





TIER 2 SITE INVESTIGATION & TIER 3 GENERIC QUANTITATIVE RISK ASSESSMENT

OF THE TULLY OF GHEEN LANDFILL

VOLUME II - APPENDICES

9TH July 2014

DOCUMENT ISSUE STATUS

REPORT ISSUE	REFERENCE NO.	DATE	
FINAL	206-01	09/07/14	
TITLE	NAME	SIGNATURE	DATE
AUTHOR	David Gilfedder	David Gilfeddan	12/06/14
PROJECT MANAGER	Padraic Mulroy	Padraic Uneray	09/07/14
CLIENT	Tom Dunworth, Galway C.C.		

LIST OF APPENDICES

APP. NO.	DESCRIPTION
1	 Walkover Survey Checklist (carried out original in 2014 and repeated in 2019) Table A1.1. Results of S-P-R Linkage Prioritisation Former Landfill At Tullyvogheen, Clifden, County Galway (By Mulroy Environmental) Details Of S-P-R Linkage Prioritisation On Former Landfill At Tullyvogheen, Clifden, County Galway (By Mulroy Environmental) Tier 1 Study/Tier 2 Indicative Work Programme & Costing, Comhairle Chontae Na Gaillimhe, Tullyvogheen Landfill, Clifden, County Galway, 16th June, 2010. & Preliminary Conceptual Site Model (Galway C.C.) EPA COP Matrix 1 - Guidance for Preliminary & Exploratory Investigations for All Unregulated Waste Disposal Sites – Green Block Indicates Completed (annotated for SI Rationale) EPA COP Matrix 2 – Guidance for Main Site Investigation for Moderate Risk (Class B = 40% to 69%) and High Risk (Class A > 70%) for Unregulated Waste Disposal Sites - Green Block Indicates Completed (annotated for SI Rationale)
2	Tier 2 Site Investigation & Risk Assessment of Former Tullyvogheen Landfill - Appropriate Assessment Screening Report
3	EPA/Teagasc Soil Mapping & EPA/Teagasc Subsoil Mapping
4	GSI Bedrock Mapping GSI H. J.
5	 GSI Hydrogeological Mapping & Clifden Castlebar GWB Report EPA Coastal Water Mapping & Surface Water Mapping
6	WFD Catch Mapping
7	Trialpit Logs
	Borehole Logs
8	Groundwater Well Field Monitoring Logs
9	 Surface Water Field Monitoring Logs Raw Validated Laboratory Analysis Reports from Chemtest Ltd. for Soil, Surface Water & Groundwater Raw Validated Laboratory Analysis Reports from CLS Laboratories for Surface Water Analysis
10	 Table A10.1. Results of Volatile Organic Compound Laboratory Analysis on Surface Water and Groundwater Samples taken from Surface Water Bodies and Groundwater Monitoring Wells at Former Landfill, at Tullyvogheen Table A10.2. Results of Semi-volatile Organic Compound Laboratory Analysis on Surface Water and Groundwater Samples taken from Surface Water Bodies and Groundwater Monitoring Wells at Former Landfill at Tullyvogheen Table A10.3. Results of MTBE/BTEX and PAH Analysis on Groundwater and Leachate Samples taken from Groundwater Monitoring Wells and Piezometers at Tullyvogheen, Clifden, County Galway Table A10.4 Results of MTBE/BTEX and PAH Analysis on Surface Water Samples taken at Tullyvogheen, Clifden, County Galway Table A10.5. Results of Organo-Phosphorous Pesticide Laboratory Analyses on Surface Water, Groundwater and Leachate Samples taken from Groundwater Monitoring Wells and Piezometers at Tullyvogheen, Clifden, County Galway Table A10.6. Results of Chlorinated Pesticide & Acid Herbicide Laboratory Analyses on Surface Water, Groundwater and Leachate Samples taken from Groundwater Monitoring Wells and Piezometers at Tullyvogheen Table A10.7. Ion Balance Analysis on Groundwater, Leachate and Surface Water Samples taken at Tullyvogheen, Clifden, County Galway Results of Laboratory Analyses carried out by EPA on Surface Water Samples taken at Tullyvogheen in 2012



APPENDIX 1

WALKOVER SURVEY CHECKLIST (CARRIED OUT ORIGINALLY IN 2014 & REPEATED IN 2019)

TABLE A1.1. RESULTS OF S-P-R LINKAGE PRIORTISATION ON FORMER LANDFILL AT TULLYVOGHEEN, CLIFDEN, COUNTY GALWAY (BY MULROY ENVIRONMENTAL)

DETAILS OF S-P-R LINKAGE PRIORTISATION ON FORMER LANDFILL AT TULLYVOGHEEN, CLIFDEN, COUNTY GALWAY (BY MULROY ENVIRONMENTAL)

TIER 1 STUDY/TIER 2 INDICATIVE WORK PROGRAMME & COSTING, COMHAIRLE CHONTAE NA GAILLIMHE, TULLYVOGHEEN LANDFILL, CAIFDEN, COUNTY GALWAY, 16TH JUNE, 2010 (BY GALWAY C.C.)

EPA CODE OF PRACTICE MATRIX 1 - PRELIMINARY & EXPLORATORY
INVESTIGATIONS FOR ALL UNREGULATED
WASTE DISPOSAL SITES
- GREEN BLOCK INDICATES COMPLETED
(ANNOTATED FOR SI RATIONALE)

EPA CODE OF PRACTICE MATRIX 2 - GUIDANCE FOR MAIN SITE INVESTIGATION REQUIREMENTS FOR MODERATE RISK (CLASS B = 40% TO 69%) AND HIGH RISK (CLASS A > 70%) FOR UNREGULATED WASTE DISPOSAL SITES - GREEN BLOCK INDICATES COMPLETED (ANNOTATED FOR SI RATIONALE)



Walkover Survey Checklist (carried out originally in 2014 and repeated in September, 2019) Part A

Information	Checked	Comment (include distances from site boundary)
1. What us current Land Use?	YES	Road Depot (bitumen, gravel storage and parking of plant) and formerly used for Galway C.C. Fire Brigade Training Services
2. What are the neighbouring Land Uses?	YES	Landfill is located in a valley with a mountain to the south and hills to the north, most surrounding land upland bog, reclaimed agricultural land to south which is used for sheep pastureland. Significant Coillte forestry plantation to east of site and public water reservoir Lough Nambrackeagh to NW
3. What is the size of the Site?	YES	1.27 Hectares
4. What is the topography?	YES	Landfill is located in a valley with a mountain to the south and hills to the north, most surrounding land upland bog. Stream flowing through the middle and lowest part of the site has been culverted with waste placed on top. The landfill was formerly covered by upland peat soil and was significantly raised
5. Are there potential receptors (if yes, give details)?	YES	ARS ARS
Houses	YESOTIOT OF	Nearest residential area is 415m southwest of the site. Significant distance from site.
Surface Water Features (if yes, distance and direction of flow)	on Purply Pitte Switch to YES	There is a culverted stream going through the landfill before continuing in southwesterly direction towards the Owenglen River located 735m away.
Any wetland or protected rheas	YES	The Twelve Bens/Garaun Complex (SAC-002031) is located 612m south of the site The Owenglen River passes through this complex.
Public Water Supplies	YES	Yes, the lake Lough Nambrackeagh supplies Clifden with potable water and is located 350m northwest of the site. However, this is hydraulically separated and upgradient of the site.
Private Wells	YES	Yes located approximately 415m south of the site at residence/farm. No GSI record available. No information provided by owner/farmer. Access requested from farmer but rejected
Services	YES	No
Other Buildings	YES	No
Other	YES	No

Walkover Survey Checklist (carried out originally in 2014 and repeated in September, 2019) Part B

Information	Checked	Comment (include distances from site boundary
6. Are there any potential sources of contamination (if yes, give details)?	YES	Yes. The waste within the site is 21-36 years old and has lost a lot of its potency by leaching chronically into the underlying stream. It is likely that leachate from the waste body is still being generated. This is likely to still be migrating into the culverted stream which passes through the site. However, the potency of the waste has dissipated significantly as evidence by recent hydrological survey.
Surface Waste (if yes, what type?)	YES	No. All of the waste is covered by a clay/peat cap.
Surface ponding of leachate	YES	Yes. Some evidence of iron mottling to the east and upgradient of the culvert opening on the western boundary of the site indicates influence of leachate.
Leachate seepage	YES ONY. AFOR A	Yes, Some iron mottling at mouth of culvert at western boundary of the site. However, hydrological survey in 2019 showed that the stream has not been severely impacted and has significantly improved since 2014.
Leachate seepage Landfill gas odouge. Land	on purpo on purpo on purpo on purpo yes	No. Putrescible waste was not identified during trialpit investigation. Age of waste indicates that it is likely to be in Phase V Ultimate Phase with no more methane/biogases being produced (see Section 10 & Chart 1 of Tier 2 Site Investigation & Tier 3 GQRA Assessment of Tullyvogheen Landfill Report). No landfill gas odours experienced on site in 2019 or complaints received by neighbours.
7. Are there any outfalls to surface water? (If yes, are there any discharges and what is the nature of the discharge?)	YES	Yes. There is a culverted stream going through the landfill from east to west, emerges to the west of the landfill before continuing in south-westerly direction towards the Owenglen River located 735m away.

Walkover Survey Checklist (carried out originally in 2014 and repeated in September, 2019) Part C

Information	Checked	Comment (include distances from site boundary)
Are there any signs of impact on the environment? (If yes, take photographic evidence)	YES	Yes. The surface water body has been impacted but has shown significant improvement since 2014 in the 2019 survey (see Section 8 and Appendix 8. Surface Water Field Monitoring Logs of <i>Tier 2 Site Investigation & Tier 3 GQRA Assessment of Tullyvogheen Landfill Report</i>)
Vegetation die off, bare ground	YES	No evidence of methane effects on vegetation on site.
Leachate seepages	YES	Yes. Some surface water ponding and iron mottling on area immediately to the east of the outfall.
Odours	YES	No. Site is capped and waste is 21-36 years old.
Litter	YES	No. Site has been entireley capped.
Gas bubbling through water	YES	No
Signs of settlement, subsidence, waterlogged areas	YES	No No
Drainage or hydraulic issues	YESONY OF THE PROPERTY OF THE	Yes Some surface water ponding and iron mottling on area immediately to the east of the outfall. Area is dominated by upland peat and would be expected to demonstrate water logging
Downstream water quality appears poorer than upstream water quality	ON PUT LEGIT	Yes. Surface water body has been impacted by the landfill but has improved significantly from the monitoring round carried out in 2014 and the round carried out in 2019
Are there any indications of remedial measures? (Provide details)	YES	Yes.
Capping	YES	An approximate 300mm layer of capping (peaty clay) was placed over the entire landfill area.
Landfill gas collection	YES	No. Size of waste body and location of the landfill in a very remote rural area indicated that this was not required.
Leachate collection	YES	No. Given waste was placed on ground surface, leachate collection to prevent entry into underlying culverted stream was not feasible
10. Describe fences and security features (if any)	YES	Area is surrounded by 1.5m high stock and some palisade fencing. Site is secure with no history of fly tipping
Any other relevant information?		No

64 Environmental Protection Agency

Table A1.1. Results of S-P-R Linkage Priortisation on Former Landfill at Tullyvogheen, Clifden, County Galway

	SOURCE			PATHWAYS					RECEP	TORS		
LEACHATE	LANDFILL GAS	GROUNDWATER VULNERABILITY (VERTICAL)		SURFACE WATER DRAINAGE	LANDFILL GAS LATERAL MIGRATION	LANDFILL GAS VERTICAL MIGRATION	LEACHATE - HUMAN PRESENCE	LEACHATE - PROTECTED AREAS	LEACHATE - AQUIFER CLASS	LEACHATE - PUBLIC WATER	LEACHATE - SURFACE WATER	LANDFILL GAS - HUMAN PRESENCE
1A	1B	2A	2B	2C	2D	2E	3A	3B	3C	3D	3E	3F
7	7	3	1	2	0	0	1	1	1	0	3	0.5

Source Pathway Receptor	Formula	Score	% Score	Linkages
SPR 1	1a * (2a + 2b + 2c) * 3e	126	42.0	Leachate to SW
SPR 2	1a * (2a + 2b + 2c) * 3b	42	14.0	Leachate to GWDTE
SPR 3	1a * (2a + 2b) * 3a	28	11.7	Leachate to Private Well
SPR 4	1a * (2a + 2b) * 3b	28	11.7	Leachate to GWDTE
SPR 5	1a * (2a + 2b) * 3c	28	7.0	Leachate to aquifer
SPR 6	1a * (2a + 2b) * 3d	0	0.0	Leachate to PWS
SPR 7	1a * (2a + 2b) * 3e	84	35.0	Leachate to SW
SPR 8	1a *2c*3e	42	70.0	Leachate to SW
SPR 9	1a *2c*3b	14	23.3	Leachate to GWDTE
SPR 10	1b *2d*3f	0	0.0	Landfill gas - humans
SPR 11	1b *2e*3f	0	0.0	Landfill gas - humans
HIGHEST INI	DIVIDUAL SCORE	42	70.0	Leachate to SW 🔊

es a for t	
No house within 250n	n so not assessed
No house directly on t	op of waste body.

Risk Classification	Range of Risk Scores
Highest Risk (Class A)	Greater than or equal to 70% for any individual SPR linkage
Moderate Risk (Class B)	Between 40 to 70% for any individual SPR linkage
Lowest Risk (Class C)	Less than or equal to 40% for any individual SPR linkage

Table 1a: Leachate: Source/Hazard Scoring Matrix

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

²⁰Table 1b: Landfill Gas: Source/Hazard Scoring Matrix

	V	WASTE FOOTPRINT (ha)				
WASTE TYPE	≤ 1 ha	$> 1 \le 5 \text{ has}$	> 5 ha			
C&D 20	0.5	0.75 et	1			
Municipal 21	5	77. 12 0.	10			
Industrial 22	3	35 of for \$5	7			
Pre-1977 sites 23	0.5	100 ited 0.75	1			
MAX 10						

²³ Pre 1977 wastes would have been substantially degraded within the landfill.



Page 1 of 5

²⁰ Predominantly inert waste with low biodegradable fraction and/or small industrial waste fraction.

 $^{{}^{21}\}textit{Typically non-hazardous domestic waste (highly biodegradable) with potentially small hazardous waste}$

fraction and/or small industrial waste fraction, e.g. town dump.

²² 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.

Table 2a: Leachate Migration: Pathways

Parameters	Points available
GROUNDWATER VULNERABILITY	
(Vertical pathway)	
Extreme Vulnerability	3
High Vulnerability	2
Moderate Vulnerability	1
Low Vulnerability	0.5
High – Low Vulnerability	2

Table 2b: Leachate Migration: Pathways

Parameters	Points available
GROUNDWATER FLOW REGIME (Horizontal pathway)	
Karstified Groundwater Bodies (Rk) 25	15°5
Productive Fissured Bedrock Groundwater Bodies (Rf and Lm) ²⁵	oy other 3
Gravel Groundwater Bodies (Rg and Lg) 25 golfot	2
Poorly Productive Bedrock Groundwater Bodiese (Ll, Pl, Pu) 25	1

; off ext	
Table 2c: Leachate Migration: Pathways	
Parameters	Points available
SURFACE WATER DRAINAGE 26	
(surface water pathway)	
Is there a direct connection between drainage ditches	
associated with the waste body and adjacent surface	2
water body? Yes	
If no direct connection	0

 $^{^{25}\ \}textit{Refer to DEHLG/EPA/GSI 1999, Groundwater Protection Schemes}.$



Table 2d: Landfill Gas: Pathway 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

^{*} Assigned a score of 0 - Residence approx. 400m to the south of site

Table 2e: Landfill Gas: Pathway Assuming Receptor Located Above Source

Parameters	Points available
LANDFILL GAS VERTICAL (UPWARDS) MIGRATION POTENTIAL	ather use.
Sand and Gravel, Made ground, urban, karst	5
Bedrock ²	3
All other Tills (including limestone, sandstone et a moderate permeability) ²	2
All Namurian or Irish Sea Tills (low permeability)	1
Clay, Alluvium, Peatre	1

^{*} Assigned a score of 0 - Residence approx. 400m to the south of site.



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 1 km of the waste body	0

^{*} Residence approx. 415m to the south of site

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 waste body	1
Greater than 1 km of the waste body	0
Undesignated sites ²⁴ within 50m of site of the waste body	1
Undesignated sites ²⁴ greater than 50m but less than 250m of the waste body	0.5
Undesignated sites ²⁴ greater than 250m of the waste body	0

^{*} SAC 002031 The Twelve Bens/Garraun Complex

Table 3c: Leachate Migration: Receptors

Parameters	Points available
AQUIFER CATEGORY 26 (resource potential)	
Regionally Important Aquifers (Rk, Rf, Rg)	5
Locally Important Aquifers (Ll, Lm, Lg)	3
Poor Aquifers (Pl, Pu)	1

²⁶ 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.



²⁴ The term 'Undesignated sites' refers to wetland sites that are not designated under the Habitats or Birds Directive or Wildlife Act but are considered to the important on a local scale. Consultation with NPWS is required to identify such sites.

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	5
(SI) for GW supplies	
Greater than 300m but less than 1km or within Outer SPA	3
(SO) for GW supplies	
Greater than 1km (karst aquifer)	3
Greater than 1km (no karst aquifer)	0

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	ي. 0

Table 3f: Landfill Gas: Receptor

Parameters purpose at the 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



Code of Practice Environmental Risk Assessment for Unregulated Waste Disposal Sites

Tier 1 Study

Tier 2 Indicative Work Programme and Costing

Comhairle Chontae na Gaillimhe

Landfill Site Site Reference:

Tullyvoheen, Clifden

5/G

OVERALL RISK RATING	High

Contents

1.	Site Description and Assessment	3
2.	Conceptual Site Model	5
3.	Source – Pathway – Receptor Scores	7
4.	Tier 2 Work Programme and Costs	8
5.	Site Photographs and Maps	10

Report prepared by:

Máire Ní Chionna, BE, MSc DIC, CEng MIEI Senior Engineer, Galway County Council

Consent of copyright owner required for any other use. Tom Dunworth, Senior Executive Technician Environment Section, Galway County Council

1. Site Description and Assessment

Source

The municipal landfill at Tullyvoheen, Clifden has an area of 1.14 Ha. The landfill operated from 1984 to 1999. During this period a maximum of 23,000 tonnes per annum may have been deposited. The site area is 1.14 ha and the total waste body is estimated at 114,000 m3 or 205,000 tonnes.

The site is located on a byroad uphill from the Clifden to Galway road approximately 2 km east of the town.

The landfill is situated on a comparatively flat area where a valley widens out into upland bog. The stream running through the valley is piped through the landfill. Although some of the landfill maybe located on peat, it is presumed that a substantial amount is in direct contact with the bedrock.

Pathway

The geology of the area consists of schists and quartizites, with the maps indicating that the site is underlain by psammitic schists. The aquifer value about maps indicate bedrock at surface for the western part of the site (where the stream exits) and extreme (less than 3 meters to bedrock) for the remainder of the site.

The principle pathway for leachate migration is along the bedrock surface, to emerge at the downstream western side of the site.

Receptors

The piped stream emerges at the west face of the landfill (see Photo E)

Surface water monitoring:

Since 2008 the EPA have been monitoring the surface water in the stream which flows underneath the landfill. This stream is a tributary of the Owenglin river. Samples are taken from the stream at 3 locations – upstream of the river (SW1), immediately downstream of the landfill (SW2) and further downstream before the stream reaches the Owenglin river (SW3).

2. Conceptual Site model

3. Source – Pathway - Receptor Scores

SPR	Maximum Score	SPR Value	Linkages	Normalised Score
1	$10 \times (3+5+2) \times 3 = 300$	$7 \times (3+1+2) \times 3 = 126$	leachate – s/water	42%
2	$10 \times (3+5+2) \times 3 = 300$	$7 \times (3+1+2) \times 0 = 0$	leachate - GWDTE	0%
3	$10 \times (3+5) \times 3 = 240$	$7 \times (3+1) \times 0 = 0$	leachate – private wells	0%
4	$10 \times (3+5) \times 3 = 240$	$7 \times (3+1) \times 0 = 0$	leachate - GWDTE	0%
5	$10 \times (3+5) \times 5 = 400$	$7 \times (3+1) \times 1 = 28$	leachate – aquifer	7%
6	$10 \times (3+5) \times 7 = 560$	$7 \times (3+1) \times 3 = 84$	leachate - PWS	15%
7	$10 \times (3+5) \times 3 = 240$	$7 \times (3+1) \times 3 = 84$	leachate – s/water	35%
8	$10 \times 2 \times 3 = 60$	$7 \times 2 \times 3 = 42$	leachate – %/water	70%
9	$10 \times 2 \times 3 = 60$	$7 \times 2 \times 0 = 0$ $7 \times 2 \times 0 = 20$	leachate - GWDTE	0%
10	$10 \times 3 \times 5 = 150$	TX ZX 0.5 - 59 160	landfill gas - humans	5%
11	10 x 5 x 5 = 250	7 x 3 x 0.5 ≥ 10.5	landfill gas - humans	4%

Risk Classification	Range of Risk Scores
Highest Risk (Class A)	Greater than or equal to 70% for any individual SPR linkage
Moderate Risk (Class B)	Between 40-70% for any individual SPR linkage
Lowest Risk (Class C)	Less than or equal to 40% for any individual SPR linkage

OVERALL RISK RATING	HICH

4. Tier 2 Exploratory Investigations & Sampling

The principle aim of the Tier 2 study is to confirm the quality of waste present and the nature and size of hazardous waste, if any. The Work Programme consists of gathering further information with a view of making a decision on what is to be done with the site.

Work Programme:

- Excavating a number of trial pits will be required, taking photographs and making detail logs of the pits.
- Place 2 casings in pits and backfill, cap casings. (gas monitoring)
- Use handheld gas detectors and physical observations to assess gas presence.
- Take samples of waste and soil and have them analysed.
- Take surface water samples upstream and downstream of the waste body and have them analysed.
- Take leachate samples (if any)
- Carry out topographic and ecological survey
- Identify previous studies carried out and assess information provided from those studies. Consult with hydrogeologist.

• Write up interpretive report.

Exploratory Investigation & Sampling Costs	€
Exploratory Investigation & Sampling Costs Trial Pits & Trenches 1 day Waste Assessment 1 day Waste Sampling Say 6 samples @ £75 per sample Leachate Sampling Say 2-4 samples @ £475 per sample Soil Sampling / Waste Sampling Say 10 samples @ £300 per sample	1,000
1 day	,
Waste Assessment georging	700
1 day	
Waste Sampling	1,650
Say 6 samples @ €275 per sample	
Leachate Sampling	1,900
Say 2-4 samples @ €475 per sample	
Soil Sampling / Waste Sampling	3,000
Say 10 samples @ €300 per sample	
Surface Water Sampling	600
Say 2 sample @ €300 per sample	
Groundwater sampling	1,800
Say 6 sample from bottom of pits @ €300 per sample	
Topographic Survey	1,500
Site Supervision and field sampling	2,100
Say 3 days @ €700 per day	
Reporting	1,750
Total	€16,000



(A) Access Road to Landfill site.



(B) Entrance to Landfill



(C) Typical Ground cover



(D)



(E) View of the piped stream as it emerges at the west face of the landfill

Preliminary Conceptual Site Model

A conceptual site model is a means of understanding the manner in which a system for contaminated land/waste body and the surrounding environment is likely to interact.

A well-defined conceptual site model should be used as a basis for all the subsequent risk assessments. It should be used to identify all possible sources (S), pathways (P) and receptors (R) as well as the processes that are likely to occur along each of the source pathway receptor S-P-R linkages and uncertainties.

Source

The municipal landfill at Tullyvoheen, Clifden has an area of 1.14 Ha. The landfill operated from 1984 to 1999. During this period a maximum of 23,000 tonnes per annum may have been deposited. The site area is 1.14 ha and the total waste body is estimated at 114,000 m³ or 205,000 tonnes.

The site is located on a country road uphill from the Clifden to Galway road approximately 2km east of the town. The landfill is situated on a comparatively flat area where a valley widens out into upland bog. The stream running through the valley is piped through the landfill. Although some of the landfill maybe located on peat, it is presumed that a substantial amount is in direct contact with the bedrock.

Pathway

The geology of the area consists of schists and quartizites with the maps indicating that the site is underlain by psammitic schists. The aquifer vulnerability maps indicate bedrock at surface for the western part of the site (where the stream exits) and extreme (less than 3 meters to bedrock) for the remainder of the site. The principle pathway for leachate migration is along the bedrock surface, to emerge at the downstream western side of the site.

Receptor

A culverted stream emerges at the west face of the landfill which leads into the Owenglen River. There are also residents nearby and the groundwater aquifer could be considered a receptor.

The SPR linkages for the Tullyvogheen Landfill can be identified as:

- 1. Migration of leachate to the culverted stream passing through the site;
- 2. Migration of leachate to the underlying aquifer;
- 3. Migration of contaminated surface water from the stream passing through the site to nearby Owenglen River and the SAC; and
- 4. Migration of groundwater contaminated with leachate to off-site private groundwater abstraction wells.

				TIER 1	: PRELIMINARY INVESTIG	GATION		TIER 2: EXPLORATORY INVESTIGATION & SAMPLING								
ALL SITES AN WHICH WILL PHASE OF A MODEL (CSM) OF SITE INVE	OTE: THIS INITIAL PHASE D SHOULD AIM TO COMPI BE CONFIRMED BY THE ASSESSMENT WILL DEVE) AND SHOULD GUIDE THI STIGATION (SI). THE APP		ı													
THE RELE		IPLETED IN ACCORDANCE WITH UIDANCE DOCUMENTS AND CED PRACTITIONERS.	NCE DOCUMENTS AND		WALKOVER SURVEY	MODEL (CSM)		TRIAL PITS & TRENCHES	WASTE TYPE	WASTE SAMPLING	ASTE SAMPLING LEACHATE SAMPLING		Surface or Groundwater Sampling	T Topographic & GPS SURVEY		
SPR LINKAGE	SOURCE	PATHWAY	RECEPTOR	Critical mandatory element of the SI process - includes gathering baseline site and local area data, history of landfill, waste types, volumes, ase, presence and distance to potential receptors, etc	Very important element of the SI process. Confirms physical conditions on site, desk study findinas and examines access issues, visual assessment of pathways/receptors allows initial SPR linkaae potential.	The development of the CSM is a critical aspect of the risk assessment and defining SPR linkaaes and therefore SI requirements	PE EXPLORATORY INVESTIGATION	JCB or tracked excavator - waste type assessment & classification - leachate/gas potential, limited depth, good bulk samples & visual assessment. Allows for sampling and possibly temporary standpipes (not best practice). Accurate logs and photoaraphs important. Where cap exists plan for full re-instatement and on site material manaaement.	Assessment of waste type in terms of content and determining composition of C&D, Municipal, Industrial, Pre 1977 sites. Should confirm reported waste types deposited as identified in Tier 1.	Waste Sampling, typically of contaminated soil matrix that waste is contained in. Dry soils analysis to assess the potential impact on human health and to enable leachability testing if risk of leachate emanating from waste exists.	Liquid samples of leachate recovered for List 1 & List 2 substances contamination - Parameters to be considered as per Table C.2 of EPA Landfill Monitorina Manual 2003.	Principle purpose of soil sampling at this staae is to assess permeability potential of surroundina materials (pathway assessment), composition of any cap and potential for local material to be used for remediation/capping. In some cases contamination assessment may be required.	Any obvious receptors should be considered for initial indicator parameter screening. Surface waters and/or existing boreholes can be sampled at this staae. Gas monitoring with hand held equipment can be completed. Parameters to be considered as per Table C.2 of EPA Landfill Monitoring Manual 2003. No new boreholes are proposed at this staae.	Topoaraphic survey of landfill area and immediate surrounds will enable assessment of waste extent & area calculations, location of sampling points, surface drains/features. Topoaraphic data & Well datum for flow direction mapping. GPS system will determine grid ref for SI works. Could be important for remediation/capping design.		
PR 1	LEACHATE	Vertical & Horizontal Groundwater to Surface Water Drainaae/Runoff	Surface Water Body	М	М	М	SCOP	М	М	R	R	R	R/S	R/S		
SPR 2	LEACHATE	Vertical & Horizontal Groundwater to Surface Water Drainaae/Runoff	Surface Water Body Protected Area (SWDTE)	М	М	М	∞ర	м	м	R	R	R	R/S	R/S		
SPR 3	LEACHATE	Vertical & Horizontal Groundwater Miaration	Human Presence (Private Well)	М	М	М	ATION	М	М	R	R	R	R/S	R/S		
PR 4	LEACHATE	Vertical & Horizontal Groundwater Miaration Vertical & Horizontal Groundwater	Groundwater Protected area (GWDTE)	М	М	М	SIFICA.	М	M	R	R	R	R/S	R/S		
SPR 5	LEACHATE	Miaration	Aquifer Cateaory	М	М	М	ဟ	М	After 12 M	R	R	R	R/S	R/S		
PR 6	LEACHATE	Miaration	Public Supply (Well) (includes Group Water Schemes)	М	М	М	CLA	M 37. 20	N M	R	R	R	R/S	R/S		
PR 7	LEACHATE	Vertical & Horizontal Groundwater Miaration	Surface Water Body	М	М	М	RISK	as ad for a	М	R	R	R	R/S	R/S		
PR 8	LEACHATE LEACHATE	Surface Water Drainage/Runoff Surface Water Drainage/Runoff	Surface Water Body Surface Water Body Protected Area	M M	M M	M M	ш	OUT COLIN	M	R R	R R	R R	R/S R/S	R/S R/S		
PR 10	LANDFILL GAS	Lateral Miaration (Subsoil)	(SWDTE) Human Presence	M	M	M	NIM	A Se am	M	R	R	R	R/S	R/S		
PR 11	LANDFILL GAS	Vertical Miaration (Subsoil)	Human Presence	M	M	М	STER.	М М	М	R	R	R	R/S	R/S		
ource & Pathw	ray & Receptor Parameters	. Targeted for CSM & Risk Screeni	ing	Research of all available published site information - Site history, waste type, extent and volumes, possible historic sources, local receptors, infrastructure etc. Interviews with previous site staff should be considered.	Walkover should confirm desk study data and investigate Source Pathway Receptor scenarios being considered.	The CSM should graphically represent the relationship's between the waste body and potential receptor's developed on the basis of hazard identification and refined during subsequent phases of assessment.	IAL SITE MODEL, B	gas source & migration	Waste type, general composition and extent within the landfill area, leachate and gas source & miaration potential.	waste type, dry soils quality and leachate potential	Waste type, leachate concentrations and leachate potential	Ground vulnerability, horizontal or vertical pathway assessment & material use in remediation of site.	Surface water or groundwater receptor and potential horizontal pathway information.	Waste area & volume estimate using trial pit data, site topoaraphy, layout/setting, access roads, surface features, accurate SI points, levels for groundwater flow direction, etc		
General comments & COP Section Reference - Note: the development of the CSM and design of the site investigation should involve an experienced SI practitioner.				Critical first step in site and waste characterisation, all potential data sources should be considered. Note Section 3.2 of COP	Allows visual assessment of site and local environs, important that walkover confirms findings of desk study and allows accurate CSM to be developed. Note Section 3.4 of COP	This is a fundamental part of the Risk Assessment exercise - the CSM information should be clearly documented and accessible in the form of text, fiaures and tables. Note section 3 of COP and reporting requirements in Chapter 8.	ESTIGATION, DEVELOP CONCEPTUAL	Trial pits and trenching is a very important phase of work to enable the potential sources and types of leachate & gas to be determined. Detailed logs and photographic records important. Note Section 5.5.2 of COP.	Characterises waste type and contamination potential. Note Section 4.3.1 of COP & Table 1a & Table 1b of Scoring Matrix.	Characterises waste type, age and contamination potential. Note Section 4.3.1 of COP & Table 1 a & Table 1b of Scoring Matrix. Dry soils analysis for comparison and screening asainst accepted Target Screening Values (TSVs) such as the UK CLEA model and compared to parameters in EPA Landfill Desian Document 2000 - Sections 7.1 & 7.2	Characterises waste type, age and contamination potential, samples can be acquired during trial pitting or from existing borehole infrastructure, if present. Leachate characteristics can be compared to parameters in EPA Landfill Desian Document 2000 -Sections 7.1 & 7.2	Characterises geology type, material strength and permeability	Full suites should be completed at least once. Should be completed as per best practice and relevant auidelines. Refer to COP 5.2.2 and EPA Landfill Monitorina Guidelines, 2nd Edition 2003, especially Sections 4 and 5.	Topographic surveys give base map for site layout, investigation points, sample and water level depths, aroundwater flow direction etc. recommended.		
		g/Sampling - This will ultimately o aste, ground conditions, variabili	depend on the type of risk identified, ty of the waste material, etc	Office based assessment using all available existing site data that is vital in assessing the initial risk level and conceptual model for the site. Sites may have GIS data available. Note: Section E of EPA Certificate of Authorisation requires ecological Appropriate Assessment Habitat Screening to be completed for waste sites so any designated protection areas should be identified at this staae.	Locations and access issues for sampling and site suitability should be assessed at this stage. Presence of potential sensitive ecological habitats requiring Appropriate Assessment Screening to be noted.	A good conceptual site model will facilitate an initial risk classification for the site and guide future works.	AFTER TIER 1 INVESTI	Typically 7 to 10 trial pits are completed to 3 to 5m per day. Dependina on size of site one to two days of trial pitting should be undertaken on and around the waste body to confirm extent and composition. Initial gas monitorina can be by hand held aas and volatile monitors & based on physical observations. Further Trial Pits & Trenching can be completed as part of the Main St if required and boreholes may be necessary to achieve greater depths.	logged as per BS	Leachability testing of waste should be completed to allow comparison to the European Waste Acceptance Criteria (WAC) analysis, as per the BS 12457 testina standard. A minimum of two samples should be acquired for the test for the trial pit phase of work. Results should be used as a preliminary screening tool to assess the potential level of contamination that the historical waste may pose. Levels of total contamination were low and leachate generation and testing was not justified.	Will depend on nature and composition of the waste and number of investigation points. Initially one to three samples should be taken with one full screen as per Table C.2 of EPA Landfill Monitorina Manual 2003, and at other locations to do indicator parameters such as pH Conductivity, Temp, BOD, Ammonia, Chloride, Sulphate, Sodium and Potassium.	Will depend on nature and variability of soil material around waste body and number of investiaation points. Initially three disturbed samples should be taken and assessed for soil type, particle size analysis, and if possible permeability and strength, refer to BS 5930 standard.	Adjacent or nearest accessible down gradient locations should be considered for exploratory sampling. Survey of springs if required. Basic indicator parameters such as pH, Conductivity, Temp. BOD, Ammonia, Chloride, Sulphate, Sodium and Potassium should be completed as a minimum. All surface water bodies/drains/streams/dit ches should be considered, as per Water Framework Directive.	A topoaraphical survey should be considered for the site area and immediate environs of low risk sites and is recommended for all moderate and high risk sites. GPS survey locations as required.		

M = Mandatory and should be completed as thoroughly as possible for each site. R = Recommended technique assuming site conditions allow. S = Should be considered but is dependent on site suitability for that methodology.

MATRIX 2 - GUIDANCE FOR MAIN SITE INVESTIGATION REQUIREMENTS FOR MODERATE RISK (CLASS B = 40% TO 69%) AND HIGH RISK (CLASS A > 70%) FOR UNREGULATED WASTE DISPOSAL SITES GREEN BLOCK INDICATES COMPLETED TIER 2: MAIN INVESTIGATION TIER 2: MAIN INVESTIGATION TIER 2 PROBE AND/OR BOREHOLE SAMPLING TIER 2 SPECIALIST SURVEYS

SITE INVESTIGATION	` '				TIE	R 2: MAIN I	NVESTIGATION				TIER 2 PROBE AI	ND/OR BOREHOL	E SAMPLING		TIER 2 S	PECIALIST SUF	RVEYS
COMPLETED TIER 1 I PHASE OF INVESTIGAT	TON WILL DEVE-C	OP THE CONC^TU	AL SITE MODE. (CSM)	The selec	tion of site in	vestigation te	chniques should be	focused on what SPI	R Linkage is bei	ng examined & tl	ne site/ground cond	itions - in some cas	es a combination of te	echniques may be requir	ed and/or additional to	rial pitting conside	ered necessary
AND SHOULD GUIDE T ULTIMATELY THE REN PROCESS AND METHO WITH THE RE.EVAN' UNDERTA	MEDIATION . THE ADDOLOGIES SHOUT GUIDANCE DOC	APPLICATION OF TUBBLE OF THE SECONDARY	THE INVESTIGATION ED IN ACCORDANCE ANDARDS AND BE	SHALLOW PROBES/HAN D AUGERS	GEOPHYSICS / INFRA RED SURVEYS	WINDOW SAMPLING	CABLE PERCUSSION BORING	AIR ROTARY OPEN OR CORED HOLE	GAS SAMPLING	LEACHATE SAMPLING	SOIL SAMPLING	SURFACE WATER SAMPLING	GROUNDWATER SAMPLING	PUMPING TEST	ECOLOGICAL SURVEYS	SURFACE WATER SURVEYS	ODOUR/DUST or ASBESTOS SURVEYS
SPR LINKAGE	SOURCE	PATHWAY	RECEPTOR	Manual cr mechanical installation of temporary probes for gas monitoring to typically 2m BGL & use of landfill gas analyser and/or PID to determine concentrations - may give limited soil profile and strength information.	Range of techniques for waste extent, depth, plumes & anomalies; can be influenced by power cables, unsuitable ground conditions, poor interpretation. Needs ground proofing.	Competitor/terrier rig shallow soil sampling, permeability testing & stancpipe installation for GW monitoring & gas taps: Ground conditions can limit	Also called Shell & Auger (S&A) drilling - deeper soil sampling, permeability testing & standpipe installation for GW monitoring & gas taps. The need for both shallow and deep monitoring boreholes should be considered. Can be limited by boulders/ obstructions. No bedrock penetration.	sampling & standpipe installation for GW monitoring permeability testing & gas taps. Very limited subsoil or waste sampling. The need for both shallow and deep	Field gas meters primarily used, more specific Gas Sampling using bags Gresham Tubes can be completed where relevant, etc.	Sampling liquid from boreholes in waste area giving data on List 1 & List 2 scbstances contamination - Parameters to be considered as per Table C.2 of EPA Landfill Monitoring Manual 2003.	Soil sampling to assess permeability potential of surrounding materials (leachate or gas pathway assessment). Further soil for contamination/leachate potential assessment may be required. Also soil assessment potential for local material to be used for remediation/capping. Detailed borehole logs with well installation information should be completed.	List 1 & List 2 scbstances contamination assessment in SW & seepage locations. Sampling applied for scriace water abstractions from shallow dug wells and scriace water socroes, (SPR 6). Parameters to be considered as per Table C. 2 of EPA Landfill Monitoring Manual 2003.	List 1 & List 2 substances contamination assessment GW flow direction. Parameters to be considered as per Table C.2 of EPA Landfill Monitoring Manual 2003.	Enables improved GW sampling for List 1 & List 2 substances contamination assessment, relevant water standards & GW flow regime & direction to be assessed. (Pumping well depth will vary - Involvement of lydrogeologist or groundwater specialist recommended for this element of work, e.g. well locations, well design, depth and guidance on pumping test).	Habitat Directive (Appropriate Assessment Screening) Statement required, (as per Article 6(3) of Habitat Directive (92/43/EEC), other serveys include surface water Q Rating, or site specific surveys for sites with potential ecological significance - surveys should be risk specific and undertaken in the right season under the right conditions.	water levels, flow rates, assimilative capacity, hycCrcloay studies	Cnly required if odours, dust and asbestos are identified as potential problem during Tier 1 and Tier 2 works
SPR 1	LEACHATE	Vertical & Horizontal Groundwater to Surface Water Drainaae/Runoff	Surface Water Body	N	S	R/S	R/S	R/S	N	R	R	R	R/S	s	S	R	N
SPR 2	LEACHATE	Vertical & Horizontal Groundwater to Surface Water Drainaae/Runoff	Surface Water Body Protected Area (SWDTE)	N	s	R/S	R/S	R/S	N siff	oses only in any of	ref li ^{ge.} R	R	R/S	s	R	R	N
SPR 3	LEACHATE	Vertical & Horizontal Groundwater Miaration	Human Presence (Private Well)	N	S	N	R/S	R/S	inspection at its owner.	s	S	N	R	s	N	N	N
SPR 4	LEACHATE	Vertical & Horizontal Groundwater Migration	Groundwater Protected area (GWDTE)	N	Ø	N	R/S	R/S of C	N N	s	s	s	R	s	R	N	N
SPR 5	LEACHATE	Vertical & Horizontal Groundwater Migration	Aauifer Category	N	s	N	s	R	N	R	R	N	R	R/S	N	N	N
SPR 6	LEACHATE	Vertical & Horizontal Groundwater Migration	Public Supply (Well) (includes Group Water Schemes)	N	s	N	s	R	N	R	R	s	R	R/S	N	N	N
SPR 7	LEACHATE	Vertical & Horizontal Groundwater Migration	Surface Water Body	N	s	s	R/S	R/S	N	R	R	R	R	s	s	R	N
SPR 8	LEACHATE	Surface Water Drainage/Runoff	Surface Water Body	N	s	R/S	R/S	N	N	R	R	R	N	N	S	R	N
SPR 9	LEACHATE	Surface Water Drainage/Runoff	Surface Water Body Protected Area (SWDTE)	N	S	R/S	R/S	N	N	R	R	R	N	N	R	R	N
SPR 10	LANDFILL GAS	Lateral Migration (Subsoil)	Human Presence	R	s	s	s	S	R/S	N	N	N	N	N	N	N	s
SPR 11	LANDFILL GAS	Vertical Migration (Subsoil)	Human Presence	R	s	s	s	s	R/S	N	N	N	N	N	N	N	s

MATRIX 2 - GUIDANCE FOR MAIN SITE	INVEST	IGATION	REQUIR	EMENTS FOR	MODERATE I	-		-	D HIGH RISK	(CLASS A > 70)%) FOR UNREG	ULATED WAS	TE DISPOS <i>A</i>	AL SITES -
SITE INVESTIGATION (SI) METHODS FOR MODERATE & HIGH RISK WASTE SITES, AS IDENTIFIED BY THE EPA COP RISK CLASSIFICATION FROM THE		TIE	ER 2: MAIN I	NVESTIGATION			1	ΓIER 2 PROBE AN		TIER 2 SPECIALIST SURVEYS				
COMPLETED TIER 1 INITIAL TIB? 2 EXPLORATORY INVESTIGATIONS. EACH PHASE OF INVESTIGATION WILL DEVE-OP THE CONC^TUAL SITE MODE. (CSM) AND SHOULD GUIDE THE DESIGN OF THE NEXT PHASE OF INVESTIGATION & ULTIMATELY THE REMEDIATION. THE APPLICATION OF THE INVESTIGATION		tion of site in	vestigation te	chniques should be	ocused on what SPI	R Linkage is bei	ng examined & th	e site/ground cond	tions - in some case	es a combination of te	echniques may be require	ed and/or additional tr	rial pitting conside	red necessary
	SHALLOW PROBES/HAN D AUGERS	GEOPHYSICS / INFRA RED SURVEYS	WINDOW SAMPLING	CABLE PERCUSSION BORING	AIR ROTARY OPEN OR CORED HOLE	GAS SAMPLING	LEACHATE SAMPLING	SOIL SAMPLING	SURFACE WATER SAMPLING	GROUNDWATER Sampling	PUMPING TEST	ECOLOGICAL SURVEYS	SURFACE WATER SURVEYS	ODOUR/DUST or ASBESTOS SURVEYS
Source & Pathway & Receptor Parameters Targeted for CSM & Risk Screening & Remediation.	waste type, footprint, soil type, thickness, strength. Suitable for gas monitoring and gas migration potential.	waste type/volume, waste footprint, depth to bedrock, groundwater vulnerability, horizontal pathway - plume migration.	waste type, groundwater vulnerability/level, gas migratio potential,	waste type, groundwater vulnerability/level, groundwater sampling, flow direction & resource potential, horizontal pathway, gas migration potential.	groundwater vulnerability/level & flow direction & resource potential, groundwater sampling, horizontal pathway, gas migration potential.	waste type, landfill gas migration, concentrations and flow potential	waste type, leachate quality, leachate concentrations and possible gas migration potential.	soil type, permeability, leachate & gas migration potential, ground vulnerability, horizontal pathway. May also assist in assessing re-use of material for remediation.	surface water receptor and pathway information.	groundwater receptor and horizontal pathway information.	assessment of aquifer status, permeability, groundwater resource potential, flow direction, horizontal pathway	Define ecologically designated areas and sensitive receptors -then lode at linkages regarding surface water pathways etc	surface water pathway/re	Air Pathway/Receptors
General comments regarding techniques & COP Section Reference - Note: the development of the CSM and design of the site investigation should involve an experienced SI practitioner.	Gas monitoring should be considered if trial pit phase identifies gas potential, thin/no capping and human presence exists. Section 5.5.2 of COP.	Geophysics should be considered for areas where extent of waste is unclear and where shallow plumes may be impacting on surface waters. Advantage of covering large areas and is not intrusive. Needs ground proofing. Section 5.5.1.2 of COP.	Window sampling option should be considered for shallow boreholes in ground without obstructions (as identified from Trial Pit Scrvey). Use boreholes for sampling, water/leachate & gas monitoring.	S&A drilling can be completed after or instead of window sampling phase especially if deeper depth required. Use boreholes for sampling, water/leachate & gas monitoring. Section 5.5.2 of COP.	Aquifer category work based on GSI well survey data & rotary drilling. Recommend minimum of three GWI level locations are available for flow direction calculation - use of data loggers to confirm levels and/or possible linkage. Core dilling rarely used unless ROD needed. Design and proper grouting of wells is important. Use boreholes for sampling, water/leachate & gas monitoring. Section 5.5.2 of COP.	Should be considered once landfill gas identified as risk to receptors. Complete as present practice and relevant guidelines. Refer to EPA Landfill Monitoring Guidelines, 2003, especially Sociolo 7.	Characterises waste type and leachate soure/contamination potential. Complete as per best practice and relevant guidelines. Section 5.5.3 of COP. Refer to EPA Landfill Monitoring Guidelines, 2nd Edition 2003, appealelly Section 6. Leachate characteristics can be compared to parameters in EPA Landfill Design Document 2303 - Sections 7.1 & 7.2	Characterises soil type and frontamination present, orbaracterises geology and permeability. Refer to relevant guidelines and Standards. Section 5.5.3 of COP. Leachate characteristics can be compared to parameters in EPA Landfill Design Document 2000 - Sections 7.1 & 7.2	Should be completed as per best practice and relevant guidelines. Refer to EPA Landfill Monitoring Guidelines, 2nd Edition 2003, especially Section 4.	Should be completed as per best practice and relevant guidelines. Refer to EPA Landfill Monitoring Guidelines, 2nd Edition 2003, especially Section 5.	Generally step test to assess well pumping capability, allow groundwater quality assessment using on-site meters and quality sampling should be followed by longer GRT test to determine aquifer characteristics and potential lineages. Level loggers should be used.	should be considered for SACs/SPA, wetlands and surface waters - if surface water body is part of salmonoid (Q Index) or marine catchment then ecology survey's should be considered. Consultation with I'WS may be required. Where applicable use existing data from EPA/CPW or local authority sources. Refer to Section 5.5.1.3 and Appendix 4 of COP.	catchment surveys, V- Notch weirs, flow studies should all be considered Consultation with relevant fisheries board may be beneficial.	Standard dust jars or specific odour surveys should be considered. Complete as per best practice and relevant guidelines. Refer to EPA Landfill Monitoring Guidelines, 2nd Edition 2003, especially Sections 8 and 10.
Provisional Guidance on Minimum Extent of Testing/Sampling - sampling totals will depend on the type of risk identified, size of site, extent & volume of waste, ground conditions, variability of the waste material, etc)	Number of probes will depend on extent of survey and depth of probes. Location bias should be towards end of site with potential receptors.	Will depend on the nature and extent of the waste and type of survey being undertaken. Needs to be site specific assessment scoped and completed by experienced and qualified contractors.	Number of probes will depend on survey area, ground conditions and depth of completion. If suitable ground exists typically two to three five metre deep boreholes are possible per day. Location bias should be towards end of site with potential receptors.	Number of boreholes will depend on survey area, ground conditions and depth of completion. Location bias should be towards end of site with potential receptors.	Number of boreholes will depend on extent of waste and location of receptors. Completion rate will be impacted by ground conditions, installations and grouting. Location bias should be towards end of site with potential receptors. The need for both deep and shallow monitoring boreholes should be considered - review by qualified hydrogeologist recommended. Borehole monitoring installed to a high standard.	Should be used at trial pit stage and with monitoring boreholes. Will depend on extent and nature of gases and receptors. Should be decided on a site specific basis. Although no viable receptors identified within proximity of site, felt worthwhile to determine the landfill gas potency of the site and its age by installing gas taps of the 3 monitoring wells and the 2 leachate wells.	Should take into account data already available from previous investigations, and will depend on the natcre and composition of the waste and number of investigation points. Full screen testing as per Table C.2 of EPA Landfill Monitoring Manual 2003, indicator parameters include pH, Conductivity, Temp, BCD, Ammonia, Chloride, Sulphate, Sodium and Potassium. Two onsite leachate wells installed with full testing carried out.	Will depend on the variability of site and geology. Ground variability will require more sampling. In-situ permeability and strength (SPT) tests and soli assessment for remediation use should be considered. Four soil samples were taken from selected trialpits and analysed for a comprehensive laboratory suite. These soil samples which were peat dominated underlied waste and were selected to determine if contaminants had moved vertically down into the soil from the overlying waste. Three soil samples were taken from the capping material at selected trialpits to determine its suitability.	Sample Upstream and downstream locations as per Table C.2 of EPA Landfill Monitoring Manual 2003. Basic indicator parameters include pH, Conductivity, Temp, BCD, Dissolved Cxygen, Suspended Solids, Ammonia, Chloride, Sulphate, Sodium and Potassium.	Sample at all borehole locations. Full screen as per Table C.2 of EPA Landfill Monitoring Manual 2003. Basic indicator parameters include pH, Conductivity, Temp, BCD, Ammonia, Chloride, Sulphate, Sodium and Potassium. Sampling on at least two occasions for indicator parameters and any elevated parameters identified in the initial sampling.	Pumping tests are important for assessing aquifer status, pathways and confirming linkages and should be completed if possible. If pumped groundwater is found to be contaminated during the step test then disposal management needs to be allowed for - drilling of pump test well outside landfill footprint and between any potentil receptor is recommended.	Quantifiled on a site specific basis. For moderate and high risk sites the functional and habitat value should be assessed and species or habitat specific serveys may be required.	Quantified on a site specif	Quantified on a site spec

TE INVESTIGATION (SI) METHODS FOR MODERATE & HIGH RISK WASTE TES, AS IDENTIFIED BY THE EPA COP RISK CLASSIFICATION FROM THE IMPLETED TIER 1 INITIAL TIB? 2 EXPLORATORY INVESTIGATIONS. EACH	TIER 2: MAIN INVESTIGATION TIER 2 PROBE AND/OR BOREHOLE SAMPLING The selection of site investigation techniques should be focused on what SPR Linkage is being examined & the site/ground conditions - in some cases a combination of techniques may be required a												TIER 2 SPECIALIST SURVEYS			
SE OF INVESTIGATION WILL DEVE-OP THE CONC^TUAL SITE MODE. (CSM) D SHOULD GUIDE THE DESIGN OF THE NEXT PHASE OF INVESTIGATION & ITIMATELY THE REMEDIATION. THE APPLICATION OF THE INVESTIGATION DCESS AND METHODOLOGIES SHOULD BE COMPLETED IN ACCORDANCE WITH THE RE.EVANT GUIDANCE DOCUMENTS AND STANDARDS AND BE UNDERTAKEN BY EXPERIENCED PRACTITIONERS.	SHALLOW PROBES/HAN D AUGERS	GEOPHYSICS / INFRA RED SURVEYS	WINDOW SAMPLING	CABLE PERCUSSION BORING		GAS SAMPLING	LEACHATE SAMPLING	SOIL SAMPLING	SURFACE WATER SAMPLING	GROUNDWATER SAMPLING	PUMPING TEST	ECOLOGICAL SURVEYS	SURFACE WATER SURVEYS	ODOUR/DUST or ASBESTOS SURVEYS		
MODERATE RISK SITES	Initial one day probe survey should be considered for moderate gas risk sites.		Minimum of one to two days drilling should be considered.	Minimum of three to five locations should be considered. Depending on site specific conditions, such as site size.	Minimum of three locations with one down gradient borehole required for moderate risk		A minimum of one full suite at two locations and indicator parameters at a minimum of two or three other locations. Additional monitoring may be required depending on site conditions.		Full suite on upstream and downstream locations at least once and indicator parameters on at least one other occasion.	Full suite on cp gradient and nearest down gradient borehole at least once and indicator parameters at all other relevant groundwater locations.	Step test and 24 hoor test should be initially considered.					
HIGH RISK SITES	Initial two day probe survey should be considered for high gas risk sites. Given absence of adjacent residences or potential receptors, felt that boreholes and leachate wells fitted with gas taps would provide sufficient data on landfill gases being generated on site. Absence of putrescible waste on site combined with existence of large culvert passing through the middle of site (providing a pathway of least resistance to release trapped gas in waste body) confirmed this opinion on risk posed by landfill gas.		Minimum of two to three days should be considered. Window Sampling not required as trialpitting more suitable. Trialpitting or overburden and waste deemed suifficient.	Minimum five locations should be considered. Depending on site specific conditions, such as site size. Cable percussion not deemed suitable as strong likelihood of large obstructions. S & A will not penetrate bedrock. Trialpitting of overburden and waste deemed suifficient.	Minimum of thee boreholes, with one downgradient, are required for high risk sites, but more should be considered if necessary, i.e. large sites	Less gas monitoring locations would be expected to be monitored for moderate risk sites: when compared to high risk sites.	A minimum of one full suite at three locations and indicator parameters at all other suitable locations. Additional monitoring may be required depending on site conditions.	Number of samples should be determined by the site specific requirements.	Full suite on up and down stream locations at least twice and indicator parameters at any other relevant surface locations on at least two other occasions. SW sampling carried out once.	Full suite on one upgradient and at least two down gradient boreholes and indicator parameters at all other relevant groundwater locations at least twice. Groundwater monitoring carried out once.	Step test and 72 hour test should be considered. Funds not available for this work. Hydraulic gradient determined from standing water levels to ordnance datum	After ecological screening the need for more detailed serveys should be determined by the site specific requirements. Recommendations were made in the report for further work to include a Small Stream Ecological Risk Assessment which would include invertebrate sampling/Q-Indexing.	Quantified on a site specific basis. In general moderate risk sites would be expected to require a less extensive scope of works to be completed. Recommendations were made in the report for further work to include a more comprehensive surface water sampling surrey (increasing the number of locations from 3 to 7) and which would also include invertebrate samiling/andexing in addition to samples submitted for chemical analysis.	Quantified on a site specific basis. In general moderate risk sites would be expected to require a less extensive scope of works to be completed. Site was capped and dust was not seen as an issue or raised as a complaint by neighbours.		

R = Recommended technique assuming site conditions allow.

S = Should be considered but is dependent on site suitability for that methodology.

N = Not recommended, but may occasionally be suitable. RQD = Rock Quality
Designation

BGL = Below Ground
Level

GSI = Geological
Survey Cf Ireland

CRT = Constant
Rate Test

NPWS = National Parks
and Wildlife Service

GW - GToendwater

QRA = Quantitative
Risk Assessment

APPENDIX 2

TIER 2 SITE INVESTIGATION & RISK ASSESSMENT OF FORMER TULLYVOGHEEN LANDFILL APPROPRIATE ASSESSMENT SCREENING REPORT









TIER 2 SITE INVESTIGATION & TIER 3 GQRA ASSESSMENT OF FORMER TULLYVOGHEEN LANDFILL

APPROPRIATE ASSESSMENT
SCREENING REPORT

16TH April 2014

DOCUMENT ISSUE STATUS

REPORT ISSUE	REFERENCE NO.	DATE	
FINAL	198-01	16/04/14	
TITLE	NAME	SIGNATURE	DATE
AUTHOR	David Gilfedder	David Gilkedden	5/04/14
PROJECT MANAGER	Padraic Mulroy	Padraic Uneray	15/04/14
CLIENT (GALWAY C.C.)	Tom Dunworth		

TABLE OF CONTENTS

1	INT	RODUCTION	1
2	LEG	SISLATIVE BACKGROUND	1
3	SCR	EENING	2
		Description of Existing Site	2
	2.2	Surrounding Property	3
	2.3	Natura 2000 Sites	3
4	ASS	ESSMENT OF LIKELY EFFECTS	5
5	SCR	EENING CONCLUSION AND STATEMENT	5

LIST OF FIGURES (PLEASE SEE MAIN REPORT FOR FIGURES 1-6)

FIGURE NO.	FIGURE DESCRIPTION	SCALE	SIZE	REVISION
1	Site Location & proximity of SACs, pNHAs &SPAs	1;20,000	A3	0
2	Site Location & Proximity of SAC No. and 002031, The Twelve Bens/ Garage Complex	1:5,000	A3	0
3	Site Location & Surrounding Property	1:3,000	A3	0
4	Site Layout & Topographical Survey (Western Half)	1:500	A3	0
5	Site Layout & Topographical Survey Eastern Half)	1:500	A3	0
6	Trialpit Locations	1:1,000	A3	0
7	Borehole Locations & Section Location	1:1,000	A3	0
8	Section A-A'	1:500	A3	0
9	Section B-B'	1:500	A3	0
10	Conceptual Site Model (CSM)	1:1,000	A3	0

LIST OF ANNEXES

Annex No.	ANNEX DESCRIPTION
1	Site Synopsis SAC No. 002031
I	Qualifying Interests for The Twelve Bens/ Garaun Complex



1 INTRODUCTION

As part of the Tier 2 Site Investigation and follow up Tier 3 Generic Quantitative Risk Assessment (GQRA), an Appropriate Assessment Screen is required for the former Tullyvogheen Landfill. This is required as part of the application to the EPA for the Certificate of Registration. The purpose of this assessment is to ascertain whether the development complies with the Department of Environment, Heritage and Local Government 2009 publication, 'Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities.'

2 LEGISLATIVE BACKGROUND

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) provides legal protection for habitats and species of European importance. The main aim of this Directive is to 'contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies'. In order to meet the aims of the Directive, actions must be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest (Habitats Directive).

Under the Habitats Directive, Special Areas of Conservation (SAC) or candidate Special Areas of Conservation (cSAC) have been selected as important examples of habitat types listed in Annex I, and the habitats of certain species listed in Annex II of the Habitats Directive. SACs (including cSACs) together with Special Protection Areas (SPAs) (including proposed SPAs) make up a network of European sites called the Natura 2000 network. SPAs are designated under the Council Directive on the Conservation of Wild Birds (79/409/EEC), otherwise known as the 'Birds Directive'.

Appropriate Assessment is required under the Habitats Directive for any plan or project likely to have a significant effect on a Natura 2000 site. Article 6, paragraphs 3 and 4 of the Directive state:

'6(3) - Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 site) but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications 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.

6(4)- If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of



overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.'

3 SCREENING

Screening involves the following:

- 1. Description of the plan/project including details of the local site or plan area characteristics.
- 2. Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives.
- 3. Assessment of likely effects (direct, indirect and cumulative) through the completion of a desk study or field survey.
- 4. Screening statement including conclusions

3.1 Description of Existing Site

According to Galway C.C., the former municipal landfill at Tullyvoheen, Clifden, County Galway, was in operation between the years of 1984 and 1992. During this period a maximum of 23,000 tonnes of mixed waste including domestic, commercial and construction & demolition waste per annum was deposited annually. The site area is 1.27 ha and the total waste body has been estimated by Galway C.C. to have a volume of 114,000m³ or 205,000 tonnes.

The site is approximately 2 km east of the town centre of Clifden. The site is located on a narrow country road that leads uphill approximately 660m from the Clifden to Galway Secondary Road (the N59). At a distance of approximately 600m from the N59 the country road turns eastwards. Where the site is located, this country road has been constructed at the edge of a valley between a small mountain to the south and a large hill to the north. The valley is orientated in an approximate west to east direction. The landfill to the south of the country road consists of a substantial infill operation where the valley was raised approximately 3.5m on the eastern boundary to 7-8m on the western boundary.

The landfill is located between Cooravoughil mountain to the south and small hills to the north on a where the valley widens out into upland bog.

The geology of the area consists of schists and quartzites, with Geological Survey of Ireland maps indicating that the site is underlain by psammitic schists. The bedrock map indicates that southern half of the site is underlain by the Streamstown Schist Formation (ST) with the northern half being underlain by the Bennabeola Quartzite Formation (BX).



These formations consist of Pre-cambrian quartzite, gneisses and schists. Aquifer vulnerability maps indicate bedrock is 'at surface' for the western part of the site (where the stream exits) and 'extreme' (less than 3 meters to bedrock) for the remainder of the site.

The stream running through the valley is culverted through the landfill before continuing in a south-westerly direction alongside the country road for a distance, then heading south-westwards and eventually joining the Owenglen River 735m to the south of the site.

3.2 Surrounding Property

The site is located in a rural and remote area and as a result there are very few properties located within its immediate vicinity. No residential or commercial property is located on the landfill site boundaries. The nearest inhabited property is located 415m 'as the crow flies' southwest of the site along the country road that leads to the N59 (main Clifden - Galway Road) located approximately 630m south of the site. Four residences exist along the N59 road to the southwest, a distance of 620m from the site. Cuirt Cregg, a medium sized housing estate, is located further to the west along the N59 road, with the nearest property in the estate located 630m 'as the crow flies' from the site, as shown on Figure 3.

Figure 3 also shows a Galway County Council compound containing a pumping station and an ESB substation located adjacent to the N69 at the bottom of the access road, 610m from the site.

3.3 Natura 2000 Sites

The Tullyvogheen site is located within the egion of a number of Natura 2000 designated protected sites, including Special Areas of Conservation (SAC), Special Protected Areas (SPA) and proposed Natural Heritage Areas (pNHA). These are the West Connaught coast, Slyn Head peninsula, the Connemara Bog complex and The Twelve Bens/ Garaun complex.

The Twelve Bens/ Garaun Complex is the closest protected site to Tullyvogheen landfill site, located approximately 612m to the south of the site's southern boundary. This is protected as:

- A Special Area of Conservation (SAC) No. 002031; and
- A proposed Natural Heritage Area (pNHA) No. 002031.

The Site Synopsis and the Qualifying Interests for The Twelve Bens/ Garaun Complex are located in Appendix 1. The overarching Conservation Objective for The Twelve Bens/ Garaun Complex Special Protection Area is to ensure the maintenance of the habitats and species for which the SAC has been selected at favourable conservation status.

The Conservation Objectives for The Twelve Bens/ Garaun Complex can be summarised as follows:



Objective 1: To maintain the Annex I habitats for which the SAC has been selected at favourable conservation status.

To be favourable the following habitat must remain intact and at their current percentage:

- Blanket bogs (active) (26% area of the site);
- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) (6% area of the site);
- Siliceous rocky slopes with chasmophytic vegetation (5% area of the site);
- Calcareous rocky slopes with chasmophytic vegetation (3% area of the site);
- Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) (1% area of the site);
- Alpine and Boreal heaths (2% area of the site);
- Old Oak Woods with *Ilex* and *Blechnum* in the British Isles (1% area of the site); and
- Depressions on peat substrates of the *Rhynchosporion* (1% area of the site).

Objective 2: To maintain the Annex II species for which the SAC has been selected at favourable conservation status.

To be favourable the following habitat must remain intactors.

- Slender Naiad;
- Otter;
- Freshwater Pearl mussel;
- Salmon.

Objective 3: To maintain the extent, species richness and biodiversity of the entire site.

Objective 4: To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

rinspection purporte



4 ASSESSMENT OF LIKELY EFFECTS

A review of the existing site indicates that there has not been:

- Any impact on an Annex I habitat;
- Any impact on the species living in the area;
- Any reduction in the area of a Natura 2000 site;
- Direct or indirect damage to the physical quality of the environment in the Natura 2000 site;
- Serious or ongoing disturbance to species or habitats for which Natura 2000 is selected;
- Direct or indirect damage to the size, characteristics or reproductive ability of populations on the Natura 2000 site; and
- Interference with mitigation measures put in place for other plans/projects.

5 SCREENING CONCLUSION AND STATEMENT

The findings and conclusions of the screening process are as follows:

No potential for significant effects/AA is not required.
 Screening established that there is no potential for significant effects and the project/plan can proceed as proposed. However, no changes that be made after this as this will invalidate the findings of the screening.

Yours sincerely,

Padraic Mulroy

BSc., MSc., MIPSS, MIEI, IRCA, C.Sci., SiLC, GSAS-CGP

Managing Director Mulroy Environmental



MULROY ENVIRONMENTAL SERVICE CONSTRAINTS

- 1. This report and the Environmental Site Assessment carried out in connection with the report (together the "Services") were compiled and carried out for Tom Brennan (the "client") in accordance with the terms of a contract, Proposal PRP198.11.05.2012, between Mulroy Environmental and the "client" dated 11th May 2012. The Services were performed by Mulroy Environmental with the skill and care ordinarily exercised by a reasonable Environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by Mulroy Environmental taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between Mulroy Environmental and the client.
- 2. Other than that expressly contained in paragraph 1 above, Mulroy Environmental provides no other representation or warranty whether express or implied, in relation to the Services.
- 3. Unless otherwise agreed the Services were performed by Mulroy Environmental exclusively for the purposes of the client. Mulroy Environmental is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, Mulroy Environmental does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party refres thereon that party does so wholly at its own and sole risk and Mulroy Environmental disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.
- 4. It is Mulroy Environmental understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without Mulroy Environmental be requested to review the report after the date hereof, Mulroy Environmental shall be entitled to additional payment at the then existing rates or such other terms as agreed between Mulroy Environmental and the client.
- 5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Mulroy Environmental. In the absence of such written advice of Mulroy Environmental, reliance on the report in the future shall be at the client's own and sole risk. Should Mulroy Environmental be requested to review the report in the future, Mulroy Environmental shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Mulroy Environmental and the client.



APPENDIX 1

- SITE SYNOPSIS SAC NO. 002031
- QUALIFYING INTERESTS FOR THE TWELVE BENS/ GARAUN COMPLEX





Conservation Objectives for The Twelve Bens/Garraun Complex SAC [002031]

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- 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.
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its matural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continues be, a sufficiently large habitat to maintain its populations on a long-term basis.

Objective: To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

- [1029] Margaritifera margaritifera
- [1106] Salmo salar (only in fresh water)
- ◆ [1355] Lutra lutra
- ◆ [1833] Najas flexilis
- [3110] Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)
- [4060] Alpine and Boreal heaths
- ◆ [7130] Blanket bogs (* if active only)
- [7150] Depressions on peat substrates of the Rhynchosporion
- [8110] Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)
- ◆ [8210] Calcareous rocky slopes with chasmophytic vegetation
- [8220] Siliceous rocky slopes with chasmophytic vegetation
- [91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Citation:

NPWS (2011) Conservation objectives for The Twelve Bens/Garraun Complex SAC [002031]. Generic Version 3.0. Department of Arts, Heritage & the Gaeltacht.

For more information please go to: www.npws.ie/protectedsites/conservationmanagementplanning

SITE SYNOPSIS

SITE NAME: THE TWELVE BENS/GARRAUN COMPLEX

SITE CODE: 002031

This is an extensive site situated in the north-west of Connemara, dominated by mountaineous terrain. The site is bounded to the south by the Connemara Bog Complex, to the east by the Maumturk Mountains and to the north by Killary Harbour. Included within the site are the Twelve Bens mountain range, the mountains to the north of Kylemore (Doughruagh, Garraun and Benchoona), rivers including the Ballynahinch and Owenglin systems and an area of coastal heath and machair near Glassilaun. The site also includes some extensive tracts of lowland blanket bog which are continuous with the mountains. Most of the mountain summits reach a height in excess of 500 m, the highest being Ben Baun in the Twelve Bens which reaches 730 m. The site includes a large portion of the Connemara National Park and a Statutory Nature Reserve at Derryclare Wood.

Geologically, the site can be divided into two distinct parts. The Twelve Bens are composed of resistant quartzite with schists in the valleys while the mountains north of Kylemore are composed of gneiss and various types of sandstones and mudstones. There are also areas of gabbro (Doughruagh and Currywongaun), mica schist (Muckanaght) and marble outcrops (south of Kylemore Lough). The main soil type within the site is peat.

The site is a candidate SAC selected for active blanket bog a priority habitat on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for, alpine heath, calcareous rocky siliceous rocky and siliceous scree vegetation, lowland oligotrophic lakes, Rhynchosporion and old Oak woodlands all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Freshwater Pearl Mussel, Atlantic Salmon, Otter and the plant Slender Naiad.

The predominant vegetation type on the site is upland blanket bog/heath dominated by Heather (*Calluna vulgaris*), Deergrass (*Scirpus cespitosus*), Cross-leaved Heath (*Erica cinerea*) and the mosses *Racomitrium lanuginosum* and *Sphagnum capillifolium*). In places this vegetation can be rich in liverwort speces such as *Adelanthus lindenbergianus* and *Bazzania pearsonii*. This unusual type of speciesrich dwarf shrub heath is almost confined to the mountains of the west of Ireland and Scotland and is particularly well developed in the Twelve Bens. Close to the mountain summits this blanket bog/heath is often very thin with a high proportion of outcropping bedrock.

Another important and widespread habitat is lowland blanket bog dominated by Purple Moor-grass (*Molinia caerulea*), Black Bog-rush (*Schoenus nigricans*), Crossleaved Heath and the liverwort *Pleurozia purpurea*. These areas of lowland blanket bog usually occur in the valleys between the mountains, e.g. the Gleninagh Valley.

Rhynchosporion vegetation is well represented around pools, in wet hollows and in quaking and flush areas associated with the lowland blanket bog. White Beak-sedge (*Rhynchospora alba*) occurs in association with such species as Bog Cotton (*Eriophorum angustifolium*), Bogbean (*Menyanthes trifoliata*), Black Bog-rush (*Schoenus nigricans*), and a range of bog mosses, including *Sphagnum auriculatum* and *S. cuspidatum*.

The site contains a large range of others habitats, including upland grassland dominated by Sheep's Fescue (*Festuca ovina*) and Mat-grass (*Nardus stricta*), Sessile Oak (*Quercus petraea*) woodland, scree, oligotrophic (nutrient-poor) lakes, rivers, reedbeds, freshwater marshes, coastal heath, machair, sand dune and salt marsh.

A number of rare, Red Data Book plant species are found within the site: Alpine Sawwort (Saussurea alpina), Holly Fern (Polystichum lonchitis), Purple Saxifrage (Saxifraga oppositifolia), and the legally protected (Flora Protection Order, 1999) Parsley Fern (Cryptogramma crispa). These are generally confined to mountains cliffs above 400 m, where a number of other scarce plant species, for example, Alpine Meadow-rue (Thalictrum alpinum), are also found. Other Red Data Book species have also been recorded from the site: Marsh Clubmoss (Lycopodiella inundata), Corncockle (Agrostemma githago) and the legally protected Heath Cudweed (Omalotheca sylvatica). The latter two species have not been recorded from the site in recent years. St. Dabeoc's Heath (Daboecia cantabrica), a species which in Ireland is restricted to Connemara and south Mayo, occurs commonly within the site.

The suite of lowland lakes that encircle the mountains represent some of the finest oligotrophic lakes in the country and two rare, Red Data Book plant species, Slender Naiad (*Najas flexilis*) and Pillwort (*Rituraria globulifera*) occur. Slender Naiad is rare in Europe and is listed on Amex II of the EU Habitats Directive.

The site contains several small areas of Sessile Oak woodland, a habitat which is particularly rare in Connemara. The best examples on the site of this habitat are found at Kylemore and on the north shore of Derryclare Lough. Derryclare Wood, a Statutory Nature Reserve, has been particularly well studied. It is composed mostly of Sessile Oak, with some Rowan (*Sorbus aucuparia*), Downy Birch (*Betula pubescens*) and occasional Ash (*Fraxinus excelsior*) forming the canopy layer. There is a well-developed lichen and fungus flora present. The fungal parasite, *Hemigrapha astericus*, a native of Australia and South America, was first recorded in the northern hemisphere from this wood. The Kylemore woods, though heavily infested by Rhododendron (*Rhododendron ponticum*), still retain a diverse flora and support interesting communities of mosses and liverworts, including such species as *Radula voluta*, *Lejeunea holtii*, *L. hibernica*, *L. flava* subsp. *moorei*, *Cephalozia hibernica*, *Teleranea nematodes*, *Campylopus setifolius*, *Oxystegus hibernicus*, *Grimmia hartmanii* and *G. funalis*.

Irish Hare, Otter, Freshwater Pearl-mussel and Common Frog have been recorded from the site. These species are protected under the 1976 Wildlife Act. The Owenglin River and Ballynahinch system supports an important population of Salmon and salmon nursery grounds. Arctic Charr, a species listed in the Irish Red

Data Book as threatened in Ireland, has been recorded from Lough Inagh, Kylemore Lough, Lough Muck and Lough Fee.

Birdlife reported from the site includes Raven, Wheatear, Stonechat, Meadow Pipit, Red Grouse, a declining species of Heather moorland, Snipe, Curlew, Woodcock, Hooded Crow, Twite, Ring Ouzel (the latter two both Irish Red Data Book species) and the EU Birds Directive Annex I species, Peregrine, Merlin, Golden Plover and Chough. The site provides excellent habitat for Peregrine and this species has traditionally bred at several locations within it.

The upland vegetation of the site is most threatened by overstocking with sheep and by afforestation with coniferous species.

The Twelve Bens/Garraun Complex includes a wide variety of habitat types, eight of which are listed on Annex I of the EU Habitats Directive, and populations of many rare or scarce plant and animal species. It is one of the largest and most varied sites of conservation interest in Ireland.

6.10.2006

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)

FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)

AND upose required

FOR SPECIAL AREAS OF CONSERVATION (SAC)

Site code: IE0002031 NATURA 2000 Data Form

1. SITE IDENTIFICATION

1.1. TYPE 1.2. SITE CODE 1.3. COMPILATION DATE 1.4. UPDATE

IE0002031 199511

1.5. RELATION WITH OTHER NATURA 2000 SITES:

1.6. RESPONDENT(S):

National Parks & Wildlife Service of the Department of the Environment, Heritage and Local Government. 7 Ely Place, Dublin 2, Ireland.

1.7. SITE NAME:

The Twelve Bens/Garraun Complex

1.8. SITE INDICATION AND DESIGNATION/CLASSIFICATION DATES:

DATE SITE PROPOSED AS ELIGIBLE AS SCI:

199805

DATE SIDE DESIGNATED AS SAC:

DATE SIDE DESIGNATED AS SAC:

Consent of convinging tradition of the convincing trad DATE SITE CLASSIFIED AS SPA:

Site code: IE0002031 NATURA 2000 Data Form

2. SITE LOCATION

2.1. SITE CENTRE LOC	CATION				
LONGITUDE			LATI	TUDE	
W 9 52 45			53	32 18	
W/E (Greenwich)					
2.2. AREA (HA):			2.3. S.	ITE LENGTH (KM):	
16170.08					
2.4. ALTITUDE (M):					
MINIMUM		MA	XIMUM		MEAN
0			730		350
2.5. ADMINISTRATIVE	REGION:			use.	
NUTS CODE	REGION	NAME		other	% COVER
IE013	West		C	nily any	99
Marine area not covo	ered by a NUTS	S-region	2 Purposes	dio	
2.6. BIOGEOGRAPHIC	REGION:	co ⁱ	ispection net i	Macaronesian	
Alpine	Atlantic	Boreal Col	Continental	Macaronesian	Mediterranean
	✓	aent or			
		CONT			

Site code: IE0002031 NATURA 2000 Data Form

3. ECOLOGICAL INFORMATION

3.1. HABITAT types present on the site and assessment for them:

ANNEX I HABITAT TYPES:

CODE	%COVER	REPRESENTATIVITY	RELATIVE SURFACE	CONSERVATION STATUS	GLOBAL ASSESSMENT
7130	44	В	В	С	С
3110	6	A	В	A	A
8220	2	A	В	A	A
7150	1	A	С	В	A
91A0	1	A	В	В	A
4060	1	В	В	В	В
8110	1	A	В	A	A
8210	1	A	В	A	A

Site code: IE0002031 NATURA 2000 Data Form

3.2. SPECIES

covered by Article 4 of Directive 79/409/EEC

and

and and solit and of the site assessment for them listed in Annex II of Directive 92/43/EEC

NATURA 2000 Data Form

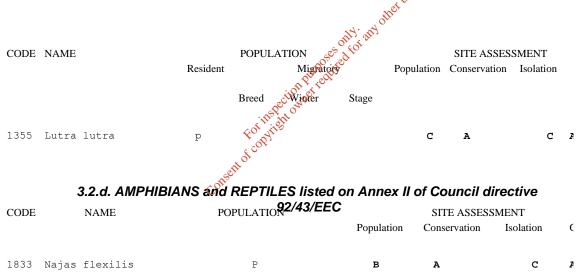
3.2.a. BIRDS listed on Annex I of Council directive 79/409/EEC

CODE	NAME		POPULATION				SITE ASSESSMENT	
		Resident		Migratory		Population	Conservation	Isolation
			Breed	Winter	Stage			
A103	Falco peregrinus	3 p				С	A	С

Site code: IE0002031

3.2.b. Regularly occuring Migratory Birds not listed on Annex I of Council directive 79/409/EEC

3.2.c. MAMMALS listed on Annex II of Council difective 92/43/EEC



3.2.e. FISHES listed on Annex II of Council directive 92/43/EEC

CODE	NAME	POPULATION			SITE ASSESSMENT			
		Resident		Migratory		Population	Conservation	Isolation
			Breed	Winter	Stage			
1106	Salmo salar	С				C	В	C

Site code: IE0002031 NATURA 2000 Data Form

3.2.f. INVERTEBRATES listed on Annex II of Council directive 92/43/EEC

CODE	NAME		POPULATION				SMENT	MENT	
		Resident		Migratory		Population	Conservation	Isolation	
			Breed	Winter	Stage				
1029	Margaritifera margaritifera	P				В	В	В	

3.2.g. PLANTS listed on Annex II of Council directive 92/43/EEC



3.3. Other Important Species of Flora and Fauna

GROUP B M A R F I	P	SCIENTIFIC NAME	POPULATION	MOTIVA	ATION
	P	Pilularia globulifera	P	A	
	Р	Saussurea alpina	P	A	
	P	Omalotheca sylvatica	P	A	
	P	Cryptogramma crispa	R	A	
	P	Agrostemma githago	P	A	
	P	Lycopodiella inundata	P	A	
	P	Polystichum lonchitis	P	A	
I		Stethophyma grossum	P		D
I		Conops vesicularis	P		D
I		Epistrophe nitidicollis	P		D
I		Ctenophora atrata	P		D
F		Salvelinus alpinus	P	A	
A		Rana temporaria	P	A	
M		Lepus timidus hibernicus	P	A	
А		Rana temporaria	P.c.		C
M		Lepus timidus hibernicus	nei P	В	
M		Lepus timidus hibernicus	1 Office P		С
(B = Birds, M = Mar	mma	Lepus timidus hibernicus Rana temporaria Lepus timidus hibernicus Lepus timidus hibernicus Als, A = Amphibians, R = Reptiles, F = Fish, I = I	invertebrates, P = Plants)		

Site code: IE0002031 NATURA 2000 Data Form

4. SITE DESCRIPTION

4.1. GENERAL SITE CHARACTER:

Habitat classes	% cover
Marine areas, Sea inlets	1
Coastal sand dunes, Sand beaches, Machair	1
Inland water bodies (Standing water, Running water)	7
Bogs, Marshes, Water fringed vegetation, Fens	46
Heath, Scrub, Maquis and Garrigue, Phygrana	34
Humid grassland, Mesophile grassland	1
Broad-leaved deciduous woodland	1
Inland rocks, Screes, Sands, Permanent Snow and ice	9
Total habitat cover	100 %

Other site characteristics

An extensive area incorporating the predominantly quartzite mountains of the Twelve Bens and encompassing a range of habitat types, including blanket bog, oligotrophic lakes, heath, exposed rock and scree, acid grassland and remnants of oak woodland. The northern part of the site is bounded by coastline and includes rocky shore and small areas of sandy beach, machair, tidal river, mud flats and saltmarsh. Several river headstreams are also within the site.

4.2. OUALITY AND IMPORTANCE:

One of the largest and most varied sites of conservation interest in Ireland, including the scenically renowned Twelve Reno mountain range, which support extensive areas of blanket bog, heath and exposed rock and a range of arcticalpine plants. Rhynchosporion vegetation is well represented in the wet areas of blanket bog. The suite of lowland lakes that encircle the mountains represent some of the finest oligotrophic lakes in the country and support several rare some of the finest oligotrophic lakes in the country and support several rare species such as Pilularia globulifeta and populations of Salvelinus alpinus. The site also has a significant population of Lutra lutra, and an important population of Salmo salar. The site includes a large portion of the Connemara National Park and a National Nature Reserve at Derryclare Wood. Additional areas are included in the site under FULLEF funded restoration projects. are included in the site under EU LIFE funded restoration projects.

4.3. VULNERABILITY

Large tracts of blanket bog are currently overgrazed by sheep and are vulnerable to erosion, a problem that could be accentuated by the striping of commonage which is taking place in some areas. Other threats are the further expansion of commercial afforestation on blanket bog, and the development of fish-farming in the oligotrophic lakes.

4.4. SITE DESIGNATION:

4.5. OWNERSHIP

National Parks and Wildlife Service (14%) Department of the Environment (9%) Privat : Multiple (77%)

4.6. DOCUMENTATION

Central Fisheries Board (2001). Irish Salmon Catches 2000. http://www.cfb.ie/: February 2001.

- Doris, Y., McGarrigle, M.L., Clabby, K.J., Lucey, J., Neill, M., Flanagan, M., Quinn, M.B. & Lehane, M., (eds.) (1999). Water Quality in Ireland 1995-1997. Statistical compendium of River Quality Data, Environmental Protection Agency.
- Douglas, C., Garvey, L., Kelly, L. and O'Sullivan, A. (1989). A Survey to Locate Blanket Bogs of Scientific Interest in County Galway, Part 2. Unpublished report to the Wildlife Service, Dublin.
- Douglas, C. and Grogan, (1987). A Survey to Locate Lowland Blanket Bogs of Scientific Interest in Connemara, County Galway. Unpublished report to the Wildlife Service, Dublin.
- Ferguson, D.K. and Westhoff, V. (1987). An Account of the Flora of Derryclare Wood, Connemara, (Co. Galway), Western Ireland. Proceedings of The Konniklijke Nederlandse Akademie van Wetenschaffen, C90 (2): 139-172.
- Folan, A.C.M. and Mitchell, M.E. (1970). The Lichens and Lichen Parasites of Derryclare Wood, Connemara. Proceedings Of The Royal Irish Academy, Section B, 70 (7) : 163-170.
- Heuff, H. (1984). The Vegetation of Irish Lakes. Unpublished report to the Wildlife Service, Dublin.
- McGarrigle, M.L., Bowman, J.J., Clabby, K.J., Lucey, J., Cunningham, P., MacCarthaigh, M., Keegan, M., Cantrell, B., Lehane, M., Clenaghan, C. and Toner, P.F. (2002). Water Quality in Ireland 1998-2000. Environmental Protection Agency, Wexford.
- Neff, M. (1972). Conservation Report. Derryclare Wood, Balkinahinch Forest, Co
- Neff, M. (19/2). Conservation Report. Deligorate wood, Education Scales. Galway. Internal Report to Forest & Wildlife Service.

 O'Reilly, P. (1991). Trout and Salmon Rivers of Ireland: an angler's guide. Merlin Unwin Books, London.
- Quinn, A.C.M. (1971). Areas of Scientific Indexest in County Galway. Unpublished preliminary report prepared for its laway County Council. An Foras Forbartha, Dublin.
- Roden, C.M. (1986). A Survey of the Bloom of some Mountain Ranges in the West of Ireland. Irish Naturalists' Journal 22 (2): 52-59.
- Scannell, M.J.P. and White, J. (1975). Cryptogramma crispa In West Galway. Irish Naturalists' Journal, 18: 338.
- Tangney, D.E. & Fairley, J.S. (1994). Otter signs and diet in Connemara National Park and its environs. Irish Naturalists' Journal 24: 434 -440.
- Webb, D.A. and Scannell, M.J.P. (1983). Flora of Connemara and the Burren. Royal Dublin Society and Cambridge University Press, Cambridge.

Site code: IE0002031 NATURA 2000 Data Form

5. SITE PROTECTION STATUS AND RELATION WITH **CORINE BIOTOPES**

5.1. DESIGNATION TYPES at National and Regional level:

CODE	% COVER
IE01	1
IE03	13

5.2. RELATION OF THE DESCRIBED SITE WITH OTHER SITES:

designated at National or Regional level:

TYPE CODE	SITE NAME	OVERLAP TYPE	% COVER
IE01	Derryclare Nature Reserve	+	1
IE03	Connemara National Park	*	13
		1150	

IE03	Connemara National	Park		*
designated at Internat	ional level:		otheruse.	
			S Only any	
5.3. RELATION O	OF THE DESCRIBED	SITE WITH COL	NE BIOTOPE SIT	TES:
CORINE SITE CODE	OVERLAP	TYPE Decitor Vineric	% COVER	
800000208		Forinstight		
800000182		, of cox		
800000243	್ವತ	it or		
	COIL			

Site code: IE0002031 NATURA 2000 Data Form

6. IMPACTS AND ACTIVITIES IN AND AROUND THE SITE

6.1. GENERAL IMPACTS AND ACTIVITIES AND PROPORTION OF THE SURFACE OF THE SITE AFFECTED

IMPACTS AND ACTIVITIES WITHIN the site

CODE	INTENSITY	% OF SITE	INFLUENCE
140	A B C	90	+ 0 -
200	А В С	1	+ 0 -
220	A B C	5	+ 0 -
230	А В С	10	+ 0 -
301	А В С	1	+ 0 -
311	А В С	1	+ 0 -
312	A B C	1	+ 0 -
501	A B C	1	+ 0 -
502	А В С	1	+ 0 -
622	A B C	5	+ 0 -
900	A B C	30	+ 0 -
954	A B C	1 15°.	+ 0 -

IMPACTS AND ACTIVITIES AROUND the site

CODE	INTENSIT	Y INFLUENCE
140	A B C	nuthanito -
161	A B C	inot priet + 0 -
311	A B C	rectiving + 0 -
312	A B C	For itight + 0 -
403	A B C	fot with + 0 -
502	A B C	+ 0 -
610	A B C	+ 0 - + 0 - + 0 -
622	A B C	+ 0 -
	Ċ	3'

6.2. SITE MANAGEMENT AND PLANS

BODY RESPONSIBLE FOR THE SITE MANAGEMENT

National Parks and Wildlife Service (c. 14%) Private ownership (77%) Department of Environment (9%)

SITE MANAGEMENT AND PLANS

A management plan is being prepared.

7. MAPS OF THE SITE

- Physical map

- Aerial photograph(s) included:

8. SLIDES

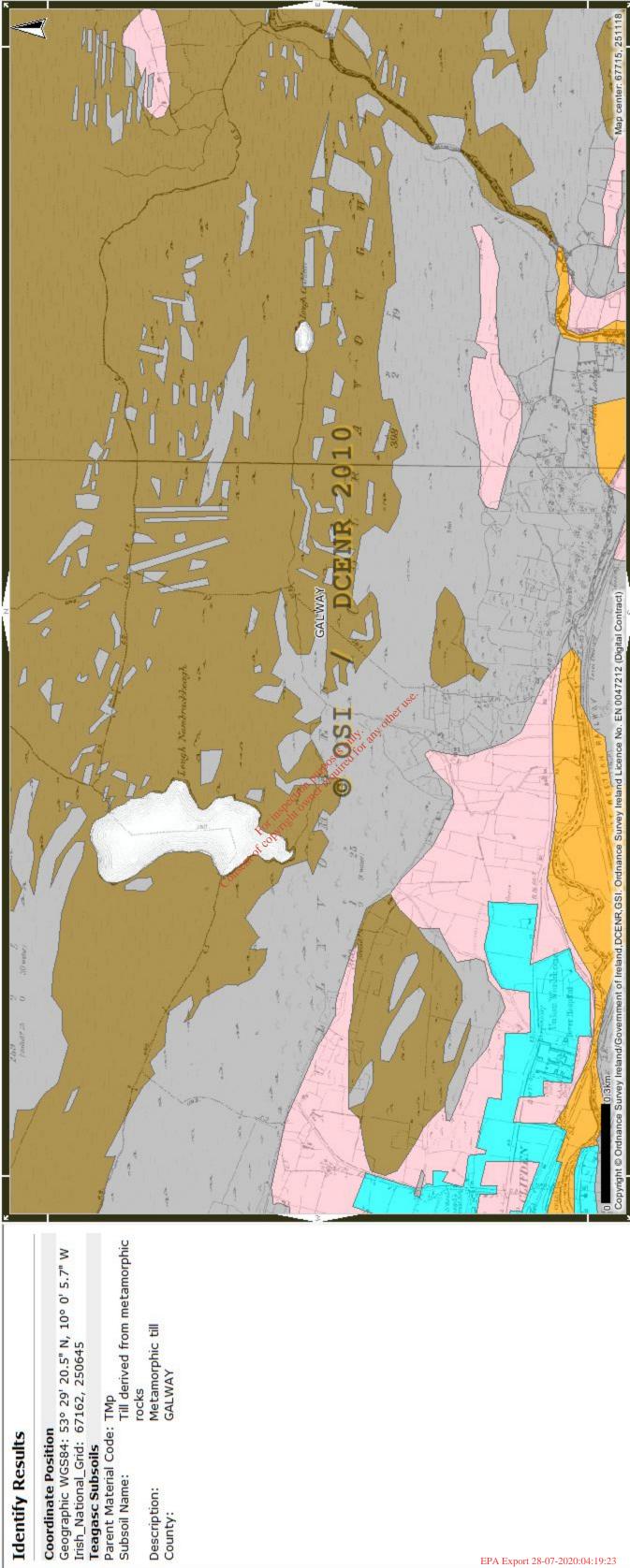
APPENDIX 3

- EPA/TEAGASC SOIL MAPPING
- EPA/TEAGASC SUBSOIL MAPPING









Identify Results

Coordinate Position Geographic WGS84: 53° 29' 20.5" N, 10° 0' 5.7" W Irish_National_Grid: 67162, 250645 Teagasc Subsoils

Description: County:

rocks Metamorphic till GALWAY

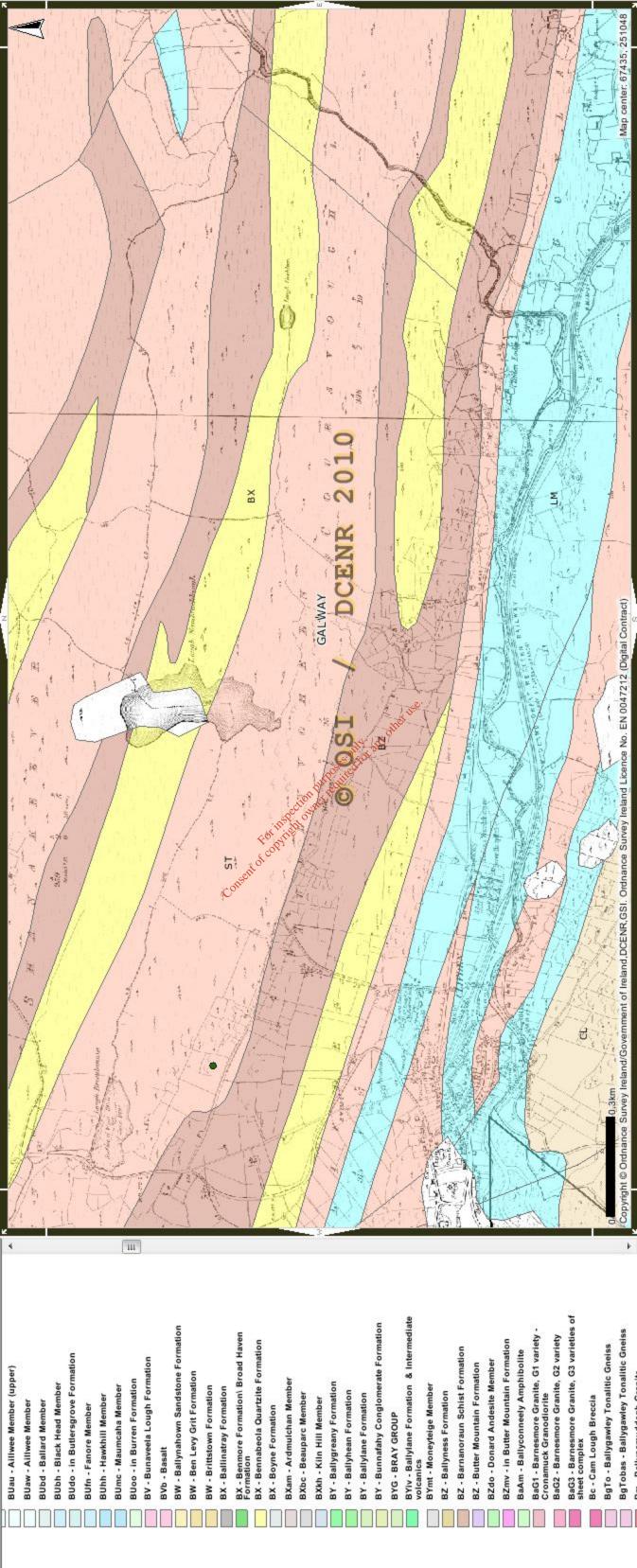
APPENDIX 4

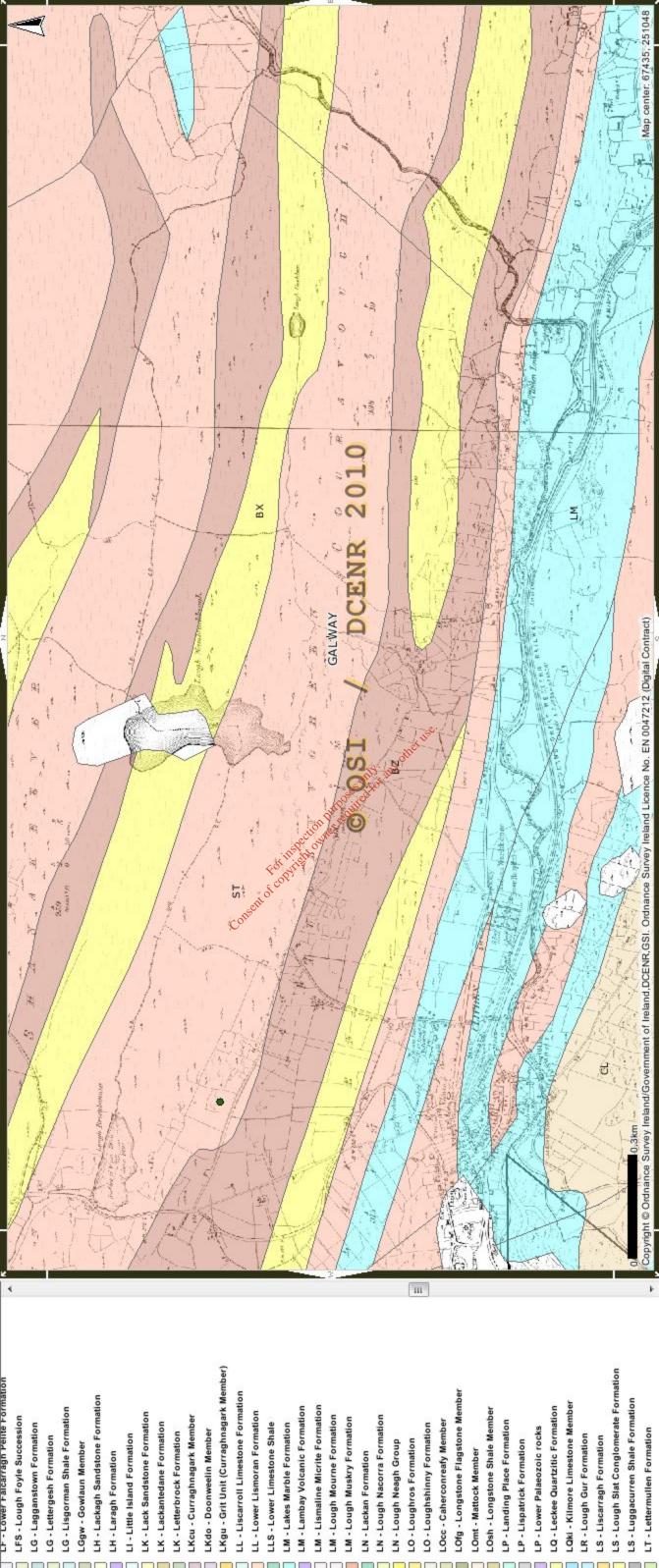
GSI BEDROCK MAPPING

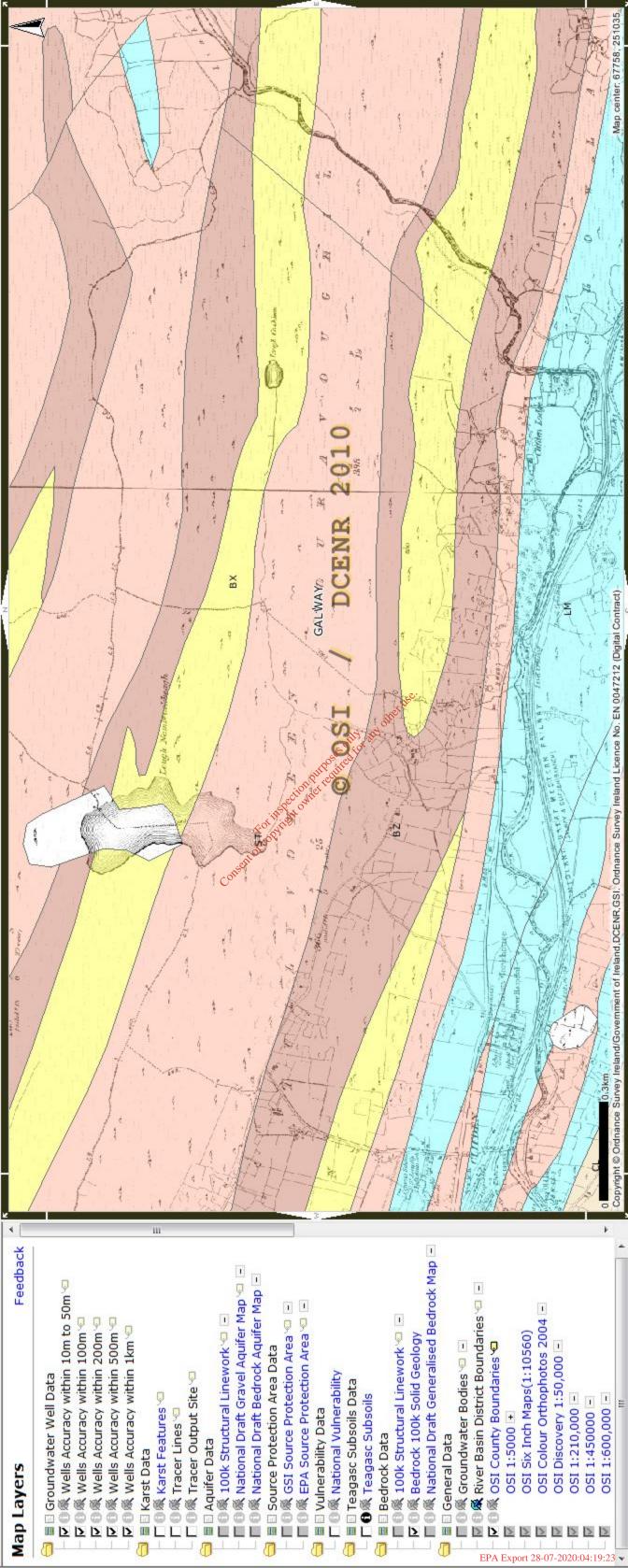
Consent of convigit owner required for any other use.



Consent of copyright owner required for any other use.







Map center: 66866, 250938 Barmoge PM Course GALWAY Willymongaun O Copyright © Ordnance Survey Ireland/Government of Ireland, DCENR, GSI. Ordnance Survey Ireland Licence No. EN 0047212 (Digital Contract) ee 0 "Malgdagar" Boolard Cushatrough neunalsin de Maunrush, full aunacrick Rock

Coordinate Position

Precambrian Quartzites, Gneisses &

348492009.3538

AREA: LEN:

Schists

Rockunit Code: PQGS

Description:

Geographic WGS84: 53° 29' 50" N, 9° 59' 59" W Irish_National_Grid: 67321, 251554 National Draft Generalised Bedrock Map

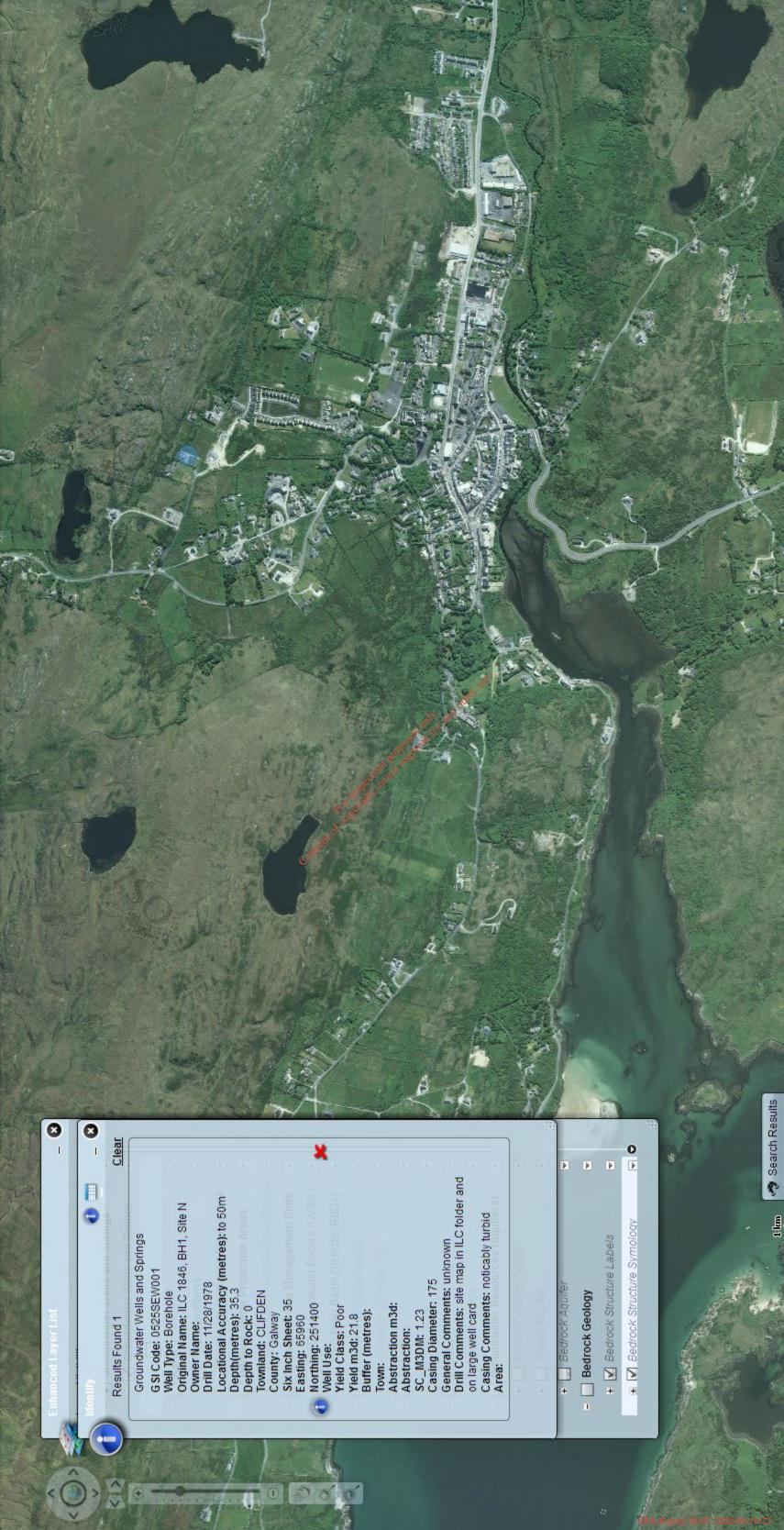
APPENDIX 5

GSI HYDROGEOLOGICAL MAPPING CLIFDEN-CASTLEBAR GWB REPORT

Consent of copyright owner rechired for any other use.



Consent of copyright owner required for any other use.



Rk - Regionally Important Aquifer - Karstifled

Rkd - Regionally Important Aquifer -Karstifled (diffuse) Rkc - Regionally Important Aquifer -Karstifled (conduit)

Rf - Regionally Important Aquifer - Fissured

National Draft Bedrock Aquifer Map

Tracer Output Site

Tracer Lines

SSSSS Superficial Solution Features

Swallow Hole

Turlough

Enclosed Depression

Estevelle Spring

Dry Valley

Cave

Karst Features

Map Legend

Borehole

LI - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local

PI - Poor Aquifer - Bedrock which is Generally Unproductive except for Local

Pu - Poor Aquifer - Bedrock which is Generally Unproductive

County Boundaries

RBD Boundaries

Unclassified

Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive Lk - Locally Important Aquifer - Karstifled

1^{st} Draft Clifden-Castlebar GWB Description July .2004

${\bf Clifden\text{-}Castlebar\ GWB:\ Summary\ of\ Initial\ Characterisation.}$

Hydrometric Area Local Authority		Associated surface water features	Associated terrestrial ecosystem(s)	Area (km²)		
32 Galway, Mayo Co Co's		There are numerous rivers, unnamed streams and lakes. See Table 1 for a full listing of the surface water features.	Connemara Bog Complex / The Twelve Pins - Garraun Complex / Mweelrea-Sheffry-Errif Complex (O'Riain, 2004).	898		
Topog- raphy	Elevations range		us terrain, flattening in a westerly direction toward the Hills, Partry Mountains and the Maamturk Mountains are per in the north.			
	Aquifer categories	Between Castlebar and Newport, there is a narro Ll: Locally important aquifer which is moderate	ly productive only in local zones. benaun, in the Partry Mountains and just north of Toormake Moy Sandstone which is: y moderately productive. m²) occupied by Visean Limestone which is:	ady there		
quifers	Main aquifer lithologies	This GWB is composed primarily of Precambrian Quartzites, Gneisses & Schists, Ordovician Metasediments and Silurian Metasediments and Volcanics. Table 2 presents a full list of lithologies present. Precambrian Marbles cross cut the southern half of the GWB in two areas, at Clifden and Letterfrack and are part of the Letterfrack GWB.				
Geology and Aquifers	Key structures	The rocks in the GWB have undergone several episodes of deformation, comprising intense folding and faulting. The main structural trend is E-W. Major E-W trending folds include the Mweelrea Syncline and the Croagh Patrick Syncline. Parallel to these synclines are several major faults such as the Lough Nafooey, Derry Bay, Errif Valley and Doon Rock Fault. The Maam Valley Fault Zone is a major NW-SW trending fault structure. (Long <i>et al</i> , 2002). Bedrock strata tend to be steeply dipping.				
	Key properties	Well data are sparse in the GWB. Three boreholes located in the schists north of Clifden, at Glenbricken and Coolacloy, have reported yields of 33, 26 and 15 m³/d with specific capacities of 15, 1.3 and 0.6 m³/d/m respectively. The data indicate low transmissivities – in the range of 0.7-20 m²/d. Two wells near Louisburgh also have similar yields and implied transmissivities. In the vicinity of faults, transmissivity may be higher. Storativity is expected to be low (<0.5%). The data are inadequate to calculate groundwater gradients, however, these are expected to be greater than 0.01.				
	Thickness	typically less than 3 m thick; a zone of interconnected fissuring typically less than 150 m,	ost part of the aquifer; comprising a broken and weather connected fissuring 10-15 m thick; and a zone of isolate in which strikes are noted between 40-50 m and 50-56 but yields are from these isolated depths are low.	ed poorly		
	Lithologies	Approximately 32% of the subsoils are dominated	ed by Blanket Peat. A full listing is given in Table 3.			
Overlying Strata	Thickness	Subsoil thickness data are sparse. Available data indicate the thickness of the subsoils is generally less than 3 m over the GWB. Subsoils are thicker in the low lying flatter areas of the GWB. The thickness of the blanket peat ranges from 0-6 m, depending on topography (Daly, 1985).				
verlyi	% area aquifer near surface	[Further Information to be added at a later date	I			
Ó	Vulnerability	[Further Information to be added at a later date	1			
Discharge Recharge	Main recharge mechanisms	Diffuse recharge occurs via rainfall percolating through the subsoil and rock outcrops. Due to the low permeability of much of the subsoil (blanket peat) and the aquifers, a high proportion of the available recharge will discharge to the streams. In addition, the steep slopes in the mountainous areas promote surface runoff. The stream density is approximately 1.5 km/km², indicating the high proportion of surface runoff.				
	Est. recharge rates	[Information to be added to and checked]				
	Large springs and large known abstractions (m³/d)	There are no known large springs or large abstra	ctions in the GWB.			
Dis	Main discharge mechanisms		treams and lakes, but the limited bedrock transmissivity metall be low. Small springs and seeps are likely to issue at the lop on the coastal cliff faces.			

1st Draft Clifden-Castlebar GWB Description July .2004

	Hydrochemical Signature	Wells north of Clifden have alkalinities in the range of 67-180 mg/l CaCO ₃ and hardness in the range of 75-178 mg/l CaCO ₃ . The signature in the GWB is predominantly Ca-Mg-HCO ₃ .
Groundwater Flow Paths Groundwater & Surface		Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. Generally, water levels are 0-8 m below ground level. Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to nearby streams and small springs. There are observed deep water strikes, indicating that there is a component of deep groundwater flow, however shallow groundwater flow is dominant. Groundwater flow directions are expected to follow topography – overall in a westerly direction. Groundwater will discharge locally to streams and rivers crossing the aquifer and also to small springs and seeps.
wate	r interactions	Owing to the poor productivity of the aquifers in this body it is unlikely that any major groundwater - surface water interactions occur. Baseflow to rivers and streams is likely to be relatively low. Lakes comprise approximately 3% of the GWB.
Conceptual model Attachn Instrum	divides. The GV aquifer: than 10r Ground Recharge bedrock Flow parting flow direction Ground The rocurrents Tab	WB is bounded to the west by the coast. The northern, southern and eastern boundaries are surface water catchment. The terrain is characterised by mountainous areas, flattening toward the coastline. WB is composed primarily of low transmissivity rocks. Most of the groundwater flux is in the uppermost part of the comprising a broken and weathered zone typically less than 3m thick; a zone of interconnected fissuring typically less m; and a zone of isolated fissuring typically less than 150m. water flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. We occurs diffusely through the subsoils and via outcrops. Recharge is limited by the peat and the low permeability to the available recharge discharges rapidly to nearby streams. The area likely to be short (30-300 m) with groundwater discharging rapidly to nearby streams and small springs and rections are expected to follow topography. Water discharges rapidly to nearby small streams, lakes, small springs and seeps. Overall flow direction is westwards. We units in GWB are generally of low permeability and baseflow to rivers and streams is likely to be relatively low. It is a gauges: 32004*, 32005, 32008, 32010, 32011*, 32013, 32014; 32015, 32016, 32017, 32018, 32019, 32020, 23, 32060, 32072, 32073, 32074, 32078. A Representative Monitoring boreholes: (Mayo 84) A Representative Monitoring points: None The terrain is characterised by mounts of the groundwater reference to its Protection from Pollution. Geological way of Ireland report for Galway County Consective Spn.
Pra acc Irel Lor Sca Aqu O' Info		y, D. (1985) Groundwater in County Galway with particular reference to its Protection from Pollution. Geological vey of Ireland report for Galway County Council 98pp. Cht, M., Lees, A., Leake, B., Feely, M. Long, B., Morris, J., McConnell, B., (2003). A geological description to company the Bedrock Geology 1:100,000 scale Map Series, Sheet 14, Galway Bay. Unpublished Geological Survey of and Map Series Report. g, B., McConnell, B., Philcox, M. E. (2002). A geological description to accompany the Bedrock Geology 1:100,000 let Map Series, Sheet 11, South Mayo. Geological Survey of Ireland Map Series Report. uifer Chapters: The Granite, Ordovician, Precambrian and Ordovician Aquifers. Riain, G., (2004). Water Dependent Ecosystems and Subtypes Draft Report. WFD Support Projects. Compass ormatics in association with National Wildlife and Parks Service (DEHLG).
Disclain	1100	e that all calculation and interpretations presented in this report represent estimations based on the information sources cribed above and established hydrogeological formulae.

Table 1 Associated surface water features

Rivers: Bellakip, Bunanakee, Bundorragh, Bunleemshough, Bunowen, Carrowbeg, Carrownisky, Cross, Culfin, Davros, Derrycraff, Erriff, Glaishwy, Glencullin, Glendavock, Glenlaur, Glenummera, Keeraun, Kylemore, Lugatoran, Moyour, Mweelin, Newport, Owenacunny, Owenadornaun, Owencloghagh, Owenduff, Owengarr, Owenglin, Owenmore, Owennabaunoge, Owennabrockagh, Owennaglogh, Owennasallagh, Owenwee, Polladirk, Shanaveagh, Traheen, Streamstown, Traheen, Erriff, Owenwee, Glenisland.

Streams: Owengarve

Lakes: Tonacrick Lough, Tawnyard Lough, Shanakeever Lough, Rusheenduff Lough, Rusheen Lough, Roonagh Lough, Prospect Lough, Moher Lough, Maw Lough, Lugaloughan, Lugaharry Lough, Lugacolliee Lake, Loughnakilky, Loughbaun, Loughauwnphaudeen, Loughaun's, Loughaunattin, Loughaunarow, Loughaunaroor, Loughaun, Loughaun, Loughaun, Loughaun, Loughauns, Loughaun, Loughanboy, Loughanaveeny, Loughan, Loughan, Woongar, Usk, Tully, Touther, Tonagh, Tarriff, Tanny, Srahwee, Sillagh, Sallagher, Phreaghaun, Oughter, Nawarawaun, Natawny, Nasoodery, Namucka, Nambrackkeagh, Nambrackkeagh, Nambrackkagh, Nakilla, Nakilla, Nahoomin, Nahillion, Nahaltora, Naguroge, Nagap, Nacorrussaun, Nacorra, Nacarrigeen, Muingacurry, Muck, Maladrolaun, Lugaloughan, Louracheragh, Laraha, Laraha, Knockaunbaun, Greney, Glenawough, Gall, Fee, Fee, Fadda, Emlaghnacourty, Emilagh, Doo, Donoghmeave, Darrdun, Cunnel, Cunnel, Cashleen, Cahasy, Bunnaboghec, Breenbannia, Brawn, Benchoona, Ben, Bellawaum, Beg, Beg, Beg, Beg, Beflawaum, Awaniareen, Awaddy, Auna, Athola, Ascardaun, Apillaun, Animma, Alisheen, Agh, Adroma, Acreragh, Acrannereen, Loch an Gherarrain Bhain, Lettershask North, Lettereen Lough, Kylemore/Pollacappul Lough, Knappaghmore Lough, Knappagh Lough, Knappagh Lough, Killadangan Lough, Island Lough, Island Lough, Island, Glencullin Lough, Glenbrickeen Lough, Gibson's Lough, Fin Lough, Fiddaungil, Feenune Lough, Faul Lough, Emlaghbeg Lough, Drinagh Lough, Drimeen Lough Doonloughan Lough, Doonloughan Lough, Dooaghtry Lough, Doo Lough, Derrywaking Lough, Derryvraun Lough, Derrylea Lough, Derrygarvebeg, Derryaun Lough, Derryascorra Lough, Derrintin Lough, Derrarlan Lough, Cuilmore Lough, Cross Lough, Croft Lough, Creggan Lough, Cregg Lough, Creeggan Lough, CourhoorLough, Corragaun Lough, Cogaula Lough, Cashel Lough, Carrowevagh Lough, Carrickawaddy Lough, Boolagare Lough, Boheh Loughs, Boheh Loughs, Beltra Lough, Barnahallia Lough, Ballynakill Lough, Ballynacarrick Lough, Ballybwee Lough, Ballinaboy Lough, Aughrusbeg Lough, Anivan



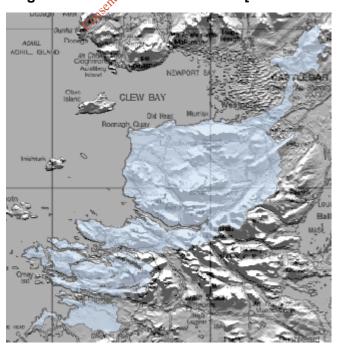
Table 2. Rock units in Clifden GWB

RockUnit	category	aquifer type	%AREA o	Code	Unit name
Dinantian Pure Bedded Limestones	Rkc	Pending Classification	1%	VIS	Visean Limestones (undifferentiated)
Cambrian Metasediments	PI	Poorly Productive Bedrock Aquifer	2%	WG	Westport Grit Formation
Devonian Old Red Sandstones	PI	Poorly Productive Bedrock Aquifer	5%	GM	Graffa More Formation
Granites & other Igneous Intrusive rocks	PI	Poorly Productive Bedrock Aquifer	12%	S	Serpentinite
Ordovician Metasediments	PI	Poorly Productive Bedrock Aquifer	36%	SH	Slate Members
Ordovician Volcanics	PI	Poorly Productive Bedrock Aquifer	2%	FN	Farnacht Formation
Precambrian Quartzites, Gneisses & Schists	PI	Poorly Productive Bedrock Aquifer	22%	ST	Streamstown Schist Formation
Silurian Metasediments and Volcanics	PI	Poorly Productive Bedrock Aquifer	19%	SK	Strake Banded Formation
Dinantian Sandstones	Lm	Productive Fractured Bedrock Aquifer	1%	MO	Moy Sandstone Formation

Table 3. List of Subsoils in Clifden GWB.

Parent Material	Code	%area of GWB
Alluvium	Α	1.07%
Alluvium clayey	Ac	0.03%
Acidic esker sand/gravel	AcEsk	0.00%
Alluvium gravelly	Ag	0.00%
Alluvium silty	Asi	0.01%
Blanket peat	BktPt	32.09%
cutover	Cut	0.70%
Sandstone sand/gravel (devonian/carb)	GDCSs	0.00%
sandstone sand/gravel (lower palaeozoic)	GLPSs	0.68%
sandstone and shale sand/gravel (lower palaezoic)	GLPSsS	0.03%
metamorphic sand/gravel	GMp	0.18%
Lake sediments undifferentiated	L	0.00%
Lakes	Lake	2.80%
islands	Lk_isle	0.02%
Madeground	Made	0.10%
Beach Sand	Mbs	0.49%
Estuarine Sediments	Mesc	0.08%
Rock at surface	Rck	41.61%
Scree	Scree	0.90%
Till sandstone devonian carboniferous	TDCSs	0.07%
Till sandstone devonian	TDSs	3.27%
Till Granitic	TGr	0.73%
Sandstone dominated Lower Palaeozoic Till	TLPSs	4.88%
Till sandstone and shaleSandstone and shale dominated till (Devonian/Carboniferous)	TLPSsS	5.42%
Limestone till	TLs	0.06%
Metamorphic Till Metamorphic Till	TMp	4.57%
Blown sand pot till	Ws	0.19%

Figure 1. Clifden-Castlebar GWB [reference only]



APPENDIX 6

EPA COASTAL WATER MAPPING

EPA SURFACE WATER MAPPING

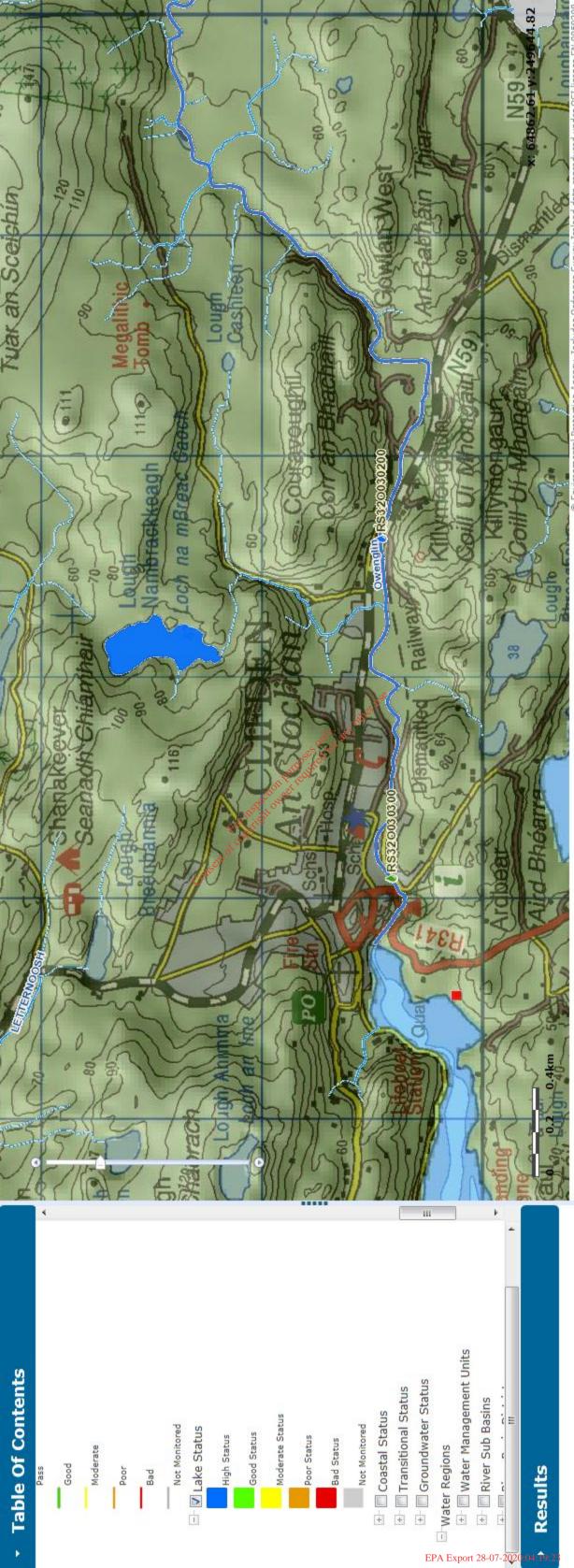
WFD CATCHMENT MAPPING

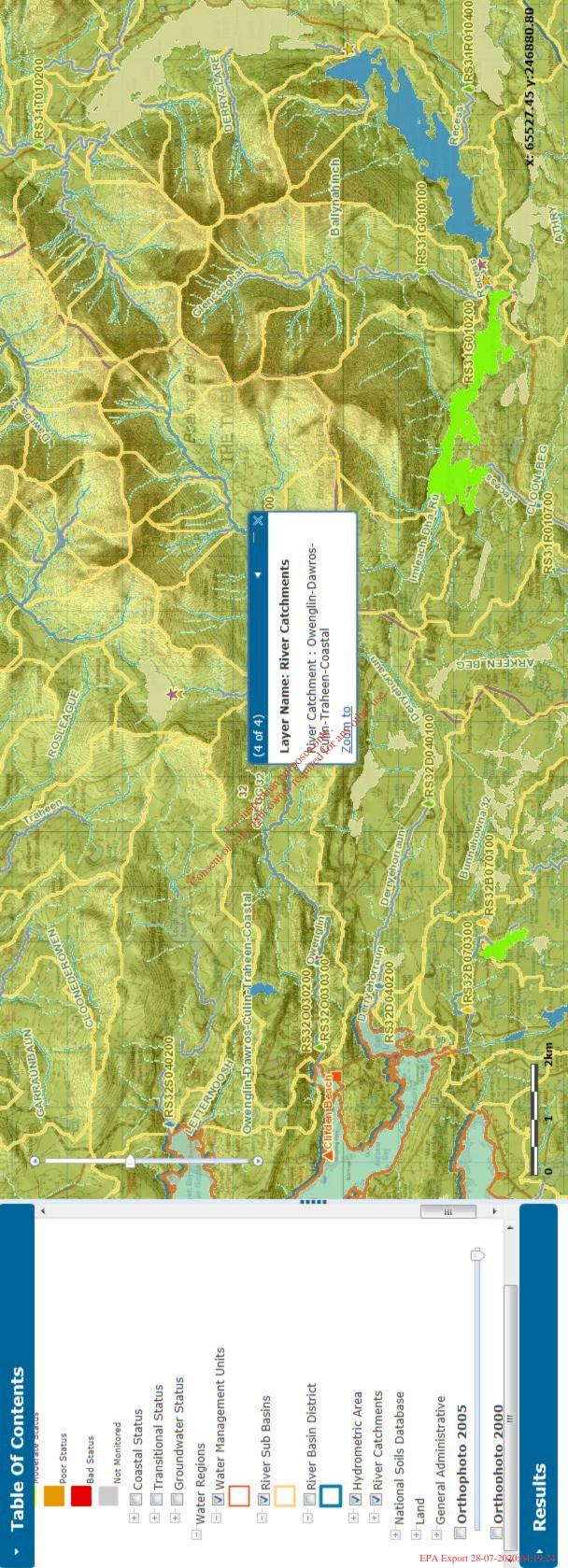
Consent of copyright owner required for any other



Consent of copyright owner required for any other use.

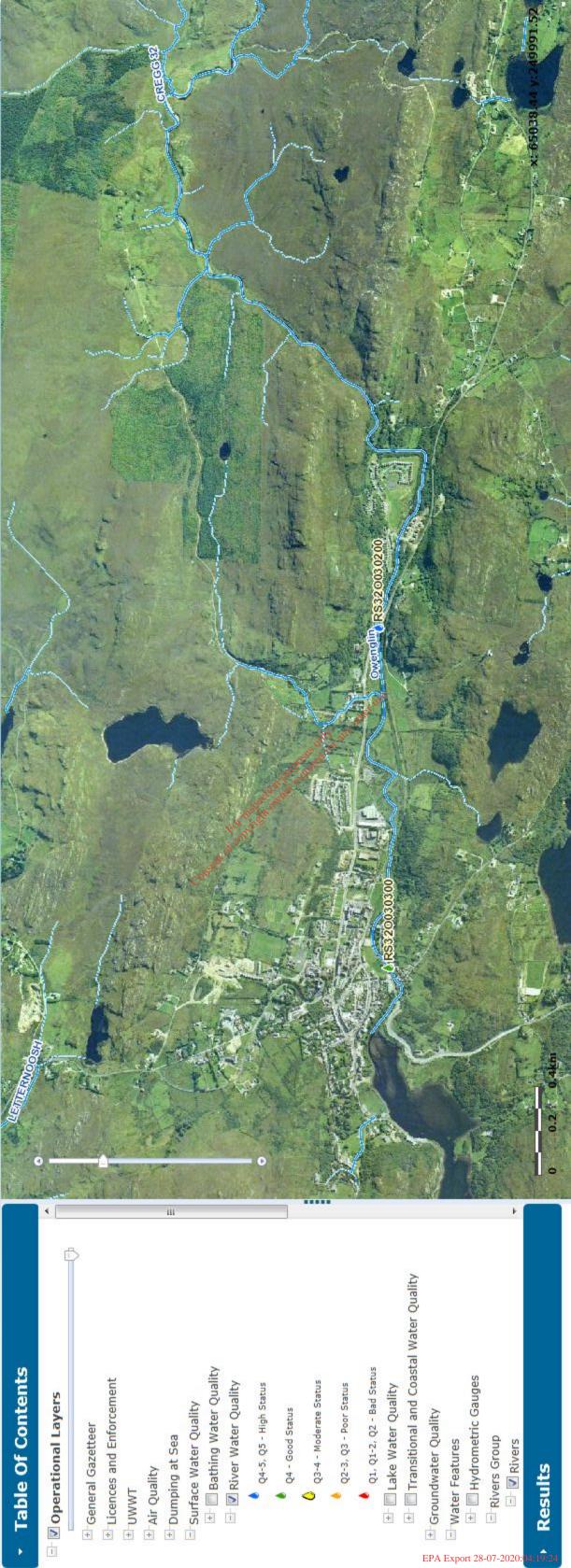


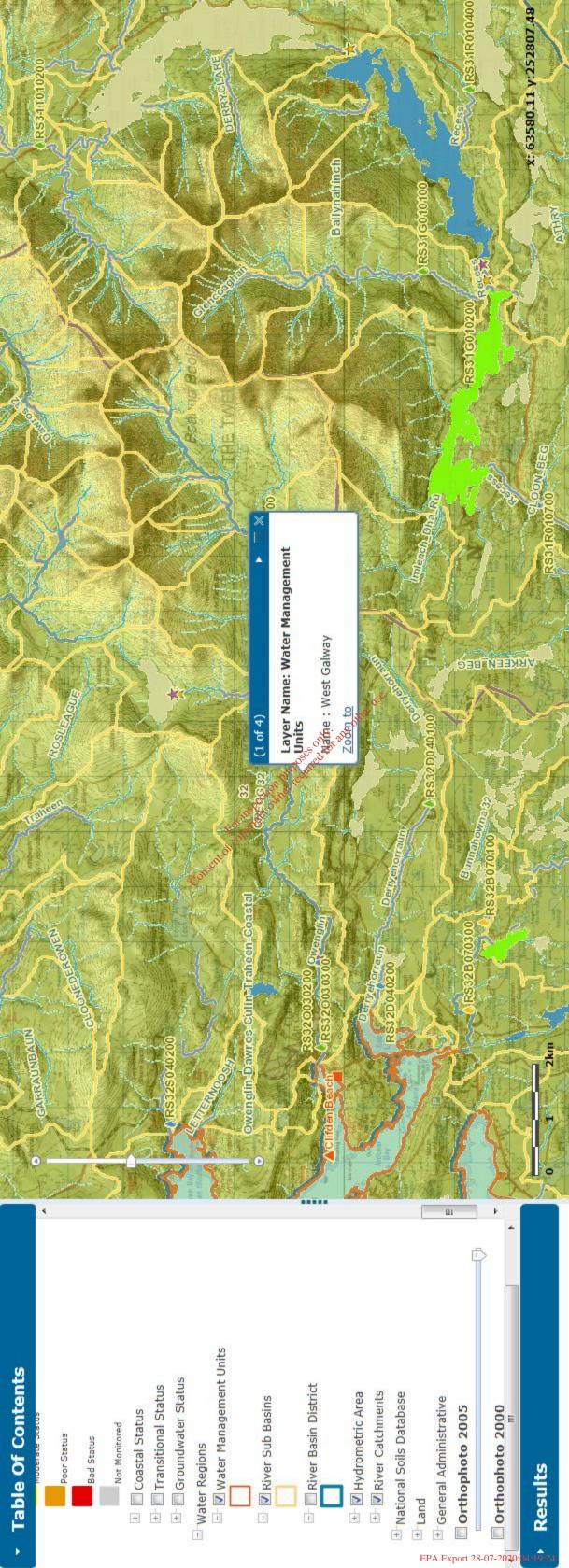








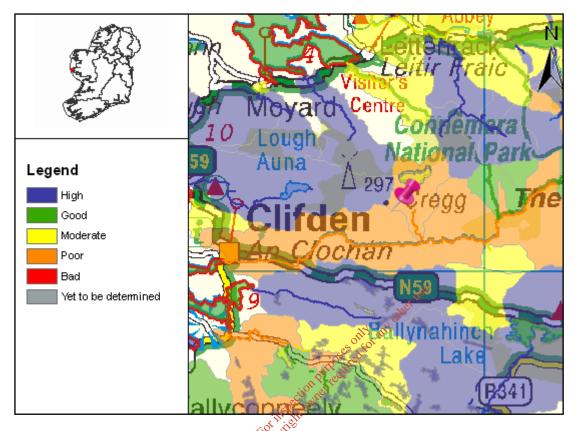








Full Report for Waterbody Cregg(BallynahinchBy), Trib of Owenglin



River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. The WaterMaps viewer is an integral part of the River Basin Management Plan and provides access to information at individual waterbody level and at Water Management Unit level for all the River Basin Districts in Ireland.

The following report provides summary plan information about the selected waterbody (indicated by the pin in the map above) relating to its status, risks, objectives, and measures proposed to retain status where this is adequate, or improve it where necessary. Waterbodies can relate to surface waters (these include rivers, lakes, estuaries [transitional waters], and coastal waters), or to groundwaters. Other relevant information not included in this report can be viewed using the WaterMaps viewer, including areas listed in the Register of Protected Areas.

You will find brief notes at the bottom of some of the individual report sheets that will help you in interpreting the information presented. More detailed information can be obtained in relation to all aspects of the RBMPs at www.wfdireland.ie.





western

Summary Information:

Water Management Unit: IE_WE_WestGalway

WaterBody Category: River Waterbody

WaterBody Name: Cregg(BallynahinchBy), Trib of

Owenglin

WaterBody Code: IE_WE_32_3028

Overall Status: Poor

Overall Objective: Restore_2021

Overall Risk: 2b Not At Risk

Heavily Modified: No

Report data based upon final RBMP, 2009-2015.

The information provided above is a summary of the principal findings related to the selected waterbody. Further details and explanation of individual elements of the report are outlined in the following pages.

Further details and explanation of individual elements of the report are outlined in the following pages.





Status Report

Water Management Unit: IE_WE_WestGalway

WaterBody Category: River Waterbody

WaterBody Name: Cregg(BallynahinchBy), Trib of

Owenglin

WaterBody Code: IE_WE_32_3028

Overall Status Result: Poor

Heavily Modified: No



	Status Element Description	Result
	Status information	
Q	Macroinvertebrate status	Good
PC	General physico-chemical status	High
FPQ	Freshwater Pearl Mussel / Macroinvertebrate status	N/A
DIA	Diatoms status	N/A
HYM	Hydromorphology status	N/A
FIS	Fish status	Poor
SP	Specific Pollutants status (SP)	N/A
ES	Overall ecological status	Poor
CS	Overall chemical status (PAS)	n/a
EXT	Extrapolated status	N/A
MON	Freshwater Pearl Mussel / Macroinvertebrate status Diatoms status Hydromorphology status Fish status Specific Pollutants status (SP) Overall ecological status Overall chemical status (PAS) Extrapolated status Monitored water body Donor water bodies	YES
DON	Donor water bodies	N/A

n/a - not assessed

Status

By 'Status' we mean the condition of the water in the waterbody. It is defined by its chemical status and its ecological status, whichever is worse. Waters are ranked in one of 5 status classes: High, Good, Moderate, Poor, Bad. However, not all waterbodies have been monitored, and in such cases the status of a similar nearby waterbody has been used (extrapolated) to assign status. If this has been done the first line of the status report shows the code of the waterbody used to extrapolate.

You can read more about status and how it is measured in our RBMP Document Library at www.wfdireland.ie (Directory 15 Status).

water matters



Risk Report

Water Management Unit: IE_WE_WestGalway

WaterBody Category: River Waterbody

WaterBody Name: Cregg(BallynahinchBy), Trib of

Owenglin

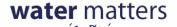
WaterBody Code: IE_WE_32_3028

Overall Risk Result: 2b Not At Risk

Heavily Modified: No



	vily riodilied.		
	Risk Test Description		Risk
	Diffuse Risk Sources		
RD1	EPA diffuse model (2008)		Not At Risk
RD2a	Road Wash - Soluble Copper		Not At Risk
RD2b	Road Wash - Total Zinc		Not At Risk
RD2c	Road Wash - Total Hydrocarbons		Not At Risk
RD3	Railways		Not At Risk
RD4a	Forestry - Acidification (2008)		Not At Risk
RD4b	Forestry - Suspended Solids (2008)	2a	Probably Not At Risk
RD4c	Forestry - Eutrophication (2008)	2a	Probably Not At Risk
RD5	Overall Unsewered (2008)	2b	Not At Risk
RD5a	Unsewered Areas - Pathogens (2008)	2a	Probably Not At Risk
RD5b	Unsewered Phosphorus (2008)	2b	Not At Risk
RD6a	Road Wash - Total Zinc Road Wash - Total Hydrocarbons Railways Forestry - Acidification (2008) Forestry - Suspended Solids (2008) Forestry - Eutrophication (2008) Overall Unsewered (2008) Unsewered Areas - Pathogens (2008) Unsewered Phosphorus (2008) Arable Sheep Dip Forestry - Dangerous Substances Diffuse Overall -Worst Case (2008)		Not At Risk
RD6b	Sheep Dip		Not At Risk
RD6c	Forestry - Dangerous Substances		Not At Risk
RDO	Diffuse Overall -Worst Case (2008)	2a	Probably Not At Risk
	Hydrology		
RHY1	Water balance - Abstraction		Not At Risk
	Morphological Risk Sources		
RM1	Channelisation (2008)		Not At Risk
RM2	Embankments (2008)		Not At Risk
RM3	Impoundments		Not At Risk
RM4	Water Regulation		Not At Risk
RM5	Intensive Landuse		N/A
RMO	Morphology Overall - Worst Case (2008)	2b	Not At Risk



	Overall Risk	
RA	Rivers Overall - Worst Case (2008)	Not At Risk
	Point Risk Sources	
RP1	WWTPs (2008)	Not At Risk
RP2	CSOs 2b	Not At Risk
RP3	IPPCs (2008) 2b	Not At Risk
RP4	Section 4s (2008) 1a	At Risk
RP5	WTPs/Mines/Quarries/Landfills	N/A
RPO	Overall Risk from Point Sources - Worst Case (2008)	At Risk
	Q Value	
Q	EPA Q rating and Margaritifera Assessment	N/A
	Q/RDI or Point/Diffuse	
QPD	Q class/EPA Diffuse Model or worst case of Point and Diffuse (2008)	Not At Risk
	Rivers Direct Impacts	
RDI1	Rivers Direct Impacts - Dangerous Substances	N/A

By 'risk' we mean the risk that a waterbody will not achieve good ecological or good chemical status/potential at least by 2015. To examine risk the various pressures acting on the waterbody were dentified along with any evidence of impact on water status. Depending on the extent of the pressure and its potential for impact, and the amount of information available, the risk to the water body was placed in one of four categories: 1a at risk; 1b probably at risk; 2a probably not at risk; 2b not at risk. Note that '2008' after the risk category means that the risk assessment was revised in 2008. All other risks were determined as part of an earlier risk assessment in 2005.

You can read more about risk assessment in our 'WFD Risk Assessment Update' document in the RBMP document library, and other documents at www.wfdireland.ie (Directory 31 Risk Assessments).





Objectives Report

Water Management Unit: IE_WE_WestGalway

WaterBody Category: River Waterbody

WaterBody Name: Cregg(BallynahinchBy), Trib of

Owenglin

WaterBody Code: IE_WE_32_3028

Overall Objective: Restore_2021

Heavily Modified: No



	Objectives Description	Result
	Extended timescale information	
E1	Extended timescales due to time requirements to upgrade WWTP discharges	No Status
E2	Extended timescales due to delayed recovery of chemical pollution and chemical status failures	No Status
E3	Extended timescales due to delayed recovery following reduction in agricultural nutrient losses	No Status
E4	Extended timescales due to delayed recovery from physical modifications and physical damage	No Status
E5	Extended timescales due to delayed recovery following implementing forestry acidification measures	No Status
E6	Extended timescales due to physical recovery timescales at mines and contaminated sites	No Status
E7	Extended timescales due to delayed recovery of highly impacted sites	2021
E8	Extended timescales due to delayed recovery following reduction in agricultural nutrient losses	No Status
E9	Extended timescales due to delayed recovery from nitrogen losses to estuaries	No Status
E10	Extended timescales due to delayed recovery following reduction in agricultural nutrient losses	No Status
E11	Extended timescales due to delayed recovery from physical modifications and physical damage (overgrazing)	No Status
E12	Extended timescales due to delayed recovery from physical modifications and physical damage (channelisation)	No Status
E13	Extended timescales from Northern Ireland Environment Agency	No Status
EOV	Overall extended timescale - combination of all extended timescales fields	2021
E14	Extended timescales due to the presence of Freshwater Pearl Mussel populations	No Status
EX15	Extended timescales due to highly impacted sites	2021





	Objectives information	
OB1	Prevent deterioration objective	No Status
OB2	Restore at least good status objective	No Status
ОВ3	Reduce chemical pollution objective	No Status
OB4	Protected areas objective	Restore_2021
OB5	Northern Ireland Environment Agency objective	No Status
ОВО	Overall objectives	Restore_2021

Extended timescales

Extended timescales have been set for certain waters due to technical, economic, environmental or recovery constraints. Extended timescales are usually of one planning cycle (6 years, to 2021) but in some cases are two planning cycles (to 2027).

Objectives

In general, we are required to ensure that our waters achieve at least good status/potential by 2015, and that their status does not deteriorate. Having identified the status of waters (this is given earlier in this report), the next stage is to set objectives for waters. Objectives consider waters that require protection from deterioration as well as waters that require restoration and the timescales needed for recovery. Four default objectives have been set initially:-

Prevent Deterioration Restore Good Status Reduce Chemical Pollution Achieve Protected Areas Objectives

These objectives have been refined based on the measures available to achieve them, the latter's likely effectiveness, and consideration of cost-effective combinations of measures. Where it is considered necessary extended deadlines have been set for achieving objectives in 2021 or 2027.

Consent of Consent





Measures Report

Water Management Unit: IE_WE_WestGalway

WaterBody Category: River Waterbody

WaterBody Name: Cregg(BallynahinchBy), Trib of

Owenglin

WaterBody Code: IE_WE_32_3028

Heavily Modified: No



	Measures Description	Applicable
BC	Total number of basic measures which apply to this waterbody	24
BW	Directive - Bathing Waters Directive	No
BIR	Directive - Birds Directive	No
HAB	Directive - Habitats Directive	Yes
DW	Directive - Drinking Waters Directive	Yes
MAE	Directive - Major Accidents and Emergencies Directive	Yes
EIA	Directive - Environmental Impact Assessment Directive	Yes
SS	Directive - Sewage Sludge Directive	Yes
UWT	Directive - Urban Waste Water Treatment Directive	Yes
PPP	Directive - Plant Protection Products Directive pure children	Yes
NIT	Directive - Nitrates Directive	Yes
IPC	Directive - Integrated Pollution Prevention Control Directive	Yes
CR	Directive - Major Accidents and Emergencies Directive Directive - Environmental Impact Assessment Directive Directive - Sewage Sludge Directive Directive - Urban Waste Water Treatment Directive purposition of dripking water sources. Directive - Plant Protection Products Directive Directive - Nitrates Directive Directive - Integrated Pollution Prevention Control Directive Other Stipulated Measure - Protection of dripking water sources.	Yes
SUS	Other Stipulated Measure - Promotion of efficient and sustainable water use	Yes
DWS	Other Stipulated Measure - Protection of drinking water sources	Yes
ABS	Other Stipulated Measure - Control of abstraction and impoundment	Yes
POI	Other Stipulated Measure - Control of point source discharges	Yes
DIF	Other Stipulated Measure - Control of diffuse source discharges	Yes
PS	Other Stipulated Measure - Control of priority substances	Yes
MOD	Other Stipulated Measure - Controls on physical modifications to surface waters	Yes
OA	Other Stipulated Measure - Controls on other activities impacting on water status	Yes
AP	Other Stipulated Measure - Prevention or reduction of the impact of accidental pollution incidents	Yes
TP1	WSIP - Agglomerations with treatment plants requiring capital works	No
TP2	\ensuremath{WSIP} - Agglomerations with treatment plants requiring further investigation prior to capital works	No
TP3	WSIP - Agglomerations requiring the implementation of actions identified in Shellfish PRPs	No
TP4	WSIP - Agglomerations with treatment plants requiring improved operational performance	No





TP5	WSIP - Agglomerations requiring investigation of CSOs	No
TP6	$WSIP\ Agglomerations where exisitng treatment capacity is currently adequate but predicted loadings would result in overloading$	No
OTS	On-site waste water treatment systems	Yes
FPM	Freshwater Pearl Mussel sub-basin plan	Yes
SHE	Shellfish Pollution Reduction Plan	Yes
IPR	IPPC licences requiring review	No
WPR	Water Pollution Act licences requiring review	Yes
FOR	Forestry guidelines and regulations	Yes
CH1	Chanelisation measures	No
CH2	Chanelisation investigations	No
OG	Overgrazing measures	No
HQW	Protect high quality waters	No

Measures

Measures are necessary to ensure that we meet the objectives set out in the previous page of this report. Many measures are already provided for in national legislation and must be implemented. Other measures have been recently introduced or are under preparation. A range of additional potential measures are also being considered but require further development. Any agreed additional measures can be introduced through the update of Water Management Unit Action Plans during the implementation process.

You can read more about Basic Measures in 'River Basin Planning Guidance and in other documents in our RBMP Document Library at www.wfdireland.ie.

Consent of Constitution Planning Guidance and in other documents in our RBMP Document Library at www.wfdireland.ie.

APPENDIX 7

TRIALPIT LOGS

Consent of congright owner required for any other use.



Consent of copyright owner required for any other use.

	[T]		Ι	Γ							
HON		SAMPLE		ER	DEPTH (m))GY	TRIALPIT NUMBER: TP01 PAGE			E 1 OF 1	
BOREHOLE	SAN		POL a)	WAT			EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
REE	H.	Ī	SOIL VAPOUR (ppm)	Į Į	PTH	GEOLOGY	CONTRACTOR: Bernard Corbett				
BOREHOLE CONSTRUCTION NUMBER SAMPL		TYPE		GROUNDWATER	DE	GE	LOGGED BY: DG/PM	GRID REF.: E	67755	N251198	
5	[5 <u>8</u>	-		G			CHECKED BY: PM	ELEVATION:	approx	. 50.98m AOD	
							DESCRIPTIO	N		COMMENTS	
					0 =	*	Soft dark brown gravelly sandy silty	, ΡΕΔΤ		Ingress of	0 =
					=	*	with fibrous roots interspersed			surface water	=
					=	*			to pit	=	
				Ž	1.5 - 2.5 - ** 2.5 - ** 3.0 - **		Mixed WASTE (DOMESTIC 80% (PLA BOTTLES, ASH AND CINDERS ETC.) C&D WASTE 10%). Typical black plastic bin bag waste Skip waste consisting of typical residenti electric cables, timber shards, etc Ectric cables, timber shards, etc to the constitute of the constitut	ETC.), COMMERCIAL 10%, idential renovation waste e.g.		Black staining- suspected sulphides	1.5
					3.5	* *	gr ^{sefit}				3.5
					- - -		Terminated at 3.5m bgl - collapsing	sides			
					=						
					-						4.0-
					_						
											-
					4.5-						4.5-
					T.J =						7.5
					_=						_
					=						
					5.0 -						<u> </u>
LOCATION / NOTES:			<u>LEGEND</u>	TRIALPIT LOG							
Ingress of surface water constant for over 3 hours. A result of ponded water on surface on						1	Disturbed Sample JO	OB TITLE TULLYVOHEEN LF SITE INVESTIGATION			
north eastern corner of site.							Undisturbed Sample				
							* Headspace Analysis	JENT GALWAY C.C.			
							▼ Groundwater Table	212111	No. Co. Comp.	ROY	
							Perched Water Table		2		

	[27]		I	Т							
NO.	SAMPLE		~	VATER	(m)		TRIALPIT NUMBER: TP02 PAG			E 1 OF 1	
BOREHOLE			POU 1)			GY	EXCAVATION DATE: 15/01/14 METHOD: TRACK				
REH TRU			SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	CONTRACTOR: Bernard Corbett DIAMETER: N/A				
BOJ NS	NUMBER	TYPE					LOGGED BY: DG/PM	GRID REF.: I	E67743	N251177	
CC	5 <u>N</u>	Ĺ	N N	G.			CHECKED BY: PM	ELEVATION:	approx	rox. 50.76m AOD	
							DESCRIPTIO	N		COMMENTS	
					T 0 =	*	Soft dark brown gravelly sandy silty PE	AT			
				=	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	with fibrous roots interspersed				=	
				0.5		Mixed WASTE (DOMESTIC 80% (PLA BOTTLES, ASH AND CINDERS ETC.) C&D WASTE 10%). Typical black plastic bin bag waste Skip waste consisting of typical residenti	, COMMERCIAL 1		Black staining, sheen on water	0.5	
	1.5-				1.5		electric cables, timber shards, etc			1.5	
					=	*					
	2.0————————————————————————————————————							2.0			
						=					
				Y	_	*	थीते. श्रीये ००				-
					=	1	see did				-
					2.5	1	Dury Chiric			Water ingress	2.5
					_	1	ction retie			at 2.5m	=
					_	1	in special com				=
					3.0—		FOT WILE	() [1]			3.0-
					3.0 =	\rightarrow	x of e	V	1		3.0 =
					_		TIE THE THE THE THE THE THE THE THE THE TH				_
					=	*			7.		=
					3.5	*			C_{j}		3.5
					=	1					=
					-	H					=
					=	1		1			
					=						4.0-
					_=	+		A SOCIONAL DE LA CONTRACTOR DE LA CONTRA	10		
							Terminated at 4.0m bgl - waste wa	ls collapsing, bott	tom		
					4.5 -		of waste not reached.	1 6,			4.5
					=						
											-
T C C	ATTION (NO	EEC.		5.0 -	1	LECEND	FETTO T A	IPT		1
LOCATION / NOTES:						LEGEND TRIALPIT LOG			I LOG		
Waste identical in makeup to Tp01							Disturbed Sample Undisturbed Sample	JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION			
							* Headspace Analysis	LOCATION CLIFDEN, CO. GALWAY			
								LIENT	GA	GALWAY C.C.	
							▼ Groundwater Table	MULROY			
							Perched Water Table				

	F#7		I	Г							
E ION	SAMPLE		R R	ER			TRIALPIT NUMBER: TP03		PAGI	E 1 OF 1	
BOREHOLE	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15 /01/14	METHOD: T	RACK	ED HYMAC	
REF		Т	VAPC (ppm)	N N	PTH	OTC	CONTRACTOR: Bernard Corbett	DIAMETER: 1	N/A		
BOOS	NUMBER	TYPE	108	SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.: E	E67730	N251157	
ŭ	N	-		5			CHECKED BY: PM	ELEVATION:	approx	. 51.25m AOD	
	-		•				DESCRIPTION	N		COMMENTS	0
						*	Soft dark brown gravelly sandy silty PE	AT]
						*	with fibrous roots interspersed				=
					-		•				=
					0.5						0.5
					=						=
					_	1					_
					=	1	Mixed WASTE (DOMESTIC 80% (PL	STIC & GLASS			=
					1.0	•	BOTTLES, ASH AND CINDERS ETC. C&D WASTE 10%).), COMMERCIAL 1	0%,		1.0
]						=
					-	H	Typical black plastic bin bag waste				-
] =	*	Skip waste consisting of typical residen	ial renovation waste	e.g.] =
					1.5 –	1	electric cables, timber shards, etc				1.5
						1					_=
					=	1					=
					2.0-	1	For Higher to the Fibrous PEAT	o*			2.0
					= =		iterit				
					_	H	थात्र, यद्यत्रे ००				_
					=	4	aes difor				=
					2.5	1	nutro direc				2.5
					_	4	ction vertee,				=
	SO-			Ā	-		in the last own				_
	TP03-	\times	1			[*]	Fibrous PEAT			Infiltration	
	01		1		3.0-	*	(S			of water at	3.0-
						*	Real Property of the Control of the			waste soil interface	_
					=	, *E				interface	=
					3.5 -	**			1		3.5
					_	⊁ <u>`</u> ;					=
						* <u>*</u> *					-
					=	* <u>*</u> *			X.		=
					_	***		V			4.0
						_	T.		1.00		=
						*					-
					=	* *					=
					4.5 <u> </u>	* *					4.5-
					=	* *					=
						[*]	Terminated at 4.9m bgl - Water floo	ding, not possible	to log.		
					5.0 -						<u> </u>
LOC	ATION /	NO'	TES:				<u>LEGEND</u>	TRIA	LPI	T LOG	
1							M 2011 10			HEEN LF	
							Disturbed Sample			STIGATION	
							Undisturbed Sample	OCATION C	LIFDE	N, CO. GALWAY	
							* Headspace Analysis	LIENT		LWAY C.C.	
1							↑ Down Borehole Analysis ✓ Groundwater Table	***	No. 10. Laure	STATE OF REAL	
1							✓ Perched Water Table			ROY	
1							¥ 1 cremed Water rable			ALCOHOLD TO THE REAL PROPERTY.	

		<u>. I</u>	т —							
BOREHOLE	SAMPLE		ER			TRIALPIT NUMBER: TP0	4	PAGI	E 1 OF 1	
BOREHOLE	SAN		WAT	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
REH TRU	_	Tanga Naga	l á	PTH		CONTRACTOR: Bernard Corber	tt DIAMETER:	N/A		
BOI NS'	NUMBER	TYPE SOIL VAPOUR (ppm)	GROUNDWATER	DEI	Ĕ	LOGGED BY: DG/PM	GRID REF.: I	E67714	N251139	
	S	<u>_</u>	GR.		ľ	CHECKED BY: PM	ELEVATION:	approx	. 51.25m AOD	
				┌	\dashv	DESCRIPTION			COMMENTS	
	[Τ	†°∃	<u>, ~ </u>	Soft dark brown gravelly sandy silty P				0 -
				=	[*	with fiberous roots interspersed				=
				1.5		gravelly clayey BOULDERS angular and sub angular Terminated at 1.25m bgl - Refusal			No waste	1.0 — 1.5 —
LOCA	TION /	/ NOTES:		J.U 7		I EGEND	TDIA	I DI	TIOC	
LOCA	11UN / [/ NOTES:				LEGEND			T LOG	
						Disturbed Sample			OHEEN LF STIGATION	
						Undisturbed Sample	LOCATION (CLIFDE	N, CO. GALWAY	
						★ Headspace Analysis→ Down Borehole Analysis	CLIENT	GA	LWAY C.C.	
						Groundwater Table Perched Water Table			ROY	

	[2]	1	т —							
m NO	SAMPLE	≃	ER			TRIALPIT NUMBER: TP05		PAGI	E 1 OF 1	
BOREHOLE	SAM	SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
REE TRU		C VAPC (ppm)	Í	PTH	070	CONTRACTOR: Bernard Corbett	DIAMETER:	N/A		
BOS	NUMBER		SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.: 1	E 67730	N251139	
ŏ		- "	15			CHECKED BY: PM	ELEVATION:	approx	. 51.25m AOD	
		-				DESCRIPTIO	N		COMMENTS	0
			∇	$\Gamma^{\circ} =$, **	Soft dark brown gravelly sandy silty	PEAT]
			÷	_=	*					_=
				=	[*	with fibrous roots interspersed				=
				0.5	¥					0.5
				=	*					=
				-	1					-
					1	Mixed WASTE (DOMESTIC 80% (PLA BOTTLES, ASH AND CINDERS ETC.)	STIC & GLASS	0%		1 =
				1.0	*	C&D WASTE 10%).	, COMMERCIAL I	.070,		1.0-
				_=	H	Typical black plastic bin bag waste				_=
				=	 	Skip waste consisting of typical residenti	al renovation wasts	e o		
				1.5 _	*	electric cables, timber shards, etc	ai ichovanon waste	c.g.		1.5
				=	+					
				_						-
				2.0 <i>-</i>	1	۔و				2.0-
				Z.U — -	1	Torminated at 2.5 called Water inw				2.0
				=	!	ay apy our				=
				=	1	ses aforth				:
				2.5		The state of the s	1 . 10			2.5
				_		reminated at 2.5 m ogi - water mur	idated from top			
				=		nsett of copyright on the state of the state				-
				3.0—		For Africa				3.0-
				- - -		N. O. C.				-
				-	وح	Mer.				-
				=						
				3.5-						3.5-
				=						:
				_						-
				=						4.0-
				=						
				_						-
				=						
				4.5						4.5-
				=						:
				=						
				5.0 -						
LOC	CATION / N	OTES:				<u>LEGEND</u>	TRIA	LPI	Γ LOG	
Water floodi 2.5m bgl	ing hole, no	ot possibl	le to	log be	elow	Disturbed Sample			HEEN LF TIGATION	
						Undisturbed Sample			N, CO. GALWAY	
						* Headspace Analysis	LIENT		VAY C.C.	
						✓ Groundwater Table	,,,,,	MUL	CONTROL OF ROSE	
						Perched Water Table		environ	mental	
						-				

	(u)	$\overline{}$									
m 0 N	SAMPLE	1	R	ER			TRIALPIT NUMBER: TPO	6	PAG	E 1 OF 1	
BOREHOLE	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/	4 METHOD: T	RACK	ED HYMAC	
REH TRU			C VAPC (ppm)	ND	PTH	OTC	CONTRACTOR: Bernard Corbe	t DIAMETER:	N/A		
BOJ NS	NUMBER	TYPE	OIL (OO	DE	GE	LOGGED BY: DG/PM	GRID REF.: 1	E 67719	N251179	
5	NO.	<u>`</u>	S	GR			CHECKED BY: PM	ELEVATION:	approx	a. 50.75m AOD	
							DESCRIPTI	ON		COMMENTS	0
	SO-					*	Soft dark brown gravelly sandy si	tv PEAT		Small amount of	I `⊢
	TP06- 01	\triangle				* *	with fibrous roots interspersed			water ingress at 0.3m	
					0.5		Mixed WASTE (DOMESTIC 50%	/ COMMERCIAL :	50%).		0.5
							Tyres, steel cables, timber, skip wa				
					1.0		empty oil bottles.				1.0
					_						
					1.5 —						1.5
					2.0-			Ø ₁ •			2.0
				∇	2.0-		w. watteri	5			2.0-
				¥	_		the Ho				=
					2.5						2.5
									1		
					3.0						3.0
							neet 1				
					3.5						3.5
					-						-
					4.0-						4.0
							Terminated at 4.25m bgl	- Sides collapsing			_
					4.5—						4.5—
					-						5
					=] =
					_ =						
					5.0 -						
<u>LOC.</u>	ATION / N	NOTE	ES:				<u>LEGEND</u>			T LOG	
							Undisturbed Sample	SIT	E INVE	OHEEN LF ESTIGATION	
1							* Headspace Analysis	LOCATION (CLIFDE	N, CO. GALWAY	
								CLIENT	GA	LWAY C.C.	
							✓ Groundwater Table ✓ Perched Water Table		MUL	ROY	
_							-				

	r~1		I		Π						
E	SAMPLE		<u> </u>	ER			TRIALPIT NUMBER: TP07		PAG	E 1 OF 1	
BOREHOLE CONSTRUCTION	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
REF	ER	111	VAPC (ppm)	N.	PTE)OT(CONTRACTOR: Bernard Corbett	DIAMETER: 1	N/A		
BO	NUMBER	TYPE	SOII	ROU	DE	GE	LOGGED BY: DG/PM	GRID REF.: E			
Ō	S S			Ū			CHECKED BY: PM	ELEVATION:	approx	50.87m AOD	
					L		DESCRIPTION			COMMENTS	0
					<u> </u>	*	Soft dark brown gravelly sandy silty I	PEAT		Surface water	
					-	*	with fibrous roots interspersed			inflow from top	-
					=	—	1			1	 -
					0.5	1				Sulphide odor	0.5
					=	土					=
					=	X	M' IWAGTE (DOMEGTIG 999) (DI AG				_
					_ 1.0 <i>-</i>	1	Mixed WASTE (DOMESTIC 80% (PLAS BOTTLES, ASH AND CINDERS ETC.),	TIC & GLASS COMMERCIAL 1	0%,		1.0
						1	C&D WASTE 10%).				=
					-	*	Typical black plastic bin bag waste				-
					=	*	Skip waste consisting of typical residential	l renovation waste	e.g.	No sheen on water	-
					1.5	+	electric cables, timber shards, etc		_		1.5
						H					
					=	H					=
					2.0	1	For its get ion purposes only any other use.				2.0-
					=	1	attet				=
					-	Kt.	लांभें, बामे				-
					_ =	世	roses lov				_ =
					2.5	1	an Purt edur				2.5
					_=	H	Dection and				_=
				_	=	H	cot its dit				=
				Ā	3.0	H	*C062,				3.0-
					=	1	asett o				=
					_		St.				=
					3.5 [—]	+					3.5
					J.J		Terminated at 3.5m bgl- Water ingress	and collapsing s	ides		-
					_						-
					-			A VENT			=
					4.0						4.0-
											_=
					=						=
					4.5 <u> </u>						4.5
					=						=
					-						-
					5.0 -						
LOCA	ATION /	<u>'N</u> O'	<u>TES</u> :				<u>LEGEND</u>	TRIA	Į,pi	T LOG	
								TITLE TU	ILLYV(OHEEN LF ESTIGATION	
							Undisturbed Sample			N, CO. GALWAY	
							* Headspace Analysis	ENT CATION C		ALWAY C.C.	
							Down Boreliole Analysis	LEINI	Let De Carro	-2010	
							▼ Groundwater Table▼ Perched Water Table		MUL	ROY	
							T I GICHEU WAIGH TADIE				

	F#3			Г	Ι				T		
n Z Z	SAMPLE		E	ER	_		TRIALPIT NUMBER: TP0	3	PAGE	1 OF 1	
BOREHOLE	SAIV		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/1	4 METHOD: T	RACKE	ED HYMAC	
REF		Ī	VAPC (ppm)	S	PTH	OTO	CONTRACTOR: Bernard Corbet	DIAMETER: 1	N/A		
OB SNC	NUMBER	TYPE	1108	SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.: E	E67692 N	N251136	
ŭ	NO	-	J	5			CHECKED BY: PM	ELEVATION:	approx.	51.20m AOD	
					L		DESCRIPTI			COMMENTS	0
					- - -	**	Soft dark brown gravelly sandy silty Pl with fibrous roots interspersed	AT		Water ingress from south	-
				Ā	0.5		Gravelly clayey BOULDERS (Marge angular and sub angular Coarse light green/grey sandy clayers)				0.5
					1.5		Terminated at 1.25m bgl - angular bedrock		ered		1.5
					2.0		ages only any other th	· .			2.0
					2.5		Ed Hild Land				2.5
					3.5	Ö					3.5
					4.0						4.0
					5.0 -						
LOCA	ATION /	NO	TES:		5.0		<u>LEGEND</u>	TRIA	TIQ,I	T LOG	_
Located close to eastern corner of	start o			Sout	h		<u> </u>	OB TITLE TU	JLLYVO	HEEN LF	
							Undisturbed Sample			STIGATION	
							* Headspace Analysis			CO. GALWAY	
							Down Borehole Analysis	CLIENT G.	ALWAY	C.C.	
							▼ Groundwater Table ▼ Perched Water Table		MULE	ROY	

				1					T		
NO.	SAMPLE		≅	H			TRIALPIT NUMBER: TP0	9	PAG	E 1 OF 1	
BOREHOLE	SAIN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/1	4 METHOD: T	RACK	ED HYMAC	
REE	ER.	Ī	VAPC (ppm)	Į į	PTH)TO	CONTRACTOR: Bernard Corbet	t DIAMETER:	N/A		
SNC	NUMBER	TYPE	1108	SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.: 1	E46770	2 N251193	
ŭ	NO	-		5			CHECKED BY: PM	ELEVATION:	approx	x. 51.34m AOD	
							DESCRIPTI	ON		COMMENTS	0
					Γ $^{-}$	**	Soft dark brown gravelly sandy silty PEAT]
				Ţ	1.5 1.5		Soft gray/green sandy GRAVEL (Now with cobbles and large angular bound of the state	ASTIC & GLASS E.), COMMERCIAL Extra transfer of the state	10%, e.g.	Water ingress at 2.3m bgl	1.5 = 1.5 =
					5.0 -	1	F		- -		
	ATION /					LEGEND TRIALPIT LOC			T LOG		
Probable location	on of fo	orme	er haul r	oad.			Disturbed Sample			VOHEEN LF /ESTIGATION	
							Undisturbed Sample	LOCATION (CLIFDE	N, CO. GALWAY	
							* Headspace Analysis Down Borehole Analysis	CLIENT		ALWAY C.C.	
							Down Borehole Analysis Groundwater Table Perched Water Table		MULROY		

MPLE		_≅	ER			TRIALPIT NUMBER: TP10		PAGE	1 OF 1	
SAN		ا _ت ا	WAT	I (m)	OGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACKE	ED HYMAC	
BR.	5	, AA (ppn	N N	PTF)TO	CONTRACTOR: Bernard Corbett	DIAMETER: 1	N/A		
MB]	YPE		SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.: E	E67690 1	N 251175	
NO			Ð			CHECKED BY: PM	ELEVATION:	approx.	50.83m AOD	
	-			_ 0 _					COMMENTS	0
			\ <u>=</u>		, * , *		Τ]
				1.0		BOTTLES, ASH AND CINDERS ETC.). C&D WASTE 10%). Typical black plastic bin bag waste Skip waste consisting of typical residential electric cables, timber shards, etc	COMMERCIAL 1			1.5
				4.0		Terminated at 4.0m bgl - collapsing waste not reached	g sides, bottom of		from all four	3.5 — 4.0 — 4.5 — 4.5 —
ATION / 1	NOTE	ES:		5.0		Undisturbed Sample * Headspace Analysis	STITLE TO SI	TULLYV TE INVI LIFDEN GA	OHEEN LF ESTIGATION I, CO. GALWAY ALWAY C.C.	
	NUMBER SAMPLE	NUMBER TYPE	—— ₹ ₽	NUMBER TYPE SOIL VA (Ppi)	HATER AND	NUMBER OF THE PROPERTY OF THE	Second S	O.5 DESCRIPTION DESCRIPTION	DESCRIPTION O.5- Mixed WASTE (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, CRB WASTE 109%. Typical black plastic bin bag waste Skip waste consisting of typical residential renovation waste e.g. electric eables, timber shards, etc 2.0- Terminated at 4.0m bgl - collapsing sides, bottom of waste not reached Terminated at 4.0m bgl - collapsing sides, bottom of waste not reached Terminated at 4.0m bgl - collapsing sides, bottom of waste not reached Terminated at 4.0m bgl - collapsing sides, bottom of waste not reached Terminated at 4.0m bgl - collapsing sides, bottom of collapsing sides, bottom of waste not reached Terminated at 4.0m bgl - collapsing sides, bottom of collapsing side	DESCRIPTION DESCRIPTION

	Т		ı	Т							
BOREHOLE	SAMPLE		8	GROUNDWATER		χ.	TRIALPIT NUMBER: TP1		PAG	E 1 OF 1	
BOREHOLE	SAI		SOIL VAPOUR (ppm)	WAZ	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/1	4 METHOD: T	RACK	ED HYMAC	
REF	ER		VAPC (ppm)	R	PTF	OTO	CONTRACTOR: Bernard Corbett	DIAMETER: 1	N/A		
BOS	NUMBER	TYPE	1103	SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.: 1	E67680	N251155	
ک ک	[5 <u>R</u>	-	02	GF			CHECKED BY: PM	ELEVATION:	approx	a. 51.55m AOD	
		•					DESCRIPTION)N		COMMENTS	
					├ 0∃	74	Soft dark brown gravelly sandy silty PEAT			Water inflow	- 0
					1.5		Mixed WASTE - (DOMESTIC 80% (I BOTTLES, ASH AND CINDERS ETC C&D WASTE 10%). Typical black plastic bin bag waste Skip waste- residential renovation wastshards Red inspection the property of	e e.g. electric cables,	10%,		1.5
1.00	ATTION	NO	TEG		5.0 -		LECEND	TDIA	T D1		
LOC	ATION /	NO'	<u>TES:</u>				<u>LEGEND</u>			T LOG	
							Disturbed Sample Undisturbed Sample			VOHEEN LF /ESTIGATION	
							 Undisturbed Sample Headspace Analysis 	OCATION C	LIFDE	N, CO. GALWAY	
								LIENT	G	GALWAY C.C.	
							Groundwater Table Perched Water Table		MUL	ROY	

C&D WASTE 10%). Typical black plastic bin bag waste Skip waste- residential renovation waste c.g. electric cables, timber shards clayey PEAT Terminated at 1.5m bgl - hit weathered bedrock (quartzite/schist) 2.0- 3.0- 3.0- 4.0- 4.5- LOCATION / NOTES: LEGEND Disturbed Sample TRIALPIT LOG Disturbed Sample TRIALPIT LOG SITE INVESTIGATION		[17]	1	_	Г						
LOCATION/ NOTES: CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett GRID REF:: E67669 N25113	HON NO	(PLE	¥	ER			TRIALPIT NUMBER: TP	12	PAGE	E 1 OF 1	
LOCATION/ NOTES: CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett DIAMETER: NAA GRID REF:: E67669 N251135 CONTRACTOR: Bernard Corbett GRID REF:: E67669 N25113	IOU.	SAN	POU	WAT	(m)	GY	EXCAVATION DATE: 15/01/	14 METHOD: T	RACKI	ED HYMAC	
DESCRIPTION DESCRIPTION COMMENTS Soft dark brown gravely sunds stay PEAT sush fitness roots interspersed Mixed WASTE: (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, CAD WASTE: 10%). Typical black plastic bin bug waste Skip waste- residential renovation waste e.g. electric cables, timber shards. Sign waste- residential renovation waste e.g. electric cables, timber shards. Claycy PEAT Terminated at 1.5m bgl - hit weathered bedrock (quartzite/schist) 2.5 LOCATION/NOTES. LEGEND Disturbed Sample Disturbed Sample TRIALPIT LOG JOB TITLE TUNYOHEEN IF SITE INVESTIGATION	REE		VA)	ĺ	PTH	ОГС	CONTRACTOR: Bernard Corbe	ett DIAMETER:	N/A		
DESCRIPTION DESCRIPTION COMMENTS Soft dark brown gravely sunds stay PEAT sush fitness roots interspersed Mixed WASTE: (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, CAD WASTE: 10%). Typical black plastic bin bug waste Skip waste- residential renovation waste e.g. electric cables, timber shards. Sign waste- residential renovation waste e.g. electric cables, timber shards. Claycy PEAT Terminated at 1.5m bgl - hit weathered bedrock (quartzite/schist) 2.5 LOCATION/NOTES. LEGEND Disturbed Sample Disturbed Sample TRIALPIT LOG JOB TITLE TUNYOHEEN IF SITE INVESTIGATION	BOO	MBI		SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.: 1	E67669	N251135	
Sol-tak bown garsely sundy suby PEAT with fibrous roats intempersel Mixed WASTE (DOMESTIC 80% (PLASTIC & GLASS) BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, CARD WASTE 10%) Typical black plastic bin bag waste Skip waste-residential renovation waste e.g. electric cables, timber shards. Ierminated at 1.5m bgl - hit weathered bedrock (quartzite/schist) 2.5 LEGEND Disturbed Sample TRIALPIT LOG JOH TITLE TUNYOHEPN I.F. STITINVESTIGATION	CC	NO		Ü			CHECKED BY: PM	ELEVATION:	approx.	. 51.53m AOD	
Soft dark brown gravely and yelly SEAT with thrown gravely seat and yelly SEAT with thrown gravely seat and yelly seat an								ION		COMMENTS	0
Miscal Post inflorance of infl					Γ"Ξ	*] "=
LOCATION / NOTES: LEGEND TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION		TP12-		Ā	0.5	* * ***	Mixed WASTE - (DOMESTIC 80% BOTTLES, ASH AND CINDERS ET C&D WASTE 10%). Typical black plastic bin bag waste Skip waste- residential renovation washards clayey PEAT Terminated at 1.5m bgl - hit weathered	SC.), COMMERCIAL ste e.g. electric cables d bedrock (quartzite/sc	10%,		1.0
LOCATION / NOTES: LEGEND TRIALPIT LOG Disturbed Sample JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION					4.5						4.0
Disturbed Sample JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION					5.0 -						
Disturbed Sample JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION	LOCA	ATION / N	NOTES:				<u>LEGEND</u>	TRIA	LPI	ΓLOG	
							M Disturbed Sample	JOB TITLE	TULLYV	OHEEN LF	
L LOCATION CLIFDEN CO GALWAY							Undisturbed Sample	LOCATION (CLIFDEN	N, CO. GALWAY	
* Headspace Analysis											
Down Borehole Analysis ▼ Groundwater Table ▼ Perched Water Table							Groundwater Table		O DESCRIPTION OF THE PERSON NAMED IN COLUMN 1	ALCO MANAGEMENT	

	[m]			Г							
m <u>Z</u>	SAMPLE		<u> </u>	ER	_		TRIALPIT NUMBER: TP13		PAG	E 1 OF 1	
BOREHOLE	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
REH TRU			VAJ	ĺ	PTH	OTC	CONTRACTOR: Bernard Corbett	DIAMETER: N	N/A		
BOI	NUMBER	TYPE	OIL	00	DE	GE(LOGGED BY: DG/PM	GRID REF.: E	67664	N251165	
)		Ĺ	N N	GR			CHECKED BY: PM	ELEVATION:	approx	51.66m AOD	
					_		DESCRIPTION	1		COMMENTS	
				Π	<u> </u>	۴.,	Soft dark brown gravelly sandy silty PEAT				- 0
					-	*	with fibrous roots interspersed				
					=					sulphide/ oil	=
					0.5	+				Water inflow	0.5
					0.5 =	¥				from surface.	0.0 =
					_=	1					_=
					=		Mixed WASTE - (DOMESTIC 80% (PL	ACTIC & CLASS			=
					1.0-		BOTTLES, ASH AND CINDERS ETC.),	COMMERCIAL 1	0%,		1.0-
					=	1	C&D WASTE 10%).				=
					-		Typical black plastic bin bag waste				-
					=		Skip waste- residential renovation waste e	.g. electric cables	imber		=
	1				1.5		shards	J			1.5
					=	*					=
					=	1					=
					2.0-	1	.ي				2.0-
						*	es dily. any other tree.				
					_	1	97, 414 or				_
					=	*	0	No.			=
					2.5			- N			2.5
					-	X		No service			=
					=	1					-
					_ =	1]=
					3.0-	1		A Y			3.0-
					_=	4	Carlo	一种,从外来是一个			_=
					=	7		新\NE			=
					3.5-	*		The second		No strong	3.5-
					=	H	below the second		200	water ingress	=
					-	¥				at depth	-
					=	*					=
	1				4.0					 	4.0
					=		Terminated at 4.0m bgl - bottom of	f waste not achiev	ed		=
					=						=
					_ =						4 -
					4.5						4.5-
	1				_=						=
					=						
					5.0 -	-	<u> </u>				
LOC	CATION /	NO	TES:				<u>LEGEND</u>	TRIA	LPI'	T LOG	
Located in					lle of		Disturbed Sample JOH	TITLE T	ULLY	VOHEEN LF	
the site wh	ere wast	e 1s	aeepest				Disturbed Sample Undisturbed Sample			/ESTIGATION	
							 Headspace Analysis 	CATION C	LIFDE	N, CO. GALWAY	
								IENT	G	ALWAY C.C.	
							✓ Groundwater Table		MIII	POY	
							✓ Perched Water Table		enviror	ROY	
1							=				

			Ι	Г	_			<u> </u>		
BOREHOLE	SAMPLE		 	IER			TRIALPIT NUMBER: TP14	PAG	E 1 OF 1	
BOREHOLE	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14 METHOD:	TRACK	ED HYMAC	
REI	ER	Ш	C VA		PTI:	3OL	CONTRACTOR: Bernard Corbett DIAMETER			
BC BC	NUMBER	TYPE	SOII	ROL		GE	LOGGED BY: DG/PM GRID REF.			
Ö	<u> </u>		-	Ū			CHECKED BY: PM ELEVATIO	N: approx	x. 51.66m AOD	
					L_0_		DESCRIPTION		COMMENTS	- 0
						**	Soft dark brown gravelly sandy silty PEAT			
					=	[*	with fibrous roots interspersed			1 =
					1.5	***************************************	Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLA BOTTLES, ASH AND CINDERS ETC.), COMMERCIA C&D WASTE 10%). Typical black plastic bin bag waste Skip waste- residential renovation waste e.g. electric cab shards Terminated at 4.0m bgl - bottom of waste not ach	AL 10%,	Strong ingress of water from sides (trapped in pockets)	1.5
					4.5					4.5
	A TOTAL OF THE		<u> </u>		5.0 -	1	LECENTA	- A		
LOC	ATION /	NO'	TES:				LEGEND TR	IALPI	T LOG	
							Disturbed Sample JOB TITLE		VOHEEN LF /ESTIGATION	
							Undisturbed Sample LOCATION		N, CO. GALWAY	
							* Headspace Analysis		GALWAY C.C.	
							Down Borehole Analysis Groundwater Table Perched Water Table		ROY	
							-	ň.		

-					_				T		
NO.	SAMPLE		~	ER			TRIALPIT NUMBER: TP15		PAG	E 1 OF 1	
BOREHOLE	SAN S		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
REH		Т	VAPC (ppm)	N N	PTH	OTC	CONTRACTOR: Bernard Corbett	DIAMETER: 1	N/A		
BOJ	NUMBER	TYPE		OO	DE	GE	LOGGED BY: DG/PM	GRID REF.: E	67662	N251182	
00	5 	-	N N	l E			CHECKED BY: PM	ELEVATION:	approx	51.68m AOD	
	•						DESCRIPTIO	N		COMMENTS	0
					Γ"Ξ	*	Soft dark brown gravelly sandy silty PEAT				1
					_=	* **	with fibrous roots interspersed				1 =
					=	· T					+ =
					0.5	1				Small amount	0.5
					=	*				of water inflow from	_
					-					side pockets	-
					=	H				and top.	=
					1.0-	4					1.0
						1	Mixed WASTE - (DOMESTIC 80% (P	1 A STIC & GI A SS			-
					=	1	BOTTLES, ASH AND CINDERS ETC), COMMERCIAL	10%,		
					_ 1.5 <i>-</i>	1	C&D WASTE 10%).				1.5
					=	1	Typical black plastic bin bag waste				=
					-	1	Skip waste- residential renovation waste		timber		
					=		shards The share required for the other type of the share required for the other required for the other type of the share required for the other type of the oth				=
					2.0	\mathbb{H}	ri lise	•			2.0
					=	H	d. A other				1 3
					=	+	as only and				=
					2.5-	4	TROSSIE				2.5
					_		on Prized				=
					-	1	CO Mile	0 1 10 00 00	and the		=
					=	1	of their	* 1	FL		1 =
					3.0-	1			TI		3.0
					_=	1	C.C.				=
					=	7	A	732	12/0		1 =
					3.5 [—]						3.5
					=	+		Tree Sales]
					-	H					=
						H]]
					4.0-		Tomainstal at 4.0111	franctic and a 11	a d		 4.0
					_=		Terminated at 4.0m bgl - bottom o	i wasie not achiev	ea		1 =
					=						=
					4.5						4.5
					=						
					-						-
					5.0 -						
LOC	ATION /	' <u>N</u> O'	TES:	_	•		<u>LEGEND</u>	TRIA	I .PI'	T LOG	
							Disturbed Sample			VOHEEN LF /ESTIGATION	
							Undisturbed Sample			N, CO. GALWAY	
							* Headspace Analysis	LIENT		ALWAY C.C.	
							✓ Groundwater Table	,,,,,	Let De Sant	-200	
							▼ Groundwater Table ✓ Perched Water Table		MUL	ROY	
							÷	CH!			

	[27]		Ι	Г							
NO NO	SAMPLE		~	ER			TRIALPIT NUMBER: TP16		PAG	E 1 OF 1	
BOREHOLE	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
ZEH IRU		Т	VAPC (ppm)	N N	HI	070	CONTRACTOR: Bernard Corbett	DIAMETER:			
BOF	/BE	TYPE) 		DE	$ _{\mathrm{GE}} $	LOGGED BY: DG/PM	GRID REF.: E	E67642	N251178	
CO	NUMBER	-	Ñ	GR			CHECKED BY: PM	ELEVATION:	approx	51.84m AOD	
						Н	DESCRIPTIO			COMMENTS	
				Π	-0-	<u>*</u>	Soft dark brown gravelly sandy silty PEAT				0
					=	[*	with fibrous roots interspersed				=
					_ =					Strong inflow	0.5
					0.5	7				from north	0.5 =
										west corner	_
					=	**					-
					1.0 	1					1.0
					=	H					
					_	H	Mixed WASTE - (DOMESTIC 80% (I	LASTIC & GLASS	S		_
						*	BOTTLES, ASH AND CINDERS ETC C&D WASTE 10%).	.), COMMERCIAL	10%,		=
					1.5 -	1					1.5
					=	1	Typical black plastic bin bag waste				=
						1	Skip waste- residential renovation wast		s, timbe	r	-
					=	1	shards				
					2.0	H	at jisé	•			2.0
					=	H	d. Aothe				-
							solid all,				=
					2.5—	*	to see at				2.5
							OR Pit redit]
					_	1					_
					=	1		W. Wash]
					3.0	Ä		澳大型杂乱			3.0
					=	+	en la	K			1 =
											=
					=	*					
					3.5	1					3.5
					_=			44	*		
					=	1		-	1		
					4.0—						4.0
					[]		Terminated at 4.0m bgl - bottom of	f waste not achies	ved.		
					-		- Similare at Home og Conomic	asts not donle			
					=						=
					4.5						4.5
					-						$\mid \neg \mid$
					5.0 -						
LOC	ATION /	<u>' N</u> O'	TES:	-			LEGEND	TRIA	Ţ,PI'	T LOG	
		_	_								
							M Disturbed Sample			VOHEEN LF /ESTIGATION	
							Undisturbed Sample			N, CO. GALWAY	
							* Headspace Analysis	LIENT		ALWAY C.C.	
							✓ Groundwater Table	,,,,,	MU	DOV	
1							✓ Perched Water Table		ONVITO	ROY	
							-	CH1			

	[7]	Т	_	Г						
NO N	SAMPLE	≃	ER			TRIALPIT NUMBER: TP17		PAGE	1 OF 1	
BOREHOLE	SAM	SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: TR	ACKE	ED HYMAC	
REH TRU		VAPC (ppm)	Į Š	PTH	OTC	CONTRACTOR: Bernard Corbett	DIAMETER: N/	'A		
BOJ NS	NUMBER			DE	GE	LOGGED BY: DG/PM	GRID REF.: E6	7626 N	N251187	
5	[5] f	- S	G.			CHECKED BY: PM	ELEVATION: ap	prox.	51.79m AOD	
		•				DESCRIPTIO	N		COMMENTS	
				T 0 =	*	Soft dark brown gravelly sandy silty PEAT				0 =
				_=	*	with fibrous roots interspersed				_=
				=		<u> </u>				-
				0.5						0.5
				=						=
				-	+	Mixed WASTE - (DOMESTIC 80% (I BOTTLES, ASH AND CINDERS ETC	PLASTIC & GLASS	00/		-
				=		C&D WASTE 10%).	.), COMMERCIAL I	0%,		=
				1.0	**	Typical black plastic bin bag waste				1.0
				=	1					=
				-	1	Skip waste- residential renovation wastshards	e e.g. electric cables, t	timber		-
				1.5 –						1.5-
				'.5 =	*					-
				=	+					_
	SO-			=	H					=
	TP17-	7		2.0		Light green/grey course sandy GRA	VEL	1		2.0-
	01	1		=		weathered BEDROCK and other weather to interest of condition of the condit		$\neg \uparrow$	Sheen on	1 -
				-		weathered BEDROCK			water in trial	-
				_ =		Dose de la companya del companya de la companya del companya de la			pit	
				2.5		an Printenti				2.5
				_=		Terminated at 21m bgl - hit weather	red bedrock			_=
				=		of install				=
				3.0		tools.				3.0-
				=		ento				=
				-	CS	nse .				-
]		A CHARLES TO THE STATE OF THE S	2000年	李		=
				3.5-				200		3.5-
										_=
				=			23/1			=
				4.0-						4.0-
				=						
				-						-
				=						=
				4.5		The Land of the 16		200		4.5
				=			A CONTRACTOR	15		
				=						_
				5.0 -						
LOC	ATION / N	OTES:				<u>LEGEND</u>	TRIAI	PIT	LOG	
						M 2011 10			OHEEN LF	
						Disturbed Sample			ESTIGATION	
						Undisturbed Sample Leadspace Applysis	OCATION CL	IFDEN	, CO. GALWAY	
						* Headspace Analysis Down Borehole Analysis	LIENT	GA	LWAY C.C.	
						✓ Groundwater Table		MIII	OV	
						✓ Perched Water Table		MULP	nental	
						÷ · · · · · · · · · · · · · · · · · · ·	CH,			

	[*]		Г	Г							
n O N	SAMPLE		<u> </u>	ER	_		TRIALPIT NUMBER: TP	18	PAG	E 1 OF 1	
BOREHOLE	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01	/14 METHOD:	TRACK	ED HYMAC	
REE			VAPC (ppm)	Í	PTH	OTC	CONTRACTOR: Bernard Corbo	ett DIAMETER	N/A		
BOJ	NUMBER	TYPE		SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.:	E67600	N251183	
) S	NU	-	\ \oldsymbol{O}_1	G			CHECKED BY: PM	ELEVATION	: approx	51.08m AOD	
		•	•				DESCRIPT	ION		COMMENTS	
					0.5 - 1.0 - 1.5 -		Mixed WASTE - (DOMESTIC 80% BOTTLES, ASH AND CINDERS E'C&D WASTE 10%). Typical black plastic bin bag waste Skip waste- residential renovation washards Skip waste- residential renovation washards Terminated at 4.0m bgl - bottom	(PLASTIC & GLASTIC.), COMMERCIAL aste e.g. electric cable	L 10%,		1.5 — 1.5 —
					-						=
				1	5.0 -		F			L	
LOCA	ATION /	NO'	TES:				<u>LEGEND</u>	TRI	ALPI'	T LOG	
Northwo	est corn	er o	r site.				Disturbed Sample	JOB TITLE		VOHEEN LF ESTIGATION	
							Undisturbed Sample	LOCATION		N, CO. GALWAY	
							* Headspace Analysis	CLIENT		ALWAY C.C.	
							↑ Down Borehole Analysis ✓ Groundwater Table	CELETTI		.ROY	
							Perched Water Table		, environ	nmental	

		_						_		
MON NO	SAMPLE	≃	H			TRIALPIT NUMBER: TP1	9	PAG	E 1 OF 1	
BOREHOLE	SAM	SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/	14 METHOD: T	RACK	ED HYMAC	
REH		C VAPC (ppm)	Į Ŕ	PTH	ОГС	CONTRACTOR: Bernard Corbe	tt DIAMETER:	N/A		
BOJ	NUMBER		Sol	DE	GE	LOGGED BY: DG/PM	GRID REF.: 1	E 67578	8 N 251180	
ŏ			15			CHECKED BY: PM	ELEVATION:	approx	x. 50.68m AOD	
						DESCRIPTI	ON		COMMENTS	0
					*	Soft dark brown gravelly sandy silty F	EAT		Relatively dry	7 ° <u>-</u>
	SO- TP19-			=	**	with fibrous roots interspersed				_=
	01	4			اد . باد	with florous roots interspersed				=
				0.5	ν. ^Δ					0.5
				-	*					=
				=	1					-
				=		Mixed WASTE - (DOMESTIC 80% (=
				1.0		BOTTLES, ASH AND CINDERS ET C&D WASTE 10%).	C.), COMMERCIAL	10%,		1.0
					H	Typical black plastic bin bag waste				
				=	1		_			=
				1.5 —	*	Skip waste- residential renovation was shards	te e.g. electric cables	, timber		1.5
				=	士	- ·· · 				=
				_	1					-
	so-	1		=						
	TP19- X			2.0		coarse light green/grey sandy GR	ÁVEL			2.0
	02	1		=	::::::::::::::::::::::::::::::::::::::	. A. A office				 -
				=		Terminated at 2.15m bgk-hit wea	thered bedrock			=
				2.5		it Postifed t				2.5
						Terminated at 2.15mg by hit weather the inspection purposes and convince the convince that the convince the c				=
				-		aspect owne				-
						For Wight				=
				3.0		of con.				3.0-
						nsent "				_=
				=	C					=
				3.5		and the second				3.5-
				=			A P			=
				-						-
								1		
				4.0		WENT SHAPE				4.0-
				=				* 2		=
				=		The same of the sa				=
				4.5—						4.5-
						RITEMAN STATES		Wall Con		[
										-
				5.0 -						
100	ATION / NO	TEC.		ວ.U ⁻		LECEND	TENENT A	IDI	TIOC	
LOCA	ATION / NO)1E <u>5:</u>				<u>LEGEND</u>	I'KIA	ALPI	T LOG	
						M Disturbed Sample			VOHEEN LF /ESTIGATION	
						Undisturbed Sample			N, CO. GALWAY	
						* Headspace Analysis	CLIENT		GALWAY C.C.	
								No. 100 Section		
						▼ Groundwater Table ✓ Perched Water Table		MUL	ROY	
						<u>v</u> 1 cremed water rapic				

	[4]		I		Г						
NON NO	SAMPLE		~	ER			TRIALPIT NUMBER: TP20		PAGI	E 1 OF 1	
BOREHOLE	SAIN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/14	METHOD: T	RACK	ED HYMAC	
XEH IRU		Т	C VAPC (ppm)	ĺ	L TH)TC	CONTRACTOR: Bernard Corbett	DIAMETER: 1	N/A		
BOI NS	NUMBER	TYPE	OIL (DE	GE	LOGGED BY: DG/PM	GRID REF.: E	67594	N251168	
CC	ĺ N	<u>-</u>	Š	GR			CHECKED BY: PM	ELEVATION:	approx	. 50.51m AOD	
	, ,			_			DESCRIPTION	T		COMMENTS	Π
					 0	*	Soft dark brown gravelly sandy silty PEAT				0 _
					<u>=</u> =	<u>,</u> *	with fibrous roots interspersed Gravely CLAY				<u>-</u> <u>-</u> <u>-</u>
					0.5		with boulders				0.5
						+					
					1.0	1					1.0
					<u>-</u>	*	Mixed WASTE - (DOMESTIC 80% (PL BOTTLES, ASH AND CINDERS ETC.) C&D WASTE 10%).	ASTIC & GLASS , COMMERCIAL	10%,		-
					1.5		Typical black plastic bin bag waste				1.5
					-		Skip waste- residential renovation waste shards		, timber		
					2.0		differ the control of				2.0
							Light green/grey course sandy GRA				
					2.5 <u> </u>		ction purple teditie				2.5
					=		iti diti				+ =
					3.0		Light green/grey course sandy GRA	AVEL			3.0
					-	××××	Mari				<u> </u>
					3.5		Terminated at 3.2m bgl - hit weather	red bedrock			3.5
					4.0						4.0
					 - -						-
					4.5 <u> </u>						4.5
					5.0 -						-
LOCA	ATION /	NO'	TES:		0.0		<u>LEGEND</u>	TRIA	I.PI	T LOG	
							Disturbed Sample JOB	TITLE T	TULLY	VOHEEN LF VESTIGATION	
							Undisturbed Sample LO			N, CO. GALWAY	
							* Headspace Analysis	IENT		ALWAY C.C.	
							→ Down Borehole Analysis → Groundwater Table → Perched Water Table		No. Co. Commo	ROY	
							-	,			

	F=1		ı	Г							
E	SAMPLE		R R	ER			TRIALPIT NUMBER: TP2	1	PAG	E 1 OF 1	
BOREHOLE	SAN		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	EXCAVATION DATE: 15/01/	4 METHOD: 1	ΓRACK	ED HYMAC	
REE	ER	Ī	VAPC (ppm)	N N	PTH)TO	CONTRACTOR: Bernard Corbe	t DIAMETER:	N/A		
OS	NUMBER	TYPE	108	SOU	DE	GE	LOGGED BY: DG/PM	GRID REF.:	E67586	N251156	
Ö	NU			5			CHECKED BY: PM	ELEVATION:	approx	a. 50.54m AOD	
					L		DESCRIPTI	ON		COMMENTS	0
						[*]	Soft dark brown gravelly sandy silty PEAT				" =
					_	* *	with fibrous roots interspersed				_
					=	*					<u> </u>
					0.5	*	Clayey PEAT				0.5
					=	*	with boulders and cobbles				=
					=	1	Mixed WASTE - (DOMESTIC 80%	(DI ASTIC & GI AS	2		_
					_ 1.0 <i>-</i>	4	BOTTLES, ASH AND CINDERS ET	C.), COMMERCIAI	10%,		1.0-
					· · · · - -	1	C&D WASTE 10%).				
					-	1	Typical black plastic bin bag waste				-
					-	*	Skip waste- residential renovation wa	ste e.g. electric cable	s, timber		=
					1.5	+	shards				1.5
					=	+					
					-		Compacted course sandy GRAVE	L			=
					2.0			چ. د			2.0
					=		othet'				
					-	*	Mixed WASTE - (DOMESTIC 80% BOTTLES, ASH AND CINDERS E	(PLASTIC & GLAS	S L 10%.		-
						1	C&D WASTE 10%	. 0.), 0 0 1 1 1 1 1 1 1 1 1	2 10 70,		
					2.5-		Typical black plastic bin bag waste				2.5
					=	1	Skin waste residential renovation w	ste e.g. electric cable	es. timbe	l n	=
						1	shards it dil		.,		=
					3.0	1	E COLA,				3.0
					=		Forbitie				=
					-	1	M ²				=
					3.5—	*					3.5
					3.5 <u> </u> -		Red silty GRAVEL (ash & cinder	s)] =
					-		with old bottles and burnt car who				-
					=		with old bottles and burnt car who	EC18			=
					4.0	XXXX	Terminated at 4.0m bgl - collapsi	ng sides			4.0
					=		Tommand at Nom ogi Contapol				
					_ 4.5-						4.5
					=						
					-						-
					5.0 -		1/2//	XX			
LOCA	ATION /	NO'	TES:		0.0		<u>LEGEND</u>	TRI	1 PI	T LOG	
							Disturbed Sample			VOHEEN LF /ESTIGATION	
							Undisturbed Sample			N, CO. GALWAY	
							* Headspace Analysis	CLIENT		ALWAY C.C.	
1							✓ Groundwater Table	,,,,,	W 100 Co. Sons		
							▼ Perched Water Table		MUL	ROY	
							=	-41			

TRIALPIT NUMBER: TP22 EXCAVATION DATE: 15/01/14 METHOD: TRACKED HYMAC COMMINIS ON THE PROPERTY OF THE PROPE		[7]			_	1				
CONTRACTOR. Bermard Corbett DIAMETER NA LOGGED BY: DG/PM GRID REF: E67606 N251145	NO N			24	ER			TRIALPIT NUMBER: TP22	PAG	GE 1 OF 1
CONTRACTOR. Bermard Corbett DIAMETER NA LOGGED BY: DG/PM GRID REF: E67606 N251145	OCTI	SAIN		000	VAT	(m)	GY	EXCAVATION DATE: 15/01/14	METHOD: TRAC	KED HYMAC
DESCRIPTION COMMENTS O Sol data between gravelly sonely step PACT Sold data between gravelly sonely step PACT Dark brown pearly CLAY with gravel and boulders, some light green/gray gravel 1.0 1.0 Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS) BOTTLES, ASH AND CINDERS FETC., COMMERCIAL 10%, CARD WASTE 10%). 1.5 Skip waste- residential renovation waste e.g. electric cables, timber shards 2.0 2.5 LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Headspace Analysis Down Borehole Analysis Town Borehole Analysis Town Borehole Analysis Town Borehole Analysis Tell INVESTIGATION LOCATION CLIFEN CO. GALWAY CLIENT GALWAY CC. MULPOY MULPO	REH		Т	VAJ	ΙÉ	HI	ЭТС	CONTRACTOR: Bernard Corbett	DIAMETER: N/A	
DESCRIPTION COMMENTS O Sol data between gravelly sonely step PACT Sold data between gravelly sonely step PACT Dark brown pearly CLAY with gravel and boulders, some light green/gray gravel 1.0 1.0 Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS) BOTTLES, ASH AND CINDERS FETC., COMMERCIAL 10%, CARD WASTE 10%). 1.5 Skip waste- residential renovation waste e.g. electric cables, timber shards 2.0 2.5 LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Headspace Analysis Down Borehole Analysis Town Borehole Analysis Town Borehole Analysis Town Borehole Analysis Tell INVESTIGATION LOCATION CLIFEN CO. GALWAY CLIENT GALWAY CC. MULPOY MULPO	BOI	I BE	<u> </u>			DE	GE(LOGGED BY: DG/PM	GRID REF.: E6760	6 N251145
Discreption Discreption D	000		-	Ñ	GR			CHECKED BY: PM	ELEVATION: appro	ox. 51.05m AOD
Soft date homes greenly acted by PEAT with Rineag, area in a company of the Com							Н	DESCRIPTIO		
Dark brown pealy CLAY with gravel and boulders, some light green/gray gravel 1.0 1.0 Miscal WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLES ASH AND CINDERS FITC.), COMMERCIAL 10%, C&D WASTE 10%). 1.5 Typical black plastic bin bag waste Skip waste residential renovation waste e.g. electric cables, timber shards 2.0 2.5 Light green/gray sandy GRAVEL. Terminated at 3.2m bgl - hit weathered bedrock 3.5 Light green/gray sandy GRAVEL. Terminated at 3.2m bgl - hit weathered bedrock 3.5 Disturbed Sample Undisturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis To Groundwater Table MULRCY					Π	<u></u>	F			0
with gravel and boulders, some light green/gray gravel 1.0 Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLE, ASH AND CINDERS ETC.), COMMERCIAL 10%, CAD WASTE 10%, CAD WASTE 10%						=	**	with fibrous roots interspersed		
Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, CAD WASTE 10%). 1.5 Typical black plastic bin bag waste Skip waste- residential renovation waste e.g. electric eables, timber share's 2.0 Light green'gray sandy GRAVEL. 7.5 Light green'gray sandy GRAVEL. 8.5 Light green'gray sandy GRAVEL. 8.5 Light green'gray sandy GRAVEL. 8.5 Light green'gray sandy GRAVEL. 8						=		Dark brown peaty CLAY		
1.0— Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, CAD WASTE 10%). 1.5 Typical black plastic bin bag waste Skip waste- residential renovation waste e.g. electric cables, timber shards 2.0 2.5 Light green/gray samdy GRAVEL. 7 Terminated at 3.2m bgl - hit weathered bedrock 3.5 Light green/gray samdy GRAVEL. 7 Terminated at 3.2m bgl - hit weathered bedrock 3.5 Light green/gray samdy GRAVEL. 7 Terminated at 3.2m bgl - hit weathered bedrock 3.5 LOCATION / NOTES: TRIALPIT LOG JOB TITLE TULLYVOHEBELF SITE INVESTIGATION LOCATION CLIFFEN, CO., GAIWAY CLIENT GALWAY C.C. MULROY MULROY MULROY						_ =		with gravel and boulders, some light	green/gray gravel	0.5
Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, C&D WASTE 10%). 1.5— Typical black plastic bin bug waste Skip waste- residential renovation waste e.g. electric cubles, timber shards 2.5— 3.0— Light green/gray sandy GRAVEL. 7— Terminated at 3.2m bgl - hit weathered bedrock 3.5— 4.0— 4.5— 4.5— Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis COMMERCIAL 10%, 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5						0.5	4			0.5
Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, C&D WASTE 10%). 1.5— Typical black plastic bin bug waste Skip waste- residential renovation waste e.g. electric cubles, timber shards 2.5— 3.0— Light green/gray sandy GRAVEL. 7— Terminated at 3.2m bgl - hit weathered bedrock 3.5— 4.0— 4.5— 4.5— Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis COMMERCIAL 10%, 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5						_=	-			
Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, C&D WASTE 10%). 1.5— Typical black plastic bin bug waste Skip waste- residential renovation waste e.g. electric cubles, timber shards 2.5— 3.0— Light green/gray sandy GRAVEL. 7— Terminated at 3.2m bgl - hit weathered bedrock 3.5— 4.0— 4.5— 4.5— Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis COMMERCIAL 10%, 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5						=				
Mixed WASTE - (DOMESTIC 80% (PLASTIC & GLASS BOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, C&D WASTE 10%). 1.5— Typical black plastic bin bug waste Skip waste- residential renovation waste e.g. electric cubles, timber shards 2.5— 3.0— Light green/gray sandy GRAVEL. 7— Terminated at 3.2m bgl - hit weathered bedrock 3.5— 4.0— 4.5— 4.5— Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis COMMERCIAL 10%, 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5— 4.5						10-				10-
DOTTLES, ASH AND CINDERS ETC.), COMMERCIAL 10%, CAD WASTE 10%). 1.5 Typical black plastic bin bag waste Skip waste- residential renovation waste e.g. clectric cables, timber shurds 2.0 Light green/gray sandy GRAVEL. Terminated at 3.2m bgl - hit weathered bedrock 3.5 LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample							*			
CAD WASTE 10%). Typical black plastic bin bag waste skip waste residential renovation waste e.g. electric cables, timber shards 2.0 2.5 3.0 Light green/gray sandy GRAVEL. Terminated at 3.2m bgl - hit weathered bedrock 3.5 Legend 4.5 Disturbed Sample Undisturbed Sample						_	1	Mixed WASTE - (DOMESTIC 80% (PI	ASTIC & GLASS	
Typical black plastic bin bag waste Skip waste- residential renovation waste e.g. electric cables, timber shards 2.0 2.5 3.0 Light green/gray sandy GRAVEL. Terminated at 3.2m bgl - hit weathered bedrock 3.5- 4.0 Disturbed Sample Undisturbed Sample Und						=	1	BOTTLES, ASH AND CINDERS ETC.	, COMMERCIAL 10%,	
Skip waste- residential renovation waste e.g. electric cables, timber shards 2.0 2.5 3.0 Light green/gray sandy GRAVEL. Continued at 3.2m bgl - hit weathered bedrock 3.5 4.5 4.5 LEGEND Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borchole Analysis Town B					¥	1.5	1			1.5-
Light green/gray sandy GRAVEL. 2.5 Light green/gray sandy GRAVEL. 2.5 Light green/gray sandy GRAVEL. 3.0 Light green/gray sandy GRAVEL. Terminated at 3.2m bgl - hit weathered bedrock 3.5 4.5 Jobsturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis † Down Borehole Analysis † Groundwater Table MULROY MULROY						=	1	Typical black plastic bin bag waste		
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						-	*	Skip waste- residential renovation waste	e.g. electric cables, timbe	
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						_ =	1	shards		
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						2.0-	*	at like		2.0-
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						-	1	di a dite		
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						_	4	Eoff of all,		
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						2 5-	+	rto sted i		2 5-
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY							H	on puredu		
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY								EDECTORITE.		
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						=	1	to tidit		
LOCATION / NOTES: LEGEND LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Wheadspace Analysis † Down Borehole Analysis ▼ Groundwater Table Trial LPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						3.0		T. S. A. T. C. D. A. T. L.		3.0
3.5 4.0 4.5 4.5 LOCATION / NOTES: LEGEND TRIALPIT LOG JOB TITLE JULLYVOHEEN LF SITE INVESTIGATION LOCATION LOCATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY								Light green/gray sandy GRAVEL.		
3.5 4.0 4.5 4.5 LOCATION / NOTES: LEGEND TRIALPIT LOG JOB TITLE JULLYVOHEEN LF SITE INVESTIGATION LOCATION LOCATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY							C	Terminated at 3.2m bgl - hit weathe	red bedrock	
4.0- 4.5- LOCATION / NOTES: LEGEND TRIALPIT LOG JOB TITLE JULYVOHEEN LF SITE INVESTIGATION LOCATION LOCATION LOCATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C. MULROY						2 =		S		2.5
LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						3.5-				3.5-
LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.] =			COMPANY TO THE REAL PROPERTY.	
LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						=				
LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						4.0 -				4.0-
LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						=				
LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						-			View I	
LOCATION / NOTES: LEGEND Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						=			1	
LEGEND TRIALPIT LOG Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						4.5				4.5-
LEGEND TRIALPIT LOG Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.										
LEGEND TRIALPIT LOG Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table TRIALPIT LOG JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						=				-
Disturbed Sample Undisturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.						5.0 -				
Disturbed Sample Undisturbed Sample Undisturbed Sample ★ Headspace Analysis Down Borehole Analysis Groundwater Table JOB TITLE TULLYVOHEEN LF SITE INVESTIGATION LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.	LOC	ATION /	NO'	TES:				<u>LEGEND</u>	TRIALP	IT LOG
Undisturbed Sample ★ Headspace Analysis Down Borehole Analysis Groundwater Table LOCATION CLIFDEN, CO. GALWAY CLIENT GALWAY C.C.								Disturbed Sample	TITLE TULLS	YVOHEEN LF
★ Headspace Analysis † Down Borehole Analysis ✓ Groundwater Table CLIENT GALWAY C.C. MULROY								<u> </u>		
Groundwater Table MULROY								* Headspace Analysis		
I ₹								▼ Groundwater Table	MU •nvir	LROY

APPENDIX 8

BOREHOLE LOGS

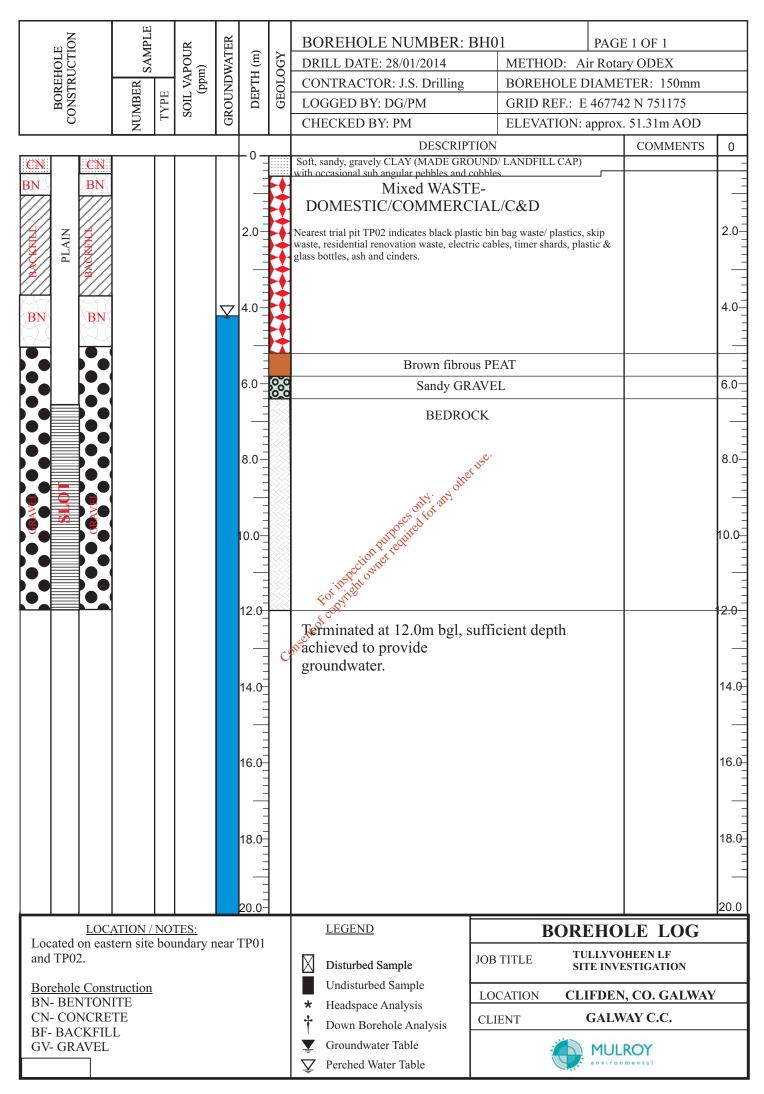
GROUNDWATER WELL FIELD MONITORING LOGS

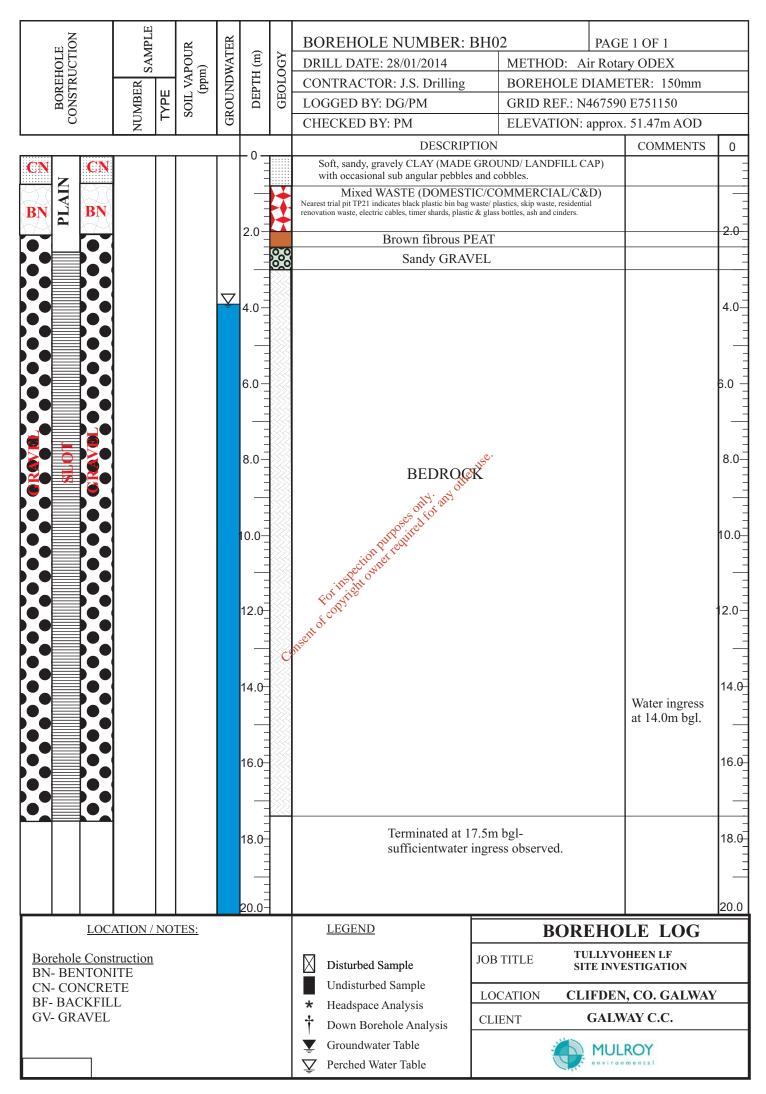
SURFACE WATER FIELD MONITORING LOGS

For inspection purposes of the land of the copyright of the land of t



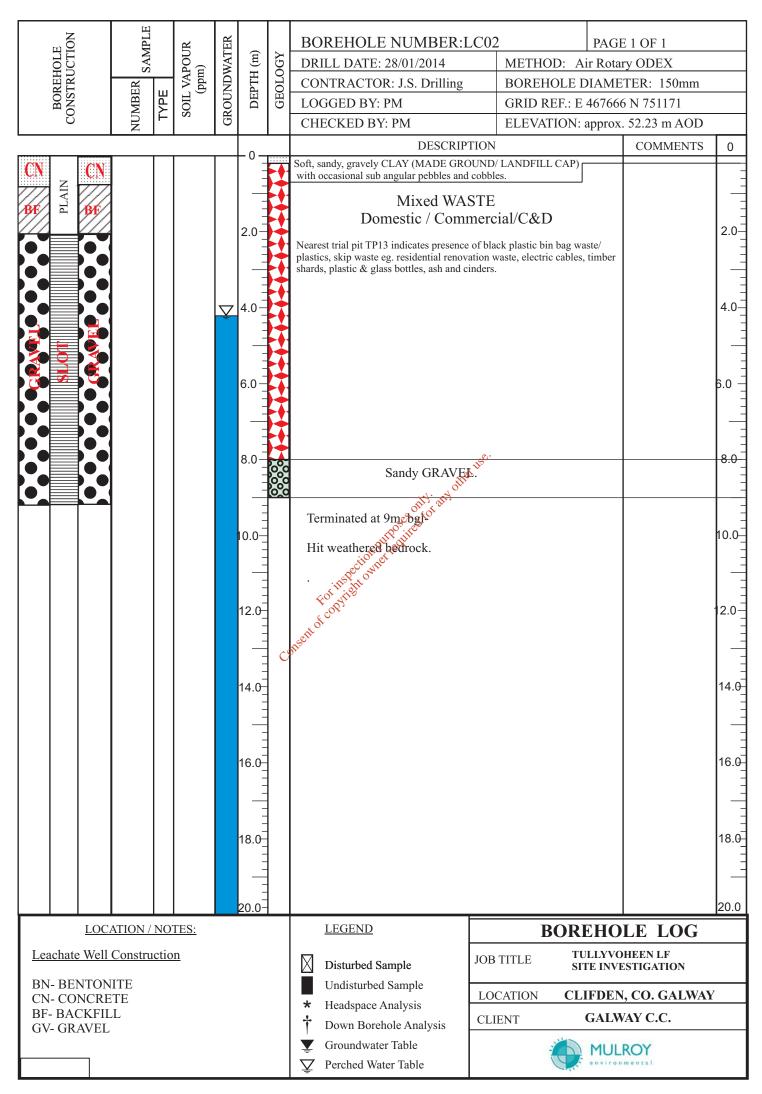
Consent of copyright owner required for any other use.





-	щ										
BOREHOLE	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	=	١,	BOREHOLE NUMBER:E			E 1 OF 1	
BOREHOLE	SAS		APO m)	WA	DEPTH (m)	GEOLOGY	DRILL DATE: 28/01/2014	METHOD: A			
ORE STR	ER	Е	C V/		EPT	EOL	CONTRACTOR: J.S. Drilling			ETER: 150mm	
) BC	NUMBER	TYPE	SOI	ROI		5	LOGGED BY: DG/PM	GRID REF.: 7			
O	ž			G		Ш	CHECKED BY: PM	ELEVATION	: approx	. 51.17m AOD	
					L_0_		DESCRIP			COMMENTS	0
CN Z CN					 - -		Soft, sandy, gravely CLAY (MADE C with occasional sub angular pebbles and	GROUND/ LANDFILI d cobbles.	L CAP)		
BI BI				∇	2.0		Mixed WASTE (DOME: Nearest Trial Pit TP19 indicates pres skip waste, blankets, plastics, empty	sence of tyres, steel cables			2.0-
					4.0		Gravelly SILT				4.0
					6.0		Large BOULDE	R.			6.0
					8.0 -		Soft red gravell	yČLAY			8.0
					10.0 		Weathered BED with sand in frame the sand in frame translation of the sand in frame to the sample to	ctures.			10.0
					14.0 	Ö	ne ^s				14.0-
					- - - - - 20.0						20.0
LOCA	ATION /	NO'	TES:				<u>LEGEND</u>	BOR	EHO	LE LOG	
Borehole Con			_				Disturbed Sample	IOR TITLE T	ULLYVO	OHEEN LF ESTIGATION	\dashv
BN- BENTO							Undisturbed Sample			N, CO. GALWAY	
CN- CONCR BF- BACKFI	ILL						★ Headspace AnalysisDown Borehole Analysis	CLIENT		VAY C.C.	
GV- GRAVE	L						Groundwater Table Perched Water Table		MUL	ROY	

[T]		Т						
IOLE JCTION SAMPLE	\	ER			BOREHOLE NUMBER: 1	LC01	PAGE 1 OF 1	
BOREHOLE CONSTRUCTION UMBER SAMPL	SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	DRILL DATE: 28/01/2014	METHOD: A	ir Rotary ODEX	
TRUE		Į Ž	PTH	070	CONTRACTOR: J.S. Drilling	BOREHOLE I	DIAMETER: 150mm	
BORE	SOIL	NO2	DE	GE	LOGGED BY: DG/PM	GRID REF.: E	467712 N 751170	
	- %	15			CHECKED BY: PM	ELEVATION:	approx. 51.47m AOD	
CN CN	•				DESCRIP	ΓΙΟΝ	COMMENTS	0
BN BN			F°∃		Soft, sandy, gravely CLAY (MADE GR	OUND/ LANDFILL CAP)	1 =
BN NIVIA WA-LCO1-O1			2.0 - - - - - - - - - -		Mixed WASTE (DOMES Nearest trial pit TP07 ind cables, timber, skip waste Sandy GR. Terminated at 6.1m bgl. Hit was Terminated at 6.1m bgl. Hit was the start of copyright owner transfer to the copyright of copyright owner transfer to the copyr	d cobbles. STIC/COMMERC icates tyres, steel e, blankets, plastic AVEL eathered BEDROCK.	IAL) s, etc	2.0- 4.0- 10.0- 12.0- 14.0- 14.0- 18.0- 18.0-
LOCATION / N	OTES:				<u>LEGEND</u>	BOR	EHOLE LOG	
Leachate Well Construc					Disturbed Sample	IOR TITLE TU	ULLYVOHEEN LF TE INVESTIGATION	
BN- BENTONITE					Undisturbed Sample	LOCATION CL	IFDEN CO CALWAY	7
CN- CONCRETE BF- BACKFILL					* Headspace Analysis		IFDEN, CO. GALWAY GALWAY C.C.	L
GV- GRAVEL					Down Borehole Analysis	ريان.	ACCUSATE A SECOND	
					✓ Groundwater Table ✓ Perched Water Table		MULROY	



	PROJECT D	ETAILS										
Project:		VOHEEN HISTORIC LANDFI	ILL SITE									
Location:		lifden, Conomarra, County Galw										
Sampler(s):		D. Gilfedder & P. Mulroy										
Date:		29/01/2014										
Dutc.		25,01,201										
	WELL DE	TAILS										
Well No.:	BH1	Grid Reference:	E 67742 N 251175									
Downgradient (D) or Upgradient (U)	U	Oil Level (m bTOC):	-									
Diameter (mm):	50 MM	Water Level(m bTOC):	4.215									
Well Head Protection (Tophat or Manhole):	Plastic Cover	Product Thickness (mm):	-									
Recharge Prevented (Yes or No):	No	Total Depth(m bTOC):	11.79									
Elevation (Tophat Cover or Manhole Cover):	52.31	Water Column or Head (m)	7.575									
Elevation (Top of Casing):	51.31	Well Volume (L):	15.1									
Water Level(m AOD): 47.095												
	25 of Cot											
FIELD P	HYSICO-CHEM	CAL PARAMETERS										
рН:	- gedicht fel											
Electrical Conductivity (μs):	HYSICO-CHEM											
Temperature (°C):	Meent -											
Dissolved Oxygen (mg/l)	-											
	FIELD OBSER	RVATIONS										
Purge Volume (L):	32221	75.50										
Colour:		Dark gray/ black										
Odour:		sulphur										
Sheen or Product Film:		None										
Emulsified Product:		None										
Comments:	Water clear when first purged, soon turned dark gray/ black color and remained same color.											



PROJECT DETAILS													
Project:	TULLY	VOHEEN HISTORIC LAND	OFILL SITE										
Location:	C	lifden, Conomarra, County Ga	alway										
Sampler(s):		D. Gilfedder & P. Mulroy											
Date:		29/01/2014											
	WELI	DETAILS											
Well No.:	BH2	Grid Reference:	E 67587 N 251146										
Downgradient (D) or Upgradient (U)	D	Oil Level (m bTOC):	-										
Diameter (mm):	50 MM	Water Level(m bTOC):	3.957										
Well Head Protection (Tophat or Manhole):	Plastic Cover	Product Thickness (mm):	-										
Recharge Prevented (Yes or No):	No	Total Depth(m bTOC):	17.78										
Elevation (Tophat Cover or Manhole Cover):	52.47	Water Column or Head (m)	13.82										
Elevation (Top of Casing):	51.17	ather											
>>	$>\!\!<$	Water Level(m AOD):	47.213										
	actif	of the state of th											
F	IELD PHYSICO CH	REMICAL PARAMETERS											
pH:	- For his												
Electrical Conductivity (μs):	Consent of col												
Temperature (°C):	-												
Dissolved Oxygen (mg/l)	-												
	EIEI D OB	SERVATIONS											
Purge Volume (L):	TIELD OD	138.00											
Colour:		Dark gray/black											
Odour:		None											
Sheen or Product Film:		None											
Emulsified Product:		None											
Comments:	Water clear when first purged, soon turned dark gray/ black color and remained same color.												



	PROJECT I	DETAILS			
Project:	TULLYVOH	IEEN HISTORIC LANDFILL SITE			
Location:	Clifder	n, Conomarra, County Galway			
Sampler(s):		D. Gilfedder & P. Mulroy			
Date:		29/01/2014			
	WELL DE	ETAILS			
Well No.:	ВН3	Grid Reference:	E 67577 N 251176		
Downgradient (D) or Upgradient (U)	D	Oil Level (m bTOC):	-		
Diameter (mm):	50 MM	Water Level(m bTOC): 5.397			
Well Head Protection (Tophat or Manhole):	Plastic Cover	Product Thickness (mm):	-		
Recharge Prevented (Yes or No):	No	Total Depth(m bTOC):	10.45		
Elevation (Tophat Cover or Manhole Cover):	52.57	Water Column or Head (m)	5.053		
Elevation (Top of Casing):	51.57	only well Volume (L):	9.9165125		
$ \\ \bigg \rangle$		Water Level(m AOD):	46.173		
	of pit	, and the second			
	FIELD PHYSICO-CHEM	IICAL PARAMETERS	_		
рН:	-Folyhight		><		
Electrical Conductivity (µs):	- For Just Hand		><		
Temperature (°C):					
Dissolved Oxygen (mg/l)	-				
	FIELD OBSERVATIONS				
Purge Volume (L): 49.58					
Colour:	Dark gray/black				
Odour:	None				
Sheen or Product Film:	None				
Emulsified Product:	None				
Comments:	Water clear when first purged, soon turned dark gray/ black color and remained same color.				



	PRC	DJECT DETAILS	
Project:		TULLYVOHEEN HISTORIC LA	ANDFILL SITE
Location:	Clifden, Conomarra, County Galway		
Sampler(s):		D. Gilfedder & P. Mu	lroy
Date:		29/01/2014	
	***	ELL DETAILS	
W.H.M.		ELL DETAILS	E 67712 N 251164
Well No.:	LC1	Grid Reference:	E 0//12 N 231104
Downgradient (D) or Upgradient (U)	D	Oil Level (m bTOC):	-
Diameter (mm):	50 MM	Water Level(m bTOC):	3.126
Well Head Protection (Tophat or Manhole):	Plastic Cover	Product Thickness (mm):	-
Recharge Prevented (Yes or No):	No	Total Depth(m bTOC):	6.215
Elevation (Tophat Cover or Manhole Cover):	-	Water Column or Head (m)	3.089
Elevation (Top of Casing):	51.47	Well Volume (L):	6
	$>\!\!<$	Water Level(m AOD):	48.344
		eciton huft felilit	
		CHEMICAL PARAMETERS	
pH:	- Ç ^O		
Electrical Conductivity (μs):	-ot		
Temperature (°C):	- Propri		
Slightly yellow tint on water (WA-SW01-01, see left bottle)	-		
	FIELD	O OBSERVATIONS	
Purge Volume (L):		30.00	
Colour:	Dark gray/ Black		
Odour:	slight Sulpher odour		
Sheen or Product Film:	None		
Emulsified Product:		None	
Comments:	Water clear when first purged, soon turned dark gray/ black color and		



	PROJECT I	DETAILS	
Project:	TULLYV	OHEEN HISTORIC LA	NDFILL SITE
Location:	Clif	den, Conomarra, County	Galway
Sampler(s):		D. Gilfedder & P. Mulr	oy
Date:		29/01/2014	
	WELL DI		
Well No.:	LC2	Grid Reference:	E 67666 N 251164
Downgradient (D) or	D	Oil Level (m bTOC):	-
Upgradient (U)	_		
Diameter (mm):	50 MM	Water Level(m bTOC):	4.275
Well Head Protection (Tophat or Manhole):	Plastic Cover	Product Thickness (mm):	-
Recharge Prevented (Yes or No):	No	Total Depth(m bTOC):	9.165
Elevation (Tophat Cover or Manhole Cover):	-	Water Column or Head (m)	4.89
Elevation (Top of Casing):	51.23	Well-Volume (L):	9.8
	- Ni	Water Level(m	46.955
		AOD):	10.755
	Dec outle		
FIELI) PHYSICO CHEM	IICAL PARAMETERS	
рН:	Consent of		
Electrical Conductivity (μs):	- -		
Temperature (°C):	-		> <
Dissolved Oxygen (mg/l)	-	> <	>>
	FIELD OBSE		
Purge Volume (L):	9.80		
Colour:	Dark gray/ Black		
Odour:	Sulpher		
Sheen or Product Film:	None		
Emulsified Product:	Slightly yellow tint on water (WA-SW01-01, see left bottle)		
Comments:	Water clear when first purged, soon turned dark gray/ black color and remained same color.		



SUI	RFACE WATER SAMPLING LOG	
	PROJECT DETAILS	
Project:	TULLYVOHEEN HISTORIC LANDFILL SITE	
Location:	Clifden, Conomarra, County Galway	
Sampler(s):	D. Gilfedder & P. Mulroy	
Date:	29/01/2014	
	MONITORING POINT DETAILS	
Monitoring Point No.:	SW1 Grid Reference: E 67778 N 25118	34
	and the state of t	
	FIELD PHYSICO-CHEMICAL PARAMETERS	
рН:	8.6 Fed High Republic	
Electrical Conductivity (μs):	270	\backslash
Temperature (°C):	. Interest Co.	
Dissolved Oxygen (mg/l)	60.050	
	FIELD OBSERVATIONS	
Colour:	Clear with slight yellow tint	
Odour:	~	
Sheen or Product Film:	~	
Emulsified Product:	~	
Comments:	Slightly yellow tint on water (WA-SW01-01, see left bottle)	



SURFACE WATER SAMPLING LOG

	PDG WGT PETA WG		
Duningt	PROJECT DETAILS THE LYVOHEEN HISTORIC LANDELL SITE		
Project: Location:	TULLYVOHEEN HISTORIC LANDFILL SITE Clifden, Conomarra, County Galway		
Sampler(s):	D. Gilfedder & P. Mulroy		
Date:	29/01/2014		
-			
M ' D' AN	MONITORING POINT DETAILS SW2 Grid Reference: E 67518 N 251149		
Monitoring Point No.:	SW2 Grid Reference: E 67518 N 251149		
	FIELD PHYSICO-CHEMICAE PARAMETERS		
рН:	8.3 Region de l'est rédit		
Electrical Conductivity (μs):	280 its the		
Temperature (°C):	~ 1087		
Dissolved Oxygen (mg/l)	<0.056		
	FIELD OBSERVATIONS		
Colour:	Mostly clear - very slight taint		
Odour:	~		
Sheen or Product Film:	~		
Emulsified Product:	~		
Comments:	Clear, very slight taint as seen below (WA-SW02-01, see middle bottle)		



SURFACE WATER SAMPLING LOG

	PROJECT DETAILS	
Project:	TULLYVOHEEN HISTORIC L	
Location:	Clifden, Conomarra, Coun	
Sampler(s):	D. Gilfedder & P. M	ulroy
Date:	29/01/2014	
	MONITORING POINT DETAILS	
Monitoring Point No.:	SW3 Grid Reference:	E 67470 N251088
	FIELD PHYSICO-CHEMICAL PARAMETER	RS
рН:	8.3 signification of the state	
Electrical Conductivity (μs):	250 col isht	
Temperature (°C):	i con	
Dissolved Oxygen (mg/l)	<0.050	
	• Olise	
	FIELD OBSERVATIONS	
Colour:	Clear	
Odour:	~	
Sheen or Product Film:	~	
Emulsified Product:	~	
	Clear, as shown below (WA-SW0	3-01, right bottle)
Comments:	WA-SWO WA-SWO ON A-SWO ON A-SW	



APPENDIX 9

RAW VALIDATED LABORATORY ANALYSIS REPORTS FROM CHEMTEST LTD. FOR SOIL, SURFACE WATER & GROUNDWATER

RAW VALIDATED LABORATORY ANALYSIS REPORTS FROM CLS LABORATORIES FOR SURFACE WATER ANALYSIS



Consent of copyright owner required for any other use.

CONFIRMATION RECEIPT



Scheduled analysis for 8 samples received 3 February 2014

Results due 10 February 2014

FAO David Gilfedder

Tullyvogheen

ogin E	Batch No					250	572		
Chemte	est LIMS ID			AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
Sample	· ID			WA	WA	WA	WA	WA	WA
Sample				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
Sampli	ng Date			Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
-	Type (AGS)								
Depth	, , , , , , , , , , , , , , , , , , ,			MATER	IA/ATED	IA/ATED	MATER	MATER	MATER
//atrix				WATER	WATER	WATER	WATER	WATER	WATER
OP↓	Determinand↓ 1I Amber Winchester	CAS No↓	Units↓	Received	Received	Received	Received	Received	Received
	11 Plastic Bottle					Received	Received	Received	Received
				Received	Received				
	30ml Septum Vial			Received	Received	Received	Received	Received	Received
	500g Plastic Tub			Received	Received	Received	Received	Received	Received
1010	Miscellaneous Bottle			Received	Received	Received	Received	Received	Received
1010		PH		Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
	Electrical Conductivity	EC	μS cm-¹	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
	Suspended solids at 105°C	SS_105	mg l-1	Ordered	Ordered	Ordered			
	Total Dissolved Solids	TDS	mg l-1	accticatific.			Ordered	Ordered	Ordered
1100	Chemical Oxygen Demand	COD	mg O2 I-1	inspire			Completed	Completed	Completed
	Dissolved Oxygen	7782447	mg O2 I-1	Ordered Ordered Ordered Ordered'	Ordered ¹				
	Redox potential	EH	mV	£ 005			Ordered	Ordered	Ordered
1300	Cyanide (total)	57125	mg l-1	Completed	Completed	Completed	Completed	Completed	Completed
1470	Iron (dissolved)	7439896	μg l-¹	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
1220	Alkalinity	ALK	mg CaCO3 I-	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
	Ammoniacal Nitrogen	AMM_NITRO	mg l-1	Ordered	Ordered	Ordered			
	Ammonium	14798039	mg l-1	Ordered	Ordered	Ordered			
	Chloride	16887006	mg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
	Fluoride	16984488	mg l-1				Ordered	Ordered	Ordered
	Nitrate	14797558	mg l-1				Ordered	Ordered	Ordered
	Nitrate as N	14797558	mg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
	Nitrite	14797650	mg l-1				Ordered	Ordered	Ordered
	Nitrite as N	14797650	mg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
	Phosphate	14265442	mg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised The above stated due by date relates to Chemtest analysis only. The expected delivery date of any subcontracted analysis will be subject to our suppliers agreed turnaround.

Purchase order/CoC number:

Please contact your Customer Service Advisor regarding any queries, quoting Chemtest Login Batch No: 250572

Column page 1

Page 1 of 3

CONFIRMATION RECEIPT



Scheduled analysis for 8 samples received 3 February 2014

Results due 10 February 2014

FAO David Gilfedder

Tullyvogheen

Login	Batch No			250	572
Chemt	est LIMS ID			AJ78964	AJ78965
Sampl	e ID			WA	WA
Sampl	e No			LC01-01	LC02-01
	ing Date			Not Provided	Not Provided
	e Type (AGS)				
Depth <i>Matrix</i>				WATER	WATER
SOP↓		CAS No↓	Units↓		
	1I Amber Winchester			Received	Received
	1I Plastic Bottle			Received	Received
	30ml Septum Vial			Received	Received Received
	500g Plastic Tub			Received	Received
	Miscellaneous Bottle			Received	Received
1010	рН	PH		Ordered	& Ordered
1020	Electrical Conductivity	EC	µS cm-¹	Ordered	Ordered
1030	Suspended solids at 105°C	SS_105	mg l-1	20 7	reat
1040	Total Dissolved Solids	TDS	mg l-1	Ordered	Ordered
1100	Chemical Oxygen Demand	COD	mg O2 I-1	Ordered Ordered Completed Ordered	Completed
1150	Dissolved Oxygen	7782447	mg O2 I-1	Qrdered ⁴	Ordered ¹
1170	Redox potential	EH	mV	Ordered	Ordered
1300	Cyanide (total)	57125	mg l-1	completed	Completed
1470	Iron (dissolved)	7439896	μg l-¹	Ordered	Ordered
1220	Alkalinity	ALK	mg CaCO3 I-1	Ordered	Ordered
	Ammoniacal Nitrogen	AMM_NITRO	mg l-1		
	Ammonium	14798039	mg l-1		
	Chloride	16887006	mg l-1	Ordered	Ordered
	Fluoride	16984488	mg I-1	Ordered	Ordered
	Nitrate	14797558	mg I-1	Ordered	Ordered
	Nitrate as N	14797558	mg l-1	Ordered	Ordered
	Nitrite	14797650	mg I-1	Ordered	Ordered
	Nitrite as N	14797650	mg I-1	Ordered	Ordered
	Phosphate	14265442	mg I-1	Ordered	Ordered

The above stated due by date relates to Chemtest analysis only. The expected delivery date of any subcontracted analysis will be subject to our suppliers agreed turnaround.

Purchase order/CoC number:

Please contact your Customer Service Advisor regarding any queries, quoting Chemtest Login Batch No: 250572

Column page 2

Page 1 of 3

CONFIRMATION RECEIPT



Scheduled analysis for 8 samples received 3 February 2014

Results due 10 February 2014

FAO David Gilfedder

Tullyvogheen

				,								
			250572									
			AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963				
			WA	WA	WA	WA	WA	WA				
			SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01				
			Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided				
			WATER	WATER	WATER	WATER	WATER	WATER				
220 Total Oxidised Nitrogen		mg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
1325 Sulfide	18496258	mg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
610 Dissolved Organic Carbon	DOC	mg I-1	Oracica			Ordered	Ordered	Ordered				
270 Hardness	HARD_TOT	mg CaCO3 I-1		other use		Ordered	Ordered	Ordered				
415 Calcium	7440702	mg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Magnesium	7439954	mg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Potassium	7440097	mg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Sodium	7440235	mg I-1		R ill	Ordered	Ordered	Ordered	Ordered				
110 Phosphorus (total)	7723140	mg I-1	Ordered Ordered Ordered Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
220 Sulfate	14808798	mg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
450 Antimony	7440364	μg I-1	Ordered 6	Ordered	Ordered	Ordered	Ordered	Ordered				
Arsenic	7440382	μg I-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Boron	7440428		Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Cadmium	7440428	μg l-1	***									
	7440473	μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Chromium	7440473	μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered Ordered				
Copper Lead		μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered					
	7439921	μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Manganese	7439965	μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Mercury	7439976	μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Nickel	7440020	μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
Selenium	7782492	μg l-1				Ordered	Ordered	Ordered				
Zinc	7440666	μg l-1	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered				
760 BTEX	BTEX	μg l-1	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹				
MTBE	VOC	μg I-¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹				
VOC	VOC	μg l-¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹	Ordered ¹				

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised
The above stated due by date relates to Chemtest analysis only. The expected delivery date of any subcontracted analysis will be subject to our suppliers agreed turnaround.

Purchase order/CoC number:

Please contact your Customer Service Advisor regarding any queries, quoting Chemtest Login Batch No: 250572

Column page 1

Page 2 of 3

CONFIRMATION RECEIPT



Scheduled analysis for 8 samples received 3 February 2014

Results due 10 February 2014

FAO David Gilfedder

Tullyvogheen

				250	572
				AJ78964	AJ78965
				WA	WA
				LC01-01	LC02-01
				Not Provided	Not Provided
				WATER	WATER
1220	Total Oxidised Nitrogen		mg l-1	Ordered	Ordered
1325	Sulfide	18496258	mg l-1	Ordered	Ordered
1610	Dissolved Organic Carbon	DOC	mg l-1	Ordered	Ordered 🞺
1270	Hardness	HARD_TOT	mg CaCO3 I-1	Ordered	Ordered Ordered
1415	Calcium	7440702	mg l-1	Ordered	
	Magnesium	7439954	mg l-1	Ordered	Orgered
	Potassium	7440097	mg l-1	Ordered	ordered
	Sodium	7440235	mg l-1	Ordered 💉	Ordered
1110	Phosphorus (total)	7723140	mg l-1	Ordered	Ordered
1220	Sulfate	14808798	mg l-1	Ordered	Ordered Ordered Ordered Ordered Ordered Ordered Ordered
1450	Antimony	7440364	µg l-¹	Ordered	Ordered
	Arsenic	7440382	µg l-¹	Ordered	Ordered
	Boron	7440428	μg l-¹	Ørdered	Ordered
	Cadmium	7440439	μg l-¹	Ordered Ordered	Ordered
	Chromium	7440473	µg l-¹ €	Ordered	Ordered
	Copper	7440508	μg l-¹	Ordered	Ordered
	Lead	7439921	μg l-¹	Ordered	Ordered
	Manganese	7439965	μg l-¹	Ordered	Ordered
	Mercury	7439976	µg l-¹	Ordered	Ordered
	Nickel	7440020	μg l-¹	Ordered	Ordered
	Selenium	7782492	μg l-¹	Ordered	Ordered
	Zinc	7440666	μg l-¹	Ordered	Ordered
1760	BTEX	BTEX	µg l-¹	Ordered ¹	Ordered ¹
	MTBE	VOC	µg l-¹	Ordered ¹	Ordered ¹
	VOC	VOC	μg l-¹	Ordered ¹	Ordered ¹

The above stated due by date relates to Chemtest analysis only. The expected delivery date of any subcontracted analysis will be subject to our suppliers agreed turnaround.

Purchase order/CoC number:

Please contact your Customer Service Advisor regarding any queries, quoting Chemtest Login Batch No: 250572

Column page 2

Page 2 of 3

CONFIRMATION RECEIPT



Scheduled analysis for 8 samples received 3 February 2014

Results due 10 February 2014

FAO David Gilfedder

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				Not Provided					
				WATER	WATER	WATER	WATER	WATER	WATER
	la			_	_		_	_	_
	SVOC	SVOC	μg l-¹	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
1820	Organophosphorus pesticides in waters		μg l-¹	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
1830	Atrazine	1912249	μg l-¹	Ordered	Ordered 🞺	Ordered	Ordered	Ordered	Ordered
	Simazine	122349	μg l-¹	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
1840	Organochlorine pesticides in waters		μg l-¹	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
1845	Acid Herbicides in waters		μg l-¹	Ordered	Ordered	Ordered	Ordered	Ordered	Ordered
1900	Phenols speciated by GCMS in waters		mg l-1	Ordered	of Cordered	Ordered	Ordered	Ordered	Ordered

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The above stated due by date relates to Chemtest analysis only. The expected delivery date of any subcontracted analysis will be subject to our suppliers agreed turnaround.

Purchase order/CoC number:

Please contact your Customer Service Advisor regarding any queries, quoting Chemtest Login Batch No: 250572

Column page 1

Page 3 of 3

CONFIRMATION RECEIPT



Scheduled analysis for 8 samples received 3 February 2014

Results due 10 February 2014

FAO David Gilfedder

Tullyvogheen

				250	0572
				AJ78964	AJ78965
				WA	WA
				LC01-01	LC02-01
				Not Provided	Not Provided
				WATER	WATER
1790	SVOC	SVOC	μg l-¹	Ordorod	Ordorod
		3000		Ordered	Ordered
1820	Organophosphorus pesticides in waters		µg l-¹	Ordered	Ordered
1830	Atrazine	1912249	μg l-¹	Ordered	Ordered 💉
	Simazine	122349	μg l-¹	Ordered	Ordered
1840	Organochlorine pesticides in waters		μg l-¹	Ordered	Ordered
1845	Acid Herbicides in waters		μg l-¹	Ordered	Ordered
1900	Phenols speciated by GCMS in waters		mg l-1	Ordered	rdered

The above stated due by date relates to Chemtest analysis only. The expected delivery date of any subcontracted analysis will be subject to our suppliers agreed turnaround.



Depot Road Newmarket CB8 0AL Tel: 01638 606070

MULROY ENVIRONMENTAL 30 LISROLAND VIEW **KNOCKBRIDGE** DUNDALK, CO LOUTH **IRELAND**

FAO David Gilfedder 14 February 2014

Dear David Gilfedder

250572 **Test Report Number**

Your Project Reference Tullyvogheen

Please find enclosed the results of analysis for the samples received 3 February 2014.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please not hesitate to contact the Customer Services Consent of copyright on

Yours sincerely

Keith Jones, Technical Manager



Notes to accompany report:

- The sign < means 'less than'
- Tests marked 'U' hold UKAS accreditation
- Tests marked 'M' hold MCertS (and UKAS) accreditation
- Tests marked 'N' do not currently hold UKAS accreditation
- Tests marked 'S' were subcontracted to an approved laboratory
- n/e means 'not evaluated'
- i/s means 'insufficient sample
- u/s means 'unsuitable sample'
- Comments or interpretations are beyond the scope of UKAS accreditation
- The results relate only to the items tested
- All results are expressed on a dry weight basis
- The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols
- For all other tests the samples were dried at < 37°C prior to analysis
- Uncertainties of measurement for the determinands tested are available upon request
- None of the test results included in this report have been recovery corrected

Test Report 250572 Cover Sheet

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

Tullyvogheen

Login E	Batch No						250	572		
Chemte	est LIMS ID				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
Sample	ID				WA	WA	WA	WA	WA	WA
Sample	· No				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
Samplii	ng Date				Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					WATER	WATER	WATER	WATER	WATER	WATER
SOP↓	Determinand↓	CAS No↓ U	nits↓ *							
1010	рН	PH		U	8.6	8.3	8.3	7.6	8.1	7.7
1020	Electrical Conductivity	EC	μS cm-1	U	270	280 , s [©] .	250	1100	550	490
1030	Suspended solids at 105°C	SS_105	mg l-1	U	17	8her	1			
1040	Total Dissolved Solids	TDS	mg l-1	N		14. 44		630	330	300
1100	Chemical Oxygen Demand	COD	mg O2 I-1	U		Office at		27	12	10
1150	Dissolved Oxygen	7782447	mg O2 I-1	N	11.2 ¹	11.0 ¹	11.1 ¹	7.5 ¹	7.5 ¹	8.1 ¹
1170	Redox potential	EH	mV	N	150 NIP NI	150	160	170	210	200
1300	Cyanide (total)	57125	mg l-1	U	11.2 1 50 11.0 11.2 11.2 11.2 11.2 11.2 11.2 11.	280 steel 11.0 1 150 <0.050 810 57	< 0.050	< 0.050	< 0.050	< 0.050
1470	Iron (dissolved)	7439896	μg l-¹	N	300 Mile	810	460	<20	30	<20
1220	Alkalinity	ALK	mg CaCO3 I-1	U	:115 400 a	57	45	590	360	210
	Chloride	16887006	mg l-1	U	€01 ×1066	63	60	54	110	43
	Fluoride	16984488	mg l-1	U	0.14	0.23	0.16	0.13	0.18	0.13
	Ammonium	14798039	mg l-1	U	0.11	2.9	1.9	11	1.1	0.51
	Ammoniacal Nitrogen	AMM_NITROG	mg l-1	Uzg	0.09	2.3	1.5	8.6	0.86	0.40
	Nitrite	14797650	mg l-1	Oug	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Nitrite as N	14797650	mg l-1	U	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Nitrate	14797558	mg l-1	U	0.78	0.96	0.50	<0.50	<0.50	<0.50
	Nitrate as N	14797558	mg l-1	U	0.42	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphate	14265442	mg l-1	U	0.084	0.077	0.077	0.074	0.073	0.080
	Total Oxidised Nitrogen		mg l-1	U	0.43	<0.20	<0.20	<0.20	<0.20	<0.20
1325	Sulfide	18496258	mg l-1	U	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1610	Dissolved Organic Carbon	DOC	mg l-1	N	21	18	18	28	11	6.7
1270	Hardness	HARD_TOT	mg CaCO3 I-1	U	55	50	38	500	240	220
1415	Calcium	7440702	mg l-1	U	9.6	12	9.3	170	81	62

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Report page 1 of 9 LIMS sample ID range AJ78958 to AJ78965

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

Logi	n Batch No				250	572
Che	ntest LIMS ID				AJ78964	AJ78965
Sam	ple ID				WA	WA
Sam	ple No				LC01-01	LC02-01
Sam	pling Date				Not Provided	Not Provided
Dep	h					
Matr	ix				WATER	WATER
SOF	² ↓ Determinand↓	CAS No↓	Units↓ *			
1010	рН	PH		U	7.3	7.2 1500 use 1500 890 diet 1500 560 diet 1500 560 diet 1500 560 diet 1500 710
1020	Electrical Conductivity	EC	μS cm-¹	U	1300	1500 🞺
1030	Suspended solids at 105°C	SS_105	mg l-1	U		ather
1040	Total Dissolved Solids	TDS	mg l-1	N	770 100 5.5 ¹ 22 <0.050 0 10 260 10 10 660 10	,4.8 <u>9</u> 0
1100	Chemical Oxygen Demand	COD	mg O2 I-1	U	100	on 100
1150	Dissolved Oxygen	7782447	mg O2 I-1	N	5.5 ¹	5.1 ¹
1170	Redox potential	EH	mV	N	22	-43
1300	Cyanide (total)	57125	mg l-1	U	<0.050	<0.050
1470	Iron (dissolved)	7439896	μg l-¹	N	260ctt wite	2900
1220	Alkalinity	ALK	mg CaCO3 I-1	U	6600	710
	Chloride	16887006	mg l-1	U	∆0, 80°	74
	Fluoride	16984488	mg l-1	U	.0° 12	0.12
	Ammonium	14798039	mg l-1	U		60
	Ammoniacal Nitrogen	AMM_NITROG	mg l-1	U U	^{©11} 72	47
	Nitrite	14797650	mg l-1	UÇ _O	<0.020	<0.020
	Nitrite as N	14797650	mg l-1	U	<0.010	<0.010
	Nitrate	14797558	mg l-1	U	0.56	< 0.50
	Nitrate as N	14797558	mg l-1	U	<0.20	<0.20
	Phosphate	14265442	mg l-1	U	0.073	0.074
	Total Oxidised Nitrogen		mg l-1	U	<0.20	<0.20
1325	Sulfide	18496258	mg l-1	U	<0.050	<0.050
1610	Dissolved Organic Carbon	DOC	mg l-1	N	19	20
1270	Hardness	HARD_TOT	mg CaCO3 I-1	U	210	420
1415	Calcium	7440702	mg l-1	U	57	140

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

Tullyvogheen

							250	572		
					AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
					WA	WA	WA	WA	WA	WA
					SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	WATER	WATER	WATER	WATER	WATER
1415	Potassium	7440097	mg l-1	U	<0.50	2.5	1.9	9.4	12	3.0
	Magnesium	7439954	mg l-1	U	4.2	5.4	4.5	17	8.1	16
	Sodium	7440235	mg l-1	U	39	37 150	32	47	26	25
1110	Phosphorus (total)	7723140	mg l-1	N	<0.050		<0.050	<0.050	<0.050	<0.050
1220	Sulfate	14808798	mg l-1	U	15	· · · · · · · · · · · · · · · · · · ·	10	59	14	5.8
1450	Arsenic	7440382	μg l-¹	U	<1.0	on x at < 1.0	<1.0	3.0	6.2	28
	Boron	7440428	μg l-¹	U	580	530	440	520	500	600
	Cadmium	7440439	μg l-¹	U	<0.080	<0.050 2 2 30 41.0 40.080 41.0 1.1 40.50 94	<0.080	<0.080	<0.080	0.35
	Chromium	7440473	μg l-¹	U	<1.00 000	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper	7440508	μg l-¹	U	1ch wher	1.1	<1.0	1.1	<1.0	<1.0
	Mercury	7439976	μg l-¹	U	. c≥0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
	Manganese	7439965	μg l-¹	U	201 1185	94	52	1800	1100	970
	Nickel	7440020	μg l-¹	U	<1.0	<1.0	<1.0	4.2	4.4	<1.0
	Lead	7439921	μg l-¹	U	col <1.0 1.6	<1.0	<1.0	<1.0	<1.0	1.3
	Antimony	7440364	μg l-¹	U U	<1.0	<1.0	<1.0	<1.0	1.2	2.2
	Selenium	7782492	μg l-¹	Con	<1.0	<1.0	<1.0	2.8	1.2	2.1
	Zinc	7440666	µg l-¹	U	9.4	6.7	6.6	10	3.0	2.5
1760	Methyl tert-butylether	1634044	μg l-¹	N	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
	Dichlorodifluoromethane	75718	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
	Chloromethane	74873	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
	Vinyl chloride	75014	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
	Bromomethane	74839	μg l-¹	U	<20 ¹	<20 ¹	<20 ¹	<20 ¹	<20 ¹	<20 ¹
	Chloroethane	75003	μg l-¹	U	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹
	Trichlorofluoromethane	75694	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
	1,1-Dichloroethene	75354	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					Not Provided	Not Provided
					WATER	WATER
1415	Potassium	7440097	mg l-1	U	19	20
	Magnesium	7439954	mg l-1	U	16	20
	Sodium	7440235	mg l-1	U	37	53 , 15 [©]
1110	Phosphorus (total)	7723140	mg l-1	N	<0.050	<0.050
1220	Sulfate	14808798	mg l-1	U	54	.4. 25
1450	Arsenic	7440382	µg l-¹	U	3.0	on 1.5
	Boron	7440428	µg l-¹	U	810	چ ^ې ک ^{۲۷} 810
	Cadmium	7440439	µg l-¹	U	<0.080	wife <0.080
	Chromium	7440473	µg l-¹	U	<1.0.	<0.050 et 25 cont 7.5 see de 1810 co.080 2.0 <1.0 <0.50 1300
	Copper	7440508	µg l-¹	U	<1.Quitanter	<1.0
	Mercury	7439976	µg l-¹	U	<0.50	<0.50
	Manganese	7439965	µg l-¹	U	€0. §86.	1300
	Nickel	7440020	μg l-¹	U	4.9	16
	Lead	7439921	µg l-¹	U	1.7	<1.0
	Antimony	7440364	μg l-¹	U	9.8	<1.0
	Selenium	7782492	μg l-¹	UÇÓ	4.9	3.8
	Zinc	7440666	μg l-¹	U	7.1	9.3
1760	Methyl tert-butylether	1634044	µg l-¹	N	<1.0 ¹	<1.0 ¹
	Dichlorodifluoromethane	75718	μg l-¹	U	<1.0 ¹	<1.0 ¹
	Chloromethane	74873	µg l-¹	U	<1.0 ¹	<1.0 ¹
	Vinyl chloride	75014	µg l-¹	U	<1.0 ¹	<1.0 ¹
	Bromomethane	74839	µg l-¹	U	<20 ¹	<20 ¹
	Chloroethane	75003	μg l-¹	U	<2.0 ¹	<2.0 ¹
	Trichlorofluoromethane	75694	μg l-¹	U	<1.0 ¹	<1.0 ¹
	1,1-Dichloroethene	75354	μg l-¹	U	<1.0 ¹	<1.0 ¹

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
				WATER	WATER	WATER	WATER	WATER	WATER
60 Dichloromethane	75092	μg l-¹	N	ne ¹	ne ¹	ne ¹	ne ¹	ne ¹	ne ¹
trans-1,2-Dichloroethene	156605	μg I-1	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,1-Dichloroethane	75343	μg I-1	U	<1.0 ¹	<1.0 ¹ .5 [©] .	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
cis-1,2-Dichloroethene	156592	μg I-1		<1.0 ¹	<1.0	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Bromochloromethane	74975	μg l- ¹	U	<1.0	41 0 1	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Trichloromethane	67663	μg l- ¹	U	<1.0 ¹ thirtied	only, 213,01	1.3 1	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,1,1-Trichloroethane	71556	μg I-1	U	<1.0 ¹ - &	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Tetrachloromethane	56235	μg l- ¹	U	<1.0 1 M	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,1-Dichloropropene	563586	μg l-1	U	<1.03 7 100	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Benzene	71432	μg I-1	U	<100 men	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,2-Dichloroethane	107062	μg l-¹	U	. (2,0°1	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹
Trichloroethene	79016	μg l-¹	N	€01 × 58.0 1	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,2-Dichloropropane	78875	μg l-¹	U	00<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Dibromomethane	74953	μg l-¹	U	<1.0 ¹ <1.0 ¹ <10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹
Bromodichloromethane	75274	μg l-¹	U	<5.0 ¹	<5.0 ¹	<5.0 ¹	<5.0 ¹	<5.0 ¹	<5.0 ¹
cis-1,3-Dichloropropene	10061015	µg l-¹	Cost	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹
Toluene	108883	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	2.3 1	1.1 ¹	<1.0 ¹
trans-1,3-Dichloropropene	10061026	μg l-¹	U	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹
1,1,2-Trichloroethane	79005	μg l-¹	U	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹
Tetrachloroethene	127184	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,3-Dichloropropane	142289	μg l-¹	U	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹
Dibromochloromethane	124481	μg l-¹	U	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹
1,2-Dibromoethane	106934	μg l-¹	U	<5.0 ¹	<5.0 ¹	<5.0 ¹	<5.0 ¹	<5.0 ¹	<5.0 ¹
Chlorobenzene	108907	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,1,1,2-Tetrachloroethane	630206	µg l-¹	U	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹	<2.0 ¹

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

				250	572
				AJ78964	AJ78965
				WA	WA
				LC01-01	LC02-01
				Not Provided	Not Provided
				WATER	WATER
1760 Dichloromethane	75092	μg l-¹	N	ne ¹	ne ¹
trans-1,2-Dichloroethene	156605	μg l-¹	U	<1.0 ¹	<1.0 ¹
1,1-Dichloroethane	75343	μg l-¹	U	<1.0 ¹	<1.0 ¹ 💖
cis-1,2-Dichloroethene	156592	µg l-¹	U	<1.0 ¹	<1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 3 <1.0 4 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1 <1.0 1
Bromochloromethane	74975	μg l-¹	U	<1.0 ¹	,_<1,0 ^{9°}
Trichloromethane	67663	μg l-¹	U	<1.0 ¹	010 € 1.0 1
1,1,1-Trichloroethane	71556	µg l-¹	U	<1.0 ¹	² 1.0 ¹
Tetrachloromethane	56235	µg l-¹	U	<1.0 ¹	1.0 ¹
1,1-Dichloropropene	563586	µg l-¹	U	<1.0 ¹ on 2 s	<1.0 ¹
Benzene	71432	µg l-¹	U	<1.00th will	1.4 ¹
1,2-Dichloroethane	107062	µg l-¹	U	<2.01	<2.0 ¹
Trichloroethene	79016	µg l-¹	N	(1.0°) (2.0°) (3.0°) (4.0°) (5.0°) (5.0°) (1.0°) (1.0°)	<1.0 ¹
1,2-Dichloropropane	78875	µg l-¹	U	્રેલ્ <u>લ</u> ે.0 ¹	<1.0 ¹
Dibromomethane	74953	µg l-¹	U	<10 ¹	<10 ¹
Bromodichloromethane	75274	µg l-¹	U	<5.0 ¹	<5.0 ¹
cis-1,3-Dichloropropene	10061015	µg l-¹	UÇÕ	<10 ¹	<10 ¹
Toluene	108883	µg l-¹	U	1.4 ¹	1.1 ¹
trans-1,3-Dichloropropene	10061026	µg l-¹	U	<10 ¹	<10 ¹
1,1,2-Trichloroethane	79005	µg l-¹	U	<10 ¹	<10 ¹
Tetrachloroethene	127184	µg l-¹	U	<1.0 ¹	<1.0 ¹
1,3-Dichloropropane	142289	µg l-¹	U	<2.0 ¹	<2.0 ¹
Dibromochloromethane	124481	μg l-¹	U	<10 ¹	<10 ¹
1,2-Dibromoethane	106934	μg l-¹	U	<5.0 ¹	<5.0 ¹
Chlorobenzene	108907	μg l-¹	U	<1.0 ¹	4.4 ¹
1,1,1,2-Tetrachloroethane	630206	μg l-¹	U	<2.0 ¹	<2.0 ¹

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
				WATER	WATER	WATER	WATER	WATER	WATER
760 Ethylbenzene	100414	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
m- & p-Xylene	1330207	µg l−¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	3.2 ¹	1.6 ¹	<1.0 ¹
o-Xylene	95476	µg l-¹	U	<1.0 ¹	<1.0 ¹ 3 ⁶	<1.0 ¹	1.5 ¹	<1.0 ¹	<1.0 ¹
Styrene	100425	μg l-¹	U	<1.0 ¹	<1.Qa	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Tribromomethane	75252	µg l-¹	U	<10 ¹	√4. ≤10°¹	<10 ¹	<10 ¹	<10 ¹	<10 ¹
Isopropylbenzene	98828	μg l-¹	U	<1.0 ¹ <10 ¹ <1.0 ¹ <1.0 ¹ <50 ¹ Huffeld <1.0 the feld <1.0 th	of 1.0 1	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Bromobenzene	108861	μg l-¹	U	<1.0 ¹ 🖋	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,2,3-Trichloropropane	96184	μg l-¹	U	<50 1 M	<50 ¹	<50 ¹	<50 ¹	<50 ¹	<50 ¹
n-Propylbenzene	103651	μg l-¹	U	<1.030	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
2-Chlorotoluene	95498	μg l-¹	U	<1,01,110	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,2,4-Trimethylbenzene	95636	μg l-¹	U	. 0e 1,00g	<1.0 ¹	<1.0 ¹	1.7 ¹	<1.0 ¹	<1.0 ¹
4-Chlorotoluene	106434	μg l-¹	U	\$1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
tert-Butylbenzene	98066	μg l-¹	U	. 00 < 1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,3,5-Trimethylbenzene	108678		U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
sec-Butylbenzene	135988	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,3-Dichlorobenzene	541731	μg l-¹	Colli	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
4-Isopropyltoluene	99876	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,4-Dichlorobenzene	106467	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
n-Butylbenzene	104518	µg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,2-Dichlorobenzene	95501	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
1,2-Dibromo-3-chloropropane	96128	μg I-1	U	<50 ¹	<50 ¹	<50 ¹	<50 ¹	<50 ¹	<50 ¹
1,2,4-Trichlorobenzene	120821	µg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
Hexachlorobutadiene	87683	μg l-¹	U	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹	<1.0 ¹
790 Acenaphthene	83329	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acenaphthylene	208968	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Report page 4 of 9

LIMS sample ID range AJ78958 to AJ78965

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					Not Provided	Not Provided
					WATER	WATER
1760	Ethylbenzene	100414	μg l-¹	U	1.2 ¹	<1.0 ¹
	m- & p-Xylene	1330207	μg l-¹	U	8.3 ¹	<1.0 ¹ 7.9 ¹ 2.2 ¹ <1.0 164 16 16 16 16 16 16 16 16 16 16 16 16 16
	o-Xylene	95476	μg l-¹	U	2.3 ¹	2.2 ¹ 💉
	Styrene	100425	μg l-¹	U	<1.0 ¹	<1.0 10
	Tribromomethane	75252	μg l-¹	U	<10 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹	×10 P
	Isopropylbenzene	98828	µg l-¹	U	<1.0 ¹	on € 1.0 1
	Bromobenzene	108861	μg l-¹	U	<1.0 ¹	€ 20 < 1.0 ¹
	1,2,3-Trichloropropane	96184	µg l-¹	U	<50 ¹	1111 <50 1
	n-Propylbenzene	103651	μg l-¹	U	<1.0 1 00 \$	<1.0 ¹
	2-Chlorotoluene	95498	μg l-¹	U	<1.00 distribution	<1.0 ¹
	1,2,4-Trimethylbenzene	95636	μg l-¹	U	6,5,1,0	4.5 ¹
	4-Chlorotoluene	106434	μg l-¹	U	\$ 2.00°1	<1.0 ¹
	tert-Butylbenzene	98066	μg l-¹	U	્રેલ્ <u>લ</u> ી.0 ¹	<1.0 ¹
	1,3,5-Trimethylbenzene	108678	μg l-¹	U	<1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹ <1.0 ¹	<1.0 ¹
	sec-Butylbenzene	135988	μg l-¹	U	<1.0 ¹	<1.0 ¹
	1,3-Dichlorobenzene	541731	μg l-¹	UÇÓ	<1.0 ¹	<1.0 ¹
	4-Isopropyltoluene	99876	μg l-¹	U	<1.0 ¹	<1.0 ¹
	1,4-Dichlorobenzene	106467	μg l-¹	U	<1.0 ¹	<1.0 ¹
	n-Butylbenzene	104518	μg l-¹	U	<1.0 ¹	<1.0 ¹
	1,2-Dichlorobenzene	95501	µg l-¹	U	<1.0 ¹	<1.0 ¹
	1,2-Dibromo-3-chloropropane	96128	µg l-¹	U	<50 ¹	<50 ¹
	1,2,4-Trichlorobenzene	120821	μg l-¹	U	<1.0 ¹	<1.0 ¹
	Hexachlorobutadiene	87683	μg l-¹	U	<1.0 ¹	<1.0 ¹
1790	Acenaphthene	83329	μg l-¹	N	<0.50	<0.50
	Acenaphthylene	208968	μg l-¹	N	< 0.50	< 0.50

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
				WATER	WATER	WATER	WATER	WATER	WATER
790 Anthracene	120127	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Azobenzene	103333	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50
Benzo[a]anthracene	56553	μg l-¹	N	<0.50	<0.50 💖	<0.50	<0.50	<0.50	< 0.50
Benzo[a]pyrene	50328	μg l-¹	N	<0.50	<0.50°	<0.50	<0.50	<0.50	<0.50
Benzo[b]fluoranthene	205992	μg l-¹	N	<0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50		<0.50	<0.50	<0.50	<0.50
Benzo[g,h,i]perylene	191242	μg l-¹	N	<0.50	<0.50 20.50 20.50 <0.50 <0.50 <0.50	<0.50	<0.50	<0.50	<0.50
Benzo[k]fluoranthene	207089	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
bis(2-Chloroethoxy)methane	111911	μg l-¹	N	< 0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
bis(2-Chloroethyl)ether	111444	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50
bis(2-Chloroisopropyl)ether	108601	μg l-¹	N	<0.50 no	<0.50	<0.50	<0.50	<0.50	< 0.50
bis(2-Ethylhexyl)phthalate	117817	μg l-¹	N	. re€0.50	<0.50	<0.50	<0.50	<0.50	< 0.50
Butylbenzylphthalate	85687	μg l-¹	N	¢ot \\$€0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbazole	86748	μg l-¹	N	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chrysene	218019	μg l-¹	N	⋄ ~0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Di-n-butylphthalate	84742	μg l-¹	N S	< 0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Di-n-octylphthalate	117840	μg l-¹	Opti	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibenzo[a,h]anthracene	53703	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibenzofuran	132649	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Diethylphthalate	84662	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dimethylphthalate	131113	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Fluoranthene	206440	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluorene	86737	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene	118741	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobutadiene	87683	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorocyclopentadiene	77474	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Report page 5 of 9

LIMS sample ID range AJ78958 to AJ78965

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					Not Provided	Not Provided
					WATER	WATER
1790	Anthracene	120127	μg l-¹	N	<0.50	<0.50
	Azobenzene	103333	μg l-¹	N	<0.50	< 0.50
	Benzo[a]anthracene	56553	μg l-¹	N	<0.50	<0.50
	Benzo[a]pyrene	50328	μg l-¹	N	<0.50	<0.50
	Benzo[b]fluoranthene	205992	μg l-¹	N	<0.50	<pre></pre>
	Benzo[g,h,i]perylene	191242	μg l-¹	N	<0.50	on ≤0.50
	Benzo[k]fluoranthene	207089	μg l-¹	N	<0.50	<0.50 € 0.50
	bis(2-Chloroethoxy)methane	111911	μg l-¹	N	<0.50	wife < 0.50
	bis(2-Chloroethyl)ether	111444	μg l-¹	N	<0.50	<0.50
	bis(2-Chloroisopropyl)ether	108601	μg l-¹	N	<0.50th with	<0.50
	bis(2-Ethylhexyl)phthalate	117817	μg l-¹	N	<0.50	< 0.50
	Butylbenzylphthalate	85687	μg l-¹	N	⋄ ∞0.50	<0.50
	Carbazole	86748	μg l-¹	N	€0.50	<0.50
	Chrysene	218019	μg l-¹	N	<0.50	<0.50
	Di-n-butylphthalate	84742	μg l-¹	N N NCO	<0.50	<0.50
	Di-n-octylphthalate	117840	μg l-¹	NCO	<0.50	< 0.50
	Dibenzo[a,h]anthracene	53703	μg l-¹	N	<0.50	<0.50
	Dibenzofuran	132649	μg l-¹	N	<0.50	<0.50
	Diethylphthalate	84662	µg l-¹	N	<0.50	< 0.50
	Dimethylphthalate	131113	μg l-¹	N	<0.50	< 0.50
	Fluoranthene	206440	μg l-¹	N	<0.50	<0.50
	Fluorene	86737	μg l-¹	N	<0.50	<0.50
	Hexachlorobenzene	118741	μg l-¹	N	<0.50	<0.50
	Hexachlorobutadiene	87683	μg l-¹	N	<0.50	<0.50
	Hexachlorocyclopentadiene	77474	μg l-¹	N	<0.50	<0.50

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

Tullyvogheen

							250	572		
					AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
					WA	WA	WA	WA	WA	WA
					SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	WATER	WATER	WATER	WATER	WATER
790 l	Hexachloroethane	67721	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
ļ	ndeno[1,2,3-cd]pyrene	193395	µg l−¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50
į	sophorone	78591	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
ı	N-Nitrosodi-n-propylamine	621647	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
i	Naphthalene	91203	µg l-¹	N	<0.50 <0.50 <0.50 <0.50 <0.50 total	<0.50 √√√	<0.50	<0.50	<0.50	<0.50
ı	Nitrobenzene	98953	µg l-¹	N	<0.50	on 20.50	<0.50	<0.50	<0.50	<0.50
Ī	Pentachlorophenol	87865	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50
ı	Phenanthrene	85018	µg l-¹	N	< 0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Ī	Phenol	108952	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ī	Pyrene	129000	μg l-¹	N	<0.50 no	<0.50	<0.50	<0.50	<0.50	<0.50
-	1,2-Dichlorobenzene	95501	μg l-¹	N	. red 50	<0.50	<0.50	<0.50	<0.50	<0.50
-	1,2,4-Trichlorobenzene	120821	μg l-¹	N	¢o √ \$0.50	<0.50	<0.50	<0.50	<0.50	<0.50
-	1,3-Dichlorobenzene	541731	μg l-¹	N	€0.50	<0.50	<0.50	<0.50	<0.50	<0.50
-	1,4-Dichlorobenzene	106467	μg l-¹	N	A 0 = 0	<0.50	<0.50	<0.50	<0.50	<0.50
	2-Chloronaphthalene	91587	μg l-¹	N N Optis	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2-Chlorophenol	95578	μg l-¹	(John	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
2	2-Methyl-4,6-dinitrophenol	534521	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2-Methylnaphthalene	91576	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
2	2-Methylphenol	95487	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2-Nitroaniline	88744	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2-Nitrophenol	88755	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2,4-Dichlorophenol	120832	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2,4-Dimethylphenol	105679	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2,4-Dinitrotoluene	121142	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2,4,5-Trichlorophenol	95954	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Report page 6 of 9

LIMS sample ID range AJ78958 to AJ78965

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					Not Provided	Not Provided
					WATER	WATER
1790	Hexachloroethane	67721	μg l-¹	N	<0.50	<0.50
	Indeno[1,2,3-cd]pyrene	193395	μg l-¹	N	<0.50	<0.50
	Isophorone	78591	μg l-¹	N	<0.50	<0.50
	N-Nitrosodi-n-propylamine	621647	μg l-¹	N	<0.50 <0.50 1.2 <0.50 <0.50 <0.50 <0.50 <0.50 doi:10 <0.50 doi:10 <0.50 doi:10 <0.50 doi:10 <0.50	<0.50 <0.50 <0.50 0.99
	Naphthalene	91203	μg l-¹	N	1.2	0.99
	Nitrobenzene	98953	μg l-¹	N	<0.50	on ≤0.50
	Pentachlorophenol	87865	μg l-¹	N	<0.50	× 0.50
	Phenanthrene	85018	μg l-¹	N	<0.50	11ite < 0.50
	Phenol	108952	μg l-¹	N	<0.50	<0.50
	Pyrene	129000	μg l-¹	N	<0.50th winer	<0.50
	1,2-Dichlorobenzene	95501	µg l-¹	N	<0.50	<0.50
	1,2,4-Trichlorobenzene	120821	μg l-¹	N	ç.∞\0;50	<0.50
	1,3-Dichlorobenzene	541731	μg l-¹	N		<0.50
	1,4-Dichlorobenzene	106467	µg l-¹	N	<0.50 <0.50 <0.50 <0.50	<0.50
	2-Chloronaphthalene	91587	µg l-¹	N	<0.50	< 0.50
	2-Chlorophenol	95578	μg l-¹	NÇÓ	<0.50	<0.50
	2-Methyl-4,6-dinitrophenol	534521	μg l-¹	N	<0.50	<0.50
	2-Methylnaphthalene	91576	μg l-¹	N	<0.50	<0.50
	2-Methylphenol	95487	µg l-¹	N	<0.50	< 0.50
	2-Nitroaniline	88744	μg l-¹	N	<0.50	< 0.50
	2-Nitrophenol	88755	μg l-¹	N	<0.50	<0.50
	2,4-Dichlorophenol	120832	μg l-¹	N	<0.50	<0.50
	2,4-Dimethylphenol	105679	μg l-¹	N	<0.50	<0.50
	2,4-Dinitrotoluene	121142	μg l-¹	N	<0.50	<0.50
	2,4,5-Trichlorophenol	95954	μg l-¹	N	<0.50	<0.50

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

Tullyvogheen

							250	572		
					AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
					WA	WA	WA	WA	WA	WA
					SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	WATER	WATER	WATER	WATER	WATER
1790	2,4,6-Trichlorophenol	88062	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2,6-Dinitrotoluene	606202	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
	3-Nitroaniline	99092	μg l-¹	N	<0.50	<0.50 🞺	<0.50	<0.50	< 0.50	< 0.50
	4-Bromophenylphenylether	101553	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	< 0.50	<0.50
	4-Chloro-3-methylphenol	59507	μg l-¹	N	<0.50	√√. <0 ^{.50}	< 0.50	< 0.50	<0.50	<0.50
	4-Chloroaniline	106478	μg l-¹	N	<0.50	on 2€0.50	< 0.50	<0.50	<0.50	<0.50
	4-Chlorophenylphenylether	7005723	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	4-Methylphenol	106445	μg l-¹	N	< 0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
	4-Nitroaniline	100016	μg l-¹	N	<0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50	 0.50 0.50 0.50 0.50 	<0.50	<0.50	< 0.50	<0.50
	4-Nitrophenol	100027	μg l-¹	N	<0.50,00	<0.50	<0.50	<0.50	<0.50	<0.50
1820	Azinphos methyl	86500	μg l-¹	N	11202	<0.2	<0.2	<0.2	<0.2	<0.2
	Coumaphos	56724	μg l-¹	N	COT 1000.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Demeton (O+S)	8065483	μg l-¹	N	col <0.2 col <0.2 <0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Disulfoton	298044	μg I-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Fensulfothion	115902	μg l-¹	NI O	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Fenthion	55389	μg I-1	Consc	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Phorate	298022	μg I-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Prothiophos	34643464	μg I-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Sulprofos	35400432	μg I-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Trichloronate	327980	μg I-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1830	Atrazine	1912249	μg I-1	N	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Simazine	122349	μg l-1	N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1840	alpha-HCH	319846	μg l-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	gamma-HCH	58899	μg l-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	beta-HCH	319857	μg l-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

					250	572
				ĺ	AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					Not Provided	Not Provided
				-	WATER	WATER
1790	2,4,6-Trichlorophenol	88062	μg l-¹	N	<0.50	<0.50
	2,6-Dinitrotoluene	606202	μg I-¹	N	<0.50	<0.50
	3-Nitroaniline	99092	μg l-¹	N	<0.50	<0.50
	4-Bromophenylphenylether	101553	μg l-¹	N	<0.50	<0.50
	4-Chloro-3-methylphenol	59507	μg I-¹	N	<0.50	<0.50
	4-Chloroaniline	106478	μg I-¹	N	<0.50	on ≤0.50
	4-Chlorophenylphenylether	7005723	μg l-¹	N	<0.50	3° 3 < 0.50
	4-Methylphenol	106445	μg l-¹	N	<0.50	wife < 0.50
	4-Nitroaniline	100016	μg l-¹	N	<0.50	<0.50
	4-Nitrophenol	100027	μg l-¹	N	< 0.50 Miles	<0.50
1820	Azinphos methyl	86500	μg l-¹	N	<0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50 duff <0.50 d	<0.2
	Coumaphos	56724	μg l-¹	N	¢0′<0.2	<0.2
	Demeton (O+S)	8065483	μg l-¹	N	0.2	<0.2
	Disulfoton	298044	μg l-¹	N	<0.2 <0.2 <0.2 <0.2 <0.2	<0.2
	Fensulfothion	115902	μg l-¹	N	sent <0.2	<0.2
	Fenthion	55389	μg l-¹	NCOS	<0.2	<0.2
	Phorate	298022	μg l-¹	N	<0.2	<0.2
	Prothiophos	34643464	μg l-¹	N	<0.2	<0.2
	Sulprofos	35400432	μg l-¹	N	<0.2	<0.2
	Trichloronate	327980	μg l-¹	N	<0.2	<0.2
1830	Atrazine	1912249	μg l-¹	N	<0.05	< 0.05
	Simazine	122349	μg l-¹	N	<0.05	<0.05
1840	alpha-HCH	319846	μg l-¹	N	<0.2	<0.2
	gamma-HCH	58899	μg l-¹	N	<0.2	<0.2
	beta-HCH	319857	μg I-¹	N	<0.2	<0.2

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date
14 February 2014

Tullyvogheen

							250	572		
					AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
					WA	WA	WA	WA	WA	WA
					SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	WATER	WATER	WATER	WATER	WATER
1040	Heptachlor	76448	ua I 1	N	-0. 2	-0. 2	<0.2	-0.2	<0.2	<0.2
	delta-HCH	319868	μg l-¹		<0.2	<0.2 <0.2	<0.2	<0.2		
	Aldrin		μg I-1	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Heptachlor epoxide	309002 1024573	μg l-1	N N	<0.2 <0.2	<0.2	<0.2 <0.2	<0.2 <0.2	<0.2 <0.2	<0.2 <0.2
		5103742	μg I-1	N		<0.2				
	gamma-Chlordane alpha-Chlordane	5103742	μg I-1	N	<0.2 <0.2 <0.2 <0.2 <0.2 v.2 v.12 <0.2 v.12 <0	only at 0.2 only at 0.2 0.2 0.2 0.2 0.2	<0.2	<0.2	<0.2	<0.2
	Endosulfan I	959988	μg I-1	N	<0.2	01 × 0.2	<0.2	<0.2	<0.2	<0.2
			μg I-1	IN	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	4,4-DDE	72559	μg I-1	NI NI	<0.2 purple	<0.2	<0.2	<0.2	<0.2	<0.2
	Dieldrin	60571	μg I-1	N	<0.20 10 10 10 10 10 10 10 10 10 10 10 10 10		<0.2	<0.2	<0.2	<0.2
	Endrin	72208	μg l-1	N	<0.2 ₄ 11	<0.2	<0.2	<0.2	<0.2	<0.2
	4,4-DDD	72548	μg l-¹		1120.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Endosulfan II	33213659	μg I-¹	N	¢0 x €0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	4,4-DDT	50293	μg l-¹		€0.2 €0.2 €0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Endrin aldehyde	7421934	μg l-¹	N		<0.2	<0.2	<0.2	<0.2	<0.2
	Endosulfan sulfate	1031078	μg l-¹	N S	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Methoxychlor	72435	μg l-¹	Ø,		<0.2	<0.2	<0.2	<0.2	<0.2
	Endrin ketone	53494705	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
845	2,4-D	94757	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Dichlorprop	120365	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	MCPA	94746	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	MCPB	94815	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Mecoprop	7085190	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,5-T	93765	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1900	2-sec-Butyl-4,6-dinitrophenol	88857	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	4-Chloro-3-methylphenol	59507	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

^{*} Accreditation status

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					Not Provided	Not Provided
					WATER	WATER
1840	Heptachlor	76448	μg l-¹	N	<0.2 <0.2 <0.2 <0.2 <0.2 <0.2 <0.2 <0.2	<0.2
	delta-HCH	319868	μg l-¹	N	<0.2	<0.2
	Aldrin	309002	μg l-¹	N	<0.2	<0.2
	Heptachlor epoxide	1024573	μg l-¹	N	<0.2	<0.2
	gamma-Chlordane	5103742	μg l-¹	N	<0.2	<0.20
	alpha-Chlordane	5103719	μg l-¹	N	<0.2	of 1 0.2
	Endosulfan I	959988	µg l-¹	N	<0.2	30 < 0.2
	4,4-DDE	72559	μg l-¹		<0.2	Till <0.2
	Dieldrin	60571	µg l-¹	N	<0.2.	<0.2
	Endrin	72208	μg l-¹	N	<0.2th will	<0.2
	4,4-DDD	72548	μg l-¹		₹Ø.2½°	<0.2
	Endosulfan II	33213659	μg l-¹	N	¢o'<0.2	<0.2
	4,4-DDT	50293	μg l-¹		№ 0.2	<0.2
	Endrin aldehyde	7421934	μg l-¹	N	<0.2 <0.2 <0.2 <0.2	<0.2
	Endosulfan sulfate	1031078	µg l-¹	N	<0.2	<0.2
	Methoxychlor	72435	µg l-¹	NÇ	<0.2	<0.2
	Endrin ketone	53494705	μg l-¹	N	<0.2	<0.2
1845	2,4-D	94757	μg l-¹	N	<0.5	<0.5
	Dichlorprop	120365	μg l-¹	N	<0.5	<0.5
	MCPA	94746	μg l-¹	N	<0.5	<0.5
	MCPB	94815	µg l-¹	N	<0.5	<0.5
	Mecoprop	7085190	μg l-¹	N	<0.5	<0.5
	2,4,5-T	93765	μg l-¹	N	<0.5	<0.5
1900	2-sec-Butyl-4,6-dinitrophenol	88857	mg l-1	N	<0.0002	<0.0002
	4-Chloro-3-methylphenol	59507	mg l-1	N	<0.0002	<0.0002

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

FAO David Gilfedder

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
				WATER	WATER	WATER	WATER	WATER	WATER
900 2-Chlorophenol	95578	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4-Dichlorophenol	120832	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2,6-Dichlorophenol	87650	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4-Dimethylphenol	105679	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4-Dinitrophenol	51285	mg l-1	N	<0.0002	0	<0.0002	<0.0002	<0.0002	<0.0002
2-Methyl-4,6-dinitrophenol	534521	mg l-1	N	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2-Methylphenol	95487	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
3-Methylphenol	108394	mg l-1	N	<0.0002 <0.0002 <0.0002	<0.0002 0.0002 0.0002 0.0002 0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
4-Methylphenol	106445	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2-Nitrophenol	88755	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
4-Nitrophenol	100027	mg l-1	N	₹0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
Pentachlorophenol	87865	mg l-1	N	\$0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Phenol	108952	mg l-1	N	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,3,4,5-Tetrachlorophenol	4901513	mg l-1	N	< 0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,3,4,6-Tetrachlorophenol	58902	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,3,5,6-Tetrachlorophenol	935955	mg l-1	Option	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,3,4-Trichlorophenol	15950660	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2,3,5-Trichlorophenol	933788	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,3,6-Trichlorophenol	933755	mg I-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2,4,5-Trichlorophenol	95954	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4,6-Trichlorophenol	88062	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
3,4,5-Trichlorophenol	609198	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

All tests undertaken between 04/02/2014 and 14/02/2014

* Accreditation status

Report page 9 of 9 LIMS sample ID range AJ78958 to AJ78965

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

FAO David Gilfedder

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 14 February 2014

					250	572
				1	AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					Not Provided	Not Provided
				_	WATER	WATER
1900	2-Chlorophenol	95578	mg l-1	N	<0.0002	<0.0002
	2,4-Dichlorophenol	120832	mg l-1	N	<0.0002	<0.0002
	2,6-Dichlorophenol	87650	mg l-1	N	<0.0002	<0.0002
	2,4-Dimethylphenol	105679	mg l-1	N	<0.0002	<0.0002
	2,4-Dinitrophenol	51285	mg l-1	N	<0.0002	≤0.0002
	2-Methyl-4,6-dinitrophenol	534521	mg l-1	N	<0.0002	3 \ 0 .0002
	2-Methylphenol	95487	mg l-1	N	<0.0002	<i>€</i> 0.0002
	3-Methylphenol	108394	mg l-1	N	<0.0002	wift <0.0002
	4-Methylphenol	106445	mg l-1	N	<0.0002	<0.0002
	2-Nitrophenol	88755	mg l-1	N	<0.0002	<0.0002
	4-Nitrophenol	100027	mg l-1	N	<0.0002	 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002
	Pentachlorophenol	87865	mg l-1	N	<0.0002	<0.0002
	Phenol	108952	mg l-1	N	<0.0002	<0.0002
	2,3,4,5-Tetrachlorophenol	4901513	mg l-1	N	√ <0.0002	< 0.0002
	2,3,4,6-Tetrachlorophenol	58902	mg l-1	N NCO	<0.0002	< 0.0002
	2,3,5,6-Tetrachlorophenol	935955	mg l-1	NCO	<0.0002	<0.0002
	2,3,4-Trichlorophenol	15950660	mg l-1	N	<0.0002	<0.0002
	2,3,5-Trichlorophenol	933788	mg l-1	N	<0.0002	<0.0002
	2,3,6-Trichlorophenol	933755	mg l-1	N	<0.0002	<0.0002
	2,4,5-Trichlorophenol	95954	mg l-1	N	<0.0002	<0.0002
	2,4,6-Trichlorophenol	88062	mg l-1	N	<0.0002	<0.0002
	3,4,5-Trichlorophenol	609198	mg l-1	N	<0.0002	<0.0002

¹No sampling date was specified, stability times for this analyte may have been exceeded and these results may be compromised. The accreditation for these results remains unaffected.

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

Login E	Batch No						250	572		
Chemte	est LIMS ID				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
Sample	ID				WA	WA	WA	WA	WA	WA
Sample	· No				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
Samplii	ng Date				31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
Depth										
Matrix					WATER	WATER	WATER	WATER	WATER	WATER
SOP↓	Determinand↓	CAS No↓ U	nits↓ *							
1010	рН	PH		U	8.6	8.3	8.3	7.6	8.1	7.7
1020	Electrical Conductivity	EC	μS cm-¹	U	270	280	250	1100	550	490
1030	Suspended solids at 105°C	SS_105	mg l-1	U	17	8her	1			
1040	Total Dissolved Solids	TDS	mg l-1	Ν		14. 44		630	330	300
1100	Chemical Oxygen Demand	COD	mg O2 I-1	U		Official ar		27	12	10
	Dissolved Oxygen	7782447	mg O2 I-1	N	11.2 ¹ 😅	20 ¹ 11.0 ¹	11.1 ¹	7.5 ¹	7.5 ¹	8.1 ¹
1170	Redox potential	EH	mV	N	150 aliferia	150	160	170	210	200
1300	Cyanide (total)	57125	mg l-1	U	<0.050	280 the same and same	< 0.050	< 0.050	< 0.050	< 0.050
1470	Iron (dissolved)	7439896	μg l-¹	N	300 wilet	810	460	<20	30	<20
1220	Alkalinity	ALK	mg CaCO3 I-1	U	: 15 40°	57	45	590	360	210
	Chloride	16887006	mg l-1	U	40t x166	63	60	54	110	43
	Fluoride	16984488	mg l-1	U	0.14	0.23	0.16	0.13	0.18	0.13
	Ammonium	14798039	mg l-1	U	0.11	2.9	1.9	11	1.1	0.51
	Ammoniacal Nitrogen	AMM_NITROG	mg l-1	U	0.09	2.3	1.5	8.6	0.86	0.40
	Nitrite	14797650	mg l-1	College	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Nitrite as N	14797650	mg l-1	U	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Nitrate	14797558	mg l-1	U	0.78	0.96	0.50	< 0.50	<0.50	<0.50
	Nitrate as N	14797558	mg l-¹	U	0.42	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphate	14265442	mg l-1	U	0.084	0.077	0.077	0.074	0.073	0.080
	Total Oxidised Nitrogen		mg l-1	U	0.43	<0.20	<0.20	<0.20	<0.20	<0.20
	Sulfide	18496258	mg l-1	U	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1610	Dissolved Organic Carbon	DOC	mg l-1	N	21	18	18	28	11	6.7
1270	Hardness	HARD_TOT	mg CaCO3 I-1	U	55	50	38	500	240	220
1415	Calcium	7440702	mg l-1	U	9.6	12	9.3	170	81	62

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Logi	n Batch No				250	572
Chen	ntest LIMS ID				AJ78964	AJ78965
Sam	ole ID				WA	WA
Sam	ole No				LC01-01	LC02-01
Sam	pling Date				31/1/2014	31/1/2014
Dept	h					
Matri	'x				WATER	WATER
SOP	↓ Determinand↓	CAS No↓	Units↓ *			
1010	рН	PH		U	7.3	7.2 1500 156 1500 156 156 156 156 156 156 156 156 156 156
1020	Electrical Conductivity	EC	μS cm-¹	U	1300	1500 💉
1030	Suspended solids at 105°C	SS_105	mg l-1	U		affet
1040	Total Dissolved Solids	TDS	mg l-1	N	770 100 5.5 ¹ 22 <0.050 n h t t t 260 t t t t t	×4.880
1100	Chemical Oxygen Demand	COD	mg O2 I-1	U	100	of 0100
1150	Dissolved Oxygen	7782447	mg O2 I-1	N	5.5 ¹	50° 5.1 1
1170	Redox potential	EH	mV	N	22	dille -43
1300	Cyanide (total)	57125	mg l-1	U	<0.050	<0.050
1470	Iron (dissolved)	7439896	μg l-¹	N	260ch wine	2900
1220	Alkalinity	ALK	mg CaCO3 I-1	U	6600	710
	Chloride	16887006	mg l-1	U	401 828)	74
	Fluoride	16984488	mg l-1	U	93 <0.020 <0.010	0.12
	Ammonium	14798039	mg l-1	U	93	60
	Ammoniacal Nitrogen	AMM_NITROG	mg l-1	U	se ^{ft} 72	47
	Nitrite	14797650	mg l-1	UÇÕ	<0.020	<0.020
	Nitrite as N	14797650	mg l-1	U	<0.010	<0.010
	Nitrate	14797558	mg l-1	U	0.56	<0.50
	Nitrate as N	14797558	mg l-1	U	<0.20	<0.20
	Phosphate	14265442	mg l-1	U	0.073	0.074
	Total Oxidised Nitrogen		mg l-1	U	<0.20	<0.20
1325	Sulfide	18496258	mg l-1	U	<0.050	<0.050
1610	Dissolved Organic Carbon	DOC	mg l-1	N	19	20
1270	Hardness	HARD_TOT	mg CaCO3 I-1	U	210	420
1415	Calcium	7440702	mg l-1	U	57	140

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

FAO David Gilfedder

AMENDED LABORATORY TEST REPORT



Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

Tullyvogheen

							250	572		
					AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
					WA	WA	WA	WA	WA	WA
					SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
					31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
					WATER	WATER	WATER	WATER	WATER	WATER
1415	Potassium	7440097	mg l-1	U	<0.50	2.5	1.9	9.4	12	3.0
	Magnesium	7439954	mg l-1	U	4.2	5.4	4.5	17	8.1	16
	Sodium	7440235	mg l-1	U	39	37 NSC.	32	47	26	25
1110	Phosphorus (total)	7723140	mg l-1	N	< 0.050	<0 0.50°	<0.050	<0.050	<0.050	<0.050
1220	Sulfate	14808798	mg l-1	U	15	· 1 · 12	10	59	14	5.8
1450	Arsenic	7440382	μg l-¹	U	<1.0	on 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<1.0	3.0	6.2	28
	Boron	7440428	μg l-¹	U	580 🗳	530	440	520	500	600
	Cadmium	7440439	μg l-¹	U	15 <1.0 580 <0.080 utrouit <1.00 treet	<0.080	<0.080	<0.080	<0.080	0.35
	Chromium	7440473	µg l-¹	U	<1,000 1000	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper	7440508	μg l-¹	U	1ch wher	1.1	<1.0	1.1	<1.0	<1.0
	Mercury	7439976	μg l-¹	U		<0.50	<0.50	<0.50	<0.50	<0.50
	Manganese	7439965	μg l-¹	U	COT 1065	94	52	1800	1100	970
	Nickel	7440020	µg l-¹	U	.co [®] <1.0	<1.0	<1.0	4.2	4.4	<1.0
	Lead	7439921	μg l-¹	U	cot <1.0 0 1.6	<1.0	<1.0	<1.0	<1.0	1.3
	Antimony	7440364	µg l-¹	Unser	<1.0	<1.0	<1.0	<1.0	1.2	2.2
	Selenium	7782492	μg l-¹	Coll	<1.0	<1.0	<1.0	2.8	1.2	2.1
	Zinc	7440666	μg l-¹	U	9.4	6.7	6.6	10	3.0	2.5
1760	Methyl tert-butylether	1634044	μg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Dichlorodifluoromethane	75718	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Chloromethane	74873	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Vinyl chloride	75014	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromomethane	74839	μg l-¹	U	<20	<20	<20	<20	<20	<20
	Chloroethane	75003	μg l-¹	U	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Trichlorofluoromethane	75694	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethene	75354	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Report page 2 of 9 LIMS sample ID range AJ78958 to AJ78965

^{*} Accreditation status

FAO David Gilfedder

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Report Date 07 April 2014

Results of analysis of 8 samples received 3 February 2014

					250	572
				Ì	AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					31/1/2014	31/1/2014
					WATER	WATER
1415	Potassium	7440097	mg l-1	U	19	20
	Magnesium	7439954	mg l-1	U	16	20
	Sodium	7440235	mg l-1	U	37	53 1 ¹⁵⁸
1110	Phosphorus (total)	7723140	mg l-1	N	<0.050	
1220	Sulfate	14808798	mg l-1	U	54	25
1450	Arsenic	7440382	µg l-¹	U	<0.050 54 3.0 810 <0.080 <1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	of 21.5
	Boron	7440428	µg l-¹	U	810	810 × 810
	Cadmium	7440439	μg l-¹	U	<0.080	11it < 0.080
	Chromium	7440473	µg l-¹	U	<1.0.	2.0
	Copper	7440508	μg l-¹	U	<1.Quitanter	<1.0
	Mercury	7439976	µg l-¹	U	<0.50	< 0.50
	Manganese	7439965	μg l-¹	U	€0.888	1300
	Nickel	7440020	µg l-¹	U	8.2	16
	Lead	7439921	µg l-¹	U	1.7	<1.0
	Antimony	7440364	µg l-¹	U	4.9	<1.0
	Selenium	7782492	μg l-¹	UÇÕ	4.9	3.8
	Zinc	7440666	µg l-¹	U	7.1	9.3
1760	Methyl tert-butylether	1634044	μg l-¹	N	<1.0	<1.0
	Dichlorodifluoromethane	75718	µg l-¹	U	<1.0	<1.0
	Chloromethane	74873	µg l-¹	U	<1.0	<1.0
	Vinyl chloride	75014	µg l-¹	U	<1.0	<1.0
	Bromomethane	74839	μg l-¹	U	<20	<20
	Chloroethane	75003	µg l-¹	U	<2.0	<2.0
	Trichlorofluoromethane	75694	µg l-¹	U	<1.0	<1.0
	1,1-Dichloroethene	75354	µg l-¹	U	<1.0	<1.0

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

FAO David Gilfedder

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

Tu

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
				WATER	WATER	WATER	WATER	WATER	WATER
760 Dichloromethane	75092	μg l-¹	N	ne	ne	ne	ne	ne	ne
trans-1,2-Dichloroethene	156605	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	75343	µg l-¹	U	<1.0	<1.0, 350	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	156592	µg l-¹	U	<1.0	-4 00	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74975	µg l-¹	U	<1.0	old <1.0 old <1.0 <1.0 <1.0 <1.0	<1.0	<1.0	<1.0	<1.0
Trichloromethane	67663	μg l-¹	U	<1.0 <1.0 <1.0 <1.0 oscillations	on 2 2 1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	71556	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloromethane	56235	μg l-¹	U	<1.0 NITO	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloropropene	563586	µg l-¹	U	<1.00 Pt. 1200 <1.00 met 1200	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	71432	µg l-¹	U	200 P	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	107062	µg l-¹	U	11220	<2.0	<2.0	<2.0	<2.0	<2.0
Trichloroethene	79016	µg l-¹	N	~of √×9.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	78875	µg l-¹	U	(col) < 1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74953	μg l-¹	U	→ ~10	<10	<10	<10	<10	<10
Bromodichloromethane	75274	µg l-¹	Unset	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	10061015	µg l-¹	Cost	<10	<10	<10	<10	<10	<10
Toluene	108883	μg l-¹	U	<1.0	<1.0	<1.0	2.3	1.1	<1.0
trans-1,3-Dichloropropene	10061026	µg l-¹	U	<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79005	μg l-¹	U	<10	<10	<10	<10	<10	<10
Tetrachloroethene	127184	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichloropropane	142289	μg l-¹	U	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane	124481	μg l-¹	U	<10	<10	<10	<10	<10	<10
1,2-Dibromoethane	106934	μg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	108907	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	630206	μg l-¹	U	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

All tests undertaken between 04/02/2014 and 14/02/2014

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

FAO David Gilfedder

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Report Date 07 April 2014

Results of analysis of 8 samples received 3 February 2014

				250	572
				AJ78964	AJ78965
				WA	WA
				LC01-01	LC02-01
				31/1/2014	31/1/2014
				WATER	WATER
1760 Dichloromethane	75092	μg l-¹	N	ne	ne
trans-1,2-Dichloroethene	156605	μg l-¹	U	<1.0	<1.0
1,1-Dichloroethane	75343	μg l-¹	U	<1.0	<1.0 💖
cis-1,2-Dichloroethene	156592	µg l-¹	U	<1.0	<1.0 <1.0 15 ⁵ <1.0 11 ⁶
Bromochloromethane	74975	μg l-¹	U	<1.0	· · · · · · · · · · · · · · · · · · ·
Trichloromethane	67663	μg l-¹	U	<1.0	011 15 1.0
1,1,1-Trichloroethane	71556	µg l-¹	U	<1.0	30 × 1.0
Tetrachloromethane	56235	µg l-¹	U	<1.0	Till <1.0
1,1-Dichloropropene	563586	µg l-¹	U	<1.0	<1.0
Benzene	71432	µg l-¹	U	<1.0:110 NIC	1.4
1,2-Dichloroethane	107062	µg l-¹	U	<2.0√°	<2.0
Trichloroethene	79016	µg l-¹	N	£01<11.0	<1.0 here <1.0 h
1,2-Dichloropropane	78875	µg l-¹	U	<0<10 <10 <10 <10 <10 14	<1.0
Dibromomethane	74953	µg l-¹	U	<10	<10
Bromodichloromethane	75274	µg l-¹	U	<5.0	<5.0
cis-1,3-Dichloropropene	10061015	µg l-¹	UÇÕ	<10	<10
Toluene	108883	µg l-¹	U	1.4	1.1
trans-1,3-Dichloropropene	10061026	µg l-¹	U	<10	<10
1,1,2-Trichloroethane	79005	µg l-¹	U	<10	<10
Tetrachloroethene	127184	µg l-¹	U	<1.0	<1.0
1,3-Dichloropropane	142289	µg l-¹	U	<2.0	<2.0
Dibromochloromethane	124481	μg l-¹	U	<10	<10
1,2-Dibromoethane	106934	μg l-¹	U	<5.0	<5.0
Chlorobenzene	108907	μg l-¹	U	<1.0	4.4
1,1,1,2-Tetrachloroethane	630206	μg l-¹	U	<2.0	<2.0

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

						250)572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
				WATER	WATER	WATER	WATER	WATER	WATER
760 Ethylbenzene	100414	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m- & p-Xylene	1330207	μg l-¹	U	<1.0	<1.0	<1.0	3.2	1.6	<1.0
o-Xylene	95476	µg l-¹	U	<1.0	<1.0, 350	<1.0	1.5	<1.0	<1.0
Styrene	100425	µg l-¹	U	<1.0 <10 <1.0 <1.0 <1.0 <50 0 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1.00 <1	<1.00	<1.0	<1.0	<1.0	<1.0
Tribromomethane	75252	µg l-¹	U	<10	.√. <u>₹</u> 10	<10	<10	<10	<10
Isopropylbenzene	98828	µg l-¹	U	<1.0	on 2 2 2 1.0	<1.0	<1.0	<1.0	<1.0
Bromobenzene	108861	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	96184	μg l-¹	U	<50 NIP	<50	<50	<50	<50	<50
n-Propylbenzene	103651	μg l-¹	U	<1,000	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorotoluene	95498	μg l-¹	U	<1.0 viic	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	95636	µg l-¹	U	1210	<1.0	<1.0	1.7	<1.0	<1.0
4-Chlorotoluene	106434	μg l-¹	U	FOT 1891.0	<1.0	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	98066	µg l-¹	U	(1.0° × 1.0°	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	108678	μg l-¹	U	~10	<1.0	<1.0	<1.0	<1.0	<1.0
sec-Butylbenzene	135988	µg l-¹	Unge	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	541731	μg l-¹	Coss	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Isopropyltoluene	99876	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	106467	μg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Butylbenzene	104518	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	95501	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	96128	µg l-¹	U	<50	<50	<50	<50	<50	<50
1,2,4-Trichlorobenzene	120821	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	87683	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
790 Acenaphthene	83329	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acenaphthylene	208968	μg l-¹	N	<0.50	< 0.50	< 0.50	< 0.50	<0.50	<0.50

All tests undertaken between 04/02/2014 and 14/02/2014

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					31/1/2014	31/1/2014
					WATER	WATER
1760 E	Ethylbenzene	100414	μg l-¹	U	1.2	<1.0
r	n- & p-Xylene	1330207	µg l-¹	U	8.3	7.9
c	o-Xylene	95476	μg l-¹	U	2.3	2.2
5	Styrene	100425	µg l-¹	U	1.2 8.3 2.3 <1.0 <10 <1.0 <1.0 <50 <1.0 to the control of the cont	<1.0 mes
1	Tribromomethane	75252	μg l-¹	U	<10	.<1000
l	sopropylbenzene	98828	µg l-¹	U	<1.0	011 0K91.0
E	Bromobenzene	108861	μg l-¹	U	<1.0	30 × 1.0
1	1,2,3-Trichloropropane	96184	µg l-¹	U	<50 N	11it <50
r	n-Propylbenzene	103651	μg l-¹	U	<1.0.	<1.0
2	2-Chlorotoluene	95498	μg l-¹	U	<1.0:110 miles	<1.0
1	1,2,4-Trimethylbenzene	95636	μg l-¹	U	6:5 X	4.5
4	1-Chlorotoluene	106434	μg l-¹	U	¢0<10€	<1.0
t	ert-Butylbenzene	98066	μg l-¹	U	્રેં∞ેે1.0	<1.0
1	1,3,5-Trimethylbenzene	108678	μg l-¹	U	<1.0	<1.0
S	sec-Butylbenzene	135988	μg l-¹	U U U	<1.0	<1.0
1	1,3-Dichlorobenzene	541731	μg l-¹	UÇÕ	<1.0	<1.0
4	1-Isopropyltoluene	99876	μg l-¹	U	<1.0	<1.0
1	1,4-Dichlorobenzene	106467	μg l-¹	U	<1.0	<1.0
r	n-Butylbenzene	104518	μg l-¹	U	<1.0	<1.0
	1,2-Dichlorobenzene	95501	μg l-¹	U	<1.0	<1.0
1	1,2-Dibromo-3-chloropropane	96128	μg l-¹	U	<50	<50
1	1,2,4-Trichlorobenzene	120821	μg l-¹	U	<1.0	<1.0
F	Hexachlorobutadiene	87683	μg l-¹	U	<1.0	<1.0
1790 <i>F</i>	Acenaphthene	83329	μg l-¹	N	<0.50	<0.50
A	Acenaphthylene	208968	µg l-¹	N	< 0.50	< 0.50

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
				WATER	WATER	WATER	WATER	WATER	WATER
790 Anthracene	120127	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Azobenzene	103333	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	< 0.50
Benzo[a]anthracene	56553	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50
Benzo[a]pyrene	50328	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzo[b]fluoranthene	205992	μg l-¹	N	<0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50	. ≤0.50	<0.50	<0.50	<0.50	< 0.50
Benzo[g,h,i]perylene	191242	μg l-¹	N	<0.50	on 2 0.50	<0.50	<0.50	<0.50	< 0.50
Benzo[k]fluoranthene	207089	μg l-¹	N	<0.50	<0.50	< 0.50	<0.50	<0.50	<0.50
bis(2-Chloroethoxy)methane	111911	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
bis(2-Chloroethyl)ether	111444	µg l-¹	N	<0.50	< 0.50	< 0.50	<0.50	<0.50	<0.50
bis(2-Chloroisopropyl)ether	108601	μg l-¹	N	<0.50/ner	<0.50	< 0.50	<0.50	<0.50	<0.50
bis(2-Ethylhexyl)phthalate	117817	μg l-¹	N	. 18 0 50°	<0.50	< 0.50	<0.50	<0.50	<0.50
Butylbenzylphthalate	85687	μg l-¹	N	€0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbazole	86748	μg l-¹	N	\$0.50 \$0.50	< 0.50	< 0.50	<0.50	<0.50	<0.50
Chrysene	218019	μg l-¹	N	⋄ <0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Di-n-butylphthalate	84742	μg l-¹	N se	<0.50	< 0.50	< 0.50	<0.50	<0.50	<0.50
Di-n-octylphthalate	117840	μg l-¹	Opti	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Dibenzo[a,h]anthracene	53703	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Dibenzofuran	132649	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Diethylphthalate	84662	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Dimethylphthalate	131113	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Fluoranthene	206440	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Fluorene	86737	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene	118741	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobutadiene	87683	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorocyclopentadiene	77474	μg l-¹	N	<0.50	< 0.50	< 0.50	<0.50	<0.50	<0.50

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

^{*} Accreditation status

FAO David Gilfedder

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Report Date 07 April 2014

Results of analysis of 8 samples received 3 February 2014

				250	572
				AJ78964	AJ78965
				WA	WA
				LC01-01	LC02-01
				31/1/2014	31/1/2014
				WATER	WATER
790 Anthracene	120127	μg l-¹	N	<0.50	<0.50
Azobenzene	103333	μg l-¹	N	<0.50	<0.50
Benzo[a]anthracene	56553	µg l-¹	N	<0.50	<0.50
Benzo[a]pyrene	50328	μg l-¹	N	<0.50	<0.50
Benzo[b]fluoranthene	205992	µg l-¹	N	< 0.50	<pre><0.50 color="1"> color="1"> color="1"> color="1"> color="1"> color="1"> color="1"> color="1" color="1</pre>
Benzo[g,h,i]perylene	191242	μg l-¹	N	<0.50	on €0.50
Benzo[k]fluoranthene	207089	μg l-¹	N	<0.50	× 0.50
bis(2-Chloroethoxy)methane	111911	µg l-¹	N	<0.50	viii <0.50
bis(2-Chloroethyl)ether	111444	μg l-¹	N	<0.50	<0.50
bis(2-Chloroisopropyl)ether	108601	μg l-¹	N	<0.50th will be	< 0.50
bis(2-Ethylhexyl)phthalate	117817	μg l-¹	N	<6.50	< 0.50
Butylbenzylphthalate	85687	μg l-¹	N	△ < 0.50	< 0.50
Carbazole	86748	μg l-¹	N	€0.50	< 0.50
Chrysene	218019	μg l-¹	N	** -O FO	< 0.50
Di-n-butylphthalate	84742	μg l-¹	N N	<0.50	< 0.50
Di-n-octylphthalate	117840	μg l-¹	NÇ	<0.50	< 0.50
Dibenzo[a,h]anthracene	53703	μg l-¹	N	< 0.50	< 0.50
Dibenzofuran	132649	μg l-¹	N	< 0.50	< 0.50
Diethylphthalate	84662	μg l-¹	N	<0.50	< 0.50
Dimethylphthalate	131113	μg l-¹	N	<0.50	<0.50
Fluoranthene	206440	μg l-¹	N	<0.50	<0.50
Fluorene	86737	μg l-¹	N	<0.50	< 0.50
Hexachlorobenzene	118741	μg l-¹	N	<0.50	<0.50
Hexachlorobutadiene	87683	μg l-¹	N	<0.50	<0.50
Hexachlorocyclopentadiene	77474	μg l-¹	N	< 0.50	< 0.50

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
				IA/A TED	IA/ATED	14/4.750	MATER	14/4750	14/4750
				WATER	WATER	WATER	WATER	WATER	WATER
790 Hexachloroethane	67721	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Indeno[1,2,3-cd]pyrene	193395	μg l-¹	N	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	78591	μg l-¹	N	<0.50	<0.50 💖	<0.50	<0.50	<0.50	<0.50
N-Nitrosodi-n-propylamine	621647	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50
Naphthalene	91203	μg l-¹	N	<0.50	× <0.50	<0.50	<0.50	<0.50	<0.50
Nitrobenzene	98953	μg l-¹	N	<0.50	on 2€0.50	<0.50	<0.50	<0.50	<0.50
Pentachlorophenol	87865	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Phenanthrene	85018	μg l-¹	N	<0.50 MAN	<0.50	<0.50	<0.50	<0.50	<0.50
Phenol	108952	μg l-¹	N	<0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Pyrene	129000	μg l-¹	N	<0.50,00	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	95501	μg l-¹	N		<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	120821	μg l-¹	N		<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	541731	μg l-¹	N	₹0.50 €0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	106467	μg l-¹	N	⋄ <0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
2-Chloronaphthalene	91587	μg l-¹	N se	<0.50	< 0.50	<0.50	<0.50	<0.50	< 0.50
2-Chlorophenol	95578	μg l-¹	(A)	<0.50	< 0.50	<0.50	<0.50	<0.50	< 0.50
2-Methyl-4,6-dinitrophenol	534521	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	< 0.50
2-Methylnaphthalene	91576	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
2-Methylphenol	95487	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Nitroaniline	88744	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
2-Nitrophenol	88755	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,4-Dichlorophenol	120832	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,4-Dimethylphenol	105679	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
2,4-Dinitrotoluene	121142	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50
2,4,5-Trichlorophenol	95954	μg l-¹	N	<0.50	< 0.50	<0.50	<0.50	<0.50	<0.50

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Column page 1

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					31/1/2014	31/1/2014
					WATER	WATER
1790	Hexachloroethane	67721	µg l-¹	N	<0.50	<0.50
	Indeno[1,2,3-cd]pyrene	193395	μg l-¹	N	<0.50	<0.50
	Isophorone	78591	μg l-¹	N	<0.50	<0.50
	N-Nitrosodi-n-propylamine	621647	μg l-¹	N	<0.50 1.2 <0.50 <0.50 <0.50 <0.50 <0.50 to 0.50 to 0.5	<0.50 net
	Naphthalene	91203	μg l-¹	N	1.2 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50 <0.50	0.99
	Nitrobenzene	98953	μg l-¹	N	<0.50	on ≤0.50
	Pentachlorophenol	87865	μg l-¹	N	<0.50	× <0.50
	Phenanthrene	85018	μg l-¹	N	<0.50	viii <0.50
	Phenol	108952	μg l-¹	N	<0.50	<0.50
	Pyrene	129000	μg l-¹	N	<0.50 Miles	<0.50
	1,2-Dichlorobenzene	95501	μg l-¹	N	<0.50	<0.50
	1,2,4-Trichlorobenzene	120821	μg l-¹	N	△ < 0.50	< 0.50
	1,3-Dichlorobenzene	541731	μg l-¹	N	€0.50	< 0.50
	1,4-Dichlorobenzene	106467	μg l-¹	N	♦ -0 F0	< 0.50
	2-Chloronaphthalene	91587	μg l-¹	N N	<0.50	<0.50
	2-Chlorophenol	95578	μg l-¹	NÇÓ	<0.50	<0.50
	2-Methyl-4,6-dinitrophenol	534521	μg l-¹	N	<0.50	<0.50
	2-Methylnaphthalene	91576	μg l-¹	N	<0.50	< 0.50
	2-Methylphenol	95487	μg l-¹	N	<0.50	<0.50
	2-Nitroaniline	88744	μg l-¹	N	<0.50	<0.50
	2-Nitrophenol	88755	μg l-¹	N	<0.50	<0.50
	2,4-Dichlorophenol	120832	μg l-¹	N	<0.50	<0.50
	2,4-Dimethylphenol	105679	μg l-¹	N	<0.50	<0.50
	2,4-Dinitrotoluene	121142	μg l-¹	N	<0.50	<0.50
	2,4,5-Trichlorophenol	95954	μg l-¹	N	<0.50	<0.50

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

							250	572		
					AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
					WA	WA	WA	WA	WA	WA
					SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
					31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
					WATER	WATER	WATER	WATER	WATER	WATER
1790	2,4,6-Trichlorophenol	88062	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	2,6-Dinitrotoluene	606202	μg l-¹	N	<0.50	<0.50	< 0.50	<0.50	<0.50	< 0.50
	3-Nitroaniline	99092	μg l-¹	N	<0.50	<0.50 💖	<0.50	<0.50	<0.50	<0.50
	4-Bromophenylphenylether	101553	μg l-¹	N	<0.50	<0.50	< 0.50	<0.50	<0.50	< 0.50
	4-Chloro-3-methylphenol	59507	μg l-¹	N	<0.50		<0.50	<0.50	<0.50	<0.50
	4-Chloroaniline	106478	μg l-¹	N	<0.50	0.50	< 0.50	<0.50	<0.50	<0.50
	4-Chlorophenylphenylether	7005723	μg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	4-Methylphenol	106445	μg l-¹	N	< 0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	4-Nitroaniline	100016	μg l-¹	N	<0.50 <0.50 <0.50 <0.50 interest <0.50 till di <0.50 till di <0.50 till di <0.50 till di	<0.50	<0.50	<0.50	<0.50	<0.50
	4-Nitrophenol	100027	μg l-¹	N	<0.50 nex	<0.50	<0.50	<0.50	<0.50	<0.50
820	Azinphos methyl	86500	μg l-¹	N	11202	<0.2	<0.2	<0.2	<0.2	<0.2
	Coumaphos	56724	μg l-¹	N	COT <0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Demeton (O+S)	8065483	μg l-¹	N	€0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Disulfoton	298044	μg l-¹	N		<0.2	<0.2	<0.2	<0.2	<0.2
	Fensulfothion	115902	μg l-¹	N se	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Fenthion	55389	μg l-¹	Object	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Phorate	298022	µg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Prothiophos	34643464	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Sulprofos	35400432	µg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Trichloronate	327980	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
830	Atrazine	1912249	μg l-¹	N	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05
	Simazine	122349	μg l-¹	N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1840	alpha-HCH	319846	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	gamma-HCH	58899	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	beta-HCH	319857	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Column page 1

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Report Date 07 April 2014

Results of analysis of 8 samples received 3 February 2014

FAO David Gilfedder Tullyvogheen

					250	572
					AJ78964	AJ78965
					WA	WA
					LC01-01	LC02-01
					31/1/2014	31/1/2014
					WATER	WATER
1790	2,4,6-Trichlorophenol	88062	µg l-¹	N	<0.50	<0.50
	2,6-Dinitrotoluene	606202	μg l-¹	N	< 0.50	< 0.50
	3-Nitroaniline	99092	μg l-¹	N	< 0.50	<0.50 <0.50 <0.50 <0.50
	4-Bromophenylphenylether	101553	μg l-¹	N	<0.50	<0.50
	4-Chloro-3-methylphenol	59507	μg l-¹	N	<0.50	<0.50
	4-Chloroaniline	106478	μg l-¹	N	<0.50	on \$0.50
	4-Chlorophenylphenylether	7005723	µg l-¹	N	<0.50	\$ ⁶ 0.50
	4-Methylphenol	106445	µg l-¹	N	<0.50	viit <0.50
	4-Nitroaniline	100016	µg l-¹	N	<0.50	<0.50
	4-Nitrophenol	100027	µg l-¹	N	<0.50 <0.50 <0.50 <0.50 <0.50 <0.50 c0.50 c0.50 c0.50 co.50	<0.50 per (0.50
1820	Azinphos methyl	86500	μg l−¹	N	₹0.2×°	<0.2
	Coumaphos	56724	µg l-¹	N	¢of<0.2	<0.2
	Demeton (O+S)	8065483	μg l-¹	N	€0.2	<0.2
	Disulfoton	298044	μg l-¹	N	₹ ⁶ <0.2	<0.2
	Fensulfothion	115902	µg l−¹	N	<0.2	<0.2
	Fenthion	55389	μg l-¹	N N NCO	<0.2	<0.2
	Phorate	298022	μg l-¹	N	<0.2	<0.2
	Prothiophos	34643464	μg l-¹	N	<0.2	<0.2
	Sulprofos	35400432	μg l-¹	N	<0.2	<0.2
	Trichloronate	327980	μg l-¹	N	<0.2	<0.2
1830	Atrazine	1912249	μg l-¹	N	< 0.05	< 0.05
	Simazine	122349	µg l-¹	N	< 0.05	< 0.05
1840	alpha-HCH	319846	μg l−¹	N	<0.2	<0.2
	gamma-HCH	58899	μg l−¹	N	<0.2	<0.2
	beta-HCH	319857	µg l−¹	N	<0.2	<0.2

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
				WATER	WATER	WATER	WATER	WATER	WATER
340 Heptachlor	76448	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
delta-HCH	319868	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Aldrin	309002	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor epoxide	1024573	μg l-¹	N	<0.2	<0.30	<0.2	<0.2	<0.2	<0.2
gamma-Chlordane	5103742	μg l-¹	N	<0.2	· ≤0.2	<0.2	<0.2	<0.2	<0.2
alpha-Chlordane	5103719	μg l-¹	N	<0.2	on 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	<0.2	<0.2	<0.2	<0.2
Endosulfan I	959988	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
4,4-DDE	72559	μg l-¹		<0.2 M	<0.2	<0.2	<0.2	<0.2	<0.2
Dieldrin	60571	μg l-¹	N	<0.2 <0.2 <0.2 <0.2 <0.2 <0.2 <0.2 1014 February <0.2 102 103 103 103 103 103 103 103 103 103 103	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	72208	μg l-¹	N	<0.2 vino	<0.2	<0.2	<0.2	<0.2	<0.2
4,4-DDD	72548	μg l-¹		0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan II	33213659	μg l-¹	N	col <0.2	<0.2	<0.2	<0.2	<0.2	<0.2
4,4-DDT	50293	μg l-¹		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin aldehyde	7421934	μg l-¹	N		<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan sulfate	1031078	μg l-¹	N set	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methoxychlor	72435	μg l-¹	Opti	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494705	μg l-¹	N	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
45 2,4-D	94757	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorprop	120365	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MCPA	94746	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
МСРВ	94815	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Mecoprop	7085190	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-T	93765	μg l-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
000 2-sec-Butyl-4,6-dinitrophenol	88857	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
4-Chloro-3-methylphenol	59507	mg I-1	N	<0.0002	< 0.0002	<0.0002	<0.0002	<0.0002	<0.0002

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 04/02/2014 and 14/02/2014

Column page 1

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Report Date 07 April 2014

Results of analysis of 8 samples received 3 February 2014

Tullyvogheen

FAO David Gilfedder

250572 AJ78964 AJ78965 WA WA LC01-01 LC02-01 31/1/2014 31/1/2014 WATER WATER < 0.2 1840 Heptachlor 76448 μg I-1 Ν < 0.2 delta-HCH 319868 μq I-1 Ν < 0.2 < 0.2 <0.2 <0.2 Aldrin 309002 μg l-¹ Ν < 0.2 <0.2 in pull duited to <0.2 in some control of the Heptachlor epoxide 1024573 μg I-1 Ν gamma-Chlordane 5103742 μg I-1 Ν alpha-Chlordane 5103719 μg l-1 Ν μg l-¹ Endosulfan I 959988 Ν 4.4-DDE 72559 μg l-1 Dieldrin 60571 Ν μq l-1 Endrin Ν 72208 μg I-1 4,4-DDD μg l-¹ 72548 ¢01€012 Endosulfan II Ν 33213659 μg I-1 of co20.2 4,4-DDT 50293 μg l-1 < 0.2 Endrin aldehyde 7421934 Ν < 0.2 μg I-1 NCOnsent' Endosulfan sulfate 1031078 μg I-1 < 0.2 < 0.2 Methoxychlor 72435 μg l-1 < 0.2 < 0.2 Endrin ketone 53494705 μg l-¹ Ν < 0.2 < 0.2 1845 2,4-D 94757 μq I-1 Ν < 0.5 < 0.5 Dichlorprop Ν < 0.5 120365 μg l-1 < 0.5 **MCPA** Ν 94746 μg I-1 < 0.5 < 0.5 **MCPB** 94815 Ν < 0.5 < 0.5 μg I-1 Mecoprop 7085190 μg I-1 Ν < 0.5 < 0.5 2.4.5-T < 0.5 93765 μg I-1 Ν < 0.5 Ν 1900 2-sec-Butyl-4,6-dinitrophenol 88857 mg I-1 < 0.0002 < 0.0002 4-Chloro-3-methylphenol 59507 mg I-1 Ν < 0.0002 < 0.0002

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

AMENDED LABORATORY TEST REPORT



Results of analysis of 8 samples received 3 February 2014

Report Date 07 April 2014

FAO David Gilfedder

Tullyvogheen

						250	572		
				AJ78958	AJ78959	AJ78960	AJ78961	AJ78962	AJ78963
				WA	WA	WA	WA	WA	WA
				SW01-01	SW02-01	SW03-01	BH01-01	BH02-01	BH03-01
				31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014	31/1/2014
				WATER	WATER	WATER	WATER	WATER	WATER
900 2-Chlorophenol	95578	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4-Dichlorophenol	120832	mg I-1	N	<0.0002	< 0.0002	< 0.0002	<0.0002	<0.0002	<0.0002
2,6-Dichlorophenol	87650	mg l-1	N	<0.0002	<0.00025	<0.0002	<0.0002	<0.0002	<0.0002
2,4-Dimethylphenol	105679	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4-Dinitrophenol	51285	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2-Methyl-4,6-dinitrophenol	534521	mg l-1	N	<0.0002	<0.0002 only <0.0002 <0.0002 <0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2-Methylphenol	95487	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
3-Methylphenol	108394	mg l-1	N	<0.0002 ville	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
4-Methylphenol	106445	mg l-1	N	<0.0002	< 0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2-Nitrophenol	88755	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
4-Nitrophenol	100027	mg l-1	N	€0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Pentachlorophenol	87865	mg l-1	N	<0.0002 √0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Phenol	108952	mg l-1	N	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2,3,4,5-Tetrachlorophenol	4901513	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2,3,4,6-Tetrachlorophenol	58902	mg l-1	Ngg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,3,5,6-Tetrachlorophenol	935955	mg l-1	Cons	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,3,4-Trichlorophenol	15950660	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2,3,5-Trichlorophenol	933788	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.0002
2,3,6-Trichlorophenol	933755	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4,5-Trichlorophenol	95954	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
2,4,6-Trichlorophenol	88062	mg l-1	N	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
3,4,5-Trichlorophenol	609198	mg l-1	N	< 0.0002	< 0.0002	<0.0002	<0.0002	<0.0002	<0.0002

All tests undertaken between 04/02/2014 and 14/02/2014

Column page 1

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

FAO David Gilfedder

AMENDED LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Report Date 07 April 2014

Results of analysis of 8 samples received 3 February 2014

Tullyvogheen

				250	572
				AJ78964	AJ78965
				WA	WA
				LC01-01	LC02-01
				31/1/2014	31/1/2014
				WATER	WATER
1900 2-Chlorophenol	95578	mg l-1	N	<0.0002	<0.0002
2,4-Dichlorophenol	120832	mg l-1	N	<0.0002	<0.0002
2,6-Dichlorophenol	87650	mg l-1	N	<0.0002	<0.0002
2,4-Dimethylphenol	105679	mg l-1	N	<0.0002	<0.0003
2,4-Dinitrophenol	51285	mg l-1	N	<0.0002	≤0.0002
2-Methyl-4,6-dinitrophenol	534521	mg l-1	N	<0.0002	 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002
2-Methylphenol	95487	mg l-1	N	<0.0002	<i>ॐ</i> 20.0002
3-Methylphenol	108394	mg l-1	N	<0.0002	viii <0.0002
4-Methylphenol	106445	mg l-1	N	<0.0002	<0.0002
2-Nitrophenol	88755	mg l-1	N	<0.0002 110	< 0.0002
4-Nitrophenol	100027	mg l-1	N	<0.0002	< 0.0002
Pentachlorophenol	87865	mg l-1	N	♦ \$0.0002	<0.0002
Phenol	108952	mg l-1	N	₹0 .0002	< 0.0002
2,3,4,5-Tetrachlorophenol	4901513	mg l-1	N	<0.0002	< 0.0002
2,3,4,6-Tetrachlorophenol	58902	mg l-1	N NCO	<0.0002	< 0.0002
2,3,5,6-Tetrachlorophenol	935955	mg l-1	NÇÓ	<0.0002	< 0.0002
2,3,4-Trichlorophenol	15950660	mg l-1	N	<0.0002	< 0.0002
2,3,5-Trichlorophenol	933788	mg l-1	N	<0.0002	< 0.0002
2,3,6-Trichlorophenol	933755	mg l-1	N	<0.0002	<0.0002
2,4,5-Trichlorophenol	95954	mg l-1	N	<0.0002	<0.0002
2,4,6-Trichlorophenol	88062	mg l-1	N	<0.0002	<0.0002
3,4,5-Trichlorophenol	609198	mg l-1	N	< 0.0002	<0.0002

EPA Export 28-07-2020:04:19:25

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status



Depot Road Newmarket CB8 0AL Tel: 01638 606070

MULROY ENVIRONMENTAL 30 LISROLAND VIEW **KNOCKBRIDGE** DUNDALK, CO LOUTH **IRELAND**

FAO Padraic Mulroy 28 February 2014

Dear Padraic Mulroy

250676 **Test Report Number Your Project Reference** Owenglen

Please find enclosed the results of analysis for the samples received 10 February 2014.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please not hesitate to contact the Customer Services Consent of copylight on team.

Yours sincerely

Darrell Hall, Director



Notes to accompany report:

- The sign < means 'less than'
- Tests marked 'U' hold UKAS accreditation
- Tests marked 'M' hold MCertS (and UKAS) accreditation
- Tests marked 'N' do not currently hold UKAS accreditation
- Tests marked 'S' were subcontracted to an approved laboratory
- n/e means 'not evaluated'
- i/s means 'insufficient sample
- u/s means 'unsuitable sample'
- Comments or interpretations are beyond the scope of UKAS accreditation
- The results relate only to the items tested
- All results are expressed on a dry weight basis
- The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols
- For all other tests the samples were dried at < 37°C prior to analysis
- Uncertainties of measurement for the determinands tested are available upon request
- None of the test results included in this report have been recovery corrected

Test Report 250676 Cover Sheet

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 7 samples received 10 February 2014

Report Date 28 February 2014

FAO Padraic Mulroy

Owenglen

Login E	Batch No						250	1676		
Chemte	est LIMS ID				AJ80839	AJ80840	AJ80841	AJ80842	AJ80843	AJ80844
Sample	ID				SO-TP03-01	SO-TP12-01	SO-TP17-01	SO-TP19-01	SO-TP19-02	SO-TP11-01
Sample	No									
Sampli	ng Date				15/1/2014	15/1/2014	15/1/2014	15/1/2014	15/1/2014	15/1/2014
Depth										
Matrix					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SOP↓	Determinand↓	CAS No↓ U	nits↓ *							
2010	рН			M		7.6		7.7		
2625	Organic matter		%	М		16		0.98		
2220	Chloride (extractable)	16887006	g l-¹	М	0.012 3.8 0.11 <100 <0.10 purpos <2.00 per	0.048	0.028	<0.010		
	Fluoride (extractable)	16984488	mg kg-1	N	3.8	A. 4.7	0.62	0.45		
2120	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	М	0.11	of 0.27	0.17	0.23		
2430	Iron	7439896	mg kg-1	N	<100	1800	9700	13000		
2450	Thallium	7440280	mg kg-1	N	<0.10 miles	<0.10	<0.10	<0.10		
2450	Arsenic	7440382	mg kg-1	М	<2.00 7 100	<2.0	2.3	<2.0		
	Barium	7440393	mg kg-1	M	\$90 will	12	20	22		
	Cadmium	7440439	mg kg-1	M	· 10×0×10	<0.10	<0.10	0.20		
	Cobalt	7440484	mg kg-1	M	£01 × 5.0	<5.0	<5.0	<5.0		
	Chromium	7440473	mg kg-1	M	ر الأولى 5.0× ⁴	<5.0	16	12		
	Copper	7440508	mg kg-1	M	<5.0	<5.0	6.3	11		
	Mercury	7439976	mg kg-1	M M	<0.10	<0.10	0.78	1.00		
	Manganese	7439965	mg kg-1	W.	<5.0	65	160	260		
	Molybdenum	7439987	mg kg-1	M	<2.0	<2.0	<2.0	<2.0		
	Nickel	7440020	mg kg-1	M	<5.0	<5.0	14	11		
	Lead	7439921	mg kg-1	M	<5.0	<5.0	12	12		
	Antimony	7440364	mg kg-1	N	<2.0	<2.0	<2.0	3.4		
	Selenium	7782492	mg kg-1	M	<0.20	<0.20	<0.20	<0.20		
	Tin	7440315	mg kg-1	N	<5.0	<5.0	<5.0	<5.0		
	Vanadium	7440622	mg kg-1	M	<5.0	<5.0	13	8.6		
	Zinc	7440666	mg kg-1	М	<10	<10	41	27		
2675	TPH aliphatic >C5-C6		mg kg-1	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹		

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 10/02/2014 and 28/02/2014

Column page 1

^{*} Accreditation status

LABORATORY TEST REPORT

Results of analysis of 7 samples received 10 February 2014

Report Date 28 February 2014

FAO Padraic Mulroy

Owenglen Login Batch No 250676 Chemtest LIMS ID AJ80845

00.	11.55(2.11.15 12				7 10000 10	
Sam	ple ID				SO-TP06-01	
Sam	ple No					
Sam	pling Date				15/1/2014	
Dept	h					
Matr	ix				SOIL	
SOF	² ↓ Determinand↓	CAS No↓	Units↓	*		
2010	рН			М		Poses only any other use
2625	Organic matter		%	М		, 1150
2220	Chloride (extractable)	16887006	g l-¹	М		ather
	Fluoride (extractable)	16984488	mg kg-1	N		14. VJ
2120	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	М		Offic di
2430	Iron	7439896	mg kg-1	N		Seg 9 16
2450	Thallium	7440280	mg kg-1	N	all	Palific
2450	Arsenic	7440382	mg kg-1	М	:011 or	Section
	Barium	7440393	mg kg-1	М	acctic wine,	
	Cadmium	7440439	mg kg-1	М	inspire	
	Cobalt	7440484	mg kg-1	М	For vite	
	Chromium	7440473	mg kg-1	М	, cob,	
	Copper	7440508	mg kg-1	M	at of	
	Mercury	7439976	mg kg-1	M	Sett	
	Manganese	7439965	mg kg-1	MC		
	Molybdenum	7439987	mg kg-1	М		
	Nickel	7440020	mg kg-1	М		
	Lead	7439921	mg kg-1	М		
	Antimony	7440364	mg kg-1	N		
	Selenium	7782492	mg kg-1	М		
	Tin	7440315	mg kg-1	N		
	Vanadium	7440622	mg kg-1	М		
	Zinc	7440666	mg kg-1	М		
2675	TPH aliphatic >C5-C6		mg kg-1	N		

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 7 samples received 10 February 2014

Report Date 28 February 2014

FAO Padraic Mulroy

Owenglen

							250	676		
					AJ80839	AJ80840	AJ80841	AJ80842	AJ80843	AJ80844
					SO-TP03-01	SO-TP12-01	SO-TP17-01	SO-TP19-01	SO-TP19-02	SO-TP11-01
					15/1/2014	15/1/2014	15/1/2014	15/1/2014	15/1/2014	15/1/2014
					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
2675	TPH aliphatic >C6-C8		mg kg-1	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹		
	TPH aliphatic >C8-C10		mg kg-1	N	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹		
	TPH aliphatic >C10-C12		mg kg-1	М	< 1 ¹	< 1 1 15°	< 1 ¹	< 1 ¹		
	TPH aliphatic >C12-C16		mg kg-1	М	<0.11 <0.11 <11 <11 <11 <11 <11 <0.11 thirties <0.14 thirties	< her	< 1 ¹	< 1 ¹		
	TPH aliphatic >C16-C21		mg kg-1	M	< 1 ¹	M. 491	< 1 ¹	< 1 ¹		
	TPH aliphatic >C21-C35		mg kg-1	М	< 1 ¹	on at at 11	< 1 ¹	< 1 ¹		
	TPH aliphatic >C35-C44		mg kg-1	N	< 1 ¹	20 ¹⁰ < 1 ¹	< 1 ¹	< 1 ¹		
	TPH aromatic >C5-C7		mg kg-1	N	< 0.1 1 M	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹		
	TPH aromatic >C7-C8		mg kg-1	N	< 0.14 % (00)	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹		
	TPH aromatic >C8-C10		mg kg-1	N	< 0.17 110	< 0.1 ¹	< 0.1 ¹	< 0.1 ¹		
	TPH aromatic >C10-C12		mg kg-1	N	. 12 1 P	< 1 ¹	< 1 ¹	< 1 ¹		
	TPH aromatic >C12-C16		mg kg-1	М	FO 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	< 1 ¹	< 1 ¹	< 1 ¹		
	TPH aromatic >C16-C21		mg kg-1	М	20 ² < 1 ¹	< 1 ¹	< 1 ¹	< 1 ¹		
	TPH aromatic >C21-C35		mg kg-1	N	√ < 1 ¹	< 1 ¹	< 1 ¹	< 1 ¹		
	TPH aromatic >C35-C44		mg kg-1		< 1 ¹	< 1 ¹	< 1 ¹	< 1 ¹		
	Total Petroleum Hydrocarbons		mg kg-1	Oons	< 10 ¹	< 10 ¹	< 10 ¹	< 10 ¹		
800	Naphthalene	91203	mg kg-1	M	<0.10	<0.10	<0.10	<0.10		
	Acenaphthylene	208968	mg kg-1	N	<0.10	<0.10	<0.10	<0.10		
	Acenaphthene	83329	mg kg-1	M	<0.10	<0.10	<0.10	<0.10		
	Fluorene	86737	mg kg-1	M	<0.10	<0.10	<0.10	<0.10		
	Phenanthrene	85018	mg kg-1	M	<0.10	<0.10	<0.10	<0.10		
	Anthracene	120127	mg kg-1	M	<0.10	<0.10	<0.10	<0.10		
	Fluoranthene	206440	mg kg-1	М	<0.10	<0.10	<0.10	<0.10		
	Pyrene	129000	mg kg-1	М	<0.10	<0.10	<0.10	<0.10		
	Benzo[a]anthracene	56553	mg kg-1	М	<0.10	<0.10	<0.10	<0.10		

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 10/02/2014 and 28/02/2014

Column page 1

^{*} Accreditation status

FAO Padraic Mulroy

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 7 samples received 10 February 2014

Report Date 28 February 2014

Owenglen

				250676
				AJ80845
				SO-TP06-01
				15/1/2014
				SOIL
675 TPH aliphatic >C6-C8		mg kg-1	N	
TPH aliphatic >C8-C10		mg kg-1	N	
TPH aliphatic >C10-C12		mg kg-1	М	
TPH aliphatic >C12-C16		mg kg-1	М	
TPH aliphatic >C16-C21		mg kg-1	М	
TPH aliphatic >C21-C35		mg kg-1	М	For inspection to
TPH aliphatic >C35-C44		mg kg-1	N	
TPH aromatic >C5-C7		mg kg-1	N	á
TPH aromatic >C7-C8		mg kg-1	N	, of P
TPH aromatic >C8-C10		mg kg-1	N	actioning
TPH aromatic >C10-C12		mg kg-1	N	: 15Pot Ox
TPH aromatic >C12-C16		mg kg-1	М	COT Tide
TPH aromatic >C16-C21		mg kg-1	М	COS
TPH aromatic >C21-C35		mg kg-1	N	, of
TPH aromatic >C35-C44		mg kg-1	N	ent
Total Petroleum Hydrocarbons		mg kg-1	NCO	
800 Naphthalene	91203	mg kg-1	М	
Acenaphthylene	208968	mg kg-1	N	
Acenaphthene	83329	mg kg-1	М	
Fluorene	86737	mg kg-1	М	
Phenanthrene	85018	mg kg-1	М	
Anthracene	120127	mg kg-1	М	
Fluoranthene	206440	mg kg-1	М	
Pyrene	129000	mg kg-1	М	
Benzo[a]anthracene	56553	mg kg-1	М	

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

EPA Export 28-07-2020:04:19:26

^{*} Accreditation status

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 7 samples received 10 February 2014

Report Date 28 February 2014

FAO Padraic Mulroy

Owenglen

							250	676		
					AJ80839	AJ80840	AJ80841	AJ80842	AJ80843	AJ80844
					SO-TP03-01	SO-TP12-01	SO-TP17-01	SO-TP19-01	SO-TP19-02	SO-TP11-01
					15/1/2014	15/1/2014	15/1/2014	15/1/2014	15/1/2014	15/1/2014
					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
2800	Chrysene	218019	mg kg-1	М	<0.10	<0.10	<0.10	<0.10		
	Benzo[b]fluoranthene	205992	mg kg-1	N	<0.10	<0.10	<0.10	<0.10		
	Benzo[k]fluoranthene	207089	mg kg-1	N	<0.10	<0.10	<0.10	<0.10		
	Benzo[a]pyrene	50328	mg kg-1	М	<0.10	<0.40	<0.10	<0.10		
	Dibenzo[a,h]anthracene	53703	mg kg-1	N	<0.10	≤0°.10	<0.10	<0.10		
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	М	<0.10	on 20.10	<0.10	<0.10		
	Benzo[g,h,i]perylene	191242	mg kg-1	М	<0.10 <0.10 <0.10 <2.0 purper	<0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10	<0.10	<0.10		
	Total (of 16) PAHs		mg kg-1	N	<2.0 alipai	<2.0	<2.0	<2.0		
2815	PCB 101	37680732		М	For its perion per rest	< 0.01		< 0.01		
	PCB 118	31508006	mg kg-1	М	citables	< 0.01		< 0.01		
	PCB 138	35065282	mg kg-1	М	:15Ph 07	< 0.01		< 0.01		
	PCB 153	35065271	mg kg-1	М	COT THE	< 0.01		< 0.01		
	PCB 180	35065293	mg kg-1	М	COBY	< 0.01		< 0.01		
	PCB 28	7012375	mg kg-1	М	, of	< 0.01		< 0.01		
	PCB 52	35693993	mg kg-1	M &	For install owner rest	< 0.01		< 0.01		
2920	Phenols (total)		mg kg-1	(1/P)TL	<0.3	<0.3	<0.3	<0.3		
	Atterberg Limits (Subcon)			SU					see attached	see attached
	PSD (Subcon)			SU					see attached	see atttached

All tests undertaken between 10/02/2014 and 28/02/2014

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

^{*} Accreditation status

FAO Padraic Mulroy

LABORATORY TEST REPORT

Chemtest
The right chemistry to deliver results

Results of analysis of 7 samples received 10 February 2014

Report Date 28 February 2014

Owenglen

					250676 AJ80845 SO-TP06-01 15/1/2014 SOIL	
2800	Chrysene	218019	mg kg-1	М		
	Benzo[b]fluoranthene	205992	mg kg-1	N		
	Benzo[k]fluoranthene	207089	mg kg-1	N		. 3
	Benzo[a]pyrene	50328	mg kg-1	М		thet
	Dibenzo[a,h]anthracene	53703	mg kg-1	N		14. 24°
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	М		Office all.
	Benzo[g,h,i]perylene	191242	mg kg-1	M		ses die
	Total (of 16) PAHs		mg kg-1	N	alli	diffe
2815	PCB 101	37680732	mg kg-1	М	.01.7	ecc.
	PCB 118	31508006	mg kg-1	М	ecitewiner	
	PCB 138	35065282	mg kg-1	M	insputor	
	PCB 153	35065271	mg kg-1	M	COLVITIES	
	PCB 180	35065293	mg kg-1	M	COS	
	PCB 28	7012375	mg kg-1	М	, of	-
	PCB 52	35693993	mg kg-1	M	EIL	
2920	Phenols (total)		mg kg-1	MCO	ř	
	Atterberg Limits (Subcon)			SU	For its rection put For its rection where	
	PSD (Subcon)			SU	see attached	

¹The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.



ISSUED BY

: SOIL PROPERTY TESTING LTD.

DATE OF ISSUE: 27/02/14 PAGE 1 of 11 Pages

Contract

Serial No.

Chemtest Job No. 250676

S27340



~	T	T	TO 1	NTF	r	_
			r.	M'		2

CHEMTEST Depot Road Newmarket Suffolk CB8 OAP

Soil Property Testing

18 Halcyon Court, St Margarets Way, Stukeley Meadows, Huntingdon, Cambs. PE29 6DG.

Telephone (01480) 455579 Fax (01480) 453619 Email SPTownend@btclick.com

SAMPLES SUBMITTED BY:

CHEMTEST

APPROVED SIGNATORIES:

S.P.TOWNEND FGS Technical Director

☐ W.JOHNSTONE Deputy Technical/Quality Manager

ੁਹੱ਼ਣੇ.GARNER B.Eng (Hons.) FGS

∭wality Manager

SAMPLES LABELLED:

Chemtest Job No. 250676

DATE RECEIVED:

11/02/14

SAMPLES TESTED BETWEEN 11/02/14 and 27/02/14

REMARKS:

For the attention of Customer Services

Your Order No.: 13515

- All remaining samples or remnants from this contract NOTES: 1 will be disposed of after 21 days from today, unless we are notified to the contrary.
 - (a) UKAS United Kingdom Accreditation Service.
 - (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
 - Tests marked "NOT UKAS ACCREDITED" in this test report 3 are not included in the UKAS Accreditation Schedule for this testing laboratory.
 - This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.



ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 PAGE 2 of ()

Contract Serial No.

Chemtest Job No. 250676

S27340

SCHEDULE OF LABORATORY TESTS

Bh./ Tp No.	Sample Ref	Depth (from)		:MO1	sture Lio	Cont uid P i.PBD	last by	Dete ic si	leve mit	B 33													Remarks	
0043																				$\overline{}$				
0843	D			i										ļ								amples pr		
0844	D		*	*	*												ļ					amples pr		
0845	D		*	*	*			-														amples pr	efixed A	J
	_	-	3	3	3													150.			<	— Total	Number c	f Tests —
				<u> </u>										-			other	_						
											St. Cot			ļ	and the	1.00	3							
					ļ									ي د	بح کو	0,								
													5	nibel)	Mic									
												کی	doll	or y										
												USQ.	10											
											€0°	His												
										*	9													
									~0	nsent													· · · · · · · · · · · · · · · · · · ·	
											<u> </u>										+			
																					-	· · · · · · · · · · · · · · · · · · ·		
																					-			

																								·
																					+			
																			-	_				
																				-		***************************************		
																					-	-		
																					_		***************************************	
										-														
									1					1	- 1			: I	- 1	- 1				



:SOIL PROPERTY TESTING LTD. ISSUED BY

DATE OF ISSUE: As page 1 PAGE 3 of 1

Contract

Serial No.

Chemtest Job No. 250676

S27340



DETERMINATION OF MOISTURE CONTENT

Borehole/ Pit No.	Depth m.	Sample	Moisture Content	Description	Remarks
80843		D	67	Dark brown gravelly sandy silty PEAT with frequent fibrous roots. Gravel sized material is black brown and white sub angular chert grey igneous rock and fragments of glass and plastic	Description in terms of engineering behaviour. Description by Particle size = Organic silty very gravelly SAND
80844		D	72	Dark brown gravelly sandy silty PEAT with frequent fibrous roots. Gravel sized material is black brown and white sub angular chert grey igneous rock and fragments of glass and plastic	Description in terms of engineering behaviour. Description by Particle size = Organic silty very gravelly SAND
80845		D	69	Dark brown gravelly sandy silty peat with frequent fibrous roots. Gravek sized material is black brown and white sub angular chert grey igneous rock and fragments of glass and plastic	

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.3

METHOD OF TEST

: BS 1377:PART 2:1990:3.2

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

SPTR2A



ISSUED BY

:SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1

PAGE 4 of 1)

Contract

Serial No.

Chemtest Job No. 250676

S27340



SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT.

PLASTICITY INDEX AND LIQUIDITY INDEX

			Moisture	Liquid	Plastic	Plast-	Ligu-		SAMPLE PR	EPARAT ION	1		
Borehole/ Pit No.	Depth m.		Content (★)		Limit (%)	icity Index (%)	idity Index (%)	Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm	Curing Time (hrs.)	Description	CLASS
80843		D	67	60	42	18		ន	66 (M)		67	Dark brown gravelly sandy silty PEAT with frequent fibrous roots. Gravel sized material is black brown and white sub angular chert grey igneous rock and fragments of glass and plastic	МНО
80844		D	72	83	55	28		s	51 (M)	other use.	72	Dark brown gravelly sandy silty PEAT with frequent fibrous roots. Gravel sized material is black brown and white sub angular chert grey igneous rock and fragments of glass and plastic	MVO
80845		D	69	72	44	28 Fot of Co	ne de la	Pringo Pilito Principal Pr	45 (M)		72	Dark brown gravelly sandy silty PEAT with frequent fibrous roots. Gravel sized material is black brown and white sub angular chert grey igneous rock and fragments of glass and plastic	MVO

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

S = Wet Sieved Specimen N = prepared from Natural

METHOD OF TEST

: BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY

: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter. A = Assumed, M = Measured

COMMENTS

REMARKS TO INCLUDE

: Sample disturbance, loss of moisture, variation from test procedure, location and origin

of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



ISSUED BY

:SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1

PAGE 5 of 1

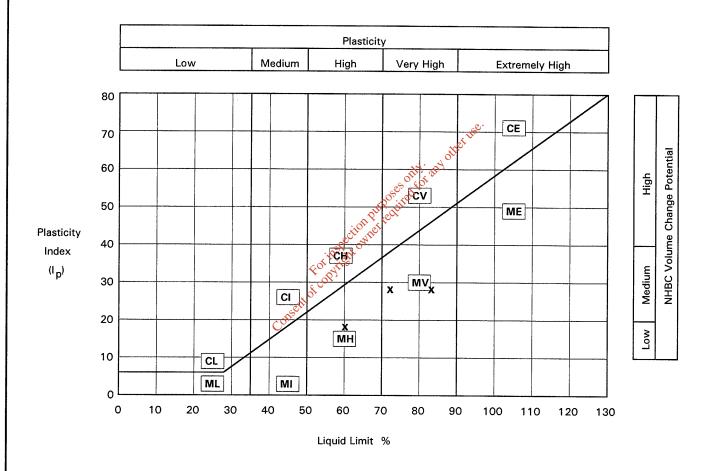
Contract

Serial No.

Chemtest Job No. 250676

S27340

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT **USING CASAGRANDE CLASSIFICATION CHART**



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST

: BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

: VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

PLASTICITY CHART BS5930:1999:Figure 18



ISSUED BY

: SOIL PROPERTY TESTING LTD.

DATE OF ISSUE: As page 1 PAGE 6 of //

Contract

Serial No.

Chemtest Job No. 250676

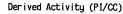
S27340



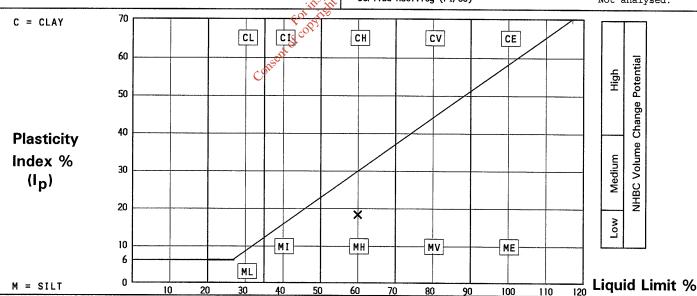
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Maisture Content		Description	Remarks
80843		D		frequent fibro	avelly sandy silty PEAT with ous roots. Gravel sized material n and white sub angular chert cock and fragments of glass and	Description in terms of engineering behaviour. Description by Particle size = Organic silty very gravelly SAND
	PF	REPARAT	ION		Liquid Limit	60 🗴
Method of Pro	eparation s	Sieved Speci	men		Plastic Limit	42 X

Sample retained 0.425 sieve (Measured) Plasticity Index 66 🕺 18 🕺 Corrected moisture content for material passing $0.425 \mathrm{mm}$ 1 Liquid ty Index Curing Time Clay Content 67 Hours Not analysed. %



Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST

: BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

: PLASTICITY CHART BS5930:1999:Figure 18

VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
CORRECTED MOISTURE CONTENT AND LIQUIDITY INDEX NOT REORTED DUE TO MATERIAL TYPE



ISSUED BY

: SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 PAGE 7 of |

Contract

Serial No.

Chemtest Job No. 250676

S27340



DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Maisture Content **		Description	Remarks
80844		D		frequent fibro	avelly sandy silty PEAT with ous roots. Gravel sized material a and white sub angular chert rock and fragments of glass and	Description in terms of engineering behaviour. Description by Particle size = Organic silty very gravelly SAND
	PF	REPARAT	ION		Liquid Limit	83 🗴
Method of Pr	eparation s	Sieved Speci	men		Plastic Limit	55 🗴
Sample retai	ned 0.425 sieve	e (Measure	d)	51 %	Plasticity Index	28 🏌
Corrected mo	isture content	for material p	passing 0.425mm	×	Liquidity Index	

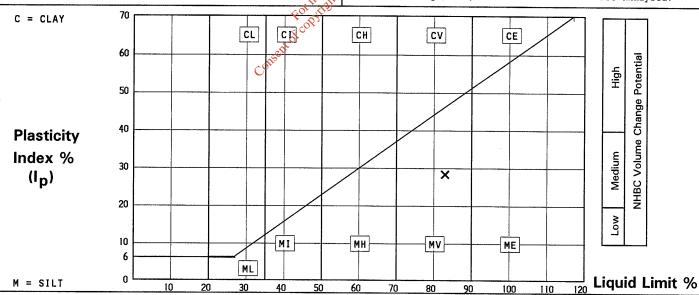
Curing Time 72 Hours

Derived Activity (PI/CC)

Clay Content

Not analysed.

Not analysed. 🕺



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST

: BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

: PLASTICITY CHART BS5930:1999:Figure 18

VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)

CORRECTED MOISTURE CONTENT AND LIQUIDITY INDEX NOT REORTED DUE TO MATERIAL TYPE



ISSUED BY

:SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 PAGE 8 of

Contract

Serial No.

Chemtest Job No. 250676

S27340



DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %		Descri	ption			Remarks
80845		D	69	frequent fib	rous roots. wn and whit	dy silty PEAT Gravel sized e sub angular ragments of gl	material eng chert Des ass and Org	scription in sineering be scription by sanic very o ty SAND	
	P	REPARAT	ΓΙΟΝ		Liquid I	Limit			72 🕻
Method of Pre	paration	Sieved Spec	imen		Plastic	Limit			44 🗴
Sample retaine	ed 0.425 siev	e (Measure	ed)	45 %	Plastic	ity Index			28 🏅
Corrected mois	sture content	for material	passing 0.425mm	Х		ty Index			
Curing Time				72 Hours	S TOCIAN COL	ntent	·	N	ot analysed. 🎜
				111.572	Der i ved	Activity (PI/CC)		N	ot analysed.
C = CLA	Y	70	CL	CISCOLITA	СН	CV	CE		
		60		onsert					ntial
		50							High e Potential
Plastic	eitv	40							Change
Index (I _p)	-	30				×			Medium NHBC Volume
•		20							1 - 1
		10 6		MI	<u>MH</u>	MV	ME		Low
M = SIL	т	0 10	20 30	40 50	60 7	0 80 90	100 1	lo 120 Li	quid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST

: BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

: PLASTICITY CHART BS5930:1999:Figure 18

VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
CORRECTED MOISTURE CONTENT AND LIQUIDITY INDEX NOT REORTED DUE TO MATERIAL TYPE



ISSUED BY

: SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1

PAGE 9 of 11

Contract

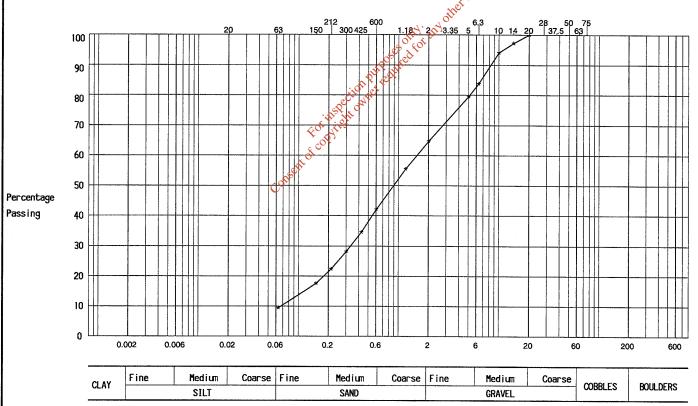
Chemtest Job No. 250676

Serial No.

S27340



		ı	DE'	TE	RN	IIN/	ΑT	10	N (ЭF	P/	٩F	RTIC)LE	S	ZE	E D	IS:	TR	BU	ΤI	OI	1								
Borehole/ Pit No.	Depth m.	Samp	ile									Des	script	ion:												Rem	narks	;			
80843		D		f	fibr whit	rk brown gravelly sandy silty PEAT with frequent prous roots. Gravel sized material is black brown and ite sub angular chert grey igneous rock and fragments glass and plastic											Des Org	gine scri gani	eri pti	ng k	oeha oy P	avio Part	s of ur. icle grave	si:	ze :	2					
Method of Test:	Wet Sieve											- 1	Metho pre-ti			:						SAL	₩.								
							-			Siz	.e (m	icr	ons)												Siz	ze (n	nm)				
Sieve Size															63	150	212	300	425	600 1	. 18	2	5	6.3	10	14	20	28 3	7.5	50	75
Percentage by Mass passing Sieve														9	18	22	28	34	42	55	65	79	84	94	97	100	-	-	-	_	
										2	12		600				other	90	,			20	50	75							



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.3 & 7.4.5

METHOD OF TEST

: BS 1377:PART 2:1990:9.2

TYPE OF SAMPLE KEY

: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

: Sample disturbance, loss of moisture, variation from test procedure, location and origin REMARKS TO INCLUDE

of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



ISSUED BY

:SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1

PAGE 10 of []

Contract

Serial No.

Chemtest Job No. 250676

S27340



		DE1	ERMINATION OF PA	RTICLE SIZE DISTRIBUTI	ON
Borehole/ Pit No.	Depth m.	Sample	De	escription	Remarks
80844		ם		silty PEAT with frequent ed material is black brown and rey igneous rock and fragments	Description in terms of engineering behaviour. Description by Particle size = Organic silty very gravelly
Method of Test:	Wet Sieve			Method of pre-treatment:	'SAND
			Size (mic	crons)	Size (mm)

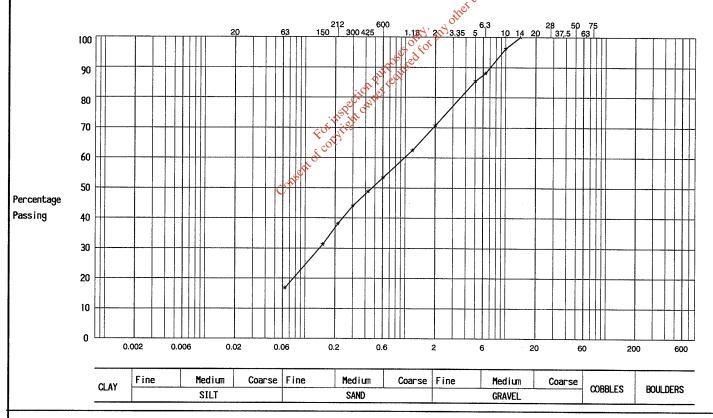
 Size (microns)

 Sieve Size
 Size (microns)

 Percentage by Mass passing Sieve
 Size (microns)

 Size (microns)

 In the color of the



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.3 & 7.4.5

METHOD OF TEST

: BS 1377:PART 2:1990:9.2

TYPE OF SAMPLE KEY

: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

:

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin

of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



ISSUED BY

:SOIL PROPERTY TESTING LTD.

DATE OF ISSUE: As page 1

PAGE 1) of (

Contract

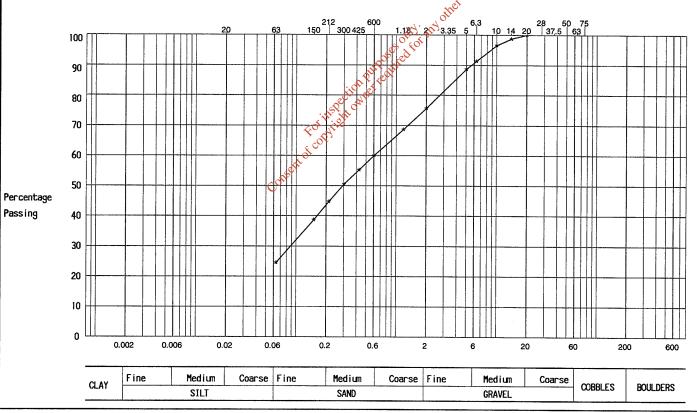
FAGE // OL /

Chemtest Job No. 250676

Serial No. S27340



Borehole/ Pit No.	Depth m.	Samp	le								Des	cript	ion												Ren	arks	i		
80845	fibrous roots. Gravel sized material is black brown and white sub angular chert grey igneous rock and fragments of glass and plastic											eng Des	ine cri	eri:	ng l	oeha oy F	vio art	s of ur. icle ly v	siz	:e =									
Method of Test:	Wet Sieve						***************************************					Metho pre-t			:						 si]	ty	SAN	Đ -					
									Si	ze (micr	ons)												Siz	ze (r	nm)			
Sieve Size														63	150	212	300	425	600	1.18	2	5	6.3	10	14	20	28 3	7.5	50 7
Percentage b	y Mass passing S	ieve												24	39	45	50	55	60	69	76	89	91	96	99	100	-	-	- -



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.3 & 7.4.5

METHOD OF TEST

: BS 1377:PART 2:1990:9.2

TYPE OF SAMPLE KEY

: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,

C = Core Cutter

COMMENTS

:

REMARKS TO INCLUDE

: Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

SPTR2M

Consent of copyright owner required for any other use.

Test	Specification	Subcontracted	CLS 17025 Status	Sub 17025 Status
Total Coliforms (Filtration) (Environmental Waters)	CLS 16	No	No	No
Faecal Coliforms (Filtration)	Based on CLS 16	No	No	No
COD	CLS 52	No	Yes	No
BOD	CLS 12	No	Yes	No

Laboratory Analysis, Sampling, Technical Backup, Training, Food Safety Program Auditing and Monitoring are all ISO 9001:2008 certified





Complete Laboratory Solutions Ros Muc, Co. Galway. [Tel] 091 574355 [Fax] 091 574356 [Email] services@cls.ie [web] www.completelabsolutions.com

Client Report No. Padraic Mulroy

218502 Mulroy Environmental Date of Receipt 29/01/2014 30 Lisroland View Start Date of Analysis 29/01/2014 Knockbridge Date of Report 05/02/2014

Dundalk CO Louth Order Number

> Sample taken by Client

CERTIFICATE OF ANALYSIS

Lab No	Sample Description	Test	Result	Units
497192	WA-SW01-01.	BOD	<1	mg/l
		COD	30	mg/l
		Faecal Coliforms (Filtration)	5	cfu/100ml
		Total Coliforms (Filtration) (Environmental Waters)	57	cfu/100ml



Environmental Scientist

See page 2 for test past fications and accreditation status.

Le page 2 for test specification. This report only relates to items. Complete Laboratory Solutions. This report only relates to items tested and shall not be reproduced but in full with the permission of

Test	Specification	Subcontracted	CLS 17025 Status	Sub 17025 Status
Total Coliforms (Filtration) (Environmental Waters)	CLS 16	No	No	No
Faecal Coliforms (Filtration)	Based on CLS 16	No	No	No
COD	CLS 52	No	Yes	No
BOD	CLS 12	No	Yes	No

Laboratory Analysis, Sampling, Technical Backup, Training, Food Safety Program Auditing and Monitoring are all ISO 9001:2008 certified





Complete Laboratory Solutions Ros Muc, Co. Galway. [Tel] 091 574355 [Fax] 091 574356 [Email] services@cls.ie [web] www.completelabsolutions.com

Client Padraic Mulroy

> Mulroy Environmental 30 Lisroland View

Knockbridge

Dundalk CO Louth

Report No.

218503 Date of Receipt 29/01/2014

Start Date of Analysis

29/01/2014

Date of Report

05/02/2014

Order Number

Sample taken by

Client

CERTIFICATE OF ANALYSIS

Lab No	Sample Description	Test	Result	Units
497193	WA-SW02-01.	BOD	<1	mg/l
		COD	20	mg/l
		Faecal Coliforms (Filtration)	3	cfu/100ml
		Total Coliforms (Filtration) (Environmental Waters)	41	cfu/100ml



Environmental Scientist

See page 2 for test past fications and accreditation status.

Le page 2 for test specification. This report only relates to items. Complete Laboratory Solutions. This report only relates to items tested and shall not be reproduced but in full with the permission of

Test	Specification	Subcontracted	CLS 17025 Status	Sub 17025 Status
Total Coliforms (Filtration) (Environmental Waters)	CLS 16	No	No	No
Faecal Coliforms (Filtration)	Based on CLS 16	No	No	No
COD	CLS 52	No	Yes	No
BOD	CLS 12	No	Yes	No

Laboratory Analysis, Sampling, Technical Backup, Training, Food Safety Program Auditing and Monitoring are all ISO 9001:2008 certified





Complete Laboratory Solutions Ros Muc, Co. Galway. [Tel] 091 574355 [Fax] 091 574356 [Email] services@cls.ie [web] www.completelabsolutions.com

Client Padraic Mulroy

> Mulroy Environmental 30 Lisroland View Knockbridge

Dundalk Co Louth

Report No.

218504 Date of Receipt 29/01/2014

Start Date of Analysis

29/01/2014 05/02/2014

Date of Report Order Number

Sample taken by Client

CERTIFICATE OF ANALYSIS

Lab No	Sample Description	Test	Result	Units
497194	WA-SW03-01.	BOD	<1	mg/l
		COD	15	mg/l
		Faecal Coliforms (Filtration)	9	cfu/100ml
		Total Coliforms (Filtration) (Environmental Waters)	34	cfu/100ml



Environmental Scientist

See page 2 for test past fications and accreditation status.

Le page 2 for test specification. This report only relates to items. Complete Laboratory Solutions. This report only relates to items tested and shall not be reproduced but in full with the permission of Consent of copyright owner required for any other use.

APPENDIX 10

TABLE A10.1. RESULTS OF VOLATILE ORGANIC COMPOUND LABORATORY ANALYSIS ON SURFACE WATER AND GROUNDWATER SAMPLES TAKEN FROM SURFACE WATER BODIES AND GROUNDWATER MONITORING WELLS AT FORMER LANDFILL, AT TULLYVOGHEEN

TABLE A10.2. RESULTS OF SEMI-VOLATILE ORGANIC COMPOUND LABORATORY ANALYSIS ON SURFACE WATER AND GROUNDWATER SAMPLES TAKEN FROM SURFACE WATER BODIES AND GROUNDWATER MONITORING WELLS AT FORMER LANDFILL AT TULLYVOGHEEN

TABLE A10.3. RESULTS OF MTBE/BTEX AND PAH ANALYSIS ON GROUNDWATER AND LEACHATE SAMPLES TAKEN FROM GROUNDWATER MONITORING WELLS AND PIEZOMETERS AT TULLYVOGHEEN, CLIFDEN, COUNTY GALWAY

TABLE A10.4 RESULTS OF MTBE/BTEX AND PAH ANALYSIS ON SURFACE WATER SAMPLES TAKEN AT TULLYVOGHEEN, CLIFDEN, COUNTY GALWAY

TABLE A10.5. RESULTS OF ORGANO-PHOSPHOROUS PESTICIDE LABORATORY ANALYSES ON SURFACE WATER, GROUNDWATER AND LEACHATE SAMPLES TAKEN FROM GROUNDWATER MONITORING WELLS AND PIEZOMETERS AT TULLYVOGHEEN, CLIFDEN, COUNTY GALWAY

TABLE A10.6. RESULTS OF CHLORINATED PESTICIDE & ACID HERBICIDE LABORATORY ANALYSES ON SURFACE WATER, GROUNDWATER AND LEACHATE SAMPLES TAKEN FROM GROUNDWATER MONITORING WELLS AND PIEZOMETERS AT TULLYVOGHEEN

TABLE A10.7. ION BALANCE ANALYSIS ON GROUNDWATER, LEACHATE AND SURFACE WATER SAMPLES TAKEN AT TULLYVOGHEEN, CLIFDEN, COUNTY GALWAY

RESULTS OF LABORATORY ANALYSES CARRIED OUT BY EPA ON SURFACE WATER SAMPLES TAKEN AT TULLYVOGHEEN IN 2012



Consent of copyright owner required for any other use.

Table A10.1. Results of Volatile Organic Compound Laboratory Analysis on Surface Water and Groundwater Samples taken from Surface Water Bodies and Groundwater Monitoring Wells at Former Landfill, at Tullyvogheen

Parameters	Units	SI 81, 1988 Water Quality (Human Consumption)	Dutch Criteria Level TV	Dutch Criteria Level IV	WA-SW1-01 (UPGRADIENT)	WA-SW2-01 (DOWNGRADIENT)	WA-SW3-01 (DOWNGRADIENT)	WA-BH101-01 (UPGRADIENT)	WA-BH102-01 (DOWN- GRADIENT)	WA-BH103-01 (DOWN- GRADIENT)	WA-LC1-01	WA-LC2-01
Dichlorodifluoromethane	mg/l	0.0005	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chloromethane	mg/l	0.0005	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl Chloride	mg/l	0.0005	0.00001	0.00500	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	mg/l	0.0005	-	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chloroethane	mg/l	0.0005	-	-	<0.002	<0.002	<0.002	< 0.002	<0.002	< 0.002	< 0.002	<0.002
Trichlorofluoromethane trans-1,2-Dichloroethene	mg/l mg/l	0.0005 0.0005	0.00001	0.02000	<0.001 <0.002	<0.001 <0.002	<0.001	<0.001	<0.001 <0.002	<0.001	<0.001	<0.001 <0.002
Dichloromethane	mg/l	-	0.00001	1.00000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Carbon disulphide	mg/l	0.0005	-	-	<0.001	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,1-Dichloroethene	mg/l	0.0005	0.00001	0.01000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,1-Dichloroethane	mg/l	0.0005	0.00700	0.90000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
tert-butyl methyl ether	mg/l	0.0005	-	9.20000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
cis-1,2-Dichloroethene	mg/l	0.0005	0.00001	0.02000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	mg/l	0.1	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	mg/l	0.1	0.00600	0.40000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2,2-Dichloropropane 1,2-Dichloroethane	mg/l	0.1	0.00080 0.00700	0.08000 0.40000	<0.001 <0.001	<0.001 <0.001	<0.001	<0.001	<0.001 <0.001	<0.001	<0.001	<0.001 <0.001
1,1,1-Trichloroethane	mg/l mg/l	-	0.00700	0.40000	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
1,1-Dichloropropene	mg/l		-	-	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	mg/l	_	0.00020	0.03000	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0014
Carbontetrachloride	mg/l	-	-	COLIN AN	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	mg/l	0.0002	-	ose ed	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,2-Dichloropropane	mg/l	0.0002	-	Diff Chit	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	mg/l	0.0002	- tio	net -	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichloroethene cis-1,3-Dichloropropene	mg/l mg/l	0.0002 0.0002	0.02400 8	0.50000	<0.001 <0.010	<0.001 <0.010	<0.001	<0.001 <0.010	<0.001 <0.010	<0.001	<0.001	<0.001 <0.010
trans-1,3-Dichloropropene	mg/l	0.0002	tol tile		<0.010	<0.010	<0.010	< 0.010	< 0.010	<0.010	<0.010	<0.010
1,1,2-Trichloroethane	mg/l	0.0002	0.00001	0.13000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Toluene	mg/l	0.0002	^{ین} 0.00700	1.00000	< 0.001	< 0.001	< 0.001	0.0023	0.0011	< 0.001	0.0014	0.0011
1,3-Dichloropropane	mg/l	0.0002	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dibromochloromethane	mg/l	0.0002	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,2-Dibromoethane	mg/l	0.0002	-	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Tetrachloroethene 1,1,1,2-Tetrachloroethane	mg/l mg/l	0.0002 0.0002	0.0000100	0.04000	<0.001 <0.002	<0.001 <0.002	<0.001	<0.001	<0.001 <0.002	<0.001	<0.001	<0.001 <0.002
Chlorobenzene	mg/l	0.0002	0.0070000	0.18000	<0.002	<0.002	<0.002	< 0.002	< 0.002	< 0.002	<0.002	0.002
Ethylbenzene	mg/l	0.0002	0.0070000	0.15000	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0012	< 0.001
p/m-Xylene	mg/l	0.0002	0.00020	0.07000	< 0.001	< 0.001	< 0.001	0.0032	0.0016	< 0.001	0.0083	0.0079
Bromoform	mg/l	0.0002	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	mg/l	0.0002	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,1,2,2-Tetrachloroethane	mg/l	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	mg/l	-	0.00020	0.07000	<0.001	<0.001	< 0.001	0.0015	< 0.001	< 0.001	0.0023	0.0022
1,2,3-Trichloropropane Isopropylbenzene	mg/l	-	-	-	<0.050 <0.001	<0.050 <0.001	<0.050	<0.050	<0.050 <0.001	<0.050	<0.050 <0.001	<0.050 <0.001
Bromobenzene	mg/l mg/l	-	-	-	<0.001	<0.001	<0.001	< 0.001	<0.001	<0.001	<0.001	<0.001
2-Chlorotoluene	mg/l	-	-	-	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Propylbenzene	mg/l	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	mg/l	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,2,4-Trimethylbenzene	mg/l	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0065	0.0045
4-Isopropyltoluene	mg/l	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,3,5-Trimethylbenzene	mg/l	-	- 0.00000	- 0.05000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,3-Dichlorobenzene 1,4-Dichlorobenzene	mg/l mg/l	-	0.00300 0.00300	0.05000 0.05000	<0.001 <0.001	<0.001 <0.001	<0.001	<0.001 <0.001	<0.001 <0.001	<0.001	<0.001	<0.001 <0.001
sec-Butylbenzene	mg/l mg/l	-	0.00300	0.03000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
tert-Butylbenzene	mg/l	-	-	_	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
1,2-Dichlorobenzene	mg/l	-	0.00300	0.05000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
n-Butylbenzene	mg/l		-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,2-Dibromo-3-chloropropane	mg/l	0.1	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2,4-Trichlorobenzene	mg/l	-	0.00001	0.01000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	mg/l	-	-	-	< 0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,2,3-Trichlorobenzene	mg/l		$\alpha \alpha \alpha \alpha \alpha \alpha 1$	$\alpha \alpha $		- /0.001	-0 001	- /n nn1	< 0.001	< 0.001	< 0.001	< 0.001
Hexachlorobutadiene	mg/l	-	0.00001	0.01000	<0.001 <0.001	<0.001 <0.001	<0.001	<0.001	< 0.001	<0.001	<0.001	< 0.001

Values are underlined wherever Dutch-TV is exceeded

Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded

-' signifies analysis not carried out on sample or no Dutch Criteria or EPA Guideline Value is available.

Table A10.2. Results of Semi-volatile Organic Compound Laboratory Analysis on Surface Water and Groundwater Samples taken from Surface Water Bodies and Groundwater Monitoring Wells at Former Landfill at Tullyvogheen

					SUR	FACE WA	ΓER	GR	OUNDWAT	ER	LEAC	HATE
Parameters	Units	SI 81, 1988 Water Quality (Human Consumption)	Dutch Criteria Level TV	Dutch Criteria Level IV	WA-SW1-01 (UPGRADIENT)	WA-SW2-01 (DOWNGRADIENT)	WA-SW3-01 (DOWNGRADIENT)	WA-BH101-01 (UPGRADIENT)	WA-BH102-01 (DOWN- GRADIENT)	WA-BH103-01 (DOWN- GRADIENT)	WA-LCI-01	WA-LC2-01
Phenol	mg/l	0.0005	0.20000	2.00000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2-Chlorophenol	mg/l	0.0005	0.00030	0.10000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,4-Dichlorophenol	mg/l	0.0005	0.00020	0.03000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,4-Dimethylphenol	mg/l	0.0005	ı	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
4-Chloro-3-methylphenol	mg/l	0.0005	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,4,6-Trichlorophenol	mg/l	0.0005	0.00001	0.01000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,4,5-Trichlorophenol	mg/l	0.0005	0.00001	0.01000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Pentachlorophenol	mg/l	0.0005	0.00004	0.00300	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2-Methylphenol	mg/l	0.0005	_	_	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
4-Methylphenol	mg/l	0.0005	_	_	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2-Nitrophenol	mg/l	0.0005	_	_	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
4-Nitrophenol	mg/l	0.0005	_	_	< 0.0005	<0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,3-Dichlorobenzene	mg/l	0.1	0.00300	0.05000	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,4-Dichlorobenzene	mg/l	0.1	0.00300	0.05000	< 0.0005	<0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2-Dichlorobenzene	mg/l	0.1	0.00300	0.05000	<0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
1,2,4-Trichlorobenzene	mg/l	0.1	0.00300	0.03000	<0.00055	< 0.0005	<0.0005	< 0.0005	<0.0005	< 0.0005	< 0.0005	<0.0005
			0.00001	0.01000	<0.00055 ≤0.0005	<0.0005	<0.0005	< 0.0005	<0.0005	< 0.0005	<0.0005	<0.0005
Nitrobenzene Azobenzene	mg/l	-	-	-	\$0.0005 \$0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.0005	<0.0005	
	mg/l			0.00050								<0.0005
Hexachlorobenzene	mg/l	-	0.00000009	0.000500	<0.0005 <0.0005	<0.0005	<0.0005	< 0.0005	<0.0005	<0.0005	< 0.0005	<0.0005
2-Chloronaphthalene	mg/l	0.0002	=	0.006	< 0.0005	<0.0005	< 0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005
2-Methylnaphthalene	mg/l	0.0002	-	in dit	< 0.0005	<0.0005	<0.0005	< 0.0005	<0.0005	<0.0005	< 0.0005	<0.0005
Carbazole	mg/l	-	-	toraling	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Isophorone	mg/l	-	-	COA.	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dibenzofuran	mg/l	-	- 0	<u>-</u>	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dimethyl phthalate	mg/l	-	- ASEM	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Diethyl phthalate	mg/l	-	Ço,	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Di-n-butylphthalate	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Di-n-octylphthalate	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Bis(2-ethylhexyl)phthalate	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Butylbenzylphthalate	mg/l	-	=	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
4-Chloroaniline	mg/l	-	-	0.030	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2-Nitroanaline	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
3-Nitroaniline	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
4-Nitroaniline	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,4-Dinitrotoluene	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
2,6-Dinitrotoluene	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Bis(2-chloroethyl)ether	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
4-Bromophenylphenylether	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
4-Chlorophenylphenylether	mg/l	0.1	=	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Hexachloroethane	mg/l	-	-	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Hexachlorobutadiene	mg/l	-	_	_	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Hexchlorocyclopentadiene	mg/l	_	_	_	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Bis(2-chloroethoxy)methane	mg/l	-		_	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0005	< 0.0005	< 0.0005
N-nitrosodi-n-propylamine	mg/l			-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0005	< 0.0005	< 0.0005	<0.0005
13-minosour-n-propyramme	1118/1	 	-	-	\0.0003	\0.0003	\0.000 <i>3</i>	\0.000 <i>3</i>	\U.UUU3	\0.000 <i>3</i>	\0.000 <i>3</i>	\0.000 <i>3</i>
	Notes:	I				<u> </u>						

Table A10.3. Results of MTBE/BTEX and PAH Analysis on Groundwater and Leachate Samples taken from Groundwater Monitoring Wells and Piezometers at Tullyvogheen, Clifden, County Galway

CHEMICAL SUB	BGROUPING	F	Petrol	Rang	ge Or	ganio	es							Polya	aromat	ic Hyd	rocark	oons (P	AHS)						
	Parameter	MTBE	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)+ Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(123cd)pyrene	Dibenzo(ah)anthracene	Benzo(ghi)perylene	Coronene	Total 16 EPA PAHs	Total 17 EPA PAHs
	Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l
DUTCH CRITERIA	Dutch Intervention Levels	-	30	1000	150	70	70	70	-	-	-	5	5	1	-	0.5	0.2	0.05	0.05	0.05	-	0.05	-	-	-
	Dutch Target Level	-	0.2	7	4	0.2	0.2	0.01	-	-	-	0.003	0.0007	0.003	-	0.0001	0.003	0.0004	0.0005	0.0004	-	0.0003	-	-	-
World Health Organisation Standard	Guideline Values	30	10	700	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption).	MACs	-	-	0.2	0.2	0.2		-	-	-	-	-	ું. -	-	-	-	-	-	-	-	-	-	-	-	-
SI No. 439 of 2000 - EC Drinking Water Regs.	Parametric Values	-	1	-	-	-	-	-	-	-	-	differ	-	-	-	-	-	-	-	-	-	-	-	-	-
EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.	Guideline Values (IGVs)	30	1	10	10	-	-	-	-	-	170 ⁵²⁵ only	Kally	-	-	-	-	-	-	-	-	-	-	-	-	-
EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010	Threshold Values	-	0.75	-	-	-	-	-	- 3	nspection	-	-	-	-	-	-	-	-	0.0075	-	-	-	-	0.075	0.075
DAY SAMPLED	GROUNDWATER WELLS								For	BALL															
24.07.2013	WA-BH1-01	<1	<1	2.30	<1	3.20	1.50	< 0.5	<08	< 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
24.07.2013	WA-BH2-01	<1	<1	1.10	<1	1.60	<1	< 0.5	35EQ0.5	< 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
24.07.2013	WA-BH3-01	<1	<1	<1	<1	<1	<1	<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
	LEACHATE PIEZOMETERS																								
24.07.2013	WA-LC1-01	<1	<1	1.40	1.20	8.30	2.30	< 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
24.07.2013	WA-LC2-01	<1	1.40	1.10	<1	7.90	2.20	<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

Table A10.4 Results of MTBE/BTEX and PAH Analysis on Surface Water Samples taken at Tullyvogheen, Clifden, County Galway

CHEMICAL SU	BGROUPING		Petr	ol Ranş	ge Org	anics								P	olyarom	atic Hyd	rocarbo	ns (PAH)	S)						
	Parameter	MTBE	Benzene	Toluene	Ethylbenzene	m-/p-Xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)+ Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(123cd)pyrene	Dibenzo(ah)anthracene	Benzo(ghi)perylene	Coronene	Total 16 EPA PAHs	Total 17 EPA PAHs
	Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l
World Health Organisation Standard	Guideline Values	30	10	700	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption).	MACs	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	ı	-	-	-	-
SI No. 439 of 2000 - EC Drinking Water Regs.	Parametric Values	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DAY SAMPLED	GROUNDWATER WELLS												e.												
31.01.2014	WA-SW1-01 (UPGRADIENT)	<1	<1	<1	<1	<1	<1	< 0.5	<0.5	<0.5	< 0.5	<0.5ei	<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
31.01.2014	WA-SW2-01 (DOWNGRADIENT)	<1	<1	<1	<1	<1	<1	< 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
31.01.2014	WA-SW3-01 (DOWNGRADIENT)	<1	<1	<1	<1	<1	<1	< 0.5	< 0.5	< 0.5	50.50 FC	<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
1											170 tired														

Values are shaded yellow and in RED bold wherever WHO Standards, S.I. MACS, ST. No. 439 of 2000 Parametric Values are exceeded.

- "'s ignifies analysis not carried out on sample or no Dutch-IV, WHO Standards, SI No. 439 of 2000 Parametric Values, EPA Guideline Values or Groundwater Reg. Threshold Levels are available.

Table A10.5. Results of Organo-Phosphorous Pesticide Laboratory Analyses on Surface Water, Groundwater and Leachate Samples taken from Groundwater Monitoring Wells and Piezometers at Tullyvogheen, Clifden, County Galway

			SURF	ACE WAT	ΓER	GRO	DUNDWA	TER	LEAC	HATE
Parameters	Units	SI 81, 1988 Water Quality (Human Consumption)	WA-SW1-01 (UPGRADIENT)	MASSW2-01 (DOWNGRADIENT)	WA-SW3-01 (DOWNGRADIENT)	WA-BH101-01 (UPGRADIENT)	WA-BH102-01 (DOWN- GRADIENT)	WA-BH103-01 (DOWN- GRADIENT)	WA-LC1-01	WA-LC2-01
ORGANOPHOSPHOROUS PESTICIDES			of its pection of	,						
Azinphos-Methyl	μg/l	0.0001	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Fenthion	μg/l	0.0001	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Finitrothion	μg/l	0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phorate	μg/l	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Trichloronate	μg/l	0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sulprofos	μg/l	0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Prothiophos	μg/l	0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Coumaphos	μg/l	0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Demeton (O+S)	μg/l	0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Disulfoton	μg/l	0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Notes:

553

Values are shaded yellow and in RED bold wherever SI No. 81 of 1988 MACs are exceeded

Table A10.6. Results of Chlorinated Pesticide Acid Herbicide Laboratory Analyses on Surface Water, Groundwater and Leachate Samples taken from Groundwater Monitoring Wells and Piezometers at Tullyvogheen

					SURF	ACE WA	ΓER	GRO	OUNDWA	TER	LEAC	HATE
Parameters	Units	SI 81, 1988 Water Quality (Human Consumption)	Dutch Criteria Level TV	Dutch Criteria Level IV	WA-SW1-01 (UPGRADIENT)	WA-SW2-01 (DOWNGRADIENT)	WA-SW3-01 (DOWNGRADIENT)	WA-BH101-01 (UPGRADIENT)	WA-BH102-01 (DOWN- GRADIENT)	WA-BH103-01 (DOWN- GRADIENT)	WA-LC1-01	WA-LC2-01
CHLORINATED PESTICIDES		L				I .				·	l	
Chlordane-gamma	μg/l	0.1	_	_	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlordane-Alpha	μg/l	0.1	_	_	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tecnazene	μg/l	0.1	_	_	<0.2	<0.2	< 0.2	<0.2	<0.2	<0.2	< 0.2	< 0.2
Trifluralin	μg/l	0.1	_	_	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hexachlorobutadiene	μg/l	0.1	_	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
alpha-HCH(Lindane)	μg/l	0.1	0.000033		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
beta-HCH(Lindane)	μg/l	0.1	0.000008	_	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
gamma-HCH(Lindane)	μg/l	0.1	0.000008	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TOTAL HCH Compounds (sum of 3)		0.1		1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	μg/l	0.1	0.05			<0.2						
Quintozene (PCNB)	μg/l	0.1	-	-	<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Triallate	μg/l	0.1	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorothalonil	μg/l	0.1	-	-	the 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor	μg/l	0.1	0.000005	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Triadimefon	μg/l	0.1	-	o.514. an	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pendimethalin	μg/l	0.1	-	202,450	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heptachlor Epoxide	μg/l	0.1	-	Apriloge to the state of the st	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o,p'-DDE	μg/l	0.1	- <u>k</u> o	- O. C.	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4.4 '-DDE	μg/l	0.1	- 0000	P' -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
p,p'- $TDE(DDD)$	μg/l	0.1	For its the	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o,p'-TDE	μg/l	0.1	FORTHE	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o,p'-DDT	μg/l	0.1	\$ 500	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4.4.DDT	μg/l	0.1	at or	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4.4.DDD	μg/l	-	0.000000004	0.01	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Endosulfan I	μg/l	0.1	0.0000002	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Aldrin	μg/l	0.1	0.000000009	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Endrin	μg/l	0.1	0.0000001	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dieldrin	μg/l	0.1	0.00000004	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Endosulfan I	μg/l	0.1	0.0000002	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Endosulfan Sulphate	μg/l	0.1	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-Methoxychlor	μg/l	0.1	_	_	<0.2	<0.2	<0.2	<0.2	<0.2	< 0.2	<0.2	<0.2
p,p'-Methyoxychlor	μg/l	0.1	_		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Permethrin	μg/l	0.1	_		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin aldehyde	μg/l	0.1	_		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methoxychlor	μg/l	0.1	-		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	μg/l	0.1			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2,4-D	μg/l	0.1			<0.5	<0.5	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2
Dichlorprop	μg/l μg/l	0.1		-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			-			<0.5	<0.5		<0.5	<0.5		
MCPA MCPP	μg/l	0.1	-	-	<0.5	<0.5	<0.5	<0.5			<0.5	<0.5
MCPB Maconyon	μg/l	0.1	-	-	<0.5			<0.5	<0.5	<0.5	<0.5	<0.5
Mecoprop 2.4.5 T	μg/l	0.1	-	-	< 0.5	< 0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-T	μg/l	0.1	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
						<u> </u>		<u> </u>				
A GVD AVEDDA GVD EG												
ACID HERBICIDES	,,		ı		0.6-	0.5-	.0.6=	0.00	0.0-		.0.6=	0.5-
Atrazine	μg/l	0.1	-	-	< 0.05	<0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05	<0.05
	μg/l μg/l	0.1 0.1	-	-	<0.05 <0.05	<0.05 <0.05	<0.05 <0.05	<0.05 <0.05	<0.05 <0.05	<0.05 <0.05	<0.05 <0.05	<0.05 <0.05

<u>553</u>	Values are underlined wherever Dutch-TV is exceeded
553	Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded
-	-' signifies analysis not carried out on sample or no Dutch Criteria is available.

Table A10.7. Major Ion Balance on Groundwater (BH1, BH2, BH3, LC1 and LC2) and Surface Water Samples (SW1, SW2 SW3) taken at Former Landfill, Tullyvogheen

		Cations			Anions			Balance				
Sample	Elec. Cond. (μScm ⁻¹)	Ca ²⁺ (meq L ⁻¹)	Mg ²⁺ (meq L ⁻¹)	Na ⁺ (meq L ⁻¹)	K ⁺ (meq L ⁻¹)	Cl (meq L-1)	SO ₄ ²⁻ (meq L ⁻¹)	HCO ₃ - (meq L ⁻¹)	$\sum^{+} (\text{meq } L^{-1})$	Σ' (meq L ⁻¹)	% Ion Balance Error	pН
WA-BH1-01	1100	8.48	1.40	0.41	0.24	1.52	1.23	11.76	10.29	14.52	-17.04	7.6
WA-BH2-01	550	4.04	0.67	0.52	0.31	3.10, 15	0.29	5.65	5.54	9.04	-24.04	8.1
WA-BH3-01	490	3.09	1.32	0.13	0.08	1,391	0.12	5.18	4.62	6.51	-17.01	7.7
					2	y. any						
WA-LC1-01	1300	2.84	1.32	0.83	0.49	2.31	1.12	4.94	5.47	8.38	-20.98	7.3
WA-LC2-01	1500	6.99	1.64	0.87	0.50 30	2.09	0.52	9.88	10.01	12.49	-11.01	7.2
					2 Dill edit							
WA-SW1-01	270	0.48	0.35	1.70	0.000 City (0.000	1.86	0.31	1.29	2.52	3.47	-15.82	8.6
WA-SW2-01	280	0.60	0.44	1.61	0.06	1.78	0.25	1.18	2.72	3.20	-8.23	8.3
WA-SW3-01	250	0.46	0.37	1.39	0.05	1.69	0.21	0.89	2.27	2.79	-10.26	8.3
				1,00%								



Environmental Protection Agency Regional Inspectorate John Moore Road, Castlebar

Test Report



Report of: Analysis of landfill site sample(s)

Report to: Galway County Council

Report date: 28/08/12

Facility: Clifden Landfill

Reference No:

Date collected: 02/08/2012 Date received: 02/08/2012

Comments:

- 1) All Metals Analysed in the EPA, Dublin Laboratory
 2) Cyanide Analysed by Alcontrol Laboratories, Dublin
 3) Phenolic Compounds Analysed by Alcontrol Labs.
 4) DRO/PRO/SVOC Analysed by Alcontrol Laboratories
 5) VOCs Analysed by EPA, Kilkenny
 6) Solvents Analysed by EPA, Dublin
 7) nm "Not measured"
 8) nd "None detected"
 9) nt "No time" Time not recorded

- 10) nr "not reported"
 11) no "none observed"
 12) VOB "Visible On Bottom"
 13) tntc "Too numerous to count"
 14) F "Field measured parameters"
 15) Total Kjeldahl Nitrogen = Total Nitrogen Total Oxidised Nitrogen
 16) Colour Analysis: Hazen units = mg/l Pt Co
 17) The scope and accuracy of the analysis will be sent with this report
 18) (**) Indicates results produced from non-accredited analytical methods

9)	nt "No time" - Time not record	led	18) (**) Indicate:	s results produced tom	non-accredited analytic	almethods
				os 1203294		
				व्याप्त, यात्र		
			Laboratory Ref:	203294	1203295	1203296
			Type of samples	1203294 Surface Water	Surface Water	Surface Water
			Sampling point		SW2	SW3
			Sampled by:	Wayne Egan	Wayne Egan	Wayne Egan
			Time Sampled:	14.20	14.30	14.40
		Start/Er	nd - Dates of Analysis:	02-08-12/08-08-12	02-08-12/08-08-12	02-08-12/08-08-12
			Status of results:	Final	Final	Final
Pa	rameter	Units	Limits			
F **	Temperature	°C		15.2	15.4	15.5
F **	Dissolved Oxygen %Sat	% Saturation		96	97	99
B4	рН	pH Units		6.2	6.8	7.1
B5	Conductivity @25°C	μS/cm		109	117	130
B2	Biochemical Oxygen Demand	mg/l O2		1.1	1.1	1.2
В1	Chemical Oxygen Demand	mg/I O2		82	76	57
В7	Suspended Solids	mg/l		<8	<8	<8
C1	Ammonia	mg/l N		<0.03	0.47	0.12
C1	Chloride	mg/l Cl		26	22	23

Carol O' Sulhvan Signed: 28/Aug/2012 Date:

Carol O'Sullivan

Regional Chemist, EPA Castlebar



Environmental Protection Agency Regional Inspectorate John Moore Road, Castlebar

Test Report



Report of: Analysis of landfill site sample(s)

Report to: Galway County Council

Report date: 12/04/12

Facility: Clifden Landfill

Reference No:

Date collected: 05/03/2012 Date received: 05/03/2012

Comments:

- 1) All Metals Analysed in the EPA, Dublin Laboratory
 2) Cyanide Analysed by Alcontrol Laboratories, Dublin
 3) Phenolic Compounds Analysed by Alcontrol Labs.
 4) DRO/PRO/SVOC Analysed by Alcontrol Laboratories
 5) VOCs Analysed by EPA, Kilkenny
 6) Solvents Analysed by EPA, Dublin
 7) nm "Not measured"
 8) nd "None detected"
 9) nt "No time" Time not recorded

- 10) nr "not reported"
 11) no "none observed"
 12) VOB "Visible On Bottom"
 13) tntc "Too numerous to count"
 14) F "Field measured parameters"
 15) Total Kjeldahl Nitrogen = Total Nitrogen Total Oxidised Nitrogen
 16) Colour Analysis: Hazen units = mg/l Pt Co
 17) The scope and accuracy of the analysis will be sent with this report
 18) (**) Indicates results produced from non-accredited analytical methods

			Laboratory Ref:	\$201007	1201008	1201009
			Laboratory Ref: Type of samples	Surface Water	Surface Water	Surface Water
			Sampling point	SW1	SW2	SW3
			Sampled by:	Cathal Ruane	Cathal Ruane	Cathal Ruane
			Time Sampled:	12.45	12.50	13.10
		Start/Er	nd - Dates of Analysis:	05-03-12/22-03-12	05-03-12/22-03-12	05-03-12/22-03-12
			Status of results:	Final	Final	Final
Pa	rameter	Units	Limits			
F **	Temperature	°C		9.0	9.0	9.3
F **	Dissolved Oxygen %Sat	% Saturation		98	98	99
В4	рН	pH Units		6.6	7.0	7.1
В5	Conductivity @25°C	μS/cm		166	212	174
B2	Biochemical Oxygen Demand	mg/l O2		<1.0	1.0	1.2
B1	Chemical Oxygen Demand	mg/l O2		55	36	28
В7	Suspended Solids	mg/l		<8	<8	<8
C1	Ammonia	mg/l N		0.07	2.3	0.46
C1	ortho-Phosphate (as P)	mg/l P		<0.012	<0.012	<0.012
C1	Total Oxidised Nitrogen (as N)	mg/l N		<0.4	<0.4	0.5
C1	Chloride	mg/l Cl		38	31	31
B1	Alkalinity-total (as CaCO3)	mg/l CaCO3		13	46	27
D1	Fluoride	mg/l F		<0.03	<0.03	<0.03
D1	Sulphate	mg/l SO4		2.8	2.3	4.1
**	Cyanide	mg/I CN		<0.05	<0.05	<0.05
**	Boron	μg/l		13	23	16
**	Sodium	mg/l		20	17	17
**	Magnesium	mg/l		2.8	3.1	2.9
**	Potassium	mg/l		0.75	2.0	1.3

Report number: CB1200709/1 Page 1 of 2

			Laboratory Ref:	1201007	1201008	1201009
			Type of sample:	Surface Water	Surface Water	Surface Water
			Sampling point:	SW1	SW2	SW3
			Sampled by:	Cathal Ruane	Cathal Ruane	Cathal Ruane
			Time Sampled:	12.45	12.50	13.10
		Start/E	nd - Dates of Analysis:	05-03-12/22-03-12	05-03-12/22-03-12	05-03-12/22-03-12
			Status of results:	Final	Final	Final
Pa	rameter	Units	Limits			
**	Calcium	mg/l		5	13	9
**	Chromium	μg/l		<0.5	<0.5	<0.5
**	Iron	μg/l		1035	1715	681
**	Manganese	μg/l		140	130	59
**	Nickel	μg/l		<0.5	<0.5	<0.5
**	Copper	μg/l		<0.5	0.6	0.7
**	Zinc	μg/l		4.0	3.7	4.4
**	Arsenic	μg/l		<0.5	<0.5	<0.5
**	Selenium	μg/l		<0.5	<0.5	<0.5
**	Cadmium	μg/l		<0.1	<0.1	<0.1
**	Antimony	μg/l		<0.5	<0.5	<0.5
**	Barium	μg/l		7	17	10
**	Mercury	μg/l		<0.05	<0.05	<0.05
**	Lead	μg/l		<0.5	<0.5	<0.5
**	Uranium	μg/l		<0.10ther	<0.1	<0.1
				<0.05 <0.5 <0.10 Test 186 <0.10 Test 186		

Carol O' Sullivan
Regional Chemist, ERA Castlebar Signed: 12/Apr/2012 Date:

Report number: CB1200709/1 Page 2 of 2



Environmental Protection Agency Regional Inspectorate John Moore Road, Castlebar

Test Report



Report of: Analysis of landfill site sample(s)

Report to: Galway County Council

Report date: 04/12/12

Facility: Clifden Landfill

Reference No:

Date collected: 14/11/2012 Date received: 14/11/2012

Comments:

- 1) All Metals Analysed in the EPA, Dublin Laboratory
 2) Cyanide Analysed by Alcontrol Laboratories, Dublin
 3) Phenols/Anionic Surfactants Analysed by Alcontrol
 4) DRO/PRO/SVOC Analysed by Alcontrol Laboratories
 5) VOCs Analysed by EPA, Kilkenny
 6) Solvents Analysed by EPA, Dublin
 7) nm "Not measured"
 8) nd "None detected"
 9) nt "No time" Time not recorded

- 10) nr "not reported"
 11) no "none observed"
 12) VOB "Visible On Bottom"
 13) tnte "Too numerous to count"
 14) F "Field measured parameters"
 15) Total Kjeldahl Nitrogen = Total Nitrogen Total Oxidised Nitrogen
 16) Colour Analysis: Hazen units = mg/l Pt Co
 17) The scope and accuracy of the analysis will be sent with this report
 18) (**) Indicates results produced from non-accredited analytical methods

9) 1	nt "No time" - Time not record	ded	18) (**) Indicate:	and any other c	non-accredited analytic	almethods
			Laboratory Ref:	205295	1205296	1205297
			Type of sample	1205295 Water Water	Surface Water	Surface Water
			Sampling points	SW1	SW2	SW3
			Sampled by:	Cathal Ruane	Cathal Ruane	Cathal Ruane
			Time Sampled:	13.05	12.50	12.40
		Start/En	d - Dates of Analysis:	14-11-12/21-11-12	14-11-12/21-11-12	14-11-12/21-11-12
			Status of results:	Final	Final	Final
Pa	rameter	Units	Limits			
*	Temperature	°C		9.4	9.5	9.6
*	Dissolved Oxygen %Sat	% Saturation		94	96	98
34	рН	pH Units		6.2	6.6	6.7
35	Conductivity @25°C	μS/cm		112	104	112
32	Biochemical Oxygen Demand	mg/l O2		1.0	<1.0	<1.0
31	Chemical Oxygen Demand	mg/l O2		71	51	37
37	Suspended Solids	mg/l		<8	<8	<8
21	Ammonia	mg/l N		0.06	0.19	0.07
21	Chloride	mg/l Cl		26	21	22
_						

Carol O' Sulhvan Signed: Date: 04/Dec/2012

Carol O'Sullivan

Regional Chemist, EPA Castlebar

Report number: CB1203853/1 Page 1 of 1