphur by Reversed Phase High Performance Liquid Chromatography with Ultra Violet spectroscopy.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Agentification using 1 MU65.	Yes		AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PMOI CONSCILLE	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	



Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

Unit 3 Deeside Point

	Zone 3
	Deeside Industrial Park
	Deeside
	CH5 2UA
Malone O'Regan	
Ground Floor - Unit 3	Tel: +44 (0) 1244 833780
Bracken Business Park Bracken Road	Fax: +44 (0) 1244 833781
Sandyford Dublin 18 D18 V4K6	HAC MRA UKAS 122
Attention :	Thomas Vainio-Mattila
Date :	9th May, 2019
Your reference :	E1506
Our reference :	Test Report 19/6650 Batch 1
Location :	Athy N' BY
Date samples received :	24th April, 2019
Status :	Final report
Issue :	E1506 Test Report 19/6650 Batch 1 use Athy 24th April, 2019 only of the transmission of

Seven samples were received for analysis on 24th April, 2019 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and ported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

6 luce

Bruce Leslie Project Co-ordinator

Reference:	Malone O E1506	'Regan					Report :	Liquid					
	Athy	, 											
		/ainio-Matti	la							=glass bottle	e, P=plastic	bottle	
JE Job No.:	19/6650			-	-		H=H ₂ SO ₄ , A	Z=ZNAC, N=	NaOH, HN=	HNU ₃			
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60						
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2						
Depth											Disesses		ataa faa all
COC No / misc												e attached n ations and a	
Containers	VUNDO	VUNDO	VUNDO	V H N P BOD G									
Sample Date	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019						
Sample Type	Ground Water	Ground Water	Ground Water	Leachate	Leachate	Surface Water	Surface Water						
Batch Number	1	1	1	1	1	1	1					Linita	Method
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019				LOD/LOR	Units	No.
Dissolved Arsenic	-	-	-	<2.5	<2.5	-	-				<2.5	ug/l	TM30/PM14
Dissolved Arsenic [#]	<2.5	<2.5	<2.5	-	-	<2.5	<2.5				<2.5	ug/l	TM30/PM14
Dissolved Boron	41	37	40	108	186	20	21				<12	ug/l	TM30/PM14
Dissolved Cadmium	-	-	-	<0.5	<0.5	-	-				<0.5	ug/l	TM30/PM14
Dissolved Cadmium [#] Dissolved Calcium	<0.5	<0.5	<0.5	-	-	<0.5	<0.5				<0.5 <0.2	ug/l	TM30/PM14 TM30/PM14
Dissolved Calcium	- 114.2	- 131.6	- 107.2	293.6 _{AA}	327.6 _{AA}	- 124.3	- 125.5				<0.2	mg/l mg/l	TM30/PM14 TM30/PM14
Total Dissolved Chromium	-	-	-	<1.5	<1.5	-					<1.5	ug/l	TM30/PM14
Total Dissolved Chromium [#]	<1.5	<1.5	<1.5			<1.5	<1.5	, 15 ⁰ .			<1.5	ug/l	TM30/PM14
Dissolved Copper	-	-	-	<7	<7	-		heruse.			<7	ug/l	TM30/PM14
Dissolved Copper [#]	<7	<7	<7	-	-	<7	17:50 C				<7	ug/l	TM30/PM14
Total Dissolved Iron	-	-	-	<20	67		offor a				<20	ug/l	TM30/PM14
Total Dissolved Iron #	<20	<20	<20	-	-	305.	31				<20	ug/l	TM30/PM14
Dissolved Lead	-	-	-	<5	<5	Dilledin	<1.5 - 00 - 00				<5	ug/l	TM30/PM14
Dissolved Lead [#]	<5	<5	<5	-	- do	01<5	<5				<5	ug/l	TM30/PM14
Dissolved Magnesium	-	-	-	20.7	350 0	A* -	-				<0.1	mg/l	TM30/PM14
Dissolved Magnesium [#]	17.6	16.9	18.3	-	N HILL BILL	11.9	11.8				<0.1	mg/l	TM30/PM14
Dissolved Manganese	-	-	-	1690 🔨	N ²⁷⁹⁶	-	-				<2	ug/l	TM30/PM14
Dissolved Manganese [#]	<2	25	<2	- 8	· -	<2	<2				<2	ug/l	TM30/PM14
Dissolved Mercury	-	-	-	Sent	<1						<1	ug/l	TM30/PM14
Dissolved Mercury [#]	<1	<1	<1	Coll	-	<1	<1				<1	ug/l	TM30/PM14
Dissolved Nickel Dissolved Nickel [#]	<2	<2	<2	-	6	<2	<2				<2 <2	ug/l ug/l	TM30/PM14 TM30/PM14
Dissolved Nickel	-	-2	-2	- 11.1	- 19.2	-2	-2				<0.1	mg/l	TM30/PM14
Dissolved Potassium [#]	1.7	4.4	10.4	-	-	2.4	2.4				<0.1	mg/l	TM30/PM14
Dissolved Sodium	-	-	-	54.5	27.6	-	-				<0.1	mg/l	TM30/PM14
Dissolved Sodium [#]	11.4	11.3	17.9	-	-	12.4	12.6				<0.1	mg/l	TM30/PM14
Dissolved Zinc	-	-	-	8	13	-	-				<3	ug/l	TM30/PM14
Dissolved Zinc [#]	<3	<3	<3	-	-	<3	<3				<3	ug/l	TM30/PM14
Methyl Tertiary Butyl Ether				-0.1	<0.1						-0 1	110/	TM15/PM10
Methyl Tertiary Butyl Ether Methyl Tertiary Butyl Ether [#]	- <0.1	- <0.1	- <0.1	<0.1	<0.1	- <0.1	- <0.1				<0.1 <0.1	ug/l	TM15/PM10 TM15/PM10
Methyl Tertiary Butyl Ether " Benzene	<0.1	<0.1	<0.1	- <0.5	- <0.5	<0.1	<0.1				<0.1	ug/l ug/l	TM15/PM10
Benzene [#]	< 0.5	< 0.5	<0.5			< 0.5	< 0.5				<0.5	ug/l	TM15/PM10
Toluene	-	-	-	<5	<5	-	-				<5	ug/l	TM15/PM10
Toluene [#]	<5	<5	<5	-	-	<5	<5				<5	ug/l	TM15/PM10
Ethylbenzene	-	-	-	<1	<1	-	-				<1	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	-	-	<1	<1				<1	ug/l	TM15/PM10
m/p-Xylene	-	-	-	<2	<2	-	-				<2	ug/l	TM15/PM10
m/p-Xylene [#]	<2	<2	<2	-	-	<2	<2				<2	ug/l	TM15/PM10
o-Xylene	-	-	-	<1	<1	-	-				<1	ug/l	TM15/PM10
o-Xylene [#]	<1	<1	<1	-	-	<1	<1				<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	99	105	110	109	106	108	109				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	98	102	101	104	104	105	105				<0	%	TM15/PM10

Client Name: Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location:	Athy												
Contact:	Thomas V	/ainio-Matti	ila				Liquids/pr	oducts: V=	40ml vial, G	=glass bottle	e, P=plastic	bottle	
JE Job No.:	19/6650						H=H ₂ SO ₄ ,	Z=ZnAc, N=	NaOH, HN=	HN0 ₃			
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60						
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2						
Depth											Disesses		
COC No / misc												e attached r ations and a	
Containers	VHNPG	VHNPG	VUNDO	V H N P BOD G									
Sample Date	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019						
Sample Type	Ground Water	Ground Water	Ground Water	Leachate	Leachate	Surface Water	Surface Water						
Batch Number	1	1	1	1	1	1	1				LOD/LOR	Units	Method
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019				LOD/LOK	Units	No.
Pesticides													
Organochlorine Pesticides													
Aldrin	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Alpha-HCH (BHC)	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Beta-HCH (BHC)	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Chlorothalonil	<2.50 ^{SV} AD	<2.50 ^{SV} AD	<2.50 ^{SV} AD	<100.00 ^{SV} AE	<187.50 ^{SV} AF	<2.50 ^{SV} AD	<2.50 ^{SV} AD				<0.01	ug/l	TM149/PM30
cis-Chlordane	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				< 0.01	ug/l	TM149/PM30
Delta-HCH (BHC) Dieldrin	<0.01 ^{sv} <0.01 ^{sv}	<0.01 ^{sv} <0.01 ^{sv}	<0.01 ^{sv} <0.01 ^{sv}	<0.40 ^{SV} _{AB} <0.40 ^{SV} _{AB}	<0.75 ^{SV} AC <0.75 ^{SV} AC	<0.01 ^{sv} <0.01 ^{sv}	<0.01 ^{sv} <0.01 ^{sv}	her use.			<0.01 <0.01	ug/l	TM149/PM30 TM149/PM30
Endosulphan I	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	SV	<0.75 AC	<0.01 <0.01 ^{SV}	<0.01 <0.01	ner			<0.01	ug/l ug/l	TM149/PM30
Endosulphan II	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	SV	<0.75 AC	<0.01 <0.01 ^{SV}	1180.02184	~			< 0.01	ug/l	TM149/PM30
Endosulphan sulphate	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 AB	<0.75 ^{SV} AC	<0.01SV	0.01 ^{sv}				<0.01	ug/l	TM149/PM30
Endrin	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 <0.00 SV	<0.01 sv				<0.01	ug/l	TM149/PM30
Gamma-HCH (BHC)	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 SV AB	<0.75 ^{SV} AC	201	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Heptachlor	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 SV AB	<0.75	0.01 ^{sv}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Heptachlor Epoxide	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 SV AB	<0.75 AC	<0.01 ⁵⁰	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Hexachlorobenzene	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.755 Ac	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Isodrin	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 SV	ST SV AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
o,p'-DDE	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				< 0.01	ug/l	TM149/PM30 TM149/PM30
o,p'-DDT o,p'-Methoxychlor	<0.01 ^{sv} <0.01 ^{sv}	<0.01 ^{sv} <0.01 ^{sv}	<0.01 ^{sv} <0.01 ^{sv}	SV	SV	<0.01 ^{SV} <0.01 ^{SV}	<0.01 ^{SV} <0.01 ^{SV}				<0.01 <0.01	ug/l ug/l	TM149/PM30 TM149/PM30
o,p'-TDE	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	<0.01 <0.01	<0.40 AB	<0.75 AC <0.75 AC	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}				<0.01	ug/l	TM149/PM30
p,p'-DDE	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	<0.40 AB	<0.75 AC	<0.01 <0.01	<0.01 ^{SV}				< 0.01	ug/l	TM149/PM30
p,p'-DDT	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{sv}	<0.01 ^{sv}				<0.01	ug/l	TM149/PM30
p,p'-Methoxychlor	<0.01 ^{SV}	<0.01 ^{sv}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{sv}	<0.01 ^{sv}				<0.01	ug/l	TM149/PM30
p,p'-TDE	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{\$V}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{\$V}				<0.01	ug/l	TM149/PM30
Pendimethalin	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Permethrin I	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{\$V}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Permethrin II	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Quintozene (PCNB)	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Tecnazene	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} _{AB} <0.40 ^{SV} _{AB}	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				< 0.01	ug/l	TM149/PM30 TM149/PM30
Telodrin trans-Chlordane	<0.01 ^{sv}	<0.01 ^{sv}	<0.01 ^{sv} <0.01 ^{sv}	a .aSV	<0.75 ^{SV} AC <0.75 ^{SV} AC	<0.01 ^{SV} <0.01 ^{SV}	<0.01 ^{sv} <0.01 ^{sv}				<0.01 <0.01	ug/l ug/l	TM149/PM30 TM149/PM30
Triadimefon	<0.01 <0.01	<0.01 <0.01	<0.01 <0.01	<0.40 AB	<0.75 AC <0.75 AC	<0.01 <0.01 <0.01	<0.01 <0.01 <0.01				<0.01	ug/i ug/i	TM149/PM30
Triallate	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}	<0.40 AB	<0.75 AC	<0.01 <0.01 ^{SV}	<0.01 <0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Trifluralin	<0.01	<0.01	<0.01 ^{SV}	<0.40 SV AB	<0.75 ^{SV} AC	<0.01 SV	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
	5.01	5.01	5.01	AB	AC	5.07	5.01					÷	
													ļ

Client Name: Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location:	Athy												
Contact:	Thomas V	/ainio-Matt	ila				Liquids/pr	oducts: V=	40ml vial, G	=glass bottl	e, P=plastic	bottle	
JE Job No.:	19/6650						H=H ₂ SO ₄ , 2	Z=ZnAc, N=	NaOH, HN=	HN0 ₃			
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60						
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2						
Depth												e attached r ations and a	
COC No / misc Containers	VHNPG	VHNDC	VHNPG										
Sample Date							23/04/2019						
Sample Type				Leachate	Leachate		Surface Water						
Batch Number	1	1	1	1	1	1	1						Method
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019				LOD/LOR	Units	No.
Pesticides													
Organophosphorus Pesticides		-					-						
Azinphos ethyl	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Azinphos methyl	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Carbophenothion	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Chlorfenvinphos	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Chlorpyrifos	<0.01 ^{SV}	<0.01 ^{sv}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Chlorpyrifos-methyl	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}	.e.			<0.01	ug/l	TM149/PM30
Diazinon	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}	her use.			<0.01	ug/l	TM149/PM30
Dichlorvos	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{sv}		(Ite			<0.01	ug/l	TM149/PM30
Disulfoton	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	180.0318W				<0.01	ug/l	TM149/PM30
Dimethoate	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 SV	D', 🔬 SV				<0.01	ug/l	TM149/PM30
Ethion	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 <0.00 SV	<0.01 ^{sv}				<0.01	ug/l	TM149/PM30
Ethyl Parathion (Parathion)	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	20 01	<0.01				<0.01	ug/l	TM149/PM30
Etrimphos	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75	TEO.01SV	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Fenitrothion	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 AC	<0.01	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Fenthion	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	0.75 AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Malathion	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 SV AB	SV AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Methyl Parathion	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 SV	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Mevinphos	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} _{AB} <0.40 ^{SV} _{AB} <0.40 ^{SV} _{AB} <0.40 ^{SV} _{AB} <0.40 ^{SV} _{AB}	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Phosalone	<0.01 ^{SV}	<0.01 ^{sv}	<0.01 ^{SV}	40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Pirimiphos Methyl	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Propetamphos	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Triazophos	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{sv}				<0.01	ug/l	TM149/PM30

Client Name:	Malone O	'Regan					Report :	Liquid					
Reference:	E1506												
Location:	Athy												
Contact: JE Job No.:		/ainio-Matt	ila							=glass bottle	e, P=plastic	bottle	
JE JOD NO.:	19/6650						п-п ₂ 30 ₄ ,	Z-ZNAC, N-	NaOH, HN=				
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60						
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2						
Depth												e attached n ations and a	
COC No / misc											abbievia	auons and a	cronyms
Containers Sample Date		V H N P G		V H N P BOD G									
Sample Date Sample Type					23/04/2019 Leachate		23/04/2019 Surface Water						
Batch Number													
	1	1	1	1	1	1	1				LOD/LOR	Units	Method No.
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019						
Acid Herbicides													
Benazolin	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM42/PM30
Bentazone	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM42/PM30
Bromoxynil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM42/PM30
Clopyralid 4-CPA	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1				<0.1 <0.1	ug/l	TM42/PM30 TM42/PM30
4-CPA 2,4-D	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l ug/l	TM42/PM30
2,4-D 2,4-DB	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM42/PM30
Dicamba	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	. 150.			<0.1	ug/l	TM42/PM30
Dichloroprop	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	neruse.			<0.1	ug/l	TM42/PM30
Diclofop	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	A=0.07				<0.1	ug/l	TM42/PM30
Fenoprop	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1 6 0 .1				<0.1	ug/l	TM42/PM30
Flamprop	<0.1	<0.1	<0.1	<0.1	<0.1	<00 ⁵ . (<0.1				<0.1	ug/l	TM42/PM30
Flamprop-isopropyl	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 <00 PUE0 PUE0 COLING	<0.1				<0.1	ug/l	TM42/PM30
loxynil	<0.1	<0.1	<0.1	<0.1	<0.1 10 <090	1 P 0.1	<0.1				<0.1	ug/l	TM42/PM30
MCPA	<0.1	<0.1	<0.1	<0.1	O	<0.1	<0.1				<0.1	ug/l	TM42/PM30
МСРВ	<0.1	<0.1	<0.1	<0.1	11/03/11	<0.1	<0.1				<0.1	ug/l	TM42/PM30
Месоргор	<0.1	<0.1	<0.1	<0.1 ᄿ	02,00.1	<0.1	<0.1				<0.1	ug/l	TM42/PM30
Picloram	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM42/PM30
Pentachlorophenol	<0.1	<0.1	<0.1	<01 01 01 01	<0.1	<0.1	<0.1				<0.1	ug/l	TM42/PM30
2,4,5-T 2,3,6-TBA	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1				<0.1 <0.1	ug/l ug/l	TM42/PM30 TM42/PM30
Triclopyr	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM42/PM30
Atrazine	<0.01 ^{SV}	<0.01 ^{SV}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{SV}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
Simazine	<0.01 ^{SV}	<0.01 ^{\$V}	<0.01 ^{SV}	<0.40 ^{SV} AB	<0.75 ^{SV} AC	<0.01 ^{\$V}	<0.01 ^{SV}				<0.01	ug/l	TM149/PM30
EPH (C8-C40)	-	-	-	<10	5770	-	-				<10	ug/l	TM5/PM30
EPH (C8-C40) [#]	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM5/PM30
C8-C40 Mineral Oil (Calculation)	<10	<10	<10	<10	3170	<10	<10				<10	ug/l	TM5/PM30
								I					

Client Name: Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location:	Athy												
Contact:	Thomas V	′ainio-Matti	la							-	e, P=plastic	bottle	
JE Job No.:	19/6650						H=H ₂ SO ₄ , 2	Z=ZnAc, N=	NaOH, HN=	HN0 ₃	_		
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60						
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2						
Depth												e attached n ations and a	
COC No / misc	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G	V H P BOD G	V H N P BOD G						
Sample Date													
Sample Type					Leachate		Surface Water						
Batch Number	1	1	1	1	1	1	1						Method
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019				LOD/LOR	Units	No.
TPH CWG													
Aliphatics													TN 100 /D1 11 /
>C5-C6 >C5-C6 [#]	- <10	- <10	- <10	<10	<10	- <10	- <10				<10 <10	ug/l	TM36/PM12 TM36/PM12
>C5-C6	-	-	-	- <10	- <10	-	-				<10	ug/l	TM36/PM12 TM36/PM12
>C6-C8 [#]	- <10	- <10	- <10	-	-	- <10	- <10				<10	ug/l ug/l	TM36/PM12
>C8-C10	-	-	-	<10	<10	-	-				<10	ug/l	TM36/PM12
>C8-C10#	<10	<10	<10	-	-	<10		.			<10	ug/l	TM36/PM12
>C10-C12	-	-	-	<5	<5	-	-	her use.			<5	ug/l	TM5/PM16/PM30
>C10-C12#	<5	<5	<5	-	-	<5	<5	her			<5	ug/l	TM5/PM16/PM30
>C12-C16	-	-	-	<10	<10	-	the the				<10	ug/l	TM5/PM16/PM30
>C12-C16#	<10	<10	<10	-	-	<10	C 10				<10	ug/l	TM5/PM16/PM30
>C16-C21	-	-	-	<10	<10	100 ⁵ 01	<u>0</u>				<10	ug/l	TM5/PM16/PM30
>C16-C21#	<10	<10	<10	-	-	Dif 10111	<5 0 1 5 5 5 5 5 5 5 5 5 5 5 5 5				<10	ug/l	TM5/PM16/PM30
>C21-C35	-	-	-	<10	1640 10	not t	-				<10	ug/l	TM5/PM16/PM30
>C21-C35#	<10	<10	<10	-	O	<10	<10				<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	-	-	-	<10	1640	-	-				<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	- 🛠	opyright o	<10	<10				<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7	-	-	-	<14.01 CONS-10	<10	-	-				<10	ug/l	TM36/PM12
>C5-EC7 #	<10	<10	<10	015-	-	<10	<10				<10	ug/l	TM36/PM12
>EC7-EC8	-	-	-	<10	<10	-	-				<10	ug/l	TM36/PM12
>EC7-EC8 [#]	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM36/PM12
>EC8-EC10	-	-	-	<10	<10	-	-				<10	ug/l	TM36/PM12
>EC8-EC10#	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM36/PM12
>EC10-EC12	-	-	-	<5	<5	-	- <5				<5 <5	ug/l	TM5/PM16/PM30 TM5/PM16/PM30
>EC10-EC12 [#] >EC12-EC16	<5	<5	<5	- <10	- <10	<5	-				<5 <10	ug/l ug/l	TM5/PM16/PM30 TM5/PM16/PM30
>EC12-EC16	- <10	- <10	- <10	-	-	- <10	- <10				<10	ug/l	TM5/PM16/PM30
>EC12-EC16 >EC16-EC21	-	-	-	- <10	- <10	-	-				<10	ug/l	TM5/PM16/PM30
>EC16-EC21#	- <10	- <10	- <10	-	-	- <10	- <10				<10	ug/l	TM5/PM16/PM30
>EC10-EC21	-	-	-	- <10	- 1160	-	-				<10	ug/l	TM5/PM16/PM30
>EC21-EC35 [#]	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	-	-	-	<10	1160	-	-				<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aromatics C5-35 [#]	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM5/TM38/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35)	-	-	-	<10	2800	-	-				<10	ug/l	TM5/TM38/PM12/PM18/PM30
Total aliphatics and aromatics(C5-35)#	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM5/TM38/PM12/PM16/PM30
					40								THOUTDING
GRO (>C4-C8)	-	-	-	<10	13	-	-				<10	ug/l	TM36/PM12
GRO (>C4-C8) [#]	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM36/PM12
GRO (>C8-C12)	-	-	-	<10	42	-	-				<10	ug/l	TM36/PM12
GRO (>C8-C12) [#]	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM36/PM12
GRO (>C4-C12)	-	-	-	<10	55	-	-				<10	ug/l	TM36/PM12
GRO (>C4-C12) [#]	<10	<10	<10	-	-	<10	<10				<10	ug/l	TM36/PM12

Reference:	Malone O E1506	'Regan					Report :	Liquid					
	Athy Thomas V 19/6650	/ainio-Matti	ila						:40ml vial, G NaOH, HN=	≔glass bottle HN0₃	e, P=plastic	bottle	
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60						
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2						
Depth											Please se	e attached no	otes for all
COC No / misc												ations and ac	
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G	V H P BOD G	V H N P BOD G						
Sample Date	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019	23/04/2019						
Sample Type		Ground Water		Leachate	Leachate		Surface Water						
Batch Number	1	1	1	1	1	1	1						
											LOD/LOR	Units	Method No.
Date of Receipt		24/04/2019	-			-	24/04/2019				<0.01	mg/l	TM26/PM0
Phenol #	- <0.01	- <0.01	- <0.01	<0.01	<0.01	- <0.01	- <0.01				<0.01	mg/l mg/l	TM26/PM0 TM26/PM0
	0.01	0.01	0.01			0.01	0.01				0.01		
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/l	TM173/PM0
Sulphate as SO4	-	-	-	189.2	46.0	-	-				<0.5	mg/l	TM38/PM0
Sulphate as SO4 [#]	26.8	33.1	75.9	-	-	34.6	35.2				<0.5	mg/l	TM38/PM0
Chloride Chloride [#]	- 30.8	- 13.4	- 32.5	- 16.8	- 20.5	- 26.5	- 26.7	her use.			<0.3 <0.3	mg/l mg/l	TM38/PM0 TM38/PM0
MRP Ortho Phosphate as P	<0.03	<0.03	<0.03	<0.03	< 0.03	<0.03	<0.03	net			<0.03	mg/l	TM38/PM0
Total Oxidised Nitrogen as N	-	-	-	<0.2	<0.2	-	the the				<0.2	mg/l	TM38/PM0
Total Oxidised Nitrogen as N [#]	8.0	12.0	6.5	-	-	3.5	26.7 <0.03 111: any - <0.01 - <0.03				<0.2	mg/l	TM38/PM0
						- 1005 I	0						
Total Cyanide	-	-	-	<0.01	<0.01	Puredu	-				<0.01	mg/l	TM89/PM0
Total Cyanide [#]	<0.01	<0.01	<0.01	-	- ctio	0.01	<0.01				<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N	-	-	-	8.22	· 197 491	• _	-				< 0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N [#]	0.05	0.04	0.04	- 🛠	or yrig	<0.03	<0.03				<0.03	mg/l	TM38/PM0
-				S	iok.								
Total Alkalinity as CaCO3 [#]	608	4038	3712	Onsent of	-	306	290				<1	mg/l	TM75/PM0
Dibutyltin	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM94/PM48
Tributyltin	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM94/PM48
Triphenyltin	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM94/PM48
				10									71.050 (71.00
BOD (Settled) BOD (Settled) [#]	-	-	-	16 -	- 21	-	- 1				<1 <1	mg/l mg/l	TM58/PM0 TM58/PM0
COD (Settled)	-	-	-	- 57	- 120	-	-				<7	mg/l	TM58/PM0 TM57/PM0
COD (Settled) [#]	-	-	-	-	-	30	32				<7	mg/l	TM57/PM0
Dissolved Oxygen	6	7	7	5	3	9	9				<1	mg/l	TM58/PM0
Electrical Conductivity @25C	-	-	-	1449	1740	-	-				<2	uS/cm	TM76/PM0
Electrical Conductivity @25C [#]	688	787	733	-	-	686	688				<2	uS/cm	TM76/PM0
Faecal Coliforms*	13	<1	<1	-	-	-	-					CFU/100ml	Subcontracted
pH	-	-	-	7.24	7.26	-	-				< 0.01	pH units	TM73/PM0
pH [#] Redox	7.57 330.61	7.35 335.51	7.37 308.18	- 304.28	- 71.95	8.26 159.24	8.29 175.32				<0.01	pH units mV	TM73/PM0 TM72/PM0
Total Organic Carbon [#]	<2	335.51	<2	-	-	-	-				<2	my/l	TM60/PM0
Total Coliforms*	116.9	2.0	<1.0	-	-	-	-				-	CFU/100ml	Subcontracted
Total Dissolved Solids [#]	421	476	448	-	-	-	-				<35	mg/l	TM20/PM0
Total Suspended Solids *	-	-	-	-	-	<10	<10				<10	mg/l	TM37/PM0

Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy
Contact:	Thomas Vainio-Mattila
JE Job No.:	19/6650

SVOC Report : Liquid

Sample ID G Depth COC No / misc Containers V H Sample Date 23/04 Sample Date 23/04 Sample Date 23/04 Sample Type Groun Batch Number 24/02 SVOC MS Phenols 2 2-Chlorophenol 2-Chlorophenol 2-Chlorophenol 2-Methylphenol 2.4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dirichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol 4-Methylphenol 4-Nitrophenol 4-Nitrophenol Pentachlorophenol	/04/2019 23 und Water Gr 1	Ground Water 1	23/04/2019 Ground Water 1	Leachate 1	23/04/2019 Leachate 1	23/04/2019 Surface Water 1 24/04/2019 - - <1 -	23/04/2019 Surface Water 1				e attached n titions and a Units ug/l	Method No.
Depth COC No / misc Containers V H Sample Date 23/04 Sample Date 23/04 Sample Type Groun Batch Number Date of Receipt Date of Receipt 24/04 SVOC MS Phenols 2-Chlorophenol 2-Chlorophenol 2-Chlorophenol 2-Methylphenol 2-Methylphenol 2-Methylphenol 2,4-Dichlorophenol 2 2,4-Dichlorophenol 2 2,4-Dirichlorophenol 2 2,4,5-Trichlorophenol 2 4-Chloro-3-methylphenol 4 4-Methylphenol 4 4-Methylphenol 4 4-Methylphenol 4 4-Nitrophenol 4 Pentachlorophenol 4 Pentachlorophenol 4	H N P G V (04/2019 22 und Water Gr 1 24 (04/2019 24 (04/20) (04/20) (04/20) (04/20) (04/20) (04/20) (0	V H N P G 3/04/2019 iround Water 1 1/4/04/2019 - <1 - <0.5 <0.5 - <0.5 <1 - <0.5 <1 - <0.5 <1 -	V H N P G 23/04/2019 Ground Water 1 24/04/2019 - - <0.5 <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - <0.5 - - <0.5 - - <0.5 - - - <0.5 - - - - <0.5 - - - - - - - - - - - - - - - - - - -	VHNPBODG 23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5 <0.5 <0.5 <0.5 -	VHNPBODG 23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5	V H P BOD G 23/04/2019 Surface Water 1 24/04/2019 - - <1 -	V H N P BOD G 23/04/2019 Surface Water 1 24/04/2019 -			abbrevia	utions and a	Method No.
COC No / misc Containers V H Sample Date 23/04 Sample Type Groun Batch Number 24/04 Date of Receipt 24/04 SVOC MS Phenols 24/04 SVOC MS Phenols 24/04 2-Chlorophenol 24/04 24/04 2-Chlorophenol 24 24/04 2-Methylphenol 24 24 2-Methylphenol 24 24 2-Methylphenol 24 24 2-A-Dichlorophenol 24 24 2-A-Dichlorophenol 24 24 2-A-Dichlorophenol 24 24 2-A-Dirichlorophenol 24 24 2-A-Dirichlorophenol 24 24 2-A-Dirichlorophenol 24 24 2-A-Dirichlorophenol 34 34 2-A-Dirichlorophenol	104/2019 2: und Water Gr 1 104/2019 2: - <1 - <0.5 - <0.5 - <0.5 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - <1 - - - - - - - - - - - - -	23/04/2019 iround Water 1 14/04/2019 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - - <1 - - - - - - - - - - - - -	23/04/2019 Ground Water 1 24/04/2019 - - <0.5 <0.5 - <0.5 - <0.5 - <0.5 - <1 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5 <0.5 <0.5 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5	23/04/2019 Surface Water 1 24/04/2019 - - <1 -	23/04/2019 Surface Water 1 24/04/2019 -			abbrevia	utions and a	Method No.
COC No / misc Containers V H Sample Date 23/04 Sample Type Groun Batch Number 24/04 Date of Receipt 24/04 SVOC MS Phenols 24/04 SVOC MS Phenols 24/04 2-Chlorophenol 24/04 24/04 2-Chlorophenol 24 24/04 2-Methylphenol 24 24 2-Methylphenol 24 24 2-Methylphenol 24 24 2-A-Dichlorophenol 24 24 2-A-Dichlorophenol 24 24 2-A-Dichlorophenol 24 24 2-A-Dirichlorophenol 24 24 2-A-Dirichlorophenol 24 24 2-A-Dirichlorophenol 24 24 2-A-Dirichlorophenol 34 34 2-A-Dirichlorophenol	104/2019 2: und Water Gr 1 104/2019 2: - <1 - <0.5 - <0.5 - <0.5 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - <1 - - - - - - - - - - - - -	23/04/2019 iround Water 1 14/04/2019 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - - <1 - - - - - - - - - - - - -	23/04/2019 Ground Water 1 24/04/2019 - - <0.5 <0.5 - <0.5 - <0.5 - <0.5 - <1 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5 <0.5 <0.5 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5	23/04/2019 Surface Water 1 24/04/2019 - - <1 -	23/04/2019 Surface Water 1 24/04/2019 -			abbrevia	utions and a	Method No.
Containers V H Sample Date 23/04 Sample Type Groun Batch Number 24/04 Date of Receipt 24/04 SVOC MS Phenols 2-Chlorophenol 2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-	104/2019 2: und Water Gr 1 104/2019 2: - <1 - <0.5 - <0.5 - <0.5 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - <1 - - - - - - - - - - - - -	23/04/2019 iround Water 1 14/04/2019 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - - <1 - - - - - - - - - - - - -	23/04/2019 Ground Water 1 24/04/2019 - - <0.5 <0.5 - <0.5 - <0.5 - <0.5 - <1 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5 <0.5 <0.5 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5	23/04/2019 Surface Water 1 24/04/2019 - - <1 -	23/04/2019 Surface Water 1 24/04/2019 -			LOD/LOR	Units	Method No.
Sample Date 23.0 Sample Type Groun Batch Number Date of Receipt Date of Receipt 24/04 SVOC MS Phenols 2-Chlorophenol 2 2-Chlorophenol 2 2-Methylphenol 2 2-Methylphenol 2 2Methylphenol 2 2Arbichlorophenol 2 2Arbichlorophenol 2 2.4Dirichlorophenol 2 2.4Dirichlorophenol 2 4Chloro-3-methylphenol 4 4Chloro-3-methylphenol 4 4Methylphenol 4 4Methylphenol 4 2Inthrophenol 4 4Methylphenol 4 2Inthorophenol 4	104/2019 2: und Water Gr 1 104/2019 2: - <1 - <0.5 - <0.5 - <0.5 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - <1 - - - - - - - - - - - - -	23/04/2019 iround Water 1 14/04/2019 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - - - <1 - - - - - - - - - - - - -	23/04/2019 Ground Water 1 24/04/2019 - - <0.5 <0.5 - <0.5 - <0.5 - <0.5 - <1 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5 <0.5 <0.5 -	23/04/2019 Leachate 1 24/04/2019 <1 - <0.5 - <0.5	23/04/2019 Surface Water 1 24/04/2019 - - <1 -	23/04/2019 Surface Water 1 24/04/2019 -					No.
Sample Type Groun Batch Number 24/04 Date of Receipt 24/04 SVOC MS 9 2-Chlorophenol 2 2-Chlorophenol 2 2-Methylphenol 2 2-Methylphenol 2 2-Methylphenol 2 2-Methylphenol 2 2,4-Dichlorophenol 2 2,4-Dichlorophenol 2 2,4-Dirichlorophenol 2 2,4,5-Trichlorophenol 2 2,4,5-Trichlorophenol 4 4-Chloro-3-methylphenol 4 4-Methylphenol 4 4-Methylphenol 4 4-Nitrophenol 4 Pentachlorophenol 4 Phonol 4	und Water Gr 1 24 /04/2019 24 - 1 - 1 - 1 - 2 <0.5 1 - 1 <0.5 1 <1 - <0.5 1 <1 - <0.5 1 <1 - <0.5 1 <1 - <0.5 1 <1 - <0.5 1 <1 -	iround Water 1 44/04/2019 - <1 - <0.5 <0.5 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - - - - - - - - - - - -	Ground Water 1 24/04/2019 - - - - - - - - - - - - -	Leachate 1 24/04/2019 <1 - <0.5 - <0.5 <0.5 <0.5 -	Leachate 1 24/04/2019 <1 - <0.5 - <0.5	Surface Water 1 24/04/2019 - - <1 -	Surface Water 1 24/04/2019 -					No.
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Date of Receipt 24/04 SVOC MS Phenols 2-Chlorophenol - 2-Chlorophenol - 2-Chlorophenol - 2-Methylphenol - 2-Methylphenol - 2-Methylphenol - 2-Nitrophenol - 2.4-Dichlorophenol - 4-Chloro-3-methylphenol - 4-Chloro-3-methylphenol - 4-Nitrophenol - 4-Nitrophenol - Pentachlorophenol - Phenol -	04/2019 24 - 1 - 1 - 1 - 5 <0.5 1 - 2 <0.5 2 <1 - <0.5 4 - 2 <0.5 4 - 2 <0.5 4 <0.5 4 <0.5 4 <1 2	4/04/2019 - <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - <1 - - - - - - - - - - - - -	24/04/2019 - <1 - <0.5 <0.5 - <0.5 - <0.5 <1 -	24/04/2019 <1 - <0.5 - <0.5 <0.5 <0.5 -	24/04/2019 <1 - <0.5 - <0.5	24/04/2019 - <1 -	24/04/2019					No.
SVOC MS Phenols 2-Chlorophenol 2-Chlorophenol 2-Chlorophenol 2-Methylphenol 2-Methylphenol 2-Methylphenol 2-Nitrophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dirtholrophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol	- <1 - <0.5 <0.5 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <1 - <1 - - <1 - - - - - - - - - - - - -	- <1 - <0.5 <0.5 - <0.5 <1 - <0.5 <1 -	- <1 - <0.5 <0.5 - <0.5 <1 -	<1 - <0.5 - <0.5 <0.5 -	<1 - <0.5 - <0.5	- <1 -	-			<1	ug/l	
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2-Chlorophenol 2-Chlorophenol 2-Chlorophenol 2-Wethylphenol 2-Methylphenol 2-Wethylphenol 2-Nitrophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dirhlorophenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol 4-Nitrophenol Pentachlorophenol Phenol	<1	<1 - <0.5 - <0.5 <1 - <0.5 <1 - <0.5 <1	<1 - <0.5 <0.5 - <0.5 <1 -	- <0.5 - <0.5 <0.5 -	- <0.5 - <0.5	<1 -				<1	ug/l	-
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2-Methylphenol 2-Methylphenol 2-Nitrophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol 4-Methylphenol 4-Nitrophenol Pentachlorophenol Phenol	- 0.5 <0.5 <0.5 <1 <0.5 <1 <0.5 <1 - <0.5 <1 <0.5 <1	- <0.5 <0.5 <1 - <0.5 <1 <1.5 <1	- <0.5 - <0.5 <1 -	<0.5 - <0.5 <0.5 -	<0.5 - <0.5	-	1			<1	ug/l	TM16/PM30
2-Methylphenol * <	<0.5 <0.5 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 -	<0.5 <0.5 - <0.5 <1 - <0.5 <1	<0.5 <0.5 - <0.5 <1 -	- <0.5 <0.5 -	- <0.5		-			<0.5	ug/l	TM16/PM30
2-Nitrophenol <	<0.5 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 - <1 - <1 - <1 - <1 - <1 - - - - - - - - - - - - -	<0.5 - <0.5 <1 - <0.5 <1	<0.5 - <0.5 <1 -	<0.5 <0.5 -	<0.5	<0.5	<0.5			<0.5	-	TM16/PM30
2,4-Dichlorophenol 2,4-Dichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol 4-Methylphenol 4-Methylphenol 4-Nitrophenol Pentachlorophenol Phenol PAHS	- <0.5 <1 - <0.5 <1 - <0.5 <1 - <0.5 <1 <0.5 <1 <1	- <0.5 <1 - <0.5 <1	- <0.5 <1 -	<0.5 -							ug/l	TM16/PM30
2,4-Dichlorophenol 2,4-Dimethylphenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 4-Chloro-3-methylphenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol	<0.5 <1 - <0.5 <1 - <0.5 <0.5 <1	<0.5 <1 - <0.5 <1	<0.5 <1 -	-	<0.5	<0.5	<0.5			< 0.5	ug/l	TM16/PM30
2,4-Dimethylphenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 4 2,4,6-Trichlorophenol 4 4-Chloro-3-methylphenol 4 4-Chloro-3-methylphenol 4 4-Nitrophenol 4 Pentachlorophenol 6 Phenol 6 7AHS 6	<1	<1 - <0.5 <1	<1 -			-	-			<0.5	ug/l	TM16/PM30
2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 4,4,6-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol 4-Nitrophenol Pentachlorophenol Phenol PAHS	- <0.5 <1 - <0.5 <1	- <0.5 <1	-	<1	-	<0.5	<0.5			<0.5	ug/l	1
2,4,5-Trichlorophenol [#] < 2,4,6-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol [#] < 4-Methylphenol 4-Nitrophenol Pentachlorophenol Phenol PAHS	<0.5 <1 - <0.5 <1	<0.5 <1			<1	<1	<1			<1	ug/l	TM16/PM30
2,4,6-Trichlorophenol 4-Chloro-3-methylphenol 4-Chloro-3-methylphenol 4-Methylphenol 4-Nitrophenol Pentachlorophenol Phenol PAHs	<1 - <0.5 <1	<1	<0.5	<0.5	<0.5	-	-			<0.5	ug/l	TM16/PM30
4-Chloro-3-methylphenol 4-Chloro-3-methylphenol [#] < 4-Methylphenol 4-Nitrophenol Pentachlorophenol Phenol PAHS	- <0.5 <1			-	-	<0.5	<0.5		 	<0.5	ug/l	TM16/PM30
4-Chloro-3-methylphenol [#] < 4-Methylphenol 4-Nitrophenol Pentachlorophenol Phenol PAHs	<0.5 <1	-	<1	<1	<1	<1	<1		 	<1	ug/l	TM16/PM30
4-Methylphenol 4-Nitrophenol Pentachlorophenol Phenol PAHs	<1	<i>c</i> -	-	<0.5	<0.5	-	-			<0.5	ug/l	TM16/PM30
4-Nitrophenol < Pentachlorophenol · Phenol · PAHs ·		<0.5	<0.5	-	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
Pentachlorophenol · · · · · · · · · · · · · · · · · · ·	<10	<1	<1	<1	<1	<1	<1	_		<1	ug/l	TM16/PM30
Phenol PAHs		<10	<10	<10	<10	<10	<10	her use.		<10	ug/l	TM16/PM30
PAHs	<1	<1	<1	<1	<1	<1	<1	é		<1	ug/l	TM16/PM30
	<1	<1	<1	<1	<1	<1	<1	St.		<1	ug/l	TM16/PM30
0 Chlansmanhthalama							B. B.					
2-Chloronaphthalene	-	-	-	<1	<1		ally any of the state			<1	ug/l	TM16/PM30
	<1	<1	<1	-	-	<1.05	<1			<1	ug/l	TM16/PM30
2-Methylnaphthalene	-	-	-	<1	<1	Ro it	-			<1	ug/l	TM16/PM30
2-Methylnaphthalene#	<1	<1	<1	-	-	Dn 201	<1			<1	ug/l	TM16/PM30
Naphthalene	-	-	-	<1	<1 :0	et -	-			<1	ug/l	TM16/PM30
Naphthalene #	<1	<1	<1	-	- CU	NT <1	<1			<1	ug/l	TM16/PM30
Acenaphthylene	-	-	-	<0.5	<1 <1 - <1 - <1 - - - - - - - - - - - - -	-	-			<0.5	ug/l	TM16/PM30
Acenaphthylene # <	<0.5	<0.5	<0.5	- ^9	1 19 m	<0.5	<0.5			<0.5	ug/l	TM16/PM30
Acenaphthene	-	-	-	<1 🔨	2 <1	-	-			<1	ug/l	TM16/PM30
Acenaphthene #	<1	<1	<1	<0501	<u>_</u> ^ك	<1	<1			<1	ug/l	TM16/PM30
Fluorene	-	-	-	<0.5	0.7	-	-			<0.5	ug/l	TM16/PM30
Fluorene [#] <	<0.5	<0.5	<0.5	.e.v	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
Phenanthrene	-	-	- (011.9	4.1	-	-			<0.5	ug/l	TM16/PM30
Phenanthrene# <	<0.5	<0.5	<0.5	-	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
Anthracene	-	-	-	<0.5	1.7	-	-			<0.5	ug/l	TM16/PM30
Anthracene [#] <	<0.5	<0.5	<0.5	-	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
Fluoranthene	-	-	-	1.7	16.3	-	-			<0.5	ug/l	TM16/PM30
Fluoranthene [#] <	<0.5	<0.5	<0.5	-	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
	-	-	-	1.5	14.7	-	-			<0.5	ug/l	TM16/PM30
	<0.5	<0.5	<0.5	-	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
	-	-	-	1.1	9.6	-	-			<0.5	ug/l	TM16/PM30
	<0.5	<0.5	<0.5	-	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
	-	-	-	1.0	10.5	-	-			<0.5	ug/l	TM16/PM30
	<0.5	<0.5	<0.5	-	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
	-	-	-	2	21	-	-			<1	ug/l	TM16/PM30
	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
	<1	<1	<1	1	12	<1	<1			<1	ug/l	TM16/PM30
	<1	<1	<1	<1	7	<1	<1			<1	ug/l	TM16/PM30
	-	-	-	<0.5	2.6	-	-			<0.5	ug/l	TM16/PM30
	- <0.5	- <0.5	- <0.5		- 2.0	- <0.5	- <0.5			<0.5	ug/l	TM16/PM30
		-	-	- 0.8	9.3					<0.5	ug/l	TM16/PM30
	- <0.5	- <0.5	- <0.5	-	9.3	- <0.5	- <0.5			<0.5	ug/i ug/i	TM16/PM30
Phthalates <	×0.0	-0.0	-0.0	-	-	~U.J	~U.J			-0.0	agri	110/1-10/00
	<5	<5	<5	<5	22	<5	<5			<5	110/	TM16/PM30
											ug/l	1
5 51	<1	<1	<1	<1	<1	<1	<1			<1	ug/l	TM16/PM30
	-	-	-	<1.5	<1.5	-	-			<1.5	ug/l	TM16/PM30
51	<1.5	<1.5	<1.5	-	-	<1.5	<1.5			<1.5	ug/l	TM16/PM30
	<1	<1	<1	<1	<1	<1	<1		 	<1	ug/l	TM16/PM30
	-	-	-	<1	<1	-	-			<1	ug/l	TM16/PM30
71	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1	<1	<1	<1	<1			<1	ug/l	TM16/PM30

Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy
Contact:	Thomas Vainio-Mattila
JE Job No.:	19/6650

SVOC Report : Liquid

JE Job No.:	19/6650	anno-wau	lia									
	1-9	10-17	18-25	26-34	35-43	44-51	52-60			1		
J E Sample No.	1-9	10-17	18-25	20-34	30-43	44-51	52-60					
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2					
Depth										Please ser	e attached n	otes for all
COC No / misc											ations and a	
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G	V H P BOD G	V H N P BOD G					
Sample Date	23/04/2019	23/04/2019		23/04/2019		23/04/2019						
Sample Type	Ground Water	Ground Water		Leachate	Leachate	Surface Water						
Batch Number Date of Receipt	1 24/04/2019	1	1 24/04/2019	1	1	1 24/04/2019	1 24/04/2019			LOD/LOR	Units	Method No.
SVOC MS	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013					
Other SVOCs												
1,2-Dichlorobenzene	-	-	-	<1	<1	-	-			<1	ug/l	TM16/PM30
1,2-Dichlorobenzene #	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene	-	-	-	<1	<1	-	-			<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene # 1,3-Dichlorobenzene	<1	<1	<1	- <1	- <1	<1	<1			<1 <1	ug/l ug/l	TM16/PM30 TM16/PM30
1,3-Dichlorobenzene [#]	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
1,4-Dichlorobenzene	-	-	-	<1	<1	-	-			<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1	<1	<1	<1	<1	<1			<1	ug/l	TM16/PM30
2,4-Dinitrotoluene 2.4-Dinitrotoluene [#]	-	-	-	<0.5	<0.5	-	-			<0.5	ug/l	TM16/PM30 TM16/PM30
2,4-Dinitrotoluene " 2,6-Dinitrotoluene	<0.5 <1	<0.5 <1	<0.5 <1	- <1	- <1	<0.5 <1	<0.5 <1			<0.5 <1	ug/l ug/l	TM16/PM30 TM16/PM30
3-Nitroaniline	<1	<1	<1	<1	<1	<1	<1			<1	ug/l	TM16/PM30
4-Bromophenylphenylether	-	-	-	<1	<1	-				<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1	<1	-	-	<1	<1	her use.		<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1	<1	<1	<1	<1	<1	of V.		<1	ug/l	TM16/PM30
4-Chlorophenylphenylether	- <1	- <1	- <1	<1	<1	- <1		Q.		<1 <1	ug/l	TM16/PM30 TM16/PM30
4-Chlorophenylphenylether * 4-Nitroaniline	<0.5	<0.5	<0.5	< 0.5	- <0.5	<1 <0.5 - 555 - 555 - 505 - 505 <1 - <0.5	114.~1140			<0.5	ug/l ug/l	TM16/PM30
Azobenzene	-	-	-	<0.5	< 0.5	- 25	for-			< 0.5	ug/l	TM16/PM30
Azobenzene [#]	<0.5	<0.5	<0.5	-	-	- 50-5 - 50-5 - 50-5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 -	<0.5			<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane	-	-	-	<0.5	<0.5	Driedh	-			<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5	<0.5	<0.5	-	- il	€€0.5	<0.5			<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether	-	-	-	<1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	- 4	-			<1	ug/l	TM16/PM30 TM16/PM30
Bis(2-chloroethyl)ether [#] Carbazole	<1	<1	<1	< 0.5	Thent	-	<1			<1 <0.5	ug/l ug/l	TM16/PM30
Carbazole [#]	<0.5	<0.5	<0.5	_ \$	ad yru	<0.5	<0.5			<0.5	ug/l	TM16/PM30
Dibenzofuran	-	-	-	<0.5 📢	<0.5	-	-			<0.5	ug/l	TM16/PM30
Dibenzofuran [#]	<0.5	<0.5	<0.5	consent or	-	<0.5	<0.5			<0.5	ug/l	TM16/PM30
Hexachlorobenzene	-	-	-	OR SEA	<1	-	-			<1	ug/l	TM16/PM30
Hexachlorobenzene [#] Hexachlorobutadiene	<1	<1	<1 (-	- <1	<1	<1			<1 <1	ug/l ug/l	TM16/PM30 TM16/PM30
Hexachlorobutadiene [#]	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1	<1	<1	<1	<1	<1			<1	ug/l	TM16/PM30
Hexachloroethane	-	-	-	<1	<1	-	-			<1	ug/l	TM16/PM30
Hexachloroethane [#]	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
Isophorone	-	-	-	<0.5	<0.5	-	-			< 0.5	ug/l	TM16/PM30 TM16/PM30
lsophorone [#] N-nitrosodi-n-propylamine	<0.5	<0.5	<0.5	- <0.5	- <0.5	<0.5	<0.5			<0.5 <0.5	ug/l ug/l	TM16/PM30 TM16/PM30
N-nitrosodi-n-propylamine #	< 0.5	< 0.5	< 0.5			< 0.5	< 0.5			<0.5	ug/l	TM16/PM30
Nitrobenzene	-	-	-	<1	<1	-	-			<1	ug/l	TM16/PM30
Nitrobenzene [#]	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	99	100	109	99	81	108	107			<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	119	121	125	103	103	120	119			<0	%	TM16/PM30

Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy
Contact:	Thomas Vainio-Mattila
JE Joh No 1	19/6650

VOC Report : Liquid

JE Job No.:	19/6650												
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60						
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2						
Depth											Diagon an	e attached n	atoo for all
COC No / misc												ations and a	
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G	V H P BOD G	V H N P BOD G						
Sample Date	23/04/2019	23/04/2019		23/04/2019	23/04/2019	23/04/2019	23/04/2019						
Sample Type	Ground Water	Ground Water		Leachate	Leachate		Surface Water						
Batch Number	1	1	1	1	1	1	1				LOD/LOR	Units	Method No.
Date of Receipt	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019	24/04/2019						NU.
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether	-	-	-	<0.1	<0.1	-	-				<0.1	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	-	-	<0.1	<0.1				<0.1	ug/l	TM15/PM10
Chloromethane	-	-	-	<3	<3	-	-				<3	ug/l	TM15/PM10
Chloromethane [#]	<3	<3	<3	-	-	<3	<3				<3	ug/l	TM15/PM10
Vinyl Chloride	-	-	-	<0.1	<0.1	-	-				<0.1	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	-	-	<0.1	<0.1				<0.1	ug/l	TM15/PM10
Bromomethane Chloroethane	<1	<1	<1	<1 <3	<1 <3	<1	<1				<1 <3	ug/l ug/l	TM15/PM10 TM15/PM10
Chloroethane [#]	- <3	- <3	- <3	-	-	- <3	- <3				<3	ug/i ug/i	TM15/PM10 TM15/PM10
Trichlorofluoromethane	-	-	-	<3	<3	-	-				<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	-	-	<3	<3				<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)	-	-	-	<3	<3	-	-				<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) [#]	<3	<3	<3	-	-	<3	<3				<3	ug/l	TM15/PM10
Dichloromethane (DCM)	-	-	-	<5	<5	-	-				<5	ug/l	TM15/PM10
Dichloromethane (DCM) [#]	<5	<5	<5	-	-	<5	<5	her use.			<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene trans-1-2-Dichloroethene	- <3	- <3	- <3	<3	<3	- <3	- <3	net			<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
1,1-Dichloroethane		-5		<3	<3		<3 0 nly 0 for-3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 3 ny 1 2 ny 1 1 2 ny 1 1 1 2 ny 1 1 1 2 n 1 2 n 1 2 n 1 1 1 1 1 1 1 1 1				<3	ug/l	TM15/PM10
1,1-Dichloroethane [#]	<3	<3	<3	-		<3	N. N.				<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene	-	-	-	<3	<3	- 25	for				<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	-	-	100 il	<3				<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	Dri Sah	<1				<1	ug/l	TM15/PM10
Bromochloromethane	-	-	-	<2	<1 <2 tho	<3 Putposes Putposes Net reduint	-				<2	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	-	opyient of	A <2	<2				<2	ug/l	TM15/PM10
Chloroform Chloroform [#]	- <2	- <2	- <2	<2	inght	- <2	- <2				<2 <2	ug/l ug/l	TM15/PM10 TM15/PM10
1,1,1-Trichloroethane	-	-	-	<2 😵	0<2	-	-				<2	ug/l	TM15/PM10
1.1.1-Trichloroethane #	<2	<2	<2	- OF	tox -	<2	<2				<2	ug/l	TM15/PM10
1,1-Dichloropropene	-	-	-	30	<3	-	-				<3	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	nser	-	<3	<3				<3	ug/l	TM15/PM10
Carbon tetrachloride	-	-	- (<2	-	-				<2	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	-	-	<2	<2				<2	ug/l	TM15/PM10
1,2-Dichloroethane	- <2	-	-	<2	<2	-	-				<2 <2	ug/l	TM15/PM10 TM15/PM10
1,2-Dichloroethane [#] Benzene		<2	<2	- <0.5	< 0.5	<2	<2				<0.5	ug/l ug/l	TM15/PM10 TM15/PM10
Benzene [#]	<0.5	<0.5	<0.5			<0.5	< 0.5				<0.5	ug/l	TM15/PM10
Trichloroethene (TCE)	-	-	-	<3	<3	-	-				<3	ug/l	TM15/PM10
Trichloroethene (TCE)#	<3	<3	<3	-	-	<3	<3				<3	ug/l	TM15/PM10
1,2-Dichloropropane	-	-	-	<2	<2	-	-				<2	ug/l	TM15/PM10
1,2-Dichloropropane [#]	<2	<2	<2	-	-	<2	<2				<2	ug/l	TM15/PM10
Dibromomethane	-	-	-	<3	<3	-	-				<3	ug/l	TM15/PM10
Dibromomethane [#] Bromodichloromethane	<3	<3	<3	- <2	- <2	<3	<3				<3 <2	ug/l ug/l	TM15/PM10 TM15/PM10
Bromodichloromethane #	<2	- <2	- <2	-	-	<2	<2				<2	ug/i ug/i	TM15/PM10 TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Toluene	-	-	-	<5	<5	-	-				<5	ug/l	TM15/PM10
Toluene [#]	<5	<5	<5	-	-	<5	<5				<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,1,2-Trichloroethane	-	-	-	<2	<2	-	-				<2	ug/l	TM15/PM10
1,1,2-Trichloroethane [#]	<2	<2	<2	-	-	<2	<2				<2	ug/l	TM15/PM10
Tetrachloroethene (PCE)	- <3	- <3	- <3	<3	<3	- <3	- <3				<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
Tetrachloroethene (PCE) [#] 1,3-Dichloropropane	<3	<3	<3	- <2	- <2	<3	<3				<3 <2	ug/i ug/i	TM15/PM10 TM15/PM10
1,3-Dichloropropane [#]	<2	<2	- <2	-	-	<2	<2				<2	ug/l	TM15/PM10
Dibromochloromethane	-	-	-	<2	<2	-	-				<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	-	-	<2	<2				<2	ug/l	TM15/PM10
1,2-Dibromoethane	-	-	-	<2	<2	-	-				<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	-	-	<2	<2				<2	ug/l	TM15/PM10
Chlorobenzene	-	-	-	<2	<2	-	-				<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	-	-	<2	<2				<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane	-	-	-	<2	<2	-	-		[[<2	ug/l	TM15/PM10

Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy
Contact:	Thomas Vainio-Mattila
JE Job No.:	19/6650

VOC Report : Liquid

Contact:		/ainio-Matt	ila									
JE Job No.:	19/6650											
J E Sample No.	1-9	10-17	18-25	26-34	35-43	44-51	52-60					
Sample ID	GW1	GW2	GW3	L1	L3	SW1	SW2					
Depth COC No / misc											e attached r ations and a	
Containers Sample Date Sample Type	V H N P G 23/04/2019 Ground Water	23/04/2019	V H N P G 23/04/2019 Ground Water	VHNPBODG 23/04/2019 Leachate	VHNPBODG 23/04/2019 Leachate	23/04/2019						
Batch Number Date of Receipt	1 24/04/2019	1	1 24/04/2019	1 24/04/2019	1 24/04/2019	1	1			LOD/LOR	Units	Method No.
VOC MS Continued												
1,1,1,2-Tetrachloroethane #	<2	<2	<2	-	-	<2	<2			<2	ug/l	TM15/PM10
Ethylbenzene	-	-	-	<1	<1	-	-			<1	ug/l	TM15/PM10
Ethylbenzene [#]	<1	<1	<1	- <2	- <2	<1	<1			<1	ug/l	TM15/PM10 TM15/PM10
m/p-Xylene m/p-Xylene [#]	- <2	- <2	<2	-	-	- <2	- <2			<2 <2	ug/l ug/l	TM15/PM10 TM15/PM10
o-Xylene	-2	-2	-2	- <1	- <1	-2	-2			<1	ug/l	TM15/PM10
o-Xylene [#]	<1	<1	<1	-	-	<1	<1			<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2			<2	ug/l	TM15/PM10
Bromoform	-	-	-	<2	<2	-	-			<2	ug/l	TM15/PM10
Bromoform [#]	<2	<2	<2	-	-	<2	<2			<2	ug/l	TM15/PM10
Isopropylbenzene	-	-	-	<3	<3	-	-			<3	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	-	-	<3	<3			<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4			<4	ug/l	TM15/PM10
Bromobenzene Bromobenzene [#]	- <2	- <2	- <2	<2	<2	- <2	- <2			<2 <2	ug/l ug/l	TM15/PM10 TM15/PM10
Bromopenzene 1,2,3-Trichloropropane	-	-	-	•				her use.		<2 <3	ug/i ug/i	TM15/PM10 TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	-0	-0	<3	<3	× 150		<3	ug/l	TM15/PM10
Propylbenzene	-	-	-	<3	<3	-	- 3	her		<3	ug/l	TM15/PM10
Propylbenzene [#]	<3	<3	<3	-	-	<3	4.<34			<3	ug/l	TM15/PM10
2-Chlorotoluene	-	-	-	<3	<3	- (MIL alt.			<3	ug/l	TM15/PM10
2-Chlorotoluene [#]	<3	<3	<3	-	-	<3.05	× <3			<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene	-	-	-	<3	<3	110 jil	- - - - - - - - - - - - - - - - - - -			<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene#	<3	<3	<3	-	-	Dr 301	<3			<3	ug/l	TM15/PM10
4-Chlorotoluene	-	-	-	<3	<3 10	not -	-			<3	ug/l	TM15/PM10 TM15/PM10
4-Chlorotoluene * tert-Butylbenzene	<3	<3	<3	-	Ó	~ <3	< 3			<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
tert-Butylbenzene #	<3	<3	<3	-0	The Hi	<3	<3			<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene	-	-	-	<3 😵	0 <3	-	-			<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene#	<3	<3	<3	- &	. · · ·	<3	<3			<3	ug/l	TM15/PM10
sec-Butylbenzene	-	-	-	CONSER OF	<3	-	-			<3	ug/l	TM15/PM10
sec-Butylbenzene [#]	<3	<3	<3	n ^{set}	-	<3	<3			<3	ug/l	TM15/PM10
4-Isopropyltoluene	-	-	- (√ <3	<3	-	-			<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	-	-	<3	<3			<3	ug/l	TM15/PM10
1,3-Dichlorobenzene	-	- <3	-	<3	<3	- <3	- <3			<3 <3	ug/l	TM15/PM10 TM15/PM10
1,3-Dichlorobenzene [#] 1,4-Dichlorobenzene	<3		<3	- <3	- <3	-	-			<3	ug/l ug/l	TM15/PM10 TM15/PM10
1,4-Dichlorobenzene [#]	<3	<3	<3	-	-	<3	<3			<3	ug/l	TM15/PM10
n-Butylbenzene	-	-	-	<3	<3	-	-			<3	ug/l	TM15/PM10
n-Butylbenzene#	<3	<3	<3	-	-	<3	<3			<3	ug/l	TM15/PM10
1,2-Dichlorobenzene	-	-	-	<3	<3	-	-			<3	ug/l	TM15/PM10
1,2-Dichlorobenzene [#]	<3	<3	<3	-	-	<3	<3			<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2			<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene Hexachlorobutadiene	<3 <3	<3 <3	<3 <3	<3 <3	<3 <3	<3 <3	<3 <3			<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
Naphthalene	<3	<3	<3	<3	<3	<3	<3			<3	ug/i ug/i	TM15/PM10 TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3			<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	99	105	110	109	106	108	109			<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	98	102	101	104	104	105	105			<0	%	TM15/PM10

Client Name:	Malone O'Regan
Reference:	E1506
Location:	Athy
Contact:	Thomas Vainio-Mattila

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
					No deviating sample report results for job 19/6650	
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					Consent of copyright owner required for any other type.	
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					sent C	
					Colt	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

19/6650 JE Job No.:

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is guoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation. S for

As surface waters require different sample preparation to groundwaters the additory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

FOI All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken so Cor

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BI ANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other guality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

# ISO17025 (UKAS Ref No. 10729) accredited - UK. SA ISO17025 (SANAS Ref No. 10729) accredited - South Africa. B Indicates analyte found in associated method blank. DR Dilution required. M MCERTS accredited. NA Not applicable NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exvox Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected cany over LOD		
B Indicates analyte found in associated method blank. DR Dilution required. M MCERTS accredited. NA Not applicable NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Determination Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected SS AQC Sample OC Outside Calibration Range OC Outside Calibration Range AQC Sample	#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
DR Dilution required. M MCERTS accredited. NA Not applicable NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Determination Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected NFD No Fibres Detected MS AQC Sample ME Blank Sample MS Client Sample MS Client Sample MS Client Sampl	SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
M MCERTS accredited. NA Not applicable NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Determination Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected NFD No Fibres Detected LB Blank Sample QC Outside Calibration Range QC Outside Calibration Range QC Outside Calibration Range QC V15 Dilution <	В	Indicates analyte found in associated method blank.
NA Not applicable NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Determination Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Results expressed to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample OC Outside Calibration Range OC Outside Calibration Range OC Outside Calibration Range Matrix Effect N N Client Sample OC Outside Calibration Range OC Outside Calibration Range OC <td< td=""><td>DR</td><td>Dilution required.</td></td<>	DR	Dilution required.
NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Determination Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample	М	MCERTS accredited.
ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Determination Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample BBank Sample Other states IB Blank Sample OC Outside Calibration Range	NA	Not applicable
NDP No Determination Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected UB Blank Sample UB Blank Sample OC Outside Calibration Range OC Outside Calibration Range OC Outside Calibration Range OC Outside Calibration Range OC Vation AA x5 Dilution AB x40 Dilution	NAD	No Asbestos Detected.
SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample OC Outside Calibration Range OC Outside Calibration Range AA x5 Dilution Kath Value Kath Value AA x5 Dilution	ND	None Detected (usually refers to VOC and/SVOC TICs).
SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample ME Matrix Effect N Client Sample ME Client Sample ME AQC Sample MB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	NDP	No Determination Possible
W Results expressed on as received basis. + AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample OC Outside Calibration Range OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	SS	Calibrated against a single substance
+ AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. ++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample N Client Sample OC Outside Calibration Range OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample ME Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	W	Results expressed on as received basis.
* Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample N Client Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
AD Samples are dried at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample Other Other LB Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	++	Result outside calibration range, results should be considered as indicative only and are not accredited.
CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample N Client Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample other N Client Sample other OC Outside Calibration Range output for the fit of	AD	Samples are dried at 35°C ±5°C
ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample N Client Sample TB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	CO	Suspected carry over
NFD No Fibres Detected BS AQC Sample LB Blank Sample N Client Sample TB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
TB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	ME	Matrix Effect
TB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	NFD	No Fibres Detected
TB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	BS	AQC Sample
TB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	LB	Blank Sample
TB Trip Blank Sample OC Outside Calibration Range AA x5 Dilution AB x40 Dilution	Ν	Client Sample
OC Outside Calibration Range AA x5 Dilution AB x40 Dilution AC x75 Dilution AD x250 Dilution	ТВ	Trip Blank Sample
AA x5 Dilution AB x40 Dilution AC x75 Dilution AD x250 Dilution	OC	Outside Calibration Range
AB x40 Dilution Fot price AC x75 Dilution of contract AD x250 Dilution as of contract	AA	x5 Dilution
AC x75 Dilution AD x250 Dilution	AB	x40 Dilution
AD x250 Dilution	AC	x75 Dilution
	AD	x250 Dilution
AE x10000 Dilution	AE	x10000 Dilution
AF x18750 Dilution	AF	x18750 Dilution

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	200 C				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30) please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			

Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.	Yes			
ТМЗО	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
ТМ30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are intered for dissolved metals and acidified if required.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PMtafcol	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
ТМ37	Modified methods USEPA 160.2, EN872:2005 and SMWW 2540D. Gravimetric determination of Total Suspended Solids. Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed.	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			

Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM42	Modified US EPA method 8270. Pesticides and herbicides by GC-MS	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM58	Ar TA Standard memory of the extraction or water and waste water (SMELWY) 52:105. Comparible with ISO 5815:1989. Measurement of Biochemical Oxygen Demand. When CBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as ammonia, nitrite and organic nitrogen which exert a nitrogenous demand. Determination of Dissolved Oxygen using the Hach UCODO Coverse Methods.	PM0	No preparation is required. No preparation is required. No preparation is required. Property of the temperation is required. High the temperation is required.				
TM58	MPRAS/amona Methods nor the extraction or water and waster water (SMELWWY) 52 rob. Comparible with ISO 5815:1989. Measurement of Biochemical Oxygen Demand. When cBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as ammonia, nitrite and organic nitrogen which exert a nitrogenous demand. Determination of Dissolved Oxygen using the Hach MO200 Owners Metry.	PM0	No Preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	PMOSt OP	ג No preparation is required.	Yes			
TM72	Redox Potential is measured by HI98120 redox meter.	PM0	No preparation is required.				
ТМ73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.				
ТМ73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1. Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			

Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.				
TM76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.				
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required. No preparation is required. No preparation is required. Bangles are pretreated and derivatised. The derviatised organotins are then extracted using hexane.	Yes			
TM94	Derivatisation and extraction of Organotins. Analysis by GC-MS		1.62				
TM149	Determination of Pesticides by Large Volume Injection on GC Triple Quad MS, based upon USEPA method 8270	PM301 COR) Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	РМО	No preparation is required.				
Subcontracted	See attached subcontractor report for accreditation status and provider.						





DETAILED IN SCOPE REG NO. 138

City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

Tel: (01) 613 6003 Fax: (01) 613 6008

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Customer

Kate Wiley Exova Environmental UK Ltd **Rosewell House** 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom

Certificate Of Analysis

Job Number:	19-55297
Issue Number:	1
Report Date:	29 April 2019

Site: Not Applicable **PO Number:** Not Supplied Date Samples Received: 23/04/2019

For inspection numposes only any other use. Please find attached the results for the samples received at our laboratory on 23/04/2019.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By:

Shane Reynolds Laboratory Manager Authorised Date: 29 April 2019

Notes:

Results relate only to the items tested. Information on methods of analysis and performance characteristics is available on request. Any opinions or interpretations indicated are outside the scope of our INAB accreditation. This test report shall not be reproduced except in full or with written approval of City Analysts Limited.

Template: 1146 Revision: 018





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Report Reference: 19-55297

Report Version: 1

Exova Environmental UK Ltd
Rosewell House
2A (1F) Harvest Drive
Newbridge, MidLothian Scotland
EH28 8QJ United Kingdom
0

436288

Customer Kate Wiley

Lab Reference Number:

Site:	Not Applicable		
Sample Description:	GW1	Date of Sampling:	23/04/2019
Sample Type:	Ground	Date Sample Received:	23/04/2019

Certificate Of Analysis

150 **PV Value** otherResult Site / Analysis Parameter Units (Drinking Water Only) Method Ref. Start Date 501 D/D1201# 23/04/2019 Coliforms 116.9 MPN/100ml _ Consent of copyright owned re D/D3221# 23/04/2019 **Faecal Coliforms** 13 cfu/100ml -

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 2 of 6





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Certificate Of Analysis

Customer Kate Wiley

Exova Environmental UK Ltd Rosewell House 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom Report Reference: 19-55297 Report Version: 1

Site:	Not Applicable		
Sample Description:	GW2	Date of Sampling:	23/04/2019
Sample Type:	Ground	Date Sample Received:	23/04/2019
Lab Reference Numbe	er: 436289		

Site / Method Ref.	Analysis Start Date	Parameter	other Result	Units	PV Value (Drinking Water Only)
D/D1201#	23/04/2019	Coliforms	2.0 Xiot to 2.0	MPN/100ml	-
D/D3221#	23/04/2019	Faecal Coliforms	< 1	cfu/100ml	-
		Consolt of copyright owner reak			

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Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

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Certificate Of Analysis

Customer Kate Wiley

Exova Environmental UK Ltd Rosewell House 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom Report Reference: 19-55297 Report Version: 1

Site:	Not Applicable		
Sample Description:	GW3	Date of Sampling:	23/04/2019
Sample Type:	Ground	Date Sample Received:	23/04/2019
Lab Reference Numbe	er: 436290		

Site / Method Ref.	Analysis Start Date	Parameter	uting offer Result	Units	PV Value (Drinking Water Only)
D/D1201#	23/04/2019	Coliforms	offorta < 1.0	MPN/100ml	-
D/D3221#	23/04/2019	Faecal Coliforms	< 1	cfu/100ml	-
		Consolt of copyright owner root			

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Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

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Certificate Of Analysis

Customer Kate Wiley

Exova Environmental UK Ltd Rosewell House 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom Report Reference: 19-55297 Report Version: 1

Site:	Not Applicable				
Sample Description	: L1	Date of Sampling:	23/04/2019		
Sample Type:	Ground	Date Sample Received:	23/04/2019		
Lab Reference Number: 436291					

Site / Method Ref.	Analysis Start Date	Parameter	uting offer Result	Units	PV Value (Drinking Water Only)				
D/D1201#	23/04/2019	Coliforms	147.0	MPN/100ml	-				
D/D3221#	23/04/2019	Faecal Coliforms	5	cfu/100ml	-				
Consent of convite to the second converte to the second									

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Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

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Certificate Of Analysis

Consent of constitution of the consent of constitution of constitution of constitution of the consent of the

Faecal Coliforms



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cfu/100ml

_

Report Reference: 19-55297 Report Version: 1

Kate Wiley Exova Environmental UK Ltd **Rosewell House** 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom

Site: Not Applicable

23/04/2019

Sample Description: L3

Site /

Method Ref.

D/D1201#

D/D3221#

Customer

Sample Type: Ground

Lab Reference Number:

Date of Sampling:	23/04/2019
Date Sample Received:	23/04/2019

1

e Number:	436292			
Analysis Start Date	Parameter	uting other Result	Units	PV Value (Drinking Water Only)
23/04/2019	Coliforms	23.8	MPN/100ml	-

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Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

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Page 6 of 6



Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

Unit 3 Deeside Point

	Zone 3
	Deeside Industrial Park
	Deeside
	CH5 2UA
Malone O'Regan	
Ground Floor - Unit 3	Tel: +44 (0) 1244 833780
Bracken Business Park Bracken Road	Fax: +44 (0) 1244 833781
Sandyford Dublin 18 D18 V4K6	
Attention :	Thomas Vainio-Mattila
Date :	21st May, 2019
Your reference :	E1506
Our reference :	Test Report 19/7496 & Test Report 19/7606 SW1 & SW2
Location :	N. Nother
Date samples received :	9th May, 2019
Status :	Final report with differ
Issue :	Test Report 19/7496 & Test Report 19/7606 SW1 & SW2 9th May, 2019 official report and official sector of the secto

Five samples were received for analysis on 9th May, 2019 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should be include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and ported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Phil Sommerton BSc Senior Project Manager

Client Name: Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location: Contact: JE Job No.:	Thomas \ 19/7496	/ainio-Matti	ila						/=40ml vial, G J=NaOH, HN=	-	e, P=plastic	bottle	
J E Sample No.	1-8	9-16	17-24	25-33	34-42				,	, ,			
J E Sample No.	1-0	5-10	17-24	20-00	34-42								
Sample ID	GW1	GW2	GW3	L1	L3								
Depth												e attached r	
COC No / misc											abbrevi	ations and a	cronyms
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G								
Sample Date	08/05/2019	08/05/2019	08/05/2019	08/05/2019	08/05/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1								Method
Date of Receipt	09/05/2019	09/05/2019	09/05/2019	09/05/2019	09/05/2019						LOD/LOR	Units	No.
Dissolved Arsenic [#]	<2.5	<2.5	<2.5	<2.5	<2.5						<2.5	ug/l	TM30/PM1
Dissolved Boron	41	47	48	141	197						<12	ug/l	TM30/PM1
Dissolved Cadmium [#]	< 0.5	< 0.5	< 0.5	<0.5	< 0.5						<0.5	ug/l	TM30/PM1
Dissolved Calcium [#] Total Dissolved Chromium [#]	119.8 <1.5	142.1 <1.5	111.0 <1.5	293.6 _{AB} <1.5	353.5 _{AB} <1.5						<0.2 <1.5	mg/l	TM30/PM1 TM30/PM1
Total Dissolved Chromium " Dissolved Copper [#]	<1.5 <7	<1.5 <7	<1.5 <7	<1.5 <7	<1.5 <7						<1.5 <7	ug/l ug/l	TM30/PM1 TM30/PM1
Total Dissolved Iron #	<20	<20	<20	<20	332						<20	ug/i ug/i	TM30/PM1
Dissolved Lead [#]	<5	<5	<5	<5	<5			2.1			<5	ug/l	TM30/PM1
Dissolved Magnesium [#]	16.8	15.1	17.9	20.0	41.2			x 150.			<0.1	mg/l	TM30/PM1
Dissolved Manganese [#]	<2	<2	<2	3546	2425		ć	ner			<2	ug/l	TM30/PM1
Dissolved Mercury#	<1	<1	<1	<1	<1		AN. MY				<1	ug/l	TM30/PM1
Dissolved Nickel [#]	<2	<2	<2	6	4	60	for				<2	ug/l	TM30/PM1
Dissolved Potassium #	1.7	4.4	9.6	8.7	24.7	- 10°50	0				<0.1	mg/l	TM30/PM1
Dissolved Sodium [#]	11.3	10.6	17.6	33.0	32.4	Duredh					<0.1	mg/l	TM30/PM1
Dissolved Zinc [#]	<3	<3	<3	6	<3 <3 citi 0 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	MICIT	alst any				<3	ug/l	TM30/PM1
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	120301						<0.1	ug/l	TM15/PM1
Benzene [#]	<0.5	<0.5	<0.5	<0.5 🞸	0.5						<0.5	ug/l	TM15/PM1
Toluene [#]	<5	<5	<5	<5 &	<5						<5	ug/l	TM15/PM1
Ethylbenzene [#]	<1	<1	<1	CONSERIO I	<1						<1	ug/l	TM15/PM1
m/p-Xylene [#]	<2	<2	<2	0122	<2						<2	ug/l	TM15/PM1
o-Xylene #	<1	<1	<1		<1						<1	ug/l	TM15/PM1
Surrogate Recovery Toluene D8	96	95	98	100	100						<0	%	TM15/PM1
Surrogate Recovery 4-Bromofluorobenzene	100	98	102	100	102						<0	%	TM15/PM1

Client Name: Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location:													
Contact:		′ainio-Matti	ila				• •		=40ml vial, G	•	e, P=plastic	bottle	
JE Job No.:	19/7496						H=H ₂ SO ₄ , 2	Z=ZnAc, N=	NaOH, HN=	HN0 ₃			
J E Sample No.	1-8	9-16	17-24	25-33	34-42								
Sample ID	GW1	GW2	GW3	L1	L3								
Depth											Please se	e attached r	otes for all
COC No / misc												ations and a	
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G								
Sample Date	08/05/2019	08/05/2019	08/05/2019	08/05/2019	08/05/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1								Method
Date of Receipt	09/05/2019	09/05/2019	09/05/2019	09/05/2019	09/05/2019						LOD/LOR	Units	No.
Pesticides	00/00/2010	00/00/2010	00/00/2010	00/00/2010	00/00/2010								-
Organochlorine Pesticides													
Aldrin	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Alpha-HCH (BHC)	<0.01	<0.01	<0.01	<0.01	<0.02 AA <0.02 AA						<0.01	ug/l	TM149/PM30
Beta-HCH (BHC)	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
Chlorothalonil	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
cis-Chlordane	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
Delta-HCH (BHC)	<0.01	<0.01	<0.01	<0.01	<0.02 AA			<i>a</i>			<0.01	ug/l	TM149/PM30
Dieldrin	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA			x 1150			<0.01	ug/l	TM149/PM30
Endosulphan I	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA		ć	her			<0.01	ug/l	TM149/PM30
Endosulphan II	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA		H. M.				<0.01	ug/l	TM149/PM30
Endosulphan sulphate	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA	in the second	a fot				<0.01	ug/l	TM149/PM30
Endrin	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA	100 ⁵ .1	9				<0.01	ug/l	TM149/PM30
Gamma-HCH (BHC)	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA	Diffedin					<0.01	ug/l	TM149/PM30
Heptachlor	<0.01	<0.01	<0.01	<0.01	<0.02	net	117. 2019 C				<0.01	ug/l	TM149/PM30
Heptachlor Epoxide	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} A0	Ar					<0.01	ug/l	TM149/PM30
Hexachlorobenzene	<0.01	<0.01	<0.01	<0.01							<0.01	ug/l	TM149/PM30
Isodrin	<0.01	<0.01	<0.01	<0.01 🍾	SV SV SV SV						<0.01	ug/l	TM149/PM30
o,p'-DDE	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
o,p'-DDT	<0.01	<0.01	<0.01		0.04 ^{SV} AA						<0.01	ug/l	TM149/PM30
o,p'-Methoxychlor	<0.01	<0.01	<0.01	01:00.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
o,p'-TDE	<0.01	<0.01	<0.01	<0.01	0.05 ^{SV} AA						<0.01	ug/l	TM149/PM30 TM149/PM30
p,p'-DDE p,p'-DDT	<0.01 <0.01	<0.01 <0.01	<0.01 <0.01	<0.01 <0.01	0.12 ^{SV} AA 0.09 ^{SV} AA						<0.01 <0.01	ug/l ug/l	TM149/PM30
p,p'-Methoxychlor	<0.01	<0.01	<0.01	<0.01	0.09 AA <0.02 AA						<0.01	ug/i ug/i	TM149/PM30
p,p'-TDE	<0.01	<0.01	<0.01	<0.01	0.21 SV						<0.01	ug/l	TM149/PM30
Pendimethalin	<0.01	<0.01	<0.01	<0.01	<0.21 AA <0.02 AA						<0.01	ug/l	TM149/PM30
Permethrin I	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
Permethrin II	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
Quintozene (PCNB)	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Tecnazene	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Telodrin	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
trans-Chlordane	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Triadimefon	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Triallate	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Trifluralin	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30

Client Name: Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location: Contact: JE Job No.:	Thomas \ 19/7496	/ainio-Matt	ila						:40ml vial, G NaOH, HN=	•	e, P=plastic	bottle	
J E Sample No.	1-8	9-16	17-24	25-33	34-42								
Sample ID	GW1	GW2	GW3	L1	L3								
Depth											Please se	e attached n	otes for all
COC No / misc											abbrevia	ations and a	cronyms
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G								
Sample Date	08/05/2019	08/05/2019	08/05/2019	08/05/2019	08/05/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method
Date of Receipt	09/05/2019	09/05/2019	09/05/2019	09/05/2019	09/05/2019						LOD/LOIX	Unita	No.
Pesticides													
Organophosphorus Pesticides		<0.04	<0.04	-0.04	-0 coSV						<0.04		TM149/PM30
Azinphos ethyl Azinphos methyl	<0.01 <0.01	<0.01 <0.01	<0.01 <0.01	<0.01 <0.01	<0.02 ^{SV} AA <0.02 ^{SV} AA						<0.01 <0.01	ug/l ug/l	TM149/PM30
Carbophenothion	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
Chlorfenvinphos	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV}						<0.01	ug/l	TM149/PM30
Chlorpyrifos	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Chlorpyrifos-methyl	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA			ee.			<0.01	ug/l	TM149/PM30
Diazinon	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA			nethe			<0.01	ug/l	TM149/PM30
Dichlorvos Disulfoton	<0.01 <0.01	<0.01 <0.01	<0.01 <0.01	<0.01 <0.01	<0.02 ^{SV} AA <0.02 ^{SV} AA		. A A	с.			< 0.01	ug/l	TM149/PM30 TM149/PM30
Disulition	<0.01	<0.01	<0.01	<0.01	<0.02 AA		our sur				<0.01 <0.01	ug/l ug/l	TM149/PM30
Ethion	<0.01	<0.01	<0.01	<0.01	<0.02 AA	2050	0 ^{x0}				<0.01	ug/l	TM149/PM30
Ethyl Parathion (Parathion)	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA	DUTPOUT	2117. 2019 2 For 2019				<0.01	ug/l	TM149/PM30
Etrimphos	<0.01	<0.01	<0.01	<0.01	<0.02	not to					<0.01	ug/l	TM149/PM30
Fenitrothion	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} <0.02 ^{SV} AA	ar.					<0.01	ug/l	TM149/PM30
Fenthion	<0.01	<0.01	<0.01	<0.01							<0.01	ug/l	TM149/PM30
Malathion	< 0.01	< 0.01	<0.01 <0.01	<0.01 ×	<0.02 AA <0.02 AA <0.02 AA <0.02 AA						< 0.01	ug/l	TM149/PM30 TM149/PM30
Methyl Parathion Mevinphos	<0.01 <0.01	<0.01 <0.01	<0.01	<0.01	<0.02 AA <0.02 AA						<0.01 <0.01	ug/l ug/l	TM149/PM30
Phosalone	<0.01	<0.01	<0.01	<0.01	<0.02 AA						<0.01	ug/l	TM149/PM30
Pirimiphos Methyl	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Propetamphos	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Triazophos	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
	I	I		I	l		I	I	I				I

Client Name: Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location: Contact: JE Job No.:	Thomas V 19/7496	/ainio-Matti	ila						=40ml vial, G =NaOH, HN=	-	e, P=plastic	bottle	
J E Sample No.	1-8	9-16	17-24	25-33	34-42								
Sample ID	GW1	GW2	GW3	L1	L3								
Depth												e attached r	
COC No / misc											abbrevia	ations and a	cronyms
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G								
Sample Date	08/05/2019	08/05/2019	08/05/2019	08/05/2019	08/05/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method
Date of Receipt	09/05/2019	09/05/2019	09/05/2019	09/05/2019	09/05/2019						LOD/LOIX	0110	No.
Acid Herbicides													
Benazolin Bontazono	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM42/PM30
Bentazone Bromoxynil	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1						<0.1 <0.1	ug/l ug/l	TM42/PM30 TM42/PM30
Clopyralid	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/i ug/i	TM42/PM30
4-CPA	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM42/PM30
2,4-D	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM42/PM30
2,4-DB	<0.1	<0.1	<0.1	<0.1	<0.1			<u>رە</u> .			<0.1	ug/l	TM42/PM30
Dicamba	<0.1	<0.1	<0.1	<0.1	<0.1			nerth			<0.1	ug/l	TM42/PM30
Dichloroprop	<0.1	<0.1	<0.1	<0.1	<0.1			Q.			<0.1	ug/l	TM42/PM30
Diclofop Fenoprop	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1		out and				<0.1 <0.1	ug/l ug/l	TM42/PM30 TM42/PM30
Flamprop	<0.1	<0.1	<0.1	<0.1	<0.1	-0 ⁵ 05	010				<0.1	ug/l	TM42/PM30
Flamprop-isopropyl	<0.1	<0.1	<0.1	<0.1	<0.1	OUTPOUI	8117. 2019 2 For 2019				<0.1	ug/l	TM42/PM30
loxynil	<0.1	<0.1	<0.1	<0.1	<0.1	a to to					<0.1	ug/l	TM42/PM30
МСРА	<0.1	<0.1	<0.1	<0.1	28ª 0	Alt					<0.1	ug/l	TM42/PM30
МСРВ	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM42/PM30
Mecoprop	<0.1	<0.1	<0.1	<0.1 🛠	Q ^{\$0.1}						<0.1	ug/l	TM42/PM30
Picloram Pentachlorophenol	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<0.1	<0.1 <0.1						<0.1 <0.1	ug/l ug/l	TM42/PM30 TM42/PM30
2,4,5-T	<0.1	<0.1	<0.1	<01201	<0.1						<0.1	ug/l	TM42/PM30
2,3,6-TBA	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM42/PM30
Triclopyr	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM42/PM30
Atrazine	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
Simazine	<0.01	<0.01	<0.01	<0.01	<0.02 ^{SV} AA						<0.01	ug/l	TM149/PM30
GRO (>C4-C8) [#]	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
GRO (>C8-C12) [#]	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
GRO (>C4-C12)*	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
EPH (C8-C40) [#]	<10	<10	<10	900	20380						<10	ug/l	TM5/PM30
Mineral Oil (C10-C40)	<10	<10	<10	<10	13534						<10	ug/l	TM5/PM16/PM30

Client Name: Reference: Location:	Malone O' E1506	'Regan					Report :	Liquid					
Contact: JE Job No.:	Thomas V 19/7496	′ainio-Matti	ila				• •		=40ml vial, G =NaOH, HN=	•	e, P=plastic	bottle	
J E Sample No.	1-8	9-16	17-24	25-33	34-42					-			
-													
Sample ID	GW1	GW2	GW3	L1	L3								
Depth												e attached n	
COC No / misc											abbrevi	ations and a	cronyms
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G								
Sample Date	08/05/2019	08/05/2019	08/05/2019	08/05/2019	08/05/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method
Date of Receipt	09/05/2019	09/05/2019	09/05/2019	09/05/2019	09/05/2019								No.
TPH CWG													
Aliphatics	<10	-10	-10	<10	<10						<10		TM26/DM4
>C5-C6 [#] >C6-C8 [#]	<10 <10	<10 <10	<10 <10	<10 <10	<10 <10						<10 <10	ug/l ug/l	TM36/PM1 TM36/PM1
>C8-C10 [#]	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM1
>C10-C12 [#]	<5	<5	<5	<5	74						<5	ug/l	TM5/PM16/PM3
>C12-C16 [#]	<10	<10	<10	<10	440		alty. any of				<10	ug/l	TM5/PM16/PM3
>C16-C21 #	<10	<10	<10	<10	1110			e			<10	ug/l	TM5/PM16/PM3
>C21-C35#	<10	<10	<10	<10	9720			neth			<10	ug/l	TM5/PM16/PM3
Total aliphatics C5-35 [#]	<10	<10	<10	<10	11344		A. A.	S.			<10	ug/l	TM5/TM36/PM12/PM16/PM
Aromatics >C5-EC7 [#]	<10	<10	<10	<10	<10		out att.				<10	ug/l	TM36/PM1
>EC7-EC8 [#]	<10	<10	<10	<10	<10	-0 ² 0	are				<10	ug/l	TM36/PM1
>EC8-EC10 [#]	<10	<10	<10	<10	<10	DUTPOUL					<10	ug/l	TM36/PM1
>EC10-EC12 [#]	<5	<5	<5	<5	<5 10 160 1179010 01179010 016730 016730 07680	not to					<5	ug/l	TM5/PM16/PM3
>EC12-EC16 [#]	<10	<10	<10	<10	160 0	Ar					<10	ug/l	TM5/PM16/PM3
>EC16-EC21#	<10	<10	<10	<10	179011						<10	ug/l	TM5/PM16/PM3
>EC21-EC35 [#]	<10	<10	<10	<10 🔨	6 ⁷³⁰						<10	ug/l	TM5/PM16/PM3
Total aromatics C5-35 [#] Total aliphatics and aromatics(C5-35) [#]	<10 <10	<10 <10	<10 <10	<10	7680 19024						<10 <10	ug/l ug/l	TM5/TM36/PM12/PM16/P
				conseta of									
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15						<0.15	mg/l	TM26/PM
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/l	TM173/PM
Sulphate as SO4 [#]	51.1	36.9	75.7	212.5	<0.5						<0.5	mg/l	TM38/PM
Chloride [#]	31.4	12.8	32.7	13.8	25.6						<0.3	mg/l	TM38/PM
MRP Ortho Phosphate as P	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/l	TM38/PM
Total Oxidised Nitrogen as N [#]	8.1	12.4	7.2	<0.2	<0.2						<0.2	mg/l	TM38/PM0
Total Cyanide [#]	<0.01	<0.01	<0.01	<0.01	0.02						<0.01	mg/l	TM89/PM
Ammoniacal Nitrogen as N [#]	<0.03	<0.03	0.03	6.06	40.56						<0.03	mg/l	TM38/PM
Total Alkalinity as CaCO3 #	1194	1930	2114	-	-						<1	mg/l	TM75/PM
Dibutyltin	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM94/PM4
Tributyltin	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM94/PM4
Triphenyltin	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM94/PM4
BOD (Settled) [#]	-	-	-	16	24						<1	mg/l	TM58/PM
COD (Settled) [#]	-	-	-	37	140						<7	mg/l	TM57/PM
Dissolved Oxygen	6	7	6	6	2						<1	mg/l	TM58/PM
Electrical Conductivity @25C #	708	767	719	1509	2078						<2	uS/cm	TM76/PM

Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location: Contact: JE Job No.:	Thomas \ 19/7496	/ainio-Matt	ila						⊧40ml vial, G NaOH, HN=	-	e, P=plastic	bottle	
J E Sample No.	1-8	9-16	17-24	25-33	34-42								
Sample ID	GW1	GW2	GW3	L1	L3								
Depth											Please se	e attached n	otes for all
COC No / misc												ations and ad	
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G								
Sample Date	08/05/2019	08/05/2019	08/05/2019	08/05/2019	08/05/2019								
Sample Type													
Batch Number		1	1	1	1								
Date of Receipt											LOD/LOR	Units	Method No.
Faecal Coliforms*	48	<1	1	-	-							CFU/100ml	Subcontracted
рН#	7.39	7.30	7.34	7.22	7.29						<0.01	pH units	TM73/PM0
Redox	165.78	186.59	198.20	9.12	-109.04							mV	TM72/PM0
Total Organic Carbon [#]	<2	<2	<2	-	-						<2	mg/l	TM60/PM0
Total Coliforms* Total Dissolved Solids [#]	1090.0 487	238.2 515	79.8 493	-	-						<35	MPN/100ml mg/l	Subcontracted TM20/PM0
	401	010	400								-00	ing/i	THE OFT WO
							ally any c	<u>ر</u> و.					
								net US					
							· A · A	01					
							oup any						
						005.00	9 to						
						Purequis							
					otio	nert							
					inspecto	6							
				Ý	orvier								
				S	ion.								
				ento									
				OIS									

Reference:	Malone O E1506	'Regan					Report :	Liquid					
Location: Contact: JE Job No.:	Thomas \ 19/7606	/ainio-Matti	ila					oducts: V= Z=ZnAc, N=		-	e, P=plastic	bottle	
J E Sample No.	34-42	43-51											
Sample ID	SW1	SW2											
Depth											Please se	e attached r	otes for all
COC No / misc												ations and a	
Containers	V H N P BOD G	V H N P BOD G											
Sample Date	09/05/2019	09/05/2019											
Sample Type													
Batch Number		1											
											LOD/LOR	Units	Method No.
Date of Receipt											-0.5		TM20/DM4
Dissolved Arsenic [#] Dissolved Boron	<2.5 23	<2.5 27									<2.5 <12	ug/l	TM30/PM14 TM30/PM14
Dissolved Boron	<0.5	<0.5									<12	ug/l ug/l	TM30/PM12
Dissolved Calcium [#]	123.9	125.5									<0.2	mg/l	TM30/PM14
Total Dissolved Chromium [#]	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper [#]	<7	<7									<7	ug/l	TM30/PM14
Total Dissolved Iron #	57	59									<20	ug/l	TM30/PM14
Dissolved Lead [#]	<5	<5						e.			<5	ug/l	TM30/PM14
Dissolved Magnesium [#]	11.1	11.3						net			<0.1	mg/l	TM30/PM14
Dissolved Manganese [#] Dissolved Mercury [#]	28 <1	29 <1					· 4· ~	с.			<2 <1	ug/l ug/l	TM30/PM14 TM30/PM14
Dissolved Nickel [#]	<2	<2					offer alt.				<2	ug/l	TM30/PM14
Dissolved Potassium [#]	2.2	2.3				505 00	9 to				<0.1	mg/l	TM30/PM14
Dissolved Sodium [#]	12.5	12.6				OUTPOUL					<0.1	mg/l	TM30/PM14
Dissolved Zinc [#]	<3	<3		Consent of	Dectio	NHEITE					<3	ug/l	TM30/PM14
Methyl Tertiary Butyl Ether #	<0.1	<0.1			(115 dit						<0.1	ug/l	TM15/PM10
Benzene [#]	<0.5	<0.5		Ŷ	optic						<0.5	ug/l	TM15/PM10
Toluene [#]	<5	<5		5							<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1		sent							<1	ug/l	TM15/PM1
m/p-Xylene [#] o-Xylene [#]	<2 <1	<2 <1		Coll							<2 <1	ug/l ug/l	TM15/PM1 TM15/PM1
Surrogate Recovery Toluene D8	111	108									<0	%	TM15/PM1
Surrogate Recovery 4-Bromofluorobenzene	109	106									<0	%	TM15/PM10
									[

	E1506	'Regan					Report :	Liquid					
	Thomas V 19/7606	′ainio-Matti	la						:40ml vial, G NaOH, HN=	≔glass bottle HN0₃	e, P=plastic	bottle	
J E Sample No.	34-42	43-51											
	-												
Sample ID	SW1	SW2											
Depth											Disesses		
COC No / misc												e attached n ations and a	
Containers													
Sample Date													
Sample Type S	Surface Water	Surface Water											1
Batch Number	1	1									LOD/LOR	Units	Method
Date of Receipt	10/05/2019	10/05/2019									200/2011	onno	No.
Pesticides													
Organochlorine Pesticides													
Aldrin	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Alpha-HCH (BHC)	<0.01	<0.01 <0.01									<0.01	ug/l	TM149/PM30 TM149/PM30
Beta-HCH (BHC) Chlorothalonil	<0.01 <2.50 _{AA}	<0.01 <2.50 _{AA}					ator any c				<0.01 <0.01	ug/l ug/l	TM149/PM30
cis-Chlordane	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Delta-HCH (BHC)	<0.01	<0.01						, 15 ⁰ .			<0.01	ug/l	TM149/PM30
Dieldrin	<0.01	<0.01					ć	het			<0.01	ug/l	TM149/PM30
Endosulphan I	<0.01	<0.01					AT. M				<0.01	ug/l	TM149/PM30
Endosulphan II	<0.01	<0.01				ري م	offor a				<0.01	ug/l	TM149/PM30
Endosulphan sulphate	<0.01	<0.01				- 10°51	0				<0.01	ug/l	TM149/PM30
Endrin	< 0.01	<0.01			*	Puredu					< 0.01	ug/l	TM149/PM30
Gamma-HCH (BHC) Heptachlor	<0.01 <0.01	<0.01 <0.01			otio	vnet t					<0.01 <0.01	ug/l ug/l	TM149/PM30 TM149/PM30
Heptachlor Epoxide	<0.01	<0.01			inspecto	2					<0.01	ug/l	TM149/PM30
Hexachlorobenzene	<0.01	<0.01		Ŕ	St VII 8						<0.01	ug/l	TM149/PM30
Isodrin	<0.01	<0.01		s e	.9 ⁹ ,						<0.01	ug/l	TM149/PM30
o,p'-DDE	<0.01	<0.01		attor							<0.01	ug/l	TM149/PM30
o,p'-DDT	<0.01	<0.01		onser							<0.01	ug/l	TM149/PM30
o,p'-Methoxychlor	<0.01	<0.01		J ^e							<0.01	ug/l	TM149/PM30
o,p'-TDE	<0.01	<0.01									< 0.01	ug/l	TM149/PM30
p,p'-DDE p,p'-DDT	<0.01 <0.01	<0.01 <0.01									<0.01 <0.01	ug/l ug/l	TM149/PM30 TM149/PM30
p,p'-Methoxychlor	<0.01	<0.01									<0.01	ug/i ug/i	TM149/PM30
p,p'-TDE	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Pendimethalin	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Permethrin I	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Permethrin II	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Quintozene (PCNB)	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Tecnazene	< 0.01	<0.01									<0.01	ug/l	TM149/PM30
Telodrin trans Chlordano	<0.01	<0.01									<0.01	ug/l	TM149/PM30 TM149/PM30
trans-Chlordane Triadimefon	<0.01 <0.01	<0.01 <0.01									<0.01 <0.01	ug/l ug/l	TM149/PM30
Triallate	<0.01	<0.01									<0.01	ug/l	TM149/PM30
Trifluralin	<0.01	<0.01									<0.01	ug/l	TM149/PM30

Exova Jones Environmental Client Name: Malone O'Regan Report : Liquid E1506 Reference: Location. Contact: Thomas Vainio-Mattila Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle 19/7606 JE Job No.: H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃ J E Sample No 34-42 43-51 Sample ID SW1 SW2 Depth Please see attached notes for all abbreviations and acronyms COC No / misc Containers V H N P BOD G V H N P BOD Sample Date 09/05/2019 09/05/2019 Sample Type Surface Wat Surface Wat Batch Number 1 1 Method LOD/LOR Units No. Date of Receipt 10/05/2019 10/05/2019 Pesticides Organophosphorus Pesticide Azinphos ethyl <0.01 <0.01 <0.01 ug/l TM149/PM3 Azinphos methyl <0.01 <0.01 <0.01 ug/l TM149/PM3 Forinsection purposes all for any differences Carbophenothion <0.01 <0.01 <0.01 ug/l TM149/PM3 Chlorfenvinphos <0.01 <0.01 <0.01 ug/l TM149/PM30 Chlorpyrifos <0.01 <0.01 <0.01 ug/l TM149/PM30 Chlorpyrifos-methyl <0.01 <0.01 <0.01 ug/l TM149/PM3 TM149/PM3 Diazinon <0.01 <0.01 <0.01 ug/l TM149/PM3 Dichlorvos < 0.01 < 0.01 < 0.01 ug/l TM149/PM3 Disulfoton < 0.01 < 0.01 < 0.01 ug/l TM149/PM30 Dimethoate < 0.01 < 0.01 < 0.01 ug/l TM149/PM3 Ethion < 0.01 < 0.01 < 0.01 ug/l Ethyl Parathion (Parathion) TM149/PM3 <0.01 < 0.01 < 0.01 ug/l TM149/PM3 Etrimphos <0.01 < 0.01 < 0.01 ug/l Fenitrothion TM149/PM3 <0.01 < 0.01 < 0.01 ug/l TM149/PM30 Fenthion <0.01 < 0.01 < 0.01 ug/l TM149/PM30 Malathion < 0.01 < 0.01 < 0.01 ug/l TM149/PM30 Methyl Parathion < 0.01 < 0.01 < 0.01 ug/l TM149/PM30 Mevinphos <0.01 < 0.01 < 0.01 ug/l TM149/PM30 <0.01 Phosalone <0.01 <0.01 ug/l TM149/PM3 Pirimiphos Methyl <0.01 <0.01 <0.01 ug/l <0.01 TM149/PM3 Propetamphos < 0.01 < 0.01 ug/l <0.01 <0.01 TM149/PM30 Triazophos < 0.01 ua/l

Exova Jones Environmental Client Name: Malone O'Regan Report : Liquid E1506 Reference: Location. Contact: Thomas Vainio-Mattila Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle 19/7606 JE Job No.: H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃ 34-42 43-51 J E Sample No Sample ID SW1 SW2 Depth Please see attached notes for all abbreviations and acronyms COC No / misc Containers V H N P BOD G V H N P BOD Sample Date 09/05/2019 09/05/2019 Sample Type Surface Wat Surface Wat Batch Number 1 1 Method LOD/LOR Units No. Date of Receipt 10/05/2019 10/05/2019 Acid Herbicides Benazolin <0.1 <0.1 <0.1 ug/l TM42/PM30 Bentazone <0.1 <0.1 <0.1 ug/l TM42/PM3 Bromoxynil <0.1 <0.1 <0.1 ug/l TM42/PM3 Forinsection purposes all for any differences Clopyralid <0.1 <0.1 <0.1 ug/l TM42/PM3 4-CPA <0.1 <0.1 <0.1 ug/l TM42/PM3 2,4-D <0.1 <0.1 <0.1 ug/l TM42/PM3 2,4-DB <0.1 <0.1 <0.1 ug/l TM42/PM3 Dicamba <0.1 <0.1 <0.1 ug/l TM42/PM3 Dichloroprop <0.1 <0.1 <0.1 ug/l TM42/PM3 TM42/PM3 Diclofop <0.1 <0.1 <0.1 ug/l TM42/PM3 Fenoprop <0.1 <0.1 <0.1 ug/l TM42/PM3 Flamprop <0.1 <0.1 <0.1 ug/l TM42/PM3 Flamprop-isopropyl <0.1 <0.1 <0.1 ug/l TM42/PM3 loxynil <0.1 <0.1 <0.1 ug/l TM42/PM30 мсра <0.1 <0.1 <0.1 ug/l TM42/PM30 мсрв <0.1 <0.1 <0.1 ug/l TM42/PM30 <0.1 <0.1 Mecoprop <0.1 ug/l TM42/PM30 <0.1 <0.1 Picloram <0.1 ug/l TM42/PM30 Pentachlorophenol <0.1 <0.1 <0.1 ug/l TM42/PM30 245-T <0.1 <0 1 <0 1 ug/l 2.3.6-TBA TM42/PM30 <0.1 <0 1 <0 1 ug/l Triclopyr TM42/PM30 <0.1 <0.1 <0.1 ug/l <0.01 <0.01 TM149/PM30 < 0.01 Atrazine ug/l TM149/PM30 Simazine < 0.01 < 0.01 < 0.01 ug/l TM36/PM1: GRO (>C4-C8)# <10 <10 <10 ua/l TM36/PM1: GRO (>C8-C12)# <10 <10 <10 ua/l TM36/PM12 GRO (>C4-C12)# <10 <10 <10 ug/l TM5/PM30 EPH (C8-C40)# <10 <10 <10 ug/l Mineral Oil (C10-C40) <10 <10 <10 ug/l M5/PM16/PM

Exova Jones Environmental Client Name: Malone O'Regan Report : Liquid E1506 Reference: Location: Thomas Vainio-Mattila Contact: Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle 19/7606 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃ JE Job No.: J E Sample No. 34-42 43-51 Sample ID SW1 SW2 Depth Please see attached notes for all abbreviations and acronyms COC No / misc Containers V H N P BOD G V H N P BOD O Sample Date 09/05/2019 09/05/2019 Sample Type Surface Wat Surface Wat Batch Number 1 1 LOD/LOR Units Date of Receipt 10/05/2019 10/05/2019 TPH CWG Aliphatics >C5-C6 # <10 <10 <10 ug/l TM36/PM12 >C6-C8 # <10 <10 <10 ug/l TM36/PM12 >C8-C10# <10 <10 <10 ug/l TM36/PM12 >C10-C12# <5 <5 <5 ug/l TM5/PM16/PM3 >C12-C16# <10 <10 <10 ug/l TM5/PM16/PM3

2012-010	<10	<10					.01		<10	ug/i	TW3/FW10/FW30
>C16-C21 #	<10	<10					at USE		<10	ug/l	TM5/PM16/PM30
>C21-C35#	<10	<10				ć	ner		<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 [#]	<10	<10				N. m			<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics						SI FOL OF					
>C5-EC7 #	<10	<10			0500	,0 [×]			<10	ug/l	TM36/PM12
>EC7-EC8 [#]	<10	<10			OUTPOUL				<10	ug/l	TM36/PM12
>EC8-EC10 [#]	<10	<10		inó	otto				<10	ug/l	TM36/PM12
>EC10-EC12#	<5	<5		- Perio	WIL				<5	ug/l	TM5/PM16/PM30
>EC12-EC16#	<10	<10		in the					<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	Ŷ	NIL O					<10	ug/l	TM5/PM16/PM30
>EC21-EC35 [#]	<10	<10	Consent of	,0×					<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35#	<10	<10	nt ^o						<10	ug/l	TM5/TM38/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	onse.						<10	ug/l	TM5/TM38/PM12/PM16/PM30
			C ^C								
Phenol [#]	<0.01	<0.01							<0.01	mg/l	TM26/PM0
Fluoride	<0.3	<0.3							<0.3	mg/l	TM173/PM0
Sulphate as SO4 [#]	37.8	36.7							<0.5	mg/l	TM38/PM0
Chloride [#]	27.4	27.3							<0.3	mg/l	TM38/PM0
MRP Ortho Phosphate as P	<0.03	<0.03							<0.03	mg/l	TM38/PM0
Total Oxidised Nitrogen as N [#]	3.5	3.7							<0.2	mg/l	TM38/PM0
Total Cyanide [#]	<0.01	<0.01							<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	<0.03	0.03							<0.03	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	282	302							<1	mg/l	TM75/PM0
Dibutyltin	<0.1	<0.1							<0.1	ug/l	TM94/PM48
Tributyltin	<0.1	<0.1							<0.1	ug/l	TM94/PM48
Triphenyltin	<0.1	<0.1							<0.1	ug/l	TM94/PM48
BOD (Settled) [#]	<1	<1							<1	mg/l	TM58/PM0
COD (Settled) [#]	17	18							<7	mg/l	TM57/PM0
Dissolved Oxygen	10	10							<1	mg/l	TM58/PM0
Electrical Conductivity @25C [#]	644	653							<2	uS/cm	TM76/PM0

Method

No.

Exova Jones Enviro	onmenta	ıl										
	Malone O E1506	'Regan					Report :	Liquid				
	Thomas \ 19/7606	/ainio-Matti	la				Liquids/pr H=H ₂ SO ₄ , 2		G=glass bottl	e, P=plastic	bottle	
J E Sample No.	34-42	43-51										
Sample ID	SW1	SW2										
Depth										Please se	e attached n	otes for all
COC No / misc										abbrevi	ations and ad	cronyms
Containers	V H N P BOD G	V H N P BOD G										
Sample Date	09/05/2019	09/05/2019										
Sample Type	Surface Water	Surface Water										1
Batch Number	1	1								LOD/LOR	Units	Method No.
Date of Receipt												
pH [#] Redox	8.27 91.16	8.26 141.55								<0.01	pH units mV	TM73/PM0 TM72/PM0
Total Suspended Solids #	<10	<10								<10	mg/l	TM37/PM
				Consent of								
								r USC.				
							, d	ner				
							My any					
						6505	dior					
						OUTPOUT						
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					. nspect of	Nº.						
				Ŕ	or Wright							
				S	os,							
				entor								
				Colla								
				1	1							

Client Name:	Malone O'Regan
Reference:	E1506
Location:	
Contact:	Thomas Vainio-Ma

Thomas Vainio-Mattila

SVOC Report : Liquid

Contact: JE Job No.:	Thomas V 19/7496	/ainio-Matti	la									
		0.46	17.04	25.22	24.40					l		
J E Sample No.	1-8	9-16	17-24	25-33	34-42							
Sample ID	GW1	GW2	GW3	L1	L3							
Depth											e attached n	
COC No / misc Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G					abbrevia	ations and a	cronyms
Sample Date	08/05/2019	08/05/2019	08/05/2019	08/05/2019	08/05/2019							
Sample Type Batch Number	Ground Water	Ground Water 1	Ground Water	Ground Water	Ground Water							Method
Date of Receipt		09/05/2019	09/05/2019	09/05/2019						LOD/LOR	Units	No.
SVOC MS Phenols												
2-Chlorophenol [#]	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}					<0.5	ug/l	TM16/PM30
2-Nitrophenol 2,4-Dichlorophenol [#]	<0.5 <0.5	<0.5 <0.5	<0.5 <0.5	<0.5 <0.5	<1.0 _{AA} <1.0 _{AA}					<0.5 <0.5	ug/l ug/l	TM16/PM30 TM16/PM30
2,4-Dimethylphenol	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol [#]	<0.5	<0.5	<0.5	<0.5 <1	<1.0 _{AA}					<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol 4-Chloro-3-methylphenol [#]	<1 <0.5	<1 <0.5	<1 <0.5	<0.5	<2 _{AA} <1.0 _{AA}					<1 <0.5	ug/l ug/l	TM16/PM30 TM16/PM30
4-Methylphenol	<1	<1	<1	<1	<2 AA					<1	ug/l	TM16/PM30
4-Nitrophenol Pentachlorophenol	<10 <1	<10 <1	<10 <1	<10 <1	<20 _{AA} <2 _{AA}					<10 <1	ug/l ug/l	TM16/PM30 TM16/PM30
Phenol	<1	<1	<1	<1	<2 AA <2 AA					<1	ug/l	TM16/PM30
PAHs #												
2-Chloronaphthalene # 2-Methylnaphthalene #	<1 <1	<1 <1	<1 <1	<1 <1	<2 _{AA} <2 _{AA}			.Ø)*		<1 <1	ug/l ug/l	TM16/PM30 TM16/PM30
Naphthalene [#]	<1	<1	<1	<1	<2 _{AA}			orthe		<1	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}		0	ne.		<0.5	ug/l	TM16/PM30
Acenaphthene [#] Fluorene [#]	<1 <0.5	<1 <0.5	<1 <0.5	<1 <0.5	<2 _{AA} 1.1 _{AA}	(ULA. SUN			<1 <0.5	ug/l ug/l	TM16/PM30 TM16/PM30
Phenanthrene [#]	<0.5	<0.5	<0.5	<0.5	3.9 _{AA}	Ses	250			<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5	<0.5	<0.5	1.8 _{AA}	allPolite	0 -			<0.5	ug/l	TM16/PM30 TM16/PM30
Fluoranthene [#] Pyrene [#]	<0.5 <0.5	<0.5 <0.5	<0.5 <0.5	0.5	17.4 _{AA}	P. Jour	atty. any			<0.5 <0.5	ug/l ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5	<0.5	<0.5	15.7 AA 12.1 AA 12.1 AA 19.0 AA	NILL				<0.5	ug/l	TM16/PM30
Chrysene [#] Benzo(bk)fluoranthene [#]	<0.5 <1	<0.5 <1	<0.5 <1	<0.5	1 122AA					<0.5 <1	ug/l ug/l	TM16/PM30 TM16/PM30
Benzo(a)pyrene	<1	<1	<1	-1	212					<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1	<1	<1	844					<1	ug/l	TM16/PM30 TM16/PM30
Dibenzo(ah)anthracene [#] Benzo(ghi)perylene [#]	<0.5 <0.5	<0.5 <0.5	<0.5 <0.5	<1 c) <0.5 01.60.5	2.8 _{AA} 10.5 _{AA}					<0.5 <0.5	ug/l ug/l	TM16/PM30 TM16/PM30
Phthalates			(Con								
Bis(2-ethylhexyl) phthalate Butylbenzyl phthalate	<5 <1	<5 <1	<5 <1	<5 <1	26 _{AA} <2 _{AA}					<5 <1	ug/l ug/l	TM16/PM30 TM16/PM30
Di-n-butyl phthalate [#]	<1.5	<1.5	<1.5	<1.5	<3.0 _{AA}					<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM30 TM16/PM30
Diethyl phthalate [#] Dimethyl phthalate	<1 <1	<1 <1	<1 <1	<1 <1	<2 _{AA} <2 _{AA}					<1 <1	ug/l ug/l	TM16/PM30 TM16/PM30

Client Name:	Malone O'Regan
Reference:	E1506
Location:	
Contact:	Thomas Vainio-Ma

SVOC Report : Liquid

Contact: JE Job No.:	Thomas \ 19/7496	/ainio-Matt	ila									
J E Sample No.	1-8	9-16	17-24	25-33	34-42							
Sample ID	GW1	GW2	GW3	L1	L3							
Depth COC No / misc											e attached n ations and a	
Containers	VHNPG	VHNPG	VHNPG	V H N P BOD G	V H N P BOD G							
Sample Date	08/05/2019	08/05/2019	08/05/2019									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1					LOD/LOR	Units	Method
Date of Receipt	09/05/2019	09/05/2019	09/05/2019	09/05/2019	09/05/2019					LOD/LOIK	Onito	No.
SVOC MS												
Other SVOCs												
1,2-Dichlorobenzene [#]	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
1,2,4-Trichlorobenzene [#]	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
1,3-Dichlorobenzene [#]	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
1,4-Dichlorobenzene #	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
2-Nitroaniline	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
2,4-Dinitrotoluene [#]	<0.5	<0.5	<0.5	<0.5						<0.5	ug/l	TM16/PM3
2,4-Dinitrotoluene 2,6-Dinitrotoluene	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}					<0.5		TM16/PM3
					<2 _{AA}						ug/l	1
3-Nitroaniline	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
4-Bromophenylphenylether #	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
4-Chloroaniline	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
4-Chlorophenylphenylether #	<1	<1	<1	<1	<2 _{AA}					<1	ug/l	TM16/PM3
4-Nitroaniline	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}					<0.5	ug/l	TM16/PM3
Azobenzene [#]	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}					<0.5	ug/l	TM16/PM3
Bis(2-chloroethoxy)methane [#]	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}					<0.5	ug/l	TM16/PM3
Bis(2-chloroethyl)ether #	<1	<1	<1	<1	<2 _{AA}			<i>.</i> е.		<1	ug/l	TM16/PM3
Carbazole [#]	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}			12		<0.5	ug/l	TM16/PM3
Dibenzofuran [#]	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}		all'any	ner		<0.5	ug/l	TM16/PM3
	<1	<1	<1	<1	<1.0AA		0	~				TM16/PM3
Hexachlorobenzene #					<2 _{AA}		13. M			<1	ug/l	
Hexachlorobutadiene [#]	<1	<1	<1	<1	<2 _{AA}	~	n cot			<1	ug/l	TM16/PM3
Hexachlorocyclopentadiene	<1	<1	<1	<1	<2 AA	Ser	8,			<1	ug/l	TM16/PM3
Hexachloroethane #	<1	<1	<1	<1	<2 _{AA}	- R it				<1	ug/l	TM16/PM3
Isophorone #	<0.5	<0.5	<0.5	<0.5	<1.0 _{AA}	Sr. Or				<0.5	ug/l	TM16/PM3
N-nitrosodi-n-propylamine #	<0.5	<0.5	<0.5	<0.5	<1.0AA	et				<0.5	ug/l	TM16/PM3
Nitrobenzene #	<1	<1	<1	<1	<1.0 AA <1.0 AA <2 AA 128 AA	NR				<1	ug/l	TM16/PM3
Surrogate Recovery 2-Fluorobiphenyl	111	81	107	98	. 102ak					<0	%	TM16/PM3
Surrogate Recovery p-Terphenyl-d14	129	113	130	118	1280					<0	%	TM16/PM3
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Client Name: Reference:	Malone O E1506	'Regan					SVOC Re	port :	Liquid			
Location:	2.000											
	Thom '	/ainio-Matti	lo									
Contact: JE Job No.:	19/7606	ainio-iviatu	la									
J E Sample No.	34-42	43-51										
Comula ID	SW1	SW2										
Sample ID	SW1	5₩2										
Depth COC No / misc											e attached n ations and a	
Containers		V H N P BOD G										
Sample Date	09/05/2019	09/05/2019										
Sample Type	Surface Water											
Batch Number	1 10/05/2019	1 10/05/2019								LOD/LOR	Units	Method No.
Date of Receipt	10/05/2019	10/05/2019										NO.
SVOC MS Phenols												
		.4								.4		TMACIDMON
2-Chlorophenol [#]	<1	<1								<1	ug/l	TM16/PM30
2-Methylphenol [#]	<0.5	<0.5								<0.5	ug/l	TM16/PM3
2-Nitrophenol	<0.5	<0.5								<0.5	ug/l	TM16/PM30 TM16/PM30
2,4-Dichlorophenol [#]	<0.5	<0.5								<0.5	ug/l	1
2,4-Dimethylphenol	<1	<1								<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol	< 0.5	<0.5								<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1								<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol [#]	<0.5	<0.5								<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1								<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10								<10	ug/l	TM16/PM30 TM16/PM30
Pentachlorophenol	<1	<1								<1	ug/l	1
Phenol	<1	<1								<1	ug/l	TM16/PM30
PAHs												TMACODIA
2-Chloronaphthalene	<1	<1						~ -		<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1						. 150.		<1	ug/l	TM16/PM30
Naphthalene #	<1 <0.5	<1 <0.5						net -		<1 <0.5	ug/l	TM16/PM30 TM16/PM30
Acenaphthylene #							, d	C.			ug/l	1
Acenaphthene #	<1	<1					17. My			<1	ug/l	TM16/PM30 TM16/PM30
Fluorene [#]	<0.5	<0.5					D'sor			<0.5	ug/l	
Phenanthrene [#]	<0.5	<0.5				-0500	9,			<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5				11P JI	Ť			<0.5	ug/l	TM16/PM30
Fluoranthene [#]	<0.5	<0.5				Prot				<0.5	ug/l	TM16/PM30
Pyrene [#]	<0.5	<0.5			di	nor				<0.5	ug/l	TM16/PM30
Benzo(a)anthracene#	<0.5	<0.5			000	4+				<0.5	ug/l	TM16/PM30
Chrysene#	<0.5	<0.5			in the					<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1		÷.	or the					<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1		Y	°&,					<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1		- 8						<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5		ont						<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5		M ^{SC}						<0.5	ug/l	TM16/PM30
Phthalates			(0								
Bis(2-ethylhexyl) phthalate	<5	<5					ator any o			<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1								<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5								<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1								<1	ug/l	TM16/PM30
Diethyl phthalate [#]	<1	<1								<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1								<1	ug/l	TM16/PM30
												}
												}
	-											}
												}
												}
	L											
				1	1		1		1			1

Client Name: Reference:	Malone O E1506	'Regan					SVOC Re	port :	Liquid			
Location:												
Contact:	Thomas V	/ainio-Matti	la									
JE Job No.:	19/7606											
	-									1		
J E Sample No.	34-42	43-51										
Sample ID	SW1	SW2										
Depth										Please se	e attached n	otes for all
COC No / misc											ations and a	
Containers	V H N P BOD G	V H N P BOD G										
Sample Date		09/05/2019										
Sample Type		Surface Water										
Batch Number	1	1										Method
Date of Receipt	10/05/2019									LOD/LOR	Units	No.
•	10/05/2019	10/05/2019										
SVOC MS												
Other SVOCs												
1,2-Dichlorobenzene [#]	<1	<1								<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene [#]	<1	<1								<1	ug/l	TM16/PM30
1,3-Dichlorobenzene#	<1	<1								<1	ug/l	TM16/PM30
1,4-Dichlorobenzene#	<1	<1								<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1								<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5	<0.5								<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1								<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1								<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1								<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1							1	<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1	<1								<1	ug/l	TM16/PM30
4-Oniorophenyiphenyiether	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Azobenzene [#]	<0.5	<0.5								<0.5	ug/l	TM16/PM30
	<0.5	<0.5						<u>~</u> e·		<0.5	-	TM16/PM30
Bis(2-chloroethoxy)methane [#]	<0.5	<0.5						112		<0.5	ug/l	TM16/PM30 TM16/PM30
Bis(2-chloroethyl)ether [#] Carbazole [#]								ner			ug/l	TM16/PM30 TM16/PM30
	<0.5	<0.5					. A. A	٢		<0.5	ug/l	
Dibenzofuran [#]	<0.5	<0.5					117. 210			<0.5	ug/l	TM16/PM30
Hexachlorobenzene [#]	<1	<1					(101 -			<1	ug/l	TM16/PM30
Hexachlorobutadiene#	<1	<1				-0500	0 ´			<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1				11P JI				<1	ug/l	TM16/PM30
Hexachloroethane #	<1	<1				P. tour				<1	ug/l	TM16/PM30
Isophorone #	<0.5	<0.5		Consent of	di ⁰	net				<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5	<0.5			oer a	4.				<0.5	ug/l	TM16/PM30
Nitrobenzene [#]	<1	<1			init					<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	101	108		4	N ME					<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	120	126		×	\$					<0	%	TM16/PM30
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Client Name:	Malone O'Regan
Reference:	E1506
Location:	
Contact:	Thomas Vainio-Ma

E1506 nas Vainio-Mattila ть

VOC Report : Liquid

Contact: JE Job No.:	Thomas V 19/7496	/ainio-Matti	la										
J E Sample No.	1-8	9-16	17-24	25-33	34-42								
Sample ID	GW1	GW2	GW3	L1	L3								
Depth											Please se	e attached n	otes for all
COC No / misc											abbrevi	ations and a	cronyms
Containers Sample Date	V H N P G 08/05/2019	V H N P G 08/05/2019	V H N P G 08/05/2019	V H N P BOD G 08/05/2019	VHNPBODG 08/05/2019								
Sample Date Sample Type	Ground Water	Ground Water	Ground Water		Ground Water								
Batch Number	1	1	1	1	1							11-24	Method
Date of Receipt	09/05/2019	09/05/2019	09/05/2019	09/05/2019	09/05/2019						LOD/LOR	Units	No.
VOC MS	-	_	-										
Dichlorodifluoromethane	<2 <0.1	<2 <0.1	<2 <0.1	<2 <0.1	<2 <0.1						<2 <0.1	ug/l	TM15/PM10 TM15/PM10
Methyl Tertiary Butyl Ether [#] Chloromethane [#]	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l ug/l	TM15/PM10 TM15/PM10
Vinyl Chloride [#]	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) [#] Dichloromethane (DCM) [#]	<3 <5	<3 <5	<3 <5	<3 <5	<3 <5						<3 <5	ug/l ug/l	TM15/PM10 TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,1-Dichloroethane [#]	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
Bromochloromethane [#] Chloroform [#]	<2 <2	<2 <2	<2 <2	<2	<2						<2 <2	ug/l ug/l	TM15/PM10 TM15/PM10
1,1,1-Trichloroethane [#]	<2	<2	<2	<2				్ల.			<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3			orthe			<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2		ć	U.C.			<2	ug/l	TM15/PM10
1,2-Dichloroethane [#]	<2	<2	<2	<2	<2		17. 217				<2	ug/l	TM15/PM10
Benzene [#] Trichloroethene (TCE) [#]	<0.5 <3	<0.5 <3	<0.5 <3	<0.5	<0.5	es.	tor				<0.5 <3	ug/l ug/l	TM15/PM10 TM15/PM10
1,2-Dichloropropane [#]	<2	<2	<2	<2	<2	100 ⁵⁰ 11	0				<2	ug/l	TM15/PM10
Dibromomethane [#]	<3	<3	<3	<3	<3	Daredar					<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2 00	othe					<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2		AL					<2	ug/l	TM15/PM10
Toluene [#] trans-1-3-Dichloropropene	<5 <2	<5 <2	<5 <2	<2	in shi						<5 <2	ug/l ug/l	TM15/PM10 TM15/PM10
1,1,2-Trichloroethane [#]	<2	<2	<2	<2 😵	QY<2						<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) [#]	<3	<3	<3	<3 5	<3						<3	ug/l	TM15/PM10
1,3-Dichloropropane [#]	<2	<2	<2	msell of	<2						<2	ug/l	TM15/PM10
Dibromochloromethane [#] 1,2-Dibromoethane [#]	<2 <2	<2 <2	<2 <2 (011.542	<2 <2						<2 <2	ug/l	TM15/PM10 TM15/PM10
Chlorobenzene [#]	<2	<2	<2	<2	<2						<2	ug/l ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
Ethylbenzene [#]	<1	<1	<1	<1	<1						<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
o-Xylene [#] Styrene	<1 <2	<1 <2	<1 <2	<1 <2	<1 <2						<1 <2	ug/l ug/l	TM15/PM10 TM15/PM10
Bromoform [#]	<2	<2	<2	<2	<2						<2	ug/l	TM15/PM10
lsopropylbenzene [#]	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4						<4	ug/l	TM15/PM10
Bromobenzene [#]	<2 <3	<2	<2 <3	<2 <3	<2						<2	ug/l	TM15/PM10 TM15/PM10
1,2,3-Trichloropropane [#] Propylbenzene [#]	<3	<3 <3	<3	<3	<3 <3						<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
2-Chlorotoluene [#]	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
4-Chlorotoluene [#]	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
tert-Butylbenzene [#]	<3 <3	<3 <3	<3 <3	<3 <3	<3 <3						<3 <3	ug/l	TM15/PM10 TM15/PM10
1,2,4-Trimethylbenzene [#] sec-Butylbenzene [#]	<3	<3	<3	<3	<3						<3	ug/l ug/l	TM15/PM10 TM15/PM10
4-Isopropyltoluene [#]	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,3-Dichlorobenzene [#]	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,4-Dichlorobenzene [#]	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
n-Butylbenzene [#] 1,2-Dichlorobenzene [#]	<3 <3	<3 <3	<3 <3	<3 <3	<3 <3						<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
1,2-Dichlorobenzene " 1,2-Dibromo-3-chloropropane	<3	<3	<3	<3	<3						<3 <2	ug/i ug/i	TM15/PM10 TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3						<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8 Surrogate Recovery 4-Bromofluorobenzene	96 100	95 98	98 102	100 100	100 102						<0 <0	%	TM15/PM10 TM15/PM10
sanogale necovery 4-bromoliuorobenzene	100	90	102	100	102		1	1	1	1	~ U	70	TIVE 3/ PIVITU

Exova Jones Enviro	onmenta	ıl										
Client Name: Reference:	Malone O E1506	'Regan					VOC Rep	ort :	Liquid			
Location:												
Contact:	Thomas	/ainio-Matti	ila									
JE Job No.:	19/7606	anno-mau	la									
J E Sample No.	34-42	43-51]		
Sample ID	SW1	SW2										
Depth										Please se	e attached r	otes for all
COC No / misc											ations and a	
Containers		V H N P BOD G 09/05/2019										
Sample Date Sample Type	09/05/2019 Surface Water	Surface Water										
Batch Number	1	1								LOD/LOR	Units	Method
Date of Receipt	10/05/2019	10/05/2019								LOD/LOR	Units	No.
VOC MS												
Dichlorodifluoromethane	<2	<2								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether [#] Chloromethane [#]	<0.1 <3	<0.1 <3								<0.1 <3	ug/l ug/l	TM15/PM10 TM15/PM10
Vinyl Chloride [#]	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1								<1	ug/l	TM15/PM10
Chloroethane [#]	<3	<3								<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)#	<3	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM) [#]	<5 <3	<5 <3								<5 <3	ug/l	TM15/PM10 TM15/PM10
trans-1-2-Dichloroethene [#]	<3 <3	<3 <3								<3	ug/l ug/l	TM15/PM10 TM15/PM10
cis-1-2-Dichloroethene [#]	<3	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1								<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2								<2	ug/l	TM15/PM10
Chloroform [#]	<2	<2								<2	ug/l	TM15/PM10
1,1,1-Trichloroethane [#]	<2	<2						150.		<2	ug/l	TM15/PM10
1,1-Dichloropropene [#] Carbon tetrachloride [#]	<3 <2	<3 <2					3	net		<3 <2	ug/l ug/l	TM15/PM10 TM15/PM10
1,2-Dichloroethane #	<2	<2					1. 40	Q.		<2	ug/l	TM15/PM10
Benzene [#]	< 0.5	<0.5					11, 31,			<0.5	ug/l	TM15/PM10
Trichloroethene (TCE)#	<3	<3				<u> </u>	X for			<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2				120 ji	a.			<2	ug/l	TM15/PM10
Dibromomethane [#]	<3	<3			4	Pur colo				<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2			otio	ner				<2	ug/l	TM15/PM10 TM15/PM10
cis-1-3-Dichloropropene Toluene [#]	<2 <5	<2 <5			- 50° 0	4				<2 <5	ug/l ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2			1 in oliv					<2	ug/l	TM15/PM10
1,1,2-Trichloroethane#	<2	<2		÷,	and the					<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) [#]	<3	<3		S	0,					<3	ug/l	TM15/PM10
1,3-Dichloropropane [#]	<2	<2		atto						<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2		0150						<2	ug/l	TM15/PM10
1,2-Dibromoethane [#] Chlorobenzene [#]	<2 <2	<2 <2	(р°						<2 <2	ug/l	TM15/PM10 TM15/PM10
Chlorobenzene " 1,1,1,2-Tetrachloroethane #	<2 <2	<2			at inspection opyright of					<2	ug/l ug/l	TM15/PM10 TM15/PM10
Ethylbenzene [#]	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2								<2	ug/l	TM15/PM10
o-Xylene [#]	<1	<1								<1	ug/l	TM15/PM10
Styrene #	<2	<2								<2	ug/l	TM15/PM10
Bromoform [#]	<2	<2								<2	ug/l	TM15/PM10
Isopropylbenzene [#] 1,1,2,2-Tetrachloroethane	<3 <4	<3 <4								<3 <4	ug/l ug/l	TM15/PM10 TM15/PM10
Bromobenzene [#]	<4	<4								<2	ug/l	TM15/PM10
1,2,3-Trichloropropane [#]	<3	<3								<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3								<3	ug/l	TM15/PM10
2-Chlorotoluene [#]	<3	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene [#]	<3	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3								<3	ug/l	TM15/PM10 TM15/PM10
tert-Butylbenzene [#] 1,2,4-Trimethylbenzene [#]	<3 <3	<3 <3								<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
sec-Butylbenzene [#]	<3	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene [#]	<3	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3								<3	ug/l	TM15/PM10
n-Butylbenzene [#]	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichlorobenzene [#]	<3	<3								<3	ug/l	TM15/PM10 TM15/PM10
1,2-Dibromo-3-chloropropane 1,2,4-Trichlorobenzene	<2 <3	<2 <3								<2 <3	ug/l ug/l	TM15/PM10 TM15/PM10
Hexachlorobutadiene	<3	<3								<3	ug/l	TM15/PM10
Naphthalene	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3								<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	111	108								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	109	106								<0	%	TM15/PM10

Client Name:Malone O'ReganReference:E1506

Location:

Contact: Thomas Vainio-Mattila

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
					No deviating sample report results for job 19/7496 & 19/7606 SW1 & SW2	
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					Consent of copying to the top of the type.	
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Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

19/7496 & 19/7606 SW1 & SW2 JE Job No.:

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is guoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation. S for

As surface waters require different sample preparation to groundwaters the additory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

FOI All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken so Cor

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BI ANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other guality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected Instrume AQC Sample offer Blank Sample offer Client Sample offer Trip Blank Sample offer Outside Calibration Range offer
BS	AQC Sample
LB	Blank Sample
Ν	Client Sample
ТВ	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x5 Dilution For prive
	Trip Blank Sample purperiod Outside Calibration Range cionner x2 Dilution insection x5 Dilution For protection

JE Job No: 19/7496 & 19/7606 SW1 & SW2

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refered PMT6/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10					
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM101 COR	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				

JE Job No: 19/7496

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM42	Modified US EPA method 8270. Pesticides and herbicides by GC-MS	PM301 COP	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	РМО	No preparation is required.	Yes			
TM58	AFTRA Standard wearous for the extraction of water and waster water (SWLWW) 32 105. Comparible with ISO 5815:1989. Measurement of Biochemical Oxygen Demand. When cBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as ammonia, nitrite and organic nitrogen which exert a nitrogenous demand. Determination of Dissolved Oxygen using the Hach	PM0	No preparation is required.				
TM58	HONOCONTRACT Methods for the extraction or water and waster water (SMEWW) 32105. Comparible with ISO 5815:1989. Measurement of Biochemical Oxygen Demand. When CBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as ammonia, nitrite and organic nitrogen which exert a nitrogenous demand. Determination of Dissolved Oxygen using the Hach MO20D Owners Metro.	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			

Method Code Appendix

JE Job No: 19/7496

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM72	Redox Potential is measured by HI98120 redox meter.	PM0	No preparation is required.				
ТМ73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
ТМ75	Modified US EPA method 310.1. Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
ТМ76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation, is required.	Yes			
ТМ89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required. No preparation is required. No preparation is required. Sho preparation is required.	Yes			
TM94	Derivatisation and extraction of Organotins. Analysis by GC-MS	PM481 COR	Samples are pretreated and derivatised. The derviatised organotins are then extracted using hexane.				
TM149	Determination of Pesticides by Large Volume Injection on GC Triple Quad MS, based upon USEPA method 8270	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.				
Subcontracted	See attached subcontractor report for accreditation status and provider.						





DETAILED IN SCOPE REG NO. 138

City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

Tel: (01) 613 6003 Fax: (01) 613 6008

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Customer

Kate Wiley Exova Environmental UK Ltd **Rosewell House** 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom

Certificate Of Analysis

Job Number:	19-55840
Issue Number:	1
Report Date:	15 May 2019

Site: Not Applicable **PO Number:** Not Supplied Date Samples Received: 08/05/2019

For inspection numposes only any other use. Please find attached the results for the samples received at our laboratory on 08/05/2019.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By:

Shane Reynolds Laboratory Manager Authorised Date: 15 May 2019

Notes:

Results relate only to the items tested. Information on methods of analysis and performance characteristics is available on request. Any opinions or interpretations indicated are outside the scope of our INAB accreditation. This test report shall not be reproduced except in full or with written approval of City Analysts Limited.

Template: 1146 Revision: 018





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Certificate Of Analysis

Customer Kate Wiley

Exova Environmental UK Ltd Rosewell House 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom Report Reference: 19-55840 Report Version: 1

Site:	Not Applicable		
Sample Description:	GW1	Date of Sampling:	08/05/2019
Sample Type:	Ground	Date Sample Received:	08/05/2019
Lab Reference Numb	er: 438036		

Site / Method Ref.	Analysis Start Date	Parameter	other Result	Units	PV Value (Drinking Water Only)
D/D1201#	08/05/2019	Coliforms	0 ¹¹ 10 ¹	MPN/100ml	-
D/D3221#	08/05/2019	Faecal Coliforms	48	cfu/100ml	-
		Consent of copyright owner rest			

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon





City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

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www.cityanalysts.ie

Certificate Of Analysis

Customer

Kate Wiley

Exova Environmental UK Ltd Rosewell House 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom

Report Reference:	19-55840
Report Version:	1

Site:	Not Applicable		
Sample Description:	GW2	Date of Sampling:	08/05/2019
Sample Type:	Ground	Date Sample Received:	08/05/2019
Lab Reference Numbe	or: 438037		

Site / Method Ref.	Analysis Start Date	Parameter	uting offer Result	Units	PV Value (Drinking Water Only)
D/D1201#	08/05/2019	Coliforms	238.2	MPN/100ml	-
D/D3221#	08/05/2019	Faecal Coliforms	< 1	cfu/100ml	-
		Consolt of copyright owner rear			

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Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon





City Analysts Limited, Pigeon House Road, Ringsend, Dublin 4.

Tel: (01) 613 6003 Fax: (01) 613 6008

Email: reports@cityanalysts.ie

www.cityanalysts.ie

Certificate Of Analysis

Customer Kate Wiley

Exova Environmental UK Ltd Rosewell House 2A (1F) Harvest Drive Newbridge, MidLothian Scotland EH28 8QJ United Kingdom Report Reference: 19-55840 Report Version: 1

Site:	Not Applicable		
Sample Description:	GW3	Date of Sampling:	08/05/2019
Sample Type:	Ground	Date Sample Received:	08/05/2019
Lab Reference Numbe	er: 438038		
·			

Site / Method Ref.	Analysis Start Date	Parameter	N: 07	Units	PV Value (Drinking Water Only)
D/D1201#	08/05/2019	Coliforms	79.8	MPN/100ml	-
D/D3221#	08/05/2019	Faecal Coliforms	1	cfu/100ml	-
		Consent of copyright owner rear			

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers. TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Page 4 of 4

APPENDIX H

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LABORATORY REPORT



4043

Contract Number: PSL19/2619

Report Date: 04 June 2019

Client's Reference: 19-0225A

Client Name: Causeway Geotech 8 Drumahiskey Road Ballymoney Co.Antrim BT53 7QL

For the attention of: Stephen Watson

Contract Title: Groundwater Monitoring Wells - K Leisure, Greenhills, Athy

Date Received:	26/4/2019
Date Commenced:	26/4/2019
Date Completed:	4/6/2019

Notes:

Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director) A Watkins (Director) R Berriman (Quality Manager)

81

S Royle (Laboratory Manager) S Eyre (Senior Technician) L Knight (Senior Technician)

Page 1 of

5 – 7 Hexthorpe Road, Hexthorpe, Doncaster DN4 0AR tel: +44 (0)844 815 6641 fax: +44 (0)844 815 6642 e-mail: rgunson@prosoils.co.uk awatkins@prosoils.co.uk

EPA Export 23-10-2020:06:37:57

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
GW04	1	U	0.00	0.45	Brown slightly sandy gravelly CLAY.
					the life.
					Contraction of the second seco
					Putposted Int
					Contraction of the second seco
					We we we we we we we we we we we we we we
					Forhigh
					S S S S S S S S S S S S S S S S S S S
					Consett
					Co.

			Contract No:
		Groundwater Monitoring Wells - K Leisure, Greenhills,	PSL19/2619
		Athy	Client Ref:
4043	Professional Soils Laboratory		19-0225A

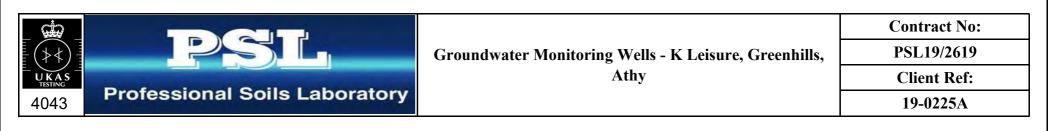
SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m ³ Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
GW04	1	U	0.00	0.45	13							
								other use				
								other of the				
							(()	only and				
							190 ⁵⁸⁵	dr				
							ection purper					
							Pectrowne.					
						-07						
						consent of e						
						COL						

SYMBOLS : NP : Non Plastic

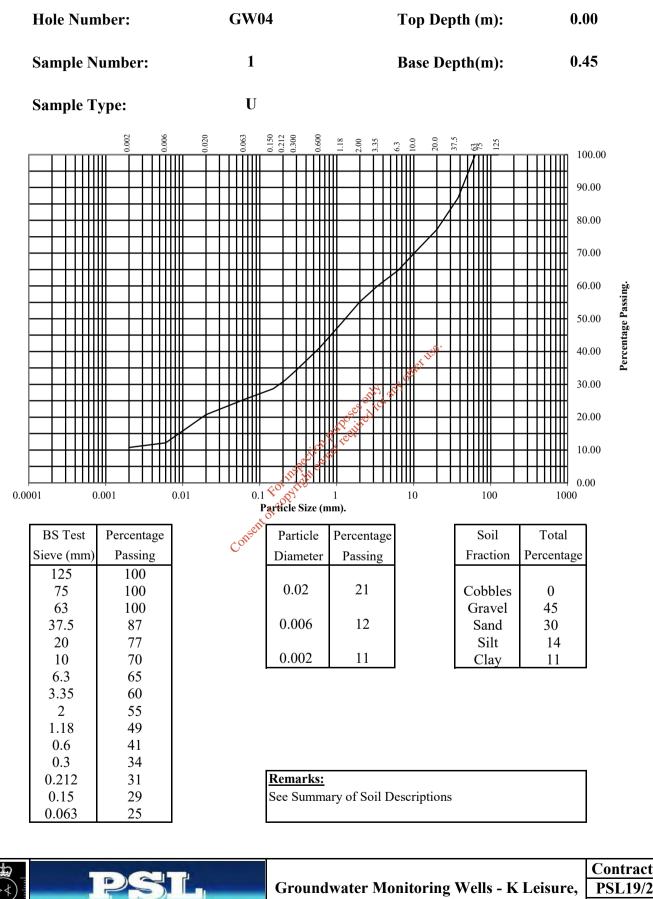
* : Liquid Limit and Plastic Limit Wet Sieved.



PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4





4043

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 : Part 6 : 1990: Clause 6

Hole Number:	GW04	Top Depth (m) :	0.00
Sample Number:	1	Base Depth (m) :	0.45
Sample Type:	U	Lift Number:	

Date

Grid Reference:

Description of Specimen				
See summary of soil descriptions.				
Remarks				
Remoulded to original density of U70 sample				

Initial Specimen Conditions				
Height	mm	102.00		
Diameter	mm the	101.50		
Area	mm ² the	8091.37		
Volume	23.COM	825.32		
Mass	s of for g	1734		
Dry Mass	g g	1530		
Bulk Density	Mg/m ³	2.10		
Dry Density	Mg/m ³	1.85		
Moisture Content	%	13		
Voids Ratio	-	0.429		
Specific Gravity	Mg/m ³	2.65		
(assumed/measured)	-	assumed		
ASCIE				

Final Specimen Conditions					
Moisture Content	%	16			
Bulk Density	Mg/m ³	2.15			
Dry Density	Mg/m ³	1.85			

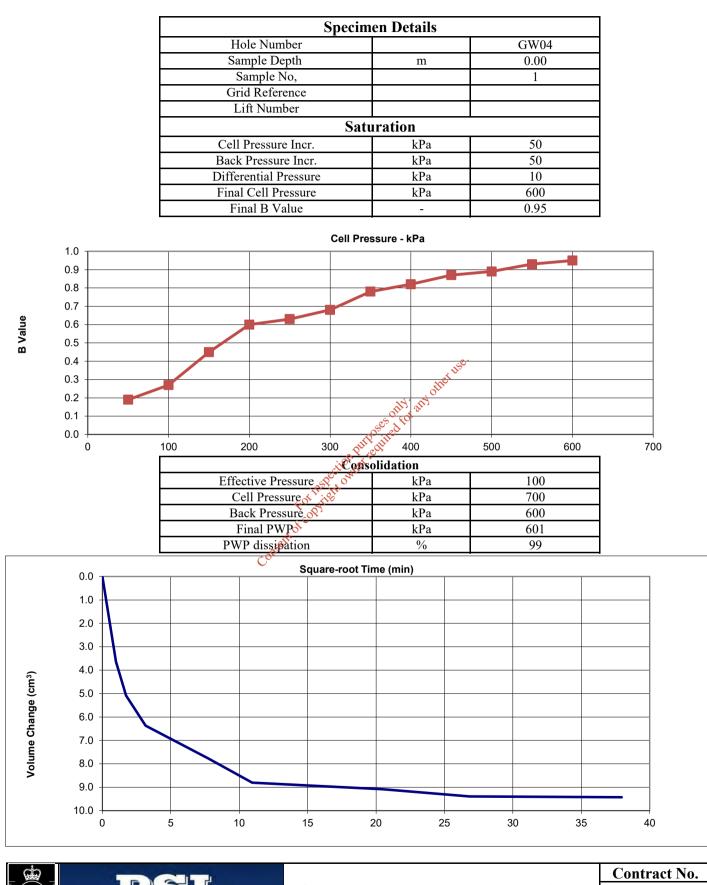
Test Setup					
Date Started		17/05/2019			
Date Finished		31/05/2019			
Top Drain Used		Y			
Base Drain Used		Y			
Method of Saturation		By back pressure			
Direction Of Flow		Vertically Downwards			
Saturation Time	Days	4			
Consolidation Time	Days	1			
Permeability Time	Days	1			



Groundwater Monitoring Wells-K Leisure,				
Greenhills, Athy				
-				

PERMEABILITY IN A TRIAXIAL CELL

BS 1377 : Part 6 : 1990 Clause 6



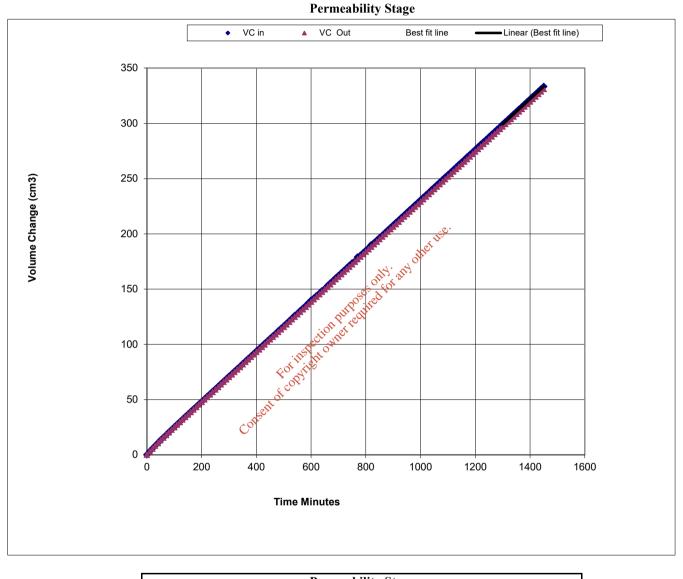


Groundwater Monitoring Wells-K Leisure, Greenhills, Athy Contract No. PSL19/2619 Client Ref 19-0225A

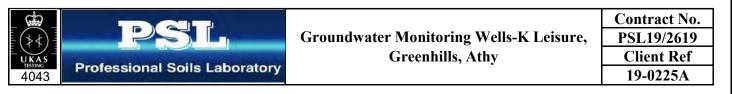
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 : Part 6 : 1990 Clause 6

Specimen Details		
Hole Number		GW04
Sample Depth	m	0.00
Sample No.		1
Grid Reference		
Lift Number		



Permeability Stage					
Cell Pressure kPa 700					
Mean Effective Stress	kPa	100			
Back Pressure Diff.	kPa	20			
Mean Rate of Flow	ml/min	0.2281			
Average Temperature	'C	22			
Vertical Permeability Kv	m/s	2.3E-08			



APPENDIX I

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October 2019



Appropriate Assessment Stage 1 Screening Report

Site at Greenhills

Kildare County Council Athy, Co. Kildare



EPA Export 23-10-2020:06:37:57

Form ES - 04



Ground Floor – Unit 3 **Bracken Business Park** Bracken Road, Sandyford Dublin 18, D18 V32Y Tel: +353-1-567 76 55 Email: enviro@mores.ie

Title: Appropriate Assessment Stage 1 Screening Report, Site at Greenhills, Kildare County Council, Athy, Co. Kildare

Job Number: E1506

Prepared By: Amelia Keane

oure Signed: OC

Revision Record

Checked	I By: Kath	ryn Broderick	Sig	gned:	Brode	reick
Approved By: Dyfrig Hubble		ig Hubble	Sig	gned:		
Revisi	on Reco	cot inspect	on purposed for owned required for			
lssue No.	Date	Description	Remark	Prepared	Checked	Approved
01	18/11/19	AA Screening Report	FINAL	AK	KB	DH

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MOR has prepared this report for the sole use of our client (as named on the front of the report) in accordance with the Client's instructions using all reasonable skill and competence and generally accepted consultancy principles. The report was prepared in accordance with the budget and terms of reference agreed with the Client and does not in any way constitute advice to any third party who is able to access it by any means. MOR excludes to the fullest extent lawfully permitted all liability whatsoever for any costs, liabilities or losses arising as a result of or reliance upon the contents of this report by any person or legal entity (other than the Client in accordance with the terms of reference). MOR has not verified any documents or information supplied by third parties and referred to herein in compiling this document and no warranty is provided as part of this document. No part of this report may be copied or reproduced without express written confirmation from MOR. Any methodology contained in this report is provided to the Client in confidence and must not be disclosed or copied to third parties without the prior written agreement of MOR. Disclosure of such information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Third parties who obtains access to this report by any means, including disclosure by the Client, will be subject to the Copyright and Third-Party Disclaimer contained herein.

Appropriate Assessment Stage 1 Screening Report Site at Greenhills Kildare County Council Athy, Co. Kildare

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1 INTRODUCTION

1.1 Background

This Appropriate Assessment Screening Report has been prepared by Malone O'Regan Environmental (MOR) on behalf of Kildare County Council (KCC) to assess the potential impacts, if any, of imported fill materials that had been deposited at a location in the legacy landfill at Greenhills, Co. Kildare (the Site), (OS Ref: S 67956 94425), on nearby sites with European conservation designations (i.e. Natura 2000 sites).

The location of the Site is shown in Figure 1-1.

In 2019 MOR undertook an Environmental Risk Assessment, which included Tier 1 Risk Screening and preliminary conceptual site model, Tier 2 Site Investigations and Testing, Tier 3 Refinement of Conceptual Site Model (CSM) and Quantitative Risk Assessment (QRA), for the Site on behalf of KCC for submission to the Environmental Protection Agency (EPA). The aim of the assessment was to assess if the imported materials deposited within the Site cause an adverse impact to the groundwater, the surface water and the receiving environment within and adjacent to the Site.

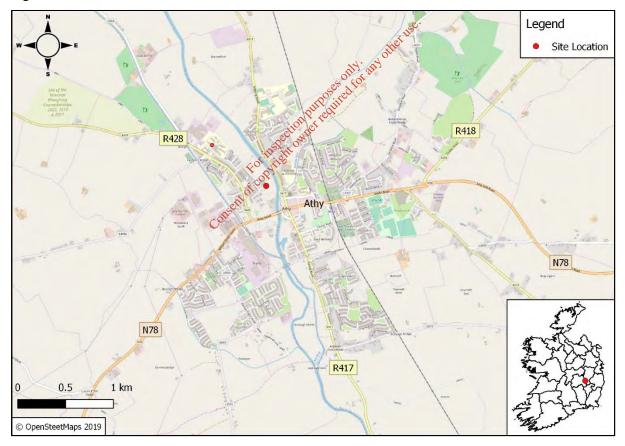


Figure 1-1: Site Location

The purpose of this assessment was to determine the appropriateness, or otherwise, of the Site in the context of the conservation objectives of European conservation designations (i.e. Natura 2000 sites).

This report also considers the need and or appropriateness, or otherwise, of the recommendations in the Environmental Risk Assessment in the context of the conservation objectives of the Natura 2000 sites.

1.2 Regulatory Context

This Appropriate Assessment Screening Report was prepared in compliance with the following legislation:

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as 'The Habitats Directive' which provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000 sites. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC as amended 2009/149/EC)) (better known as 'The Birds Directive').

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (now termed Natura Impact Statement):

"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First, the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage, and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the AA process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6(4) of the Habitats Directive, then compensation measures are required for any remaining adverse effects.

1.3 Stages of Appropriate Assessment

This Appropriate Assessment Screening Report has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC 2001) and the European Commission Guidance 'Managing Natura 2000 Sites.' The Guidance for Planning Authorities published by the Department of Environment, Heritage and Local Government (DOEHLG, December 2009) was also adhered to.

There are four distinct stages to undertaking an AA as outlined in current EU and DOEHLG guidance:

- 1. Appropriate Assessment Screening;
- 2. Appropriate Assessment;
- 3. Assessment of Alternatives in cases where significant impact cannot be prevented; and,
- 4. Where no alternatives exist, an Assessment of Compensatory Issues in the case of projects or plans which can be considered to be necessary for Imperative Reasons of Overriding Public Interest (IROPI).

This Report comprises a Stage 1 Screening Report, which seeks to determine whether the subject site will, on its own or in combination with other plans / projects, have a significant effect on Natura 2000 sites within a defined radius of the subject site.

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2 SCREENING FOR APPROPRIATE ASSESSMENT

Screening determines whether Appropriate Assessment is necessary by examining:

- 1. Whether a plan or project can be excluded from AA requirements because it is directly connected with, or necessary to, the management of a Natura 2000 site; and,
- 2. Whether the project will have a potentially significant effect on a Natura 2000 site, either alone or in combination with other projects or plans, in view of the site's conservation objectives.

Screening involves the following:

- i) Description of a plan or project;
- ii) Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives;
- iii) Assessment of likely effects direct, indirect and cumulative undertaken on the basis of available information as a desk study or field survey or primary research as necessary; and,
- iv) Screening Statement with conclusions.

2.1 Desk Based Studies

A desk-based review of information sources was completed, which included the following sources of information:

- The National Parks and Wildlife Service (NPWS) website was consulted with regard to the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment (National Parks and Wildlife Service, 2019);
- The National Biodiversity Data Centre website was consulted with regard to species distributions (National Biodiversity Data Centre, 2019);
- The EPA Envision website was consulted to obtain details about watercourses in the vicinity of the Site (http://gis.epa.ie/Envision/) (EPA, 2019); and,
- The EPA Catchments website was also consulted to obtain details about watercourses in the vicinity of the Site (https://www.catchments.ie/maps/) (EPA Catchments, 2019).

3 DESCRIPTION OF THE PROJECT

3.1 Site Context and Description

The Site is located in the centre of Athy town, County Kildare, along the national road N78, within the Townlands of Athy and Townparks (Narragh and Reban West By) refer to Figure 1-1. The area of the Site is approximately 4.09ha and is currently occupied by a public amenity building (leisure centre), which is surrounded by green areas.

There are a number of residential properties along the western boundary of the Site, the closest one at ca.15m. A shopping centre and visitor's car park adjoins the south-eastern boundary of the Site. The River Barrow adjoins the eastern boundary of the Site, followed by a school and a number of residential properties. A green field with a number of football pitches are located to the north of the Site.

A trial well drilled in 1899, a public supply well (KCC) drilled in 2001 and an infiltration gallery (public supply (Co. Co.) drilled in 1899 are located ca.25m, 28m and 45m respectively north of the Site. Another public supply well (KCC) drilled in 1977 is located ca.252m north / north-west of the Site.

There are two watercourses of note within the vicinity of the Site; the River Barrow and the Athy Stream, both located within the Barrow_SC_070 sub-catchment. The river barrow is the closest hydrological feature, located directly adjacent to the eastern boundary of the Site and flows in a southerly direction.

The Athy Stream is a tributary of the River Barrow and is located ca.40m east of the Site, where it drains into the River Barrow. Watercourses in the vicinity of the Site are presented in Figure 3-1.

The water quality and risk of the section of the River Barrow adjacent to the Site is 'unassigned' (EPA Catchments, 2019). However, ca 3km north of the Site, the water quality status of the River Barrow is 'good' and is considered 'not at risk,' and ca.1.5km to the south, water quality status of the River Barrow is 'moderate' and is considered 'at risk' (EPA Catchments, 2019). Similarly, the water quality and risk of the Athy Stream, which drains into the River Barrow 40m east of the Site, is also considered 'unassigned' (EPA Catchments, 2019).

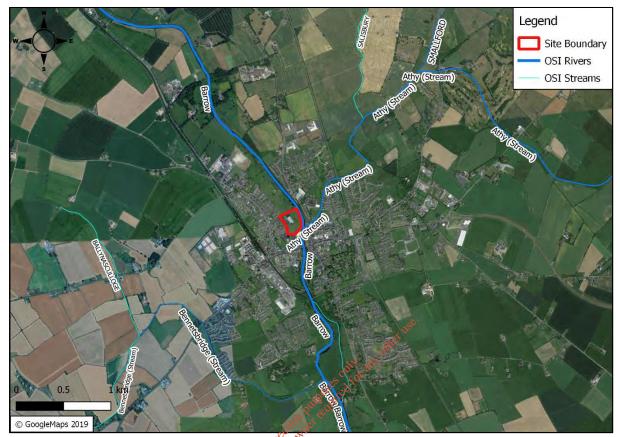


Figure 3-1: Watercourses in the vicinity of the Site

3.2 Description of the Environmental Risk Assessment

MOR was appointed by KCC to undertake an Environmental Risk Assessment based on an exploratory site investigation of Greenhills, Co. Kildare, in accordance with the EPA's published Code of Practice: *Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007)* published in December 2008, hereafter referred to as the 'CoP' (where applicable).

As part of the Environmental Risk Assessment there is a requirement to complete an AA to determine potential impacts, if any, of the Greenhills Site, on nearby Natura 2000 sites. The report also considers the need and or appropriateness, or otherwise, of the recommendations made in the Environmental Risk Assessment in the context of the conservation objectives of the Natura 2000 sites.

Before the site investigations began, a geophysical survey and a topographical survey were conducted to assess subsurface and surface conditions of the Site. Once site conditions were established, trial pits, leachate and gas boreholes and groundwater boreholes were installed. All of the monitoring / sampling locations were situated more than 20m away from the River Barrow's edge in amenity grassland with a flat topography (See Figure 3-1). Therefore, these site assessment works had no impact to the River Barrow.

3.3 Trial Pit Excavations

Trial pitting excavations at five locations were carried out on the 16th of January 2019 to characterise the imported fill materials (Figure 3-2, TP1 to TP5). The objective of the trial pitting was to assess the lateral extent and composition of the imported material. In this regard any visual or olfactory evidence of contamination was recorded including photographic evidence. A MOR environmental consultant was on site during all of the trial pit excavations.

The excavation of the trial pits to a maximum depth of approximately 4.4mbgl was undertaken using a 13-tonne tracked excavator. Each trial pit was logged in accordance with the BS 5930:2015 standards. Locations for the trial pits were selected based on initial discussions with KCC, findings of the desk-based studies, the site walkover and the results of the geophysical survey. Each trial pit was re-instated to as close to its original condition as possible. There were two different recorded profiles at the Site:

- Profile 1 Trial pits along the River Barrow (TP1, TP2 and TP3); and,
- Profile 2 Trial pits located on the raised areas along the eastern and southern parts of the leisure centre (TP4 and TP5).

3.4 Leachate and Gas Boreholes

A shell and auger rig was mobilised to the Site from the 3rd to the 8th of January 2019 to install shallow leachate/gas boreholes (Figure 3-2, L1 to L3). The three combined leachate and gas monitoring wells were installed within the imported material to depths ranging between 2.5 to 6.7mbgl. During the installation works the MOR consultant noted any field evidence of contamination throughout the soil/lithological profile to ensure that a conduit was not provided to the underlying aquifer.

3.5 Groundwater Boreholes

Three groundwater monitoring wells were installed between the 4th to the 9th of April 2019 to a maximum depth of 14.4mbgl using an air rotary drill rig (Figure 3-2, GW1 to GW3). The wells were installed in order to characterise groundwater quality upgradient and downgradient of the imported fill materials.



Figure 3-2: Sampling Pit Locations

3.6 Findings of the Environmental Risk Assessment

The Environmental Risk Assessment concluded the following:

• Overall the Environmental Risk Assessment completed in 2019, concluded that the Site has been well characterised. This assumption was based on the different investigations undertaken at the Site between January to April 2019.

Based on the evaluation of all available data in accordance with recognised best practice criteria, the following was concluded:

- According to KCC's files the Site was used as a refuse depot from approximately 1st January 1980 to 31st December 1985;
- The Site is located within a sensitive receiving environment due to the proximity of key
 receptors including the River Barrow and River Nore SAC adjacent to the Site (eastern
 boundary) and the high-extreme vulnerability rating assigned based on the Source of
 Inner Protection (SI) within the Site. It is noted that the GSI mapping assigned a
 moderate vulnerability rating;
- The hydrogeological setting of the Site comprises a regionally important sand and gravel aquifer underlain by the Milford Formation which is a regionally important karstified bedrock aquifer;
- Groundwater flow direction in the underlying aquifering interpreted to be generally to the east / north-east towards the River Barrow;
- The preliminary CSM identified the source associated with the Site;
 - The imported material underneat the Site.

The potential pathways were identified as follows;

• Shallow Sand and Gravel aquifer, bedrock aquifer and subsoils.

The key environmental receptors were identified as follows;

- The groundwater (sand & gravel and bedrock aquifers) beneath the Site, the surface water (River Barrow), residential properties in the vicinity of the Site and a number of public water supply wells and ecologically protected sites within the 10km radius.
- In general, the imported material comprises clay, gravelly clay and sandy clay with rare C&D material with a thickness of c. 0.0-6.7mbgl, which overlies a natural clay / sand and gravel layer. According to the geophysical survey, municipal waste with minor organic material mixed with C&D material and clay were also identified on site. The bedrock was interpreted as weathered limestone over competent limestone bedrock;
- The capping material encountered during the site investigations was identified as brown gravelly clay/brown clay with a thickness of 0.5 to 1.1m. According to the geotechnical results the capping material was classified as brown slightly sandy gravelly clay with a permeability of 2.3x10⁻⁸ m/s. The low permeability of the capping material overlying the imported material would impede rainfall infiltration and therefore reduce the generation of leachate;
- The soil laboratory results of three (3 No.) of the trial pits did not record any exceedances in any of the parameters analysed. There was a visually identification only of asbestos fibres at TP4 and TP5, which were further quantified at concentrations <0.001%, confirming that the imported material present on site, with the current use of the Site, poses a low risk of contamination to the underlying strata (natural ground);

- The leachate results confirm that there were some exceedances of some of the parameters analysed. However, due to the natural layer (clay) beneath the Site and the fact that the groundwater and surface water results did not report exceedances on that parameters, it was concluded that the leachate would not pose a risk to any identified receptors;
- The groundwater results confirm that the imported material has not negatively impacted upon the underlying aquifer. There were elevated concentrations of coliforms detected in groundwater but these are highly unlikely to be from the imported material as microbiological pathogens (i.e. coliforms) can only survive up to 400 days in groundwater, and therefore, are unlikely to survive the 35 to 40 years since the imported material was deposited;
- The surface water results confirm that the imported materials have not negatively impacted upon the River Barrow, the risk to surface water is therefore considered to be low;
- This assessment did not identify any impacts from the imported materials on the ecological receptors on-site or within the surrounding vicinity;
- Elevated Methane (CH₄) was detected at leachate/gas locations L1 and L3. Methane was not detected at groundwater monitoring locations external to the imported materials GW1 to GW3 during any sampling event. Given the very low flow concentrations of methane and the surface VOC monitoring survey measured within and outside the Site, the detected gas concentrations are not considered to represent a risk to any identified receptors (on and off-site);
- In strict accordance with this Code of Riactice and taking cognisance of the intrusive site investigation and the updated conceptual site model, the site would be classified as a Moderate risk site. However, during the data assessment, it was concluded that the pathways to the receptors were broken and therefore the pollutant linkages no longer exist; and,
- According to the Environmental Risk Assessment carried out for the Site, it is concluded that the imported materials have not resulted in any impacts on the identified human receptors or environmental receptors.

3.7 Environmental Risk Assessment Recommendations

The Environmental Risk Assessment considers that the Site has been well characterised at this juncture given the comprehensive investigations undertaken. Based on the evaluation of the current data set in accordance with recognised best practice criteria, it is considered that there is enough evidence to conclude that the unregulated historic landfill does not present a potential environmental risk to underlying aquifer or potential receptors and therefore, in strict accordance with the CoP, no further actions are required.

4 IDENTIFICATION OF NATURA 2000 SITES

In accordance with the European Commission Methodological Guidance (European Commission, 2002) a list of European sites that can be potentially affected by the Historic Landfill has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government (DoEHLG, 2009) states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely effects of the project. The key variables determining whether or not a particular Natura 2000 site is likely to be negatively affected by a project are: the physical distance from the project to the site; the sensitivities of the ecological receptors; and, the potential for in-combination effects. Adopting the precautionary principle, all Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) sites within a 10km radius of the Site have been considered.

Two Natura 2000 designated sites were identified within 10km of the Site (Table 4-1, Figure 4-1).

Site Name	Site Code	Distance (km)	Direction
Special Areas of Conservation		x 1150.	
River Barrow and River Nore SAC	002162	-	-
Ballyprior Grassland SAC	002256	9.4	W

Table 4-1: Natura 2000 Designated Sites within 10km of the Site

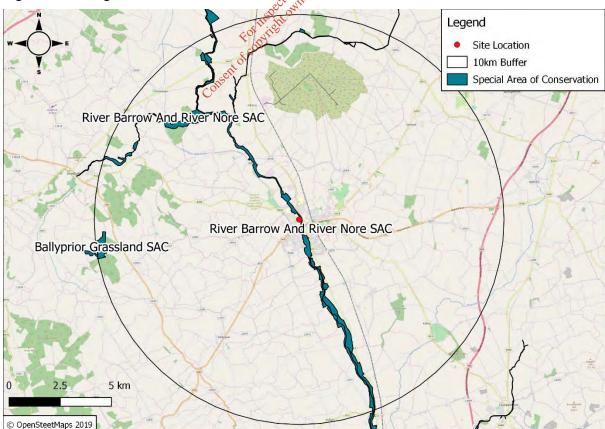


Figure 4-1: Designated Sites located further within 10km of Site Location

Given the distances separating the Site to the Ballyprior Grassland SAC (>9km) and the lack of hydraulic connectivity (Refer to Section 3.1 and Figure 3-1) and absence of impact pathways, it is considered highly unlikely that the Site would have any direct or indirect effects on Ballyprior Grassland SAC or their designated features of interest. As a result, Ballyprior Grassland SAC has been screened out and will not be considered further as part of this assessment.

However, the Site is located within the River Barrow and River Nore SAC, which flows in a southerly direction directly through the eastern boundary of the Site (see Figure 4-2). Therefore, the River Barrow and River Nore SAC was screened in for further assessment.



Figure 4-2: Site boundary overlap with River Barrow and River Nore SAC

4.1 River Barrow and River Nore SAC (Site Code 002162)

The River Barrow and River Nore SAC consists of the freshwater stretches of the Barrow and Nore River catchments extending from the Slieve Bloom Mountains to the estuary and tidal elements in Creadan Head, Waterford.

Species rich habitats (Annex I of the EU Habitats Directive) including estuaries, alluvial forests, petrifying springs, and intertidal mudflats and sandflats can be found within this SAC (see Table 4-2).

This SAC is of considerable conservation significance for multiple reasons:

- Ornithological importance: This SAC supports Kingfisher, a nationally important bird population listed in Annex I of the EU Birds Directive. One SPA (River Nore), designated under the EU Birds Directive, is also located within the SAC; and,
- This SAC supports multiple species listed on Annex II of the EU Habitats Directive, including Otter, River Lamprey and Salmon (see Table 4-3).

October 2019

Land use within the SAC is primarily agricultural, principally grazing and silage production. Fishing is also a main tourist attraction along stretches of the main rivers and their tributaries. Other recreational activities such as boating, golfing and walking also occur within the SAC. The main threats to the SAC and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and sewage plants, along with over-grazing, invasion of non-native species and land reclamation (NPWS, 2011).

Qualifying Habitats (*denotes Priority Habitat)	Code	Site Specific Conservation Objective
Estuaries	1130	Maintain favourable conservation condition
Mudflats and Sandflats not covered by seawater at low tide	1140	Maintain favourable conservation condition
Salicornia and other annuals colonizing mud and sand	1310	Maintain favourable conservation condition
Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	1330	Restore favourable conservation condition
Mediterranean salt meadows (Juncetlaia maritimi)	1410 1410	Restore favourable conservation condition
Ranunculion fluitantis and Callitricho - Batrachion	3260	Maintain favourable conservation condition
European dry heaths	4030	Maintain favourable conservation condition
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430	Maintain favourable conservation condition
Petrifying springs with tufa formation (Cratoneurion)*	7220	Maintain favourable conservation condition
Old sessile oak woods with <i>llex</i> and <i>Blechnum</i> in the British Isles	91A0	Restore favourable conservation condition
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicioncalbae)*	91E0	Restore favourable conservation condition

Table 4-2: Qualifying	Annex I Habitats	for the River Barrow	and River Nore SAC

Table 4-3: Qualifying Annex II Species for the River Barrow and River Nore SAC

Qualifying Species	Species Name	Code
Mammals listed on Annex II of the Habitats Directive	Otter <i>(Lutra lutra)</i>	1355
Molluscs listed on Annex II of the Habitats Directive	Freshwater pearl mussel (<i>Margaritifera margaritifera</i>)	1029

Species Name	Code
Nore Freshwater pearl mussel (<i>Margaritifera durrovensis</i>)	1990
Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>)	1016
White-clawed crayfish (<i>Austropotamobis pallipes</i>)	1092
Salmon (<i>Salmo salar</i>)	1106
Sea Lamprey (Petromyzon marinus)	1095
Brook Lamprey (Lampetra planeri)	1096
River Lamprey (Lampetra fluviatilis)	1099
Twaite Shad (Alosa fallax)	1103
Killarney Fern (<i>Trichomanes</i> speciosum)	1421
	Nore Freshwater pearl mussel (Margaritifera durrovensis)Desmoulin's whorl snail (Vertigo moulinsiana)White-clawed crayfish (Austropotamobis pallipes)Salmon (Salmo salar)Sea Lamprey (Petromyzon marinus)Brook Lamprey (Lampetra planeri)River Lamprey (Lampetra fluviatilis)Twaite Shad (Alosa fallax)Killarney Fern (Trichomanes

4.2 Conservation Objectives

only any European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status areas designated as candidate Special Areas of Conservation. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the EU Habitats Directives favourable conservation status of a habitat is achieved ofcor when:

- Its natural range, and area it covers within that range, is stable or increasing; •
- The specific structure and functions which are necessary for its long-term maintenance • exist and are likely to continue to exist for the foreseeable future; and,
- The conservation status of its typical species is favourable as defined below. ٠

The favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself;
- The natural range of the species is neither being reduced or likely to be reduced for the foreseeable future; and,
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The full report for the conservation objectives for the River Barrow and River Nore SAC¹ can be found on the NPWS website.

¹ https://www.npws.ie/sites/default/files/protected-sites/conservation objectives/CO002162.pdf

5 IDENTIFICATION AND ASSESSMENT OF POTENTIAL IMPACTS

Only features that have the potential to cause adverse effects on the conservation objectives of the identified Natura 2000 sites were considered. A number of factors were examined at this stage and dismissed due to the very low risk associated with them. The key area of potential concern is in relation to potential adverse effects on the SAC are from the impairment of water quality resulting from the landfill site.

5.1 Potential Impairment of Water Quality

In accordance with the EPA CoP risk prioritisation calculations prepared as part of the Environmental Risk Assessment, the Site has been classified as Class B - MODERATE risk. However, the Environmental Risk Assessment did not identify any significant levels of emissions of pollutions to either groundwater or surface water from the site.

The water quality at the sampling points in the River Barrow located above and below the Site remained unchanged. There was no significant change in any of the parameters measured at these locations. It can therefore be stated that in its current state of the historic landfill at the Site is not contributing to a detrition in water quality within the River Barrow. In the absence of any impact on the water quality within this waterbody, it can also be stated that the historic landfill is not currently causing any loss or disturbance as a result of emissions from the site to either habitats or species for which the Natura 2000 sites are designated.

5.2 Analysis of 'In-Combination' Effects

The Habitats Directive requires competent authorities to undertake an appropriate assessment of any plan or project which is likely to have a significant effect alone or incombination with other plans and projects.

The assessment has considered the possibility for impacts on River Barrow and River Nore SAC. While it can be objectively demonstrated that the historic landfill and the proposed recommendations will not have any adverse effects, direct or indirect, on the conservation objectives of these designated European sites, such as the Scowland Water Treatment Plant, agricultural practices, industrial practices, residential properties, transport infrastructure and commercial and leisure activities occurring along the River Barrow have the potential to affect the conservation objectives of the River Barrow and River Nore SAC.

The conclusions of this assessment are that the historic landfill site in its current state will not, either alone or in combination with other activities and project, will not have any adverse effects on the River Barrow and River Nore SAC.

6 SCREENING CONCLUSIONS AND STATEMENT

The screening process has examined the information available for the historic landfill site and the findings of the Risk Assessment report for the site and considered the potential for the site to cause impacts on Natura 2000 sites and qualifying features of interest within a 10km radius of the Site located at Greenhills, Athy, Co Kildare.

Taking into consideration the findings of the Risk Assessment, it has been concluded that that the historic landfill is currently not resulting in the direct loss or disturbance of any Annex I habitats or Annex II species for which the SAC is designated. Furthermore, it is considered that the implementation of further monitoring works at the site will also not have any significant impact on the SAC. The proposed monitoring of surface water and groundwater at the site will also provide an early indication to any changes at the site that could potential result in impacts to designated sites.

Taking into account all of the matters discussed, it can be concluded that the historic landfill site or the proposed monitoring works, alone or in-combination with other projects, will not adversely affect the integrity and conservation status of any of the Natura 2000 sites of their qualifying features of interest.

Accordingly, progression to Stage 2 of the Appropriate Assessment process (i.e. preparation of a Natura Impact Statement) is not considered necessary as this stage.

Should the findings of the further monitoring identify any harmful impacts from the Site or the need for the implantation of remediation works be identified, then further consideration to potential impacts on Natura 2000 sites will be required and the AA will require updating to determine potential impacts.

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