

Luas Finglas

Environmental Impact Assessment Report 2024

Appendix A11.2: Generic Qualitative Risk Assessment Report



Luas Finglas Rail Project

Generic Quantitative Risk Assessment

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1 Introduction

1.1 Description of the Project

Gavin & Doherty Geosolutions have been requested by J B Barry and Partners to undertake a review and screening of analysis results from soil samples taken as part of investigations associated with the Luas Finglas Rail Project, Dublin, Ireland.

The Luas Finglas Rail Project includes two sections of construction that are understood to be near or adjacent to potentially infilled land, including a possible landfill site. These areas have been identified as St Helena's Road (North and South) and Tolka Valley Park, as presented in Figure 1-1. These areas shall be the focus of this assessment, however the remainder of the testing of the soils from along the proposed Luas route will also be screened. The site location plans and full proposed route of the rail project are included in Appendix A.

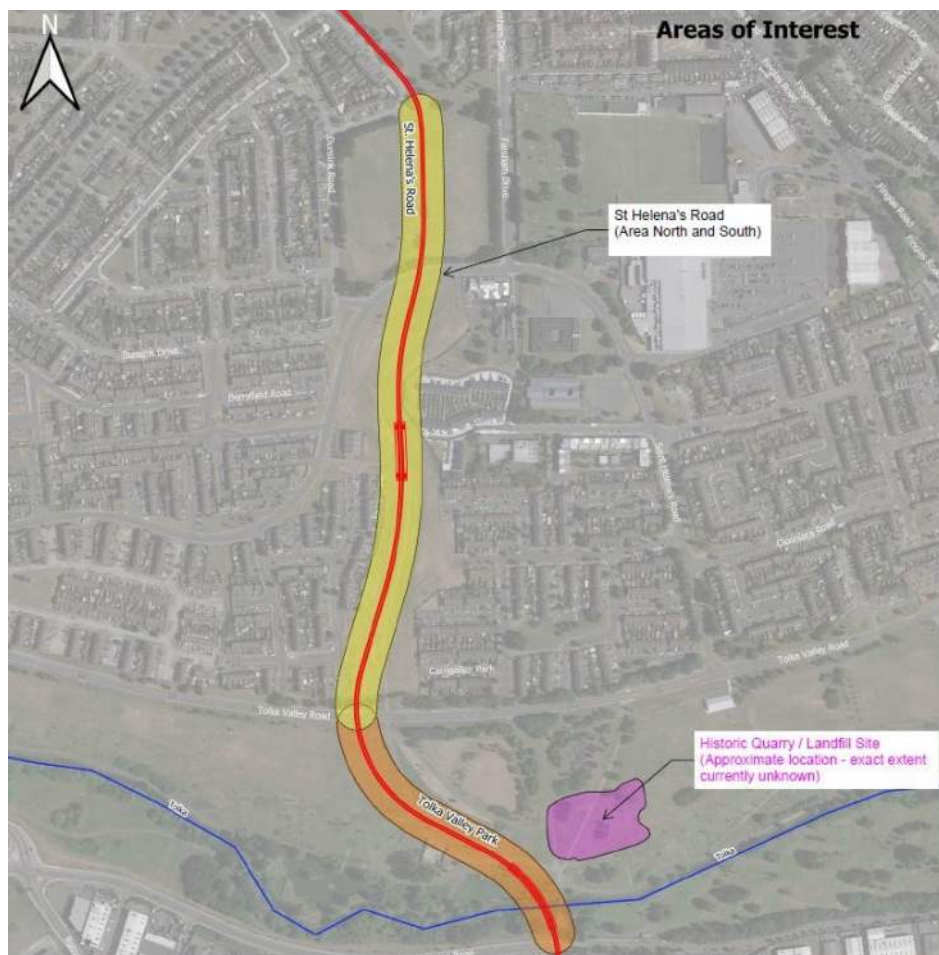


Figure 1-1 Areas of interest with regards potential contamination, highlighted in yellow and orange (JB Barry Drawing 2021)

1.2 Scope of Report

The scope of this report is as follows:

- Summarise the details of the ground investigation undertaken in relation to environmental investigation of the soils along the proposed Luas route,
- Present the ground conditions for the main geological units encountered across the area of interest,
- Present the geo-environmental soil testing results,
- Undertake a Generic Quantitative Risk Assessment and subsequently highlight any contaminants of concern,
- Recommend any remedial measures with regards to contamination within the soil, if required.
- Present the waste classification and Waste Acceptance Criteria to inform disposal, if required.

2 Ground Investigation

2.1 Field Work

A ground investigation was undertaken by Ground Investigation Ireland Ltd. between October 2021 to January 2022 in general accordance with IS EN 1997-2:2007, BS5930:2015 and BS10175:2011+A1:2013 and associated standards.

Along the proposed Luas route works comprised of:

- 21 No. Machine Excavated Trial Pits
- 35 No. Windowless Sample Boreholes
- 43 No. Cable Percussive Boreholes (42 No. with Rotary Core follow on)
- 3. No Rotary Core only Boreholes

Samples were taken from the trial pits, windowless samples, and the cable percussive phase for environmental testing.

A ground investigation plan showing the exploratory hole locations is provided in Appendix A. Logs for the investigation locations are included in Appendix B.

2.2 Sampling Strategy

Samples were taken at regular depths, changes in strata and any discrete horizons.

Samples scheduled for analysis of organic contaminants were inserted in amber bottles with little to no headspace. The bottles were then immediately sealed with polytetrafluoroethylene (PTFE) lined caps and labelled. The remaining small-disturbed samples were placed in polypropylene tubs with a

minimum of headspace, sealed with airtight polypropylene lids and labelled. The labels detailed individual sample number, location, depth, and sampler identity.

Collected samples were stored away from sunlight in temperature-controlled conditions and transported to Element Materials technology by courier. Chain of custody were completed for all samples sent off. The forms detailed individual bottle identification number and sample locations.

Two hundred and one disturbed soil samples were selected for laboratory analysis. The laboratory analyses scheduled were selected to establish the type, level and distribution of possible harmful contaminants that may be present on the site given its past and current uses.

2.2.1 Analysis Suite

Samples were tested for a broad range of possible contaminants, typically known as Suite E, as per the “Specification and related documents for Ground Investigation in Ireland”. The suite includes:

- Heavy metals: arsenic, boron, cadmium, chromium (total), copper, lead, mercury, nickel, and zinc
- pH
- Water soluble sulphate (as SO₄)
- Organic matter
- Total Petroleum Hydrocarbons (TPHs)
- Polycyclic aromatic hydrocarbons (PAHs) – USEPA16
- Phenols
- Cyanide
- Asbestos

In addition to the Suite E determinands, GDG also requested analysis for:

- An extended heavy metals suite, including antimony, barium, beryllium, molybdenum, and selenium
- Polychlorinated Biphenyls (PCBs)
- BTEX
- Semi-volatile and Volatile Organic Compounds (SVOCS, VOCs)
- Chromium III and Chromium VI
- Total Organic Carbon
- Acid/alkali reserve
- Asbestos quantification (where asbestos was indicated during ID)

With regards the PCBs, BTEX, SVOCS and VOCs it was anticipated that these would be tested for in the event that evidence of this type of contamination was encountered during the works.

The suite will enable a full assessment of the geo-environmental ground conditions, and also allow a more appropriate assessment with regards hazardous properties when considering possible reuse, or less desirably, disposal to landfill.

3 Site Attendance

A GDG engineer attended site during the excavation of trial pits LF-TP-2010 and LF-TP-2011 in Tolka Valley Park. Photographs from this visit are included in Figure 3-2 to Figure 3-5, and the locations are highlighted in blue in Figure 3-1.

The engineer noted that at LF-TP-2010, a reworked clay with occasional brick fragments 2.6m thick (i.e., a cap) overlying Made Ground between 2.6m and the termination depth of 4.35m bgl. This Made Ground showed characteristics of landfill waste, with lots of plastic, shoes, magazines, and other domestic waste. A bad odour was noted, consistent with decomposing waste. The depth of the landfill material was not confirmed, as was restricted by the depth that the excavator could reach.

At LF-TP-2011, plastic waste was noted throughout the soils, with soil mixed with plastic bags and metal rebar. The material became more cohesive with depth, and a mudstone boulder or bedrock was identified at 3.2m bgl. No odours or evidence of obvious contamination was noted.

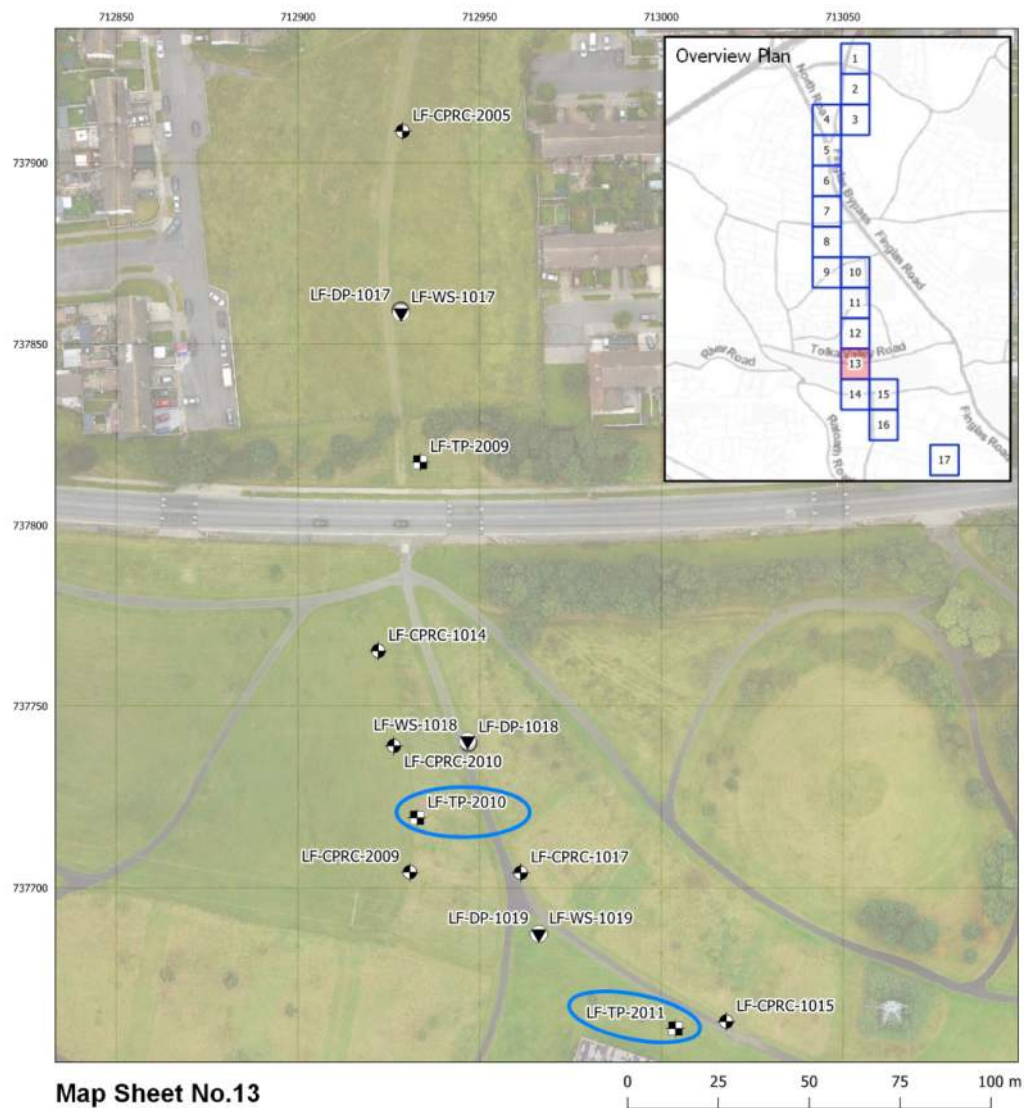


Figure 3-1 Tolka Valley Park Map Sheet 13. Blue indicates locations supervised by GDG



Figure 3-2 Overview of Tolka Valley Park, facing east



Figure 3-3 Overview of Tolka Valley Park, facing west from LF-TP 2011



Figure 3-4 Landfill Waste Excavated from LF-TP-2010



Figure 3-5 LF-TP-2011 Excavation. Visible sandy cap over landfill material

4 Ground Conditions

This section will summarise the ground conditions encountered within the previously identified areas where there was potential for contamination:

- Tolka Valley Park, Appendix A Map Sheet No.'s 13 to 15. Historic area of quarrying and landfill.
- St Helena's Road, Appendix A Map Sheet No.'s 10 to 13. Potential for landfill.

4.1 Tolka Valley Park

Nineteen exploratory hole locations considered for Tolka Valley Park are outlined in Table 4-1, the Site Investigation Plan can be found in Appendix A.

Table 4-1 Tolka Valley Park Exploratory Hole Locations

Map Sheet from SI Plan	Location ID
13	LF-TP-2010
13	LF-TP-2011
13	LF-WS-1018
13	LF-WS-1019
14	LF-WS-1020
14	LF-WS-1021
15	LF-WS-1022
13	LF-CPRC-1014
13	LF-CP-2010
13	LF-CPRC-2009
13	LF-CPRC-1017
13	LF-CPRC-1015
14	LF-CPRC-1016
14	LF-CPRC-2006
14	LF-CPRC-2007
15	LF-CPRC-1018
15	LF-RC1019
15	LF-CPRC-1020
15	LF-CPRC-1021

4.1.1 Made Ground

Most exploratory hole locations were overlain by Topsoil, which was generally described as slightly sandy and gravelly, which ranged in thickness between 0.20m and 0.30m. In locations LF-CPRC-1020 and LF-CPRC-1021 the Made Ground was overlain by 0.10m of tar road surfacing and location LF-WS-1022 was overlain by 0.15m of concrete.

The field logs do not clearly identify capping over the landfill materials described below, however the GDG supervising engineer observed that material likely to be a cap was present at both trial pits that were observed.

Made Ground consistent with domestic waste was encountered at all investigation locations at thicknesses between 0.75m and 5.55m.

Materials varied, dominantly comprising gravel and clay derived from various lithologies, brick and other waste materials. Concrete, slag, metal, plastic, glass, ceramic, tile, fabric, topsoil, wood, shells, charcoal, and tar. These materials are consistent with that of landfill waste. Boulders and cobbles were encountered locally.

With the deeper Cable Percussive and Rotary Coring borehole locations LF-CPRC-2009, LF-CPRC-1017, LF-CPRC-1015, LF-CPRC-1016 and LF-CPRC-2006, the Made Ground was found to be sitting directly at shallow depths of bedrock. Locations LF-CPRC-1015, LF-CPRC-1016, LF-CPRC-1017, LF-CPRC-2006 and LF-CPRC-2009 encountered Lucan Formation limestone at shallow depths between 1.6m bgl and 5.8m bgl.

4.1.2 Natural Deposits

A layer of Glacial Till (approximately 0.90m and 8.85m thick) of firm to very stiff slightly sandy gravelly clay was generally encountered at 8 of 19 investigation locations along the Tolka Valley Park region of the proposed Luas route. It was found to be firm to very stiff, slightly sandy, and slightly gravelly clay. With cobbles and boulders encountered locally.

At location LF-CPRC-1021 Alluvium was encountered at 11.45m bgl, of a thickness of 3.95m. The deposit consists of a succession of layers of sandy angular gravel of mixed lithology, overlying slightly clayey sand, over sandy clayey silt, on top of slightly gravelly silty clay.

4.1.3 Bedrock

Limestone bedrock belonging to the Lucan Formation was encountered at ten of the investigation points, as presented in Table 4-2.

Table 4-2 Depth to limestone bedrock

Map Sheet from SI Plan	Location ID	Bedrock Depth (m bgl)
13	LF-TP-2010	>4.5
13	LF-TP-2011	>3.2
13	LF-WS-1018	>4.0
13	LF-WS-1019	>1.7
14	LF-WS-1020	>1.2
14	LF-WS-1021	>1.0
15	LF-WS-1022	>1.7
13	LF-CPRC-1014	7.2
13	LF-CPRC-2010	>5.4

Map Sheet from SI Plan	Location ID	Bedrock Depth (m bgl)
13	LF-CPRC-2009	5.8 (weathered)
13	LF-CPRC-1017	1.6
13	LF-CPRC-1015	1.8 (weathered)
14	LF-CPRC-1016	3.5 (partially weathered)
14	LF-CPRC-2006	2.3
14	LF-CPRC-2007	5.0
15	LF-CPRC-1018	11.6
15	LF-RC-1019	10.65
15	LF-CPRC-1020	15.4
15	LF-CPRC-1021	>9.0

4.1.4 Ground Model

The Ground Model presented in Table 4-3 outlines the strata encountered during the intrusive site investigations in Tolka Valley Park.

Table 4-3 Tolka Valley Park Ground Model

Material Name	Typical Description	Depth (m bgl)	
		From	To
Superficial Geology			
Topsoil	Slightly sandy and gravelly topsoil	0.00	0.10-0.30
Made Ground	A combination of sandy, silty CLAY and GRAVEL. Comprised of a mixture of heterogenous material including red brick, plastic, plastic sheeting, glass, metal, ceramics, tar, mortar, fabric, slag, occasional plant fragments, charcoal, shells, gravel of limestone.	0.00-0.30	1.00-5.80
Glacial Till	Firm to very stiff slightly sandy, gravelly CLAY with some cobble and boulder fragments.	1.20-5.80	4.00-15.40
Bedrock			
Lucan Formation	Fine grained grey limestone, interbedded with a fine grained black mudstone.	1.60-15.40	-

4.2 St. Helena's Road

Twenty exploratory hole locations for the St Helena's Road proposed Luas route are outlined in Table 4-4, the Site Investigation Plan can be found in Appendix A.

Table 4-4 St Helena's Road Exploratory Hole Locations

Map Sheet from SI Plan	Location ID
10	LF-TP-2002
10	LF-TP-2003
10	LF-TP-2004
11	LF-TP-2005
12	LF-TP-2006
12	LF-TP-2007
12	LF-TP-2008
13	LF-TP-2009
10	LF-WS-1010
10	LF-WS-1011
10	LF-WS-1012
11	LF-WS-1013
11	LF-WS-1014
12	LF-WS-1016
12	LF-WS-1015
13	LF-WS-1017
11	LF-CPRC-1012
11	LF-CPRC-2004
12	LF-CPRC-1013
13	LF-CPRC-2005

4.2.1 Made Ground

Made Ground was encountered at all 20 exploratory hole locations at thickness between 0.5m and 5.7m. Slightly sandy and gravelly Topsoil was found to overlay the Made Ground at all locations at thicknesses between 0.1m and 0.4m. The Made Ground soils varied in composition, predominantly composed as a gravel or clay with heterogenous materials including red brick, concrete, metal plastic, timber, old topsoil and plant roots, ceramic, mortar fragments. Cobbles were encountered locally. This material is not deemed to represent domestic waste, as at Tolka Valley Park.

4.2.2 Natural Deposits

Glacial till was encountered at all but one location in the St Helena's Road investigation, firm to very stiff slightly sandy gravelly clay was encountered at depths between 0.70m bgl and 7.80m bgl, with thickness ranging from 0.3m and 9.4m.

A thin layer (approximately 0.6m to 1.9m thick) of Alluvium was encountered at three of 20 exploratory hole locations. Comprising of a succession of a medium to dense slightly silty sand and a clayey sandy fine to coarse gravel.

4.2.3 Bedrock

Limestone bedrock belonging to the Lucan Formation was encountered at 10.3m bgl at LF-CPRC-1012 and 17.2m bgl at LF-CPRC-2004 only.

4.2.4 Ground Model

The Ground Model found in Table 4-5 outlines the strata encountered during the intrusive site investigation in St Helena's Road area.

Table 4-5 St Helena's Road Ground Model

Material Name	Typical Description	Depth (m bgl)	
		From	To
Superficial Geology			
Topsoil	Slightly sandy and gravelly topsoil	0.00	0.10-0.40
Made Ground	A combination of sandy, silty CLAY and GRAVEL. Comprised of a mixture of heterogenous material including red brick, concrete, metal, tree roots, plastic bags, ceramic, wood, glass, mortar.	0.10-0.40	0.70-5.90
Glacial Till	Firm to very stiff slightly sandy, gravelly CLAY with some cobble and boulder fragments	0.70-7.80	3.00-17.20
Granular soil derived from limestone	Comprises of medium to dense slightly silty clayey fine to medium grained SAND and very clayey and sandy fine to coarse subangular to rounded GRAVEL with occasional cobbles and boulders.	3.90-5.90	4.50-7.80
Bedrock			
Lucan Formation	Fine grained grey limestone, interbedded with a fine grained black mudstone.	10.30-17.20	-

4.3 Evidence of Contamination

In addition to the evidence of landfill waste and Made Ground observed, localised evidence of hydrocarbon contamination was observed at one exploratory hole along the proposed Luas route (LF-CPRC-2010). Table 4-6 summarises the evidence of contamination encountered during the ground investigation.

Table 4-6 Exploratory Hole Location Contamination

Location ID	From (mBGL)	To(mBGL)	Lithology	Contamination
LF-CPRC-2010	3.00	4.20	Made Ground	Faint hydrocarbon odour
LF-CPRC-2011	Approx. 1.20	-	Made Ground	Visual identification of asbestos

The location of LF-CPRC-2010 is shown in Figure 4-1 and is in Tolka Valley Park which was previously identified to contain areas of historic landfill. The ground conditions of the borehole are summarised in Table 4-7. The borehole was terminated at 5.40m bgl due to refusal.

Table 4-7 LF-CPRC-2010 ground condition summary

Material Name	Typical Description	Depth (mBGL)	
		From	To
Topsoil	Slightly Gravelly	0	0.30
Made Ground	Slightly sandy gravelly clay with fragments of red brick, plastic, mortar, charcoal, shells, slag, glass, ceramic	0.30	4.20
Clay	Stiff and very stiff slightly sandy and gravelly clay with occasional subangular cobbles	4.20	-

The client has informed GDG that potential visual contamination of asbestos was observed by the drillers, in exploratory hole location LF-CPRC-2011 at 1.20m bgl. The location is out with the focus area of this report. No sample of the suspected material was collected to confirm the identification.

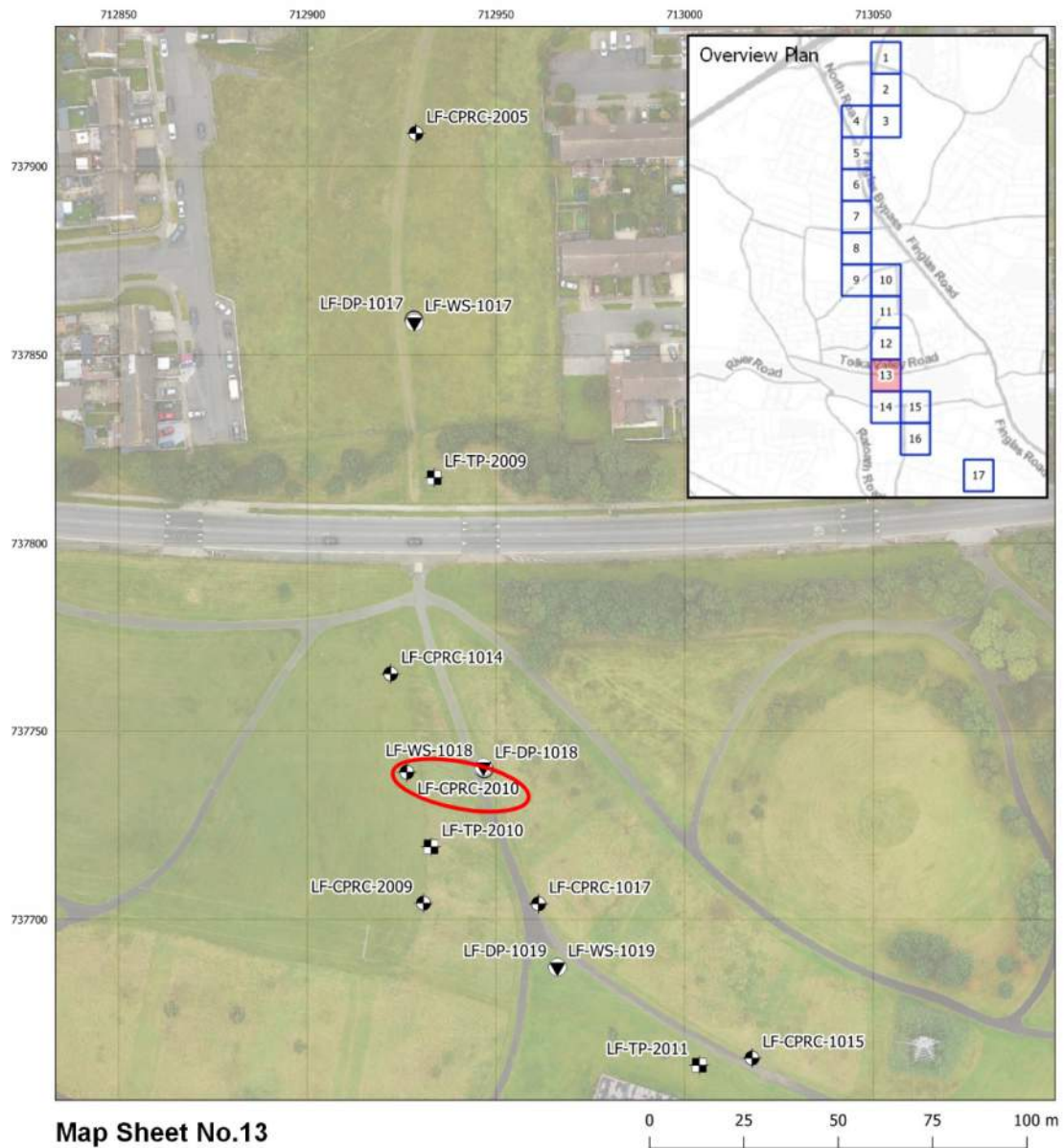


Figure 4-1 Tolka Valley Park Map Sheet 13. Red highlights location of LF-CPRC-2010

5 Generic Quantitative Risk Assessment

5.1 Soil Assessment Criteria

The risk from soil contamination is considered in the context of:

- Site users and future site users
- Construction workers
- Buried concrete

A Generic Quantitative Risk Assessment (GQRA) for human health was carried out by comparing contaminant concentrations against appropriate Generic Assessment Criteria (GAC). These have been generated to reflect risk scenarios including Public Open Space (Park), which is applicable in this project.

GAC's pertinent to the end use have been taken from Chartered Institute of Environmental Health (CIEH) /Land Quality Management (LQM) and Environmental Agency Soil Guideline Values (SGV) in accordance with Contaminated Land: Applications in Real Environments (CL:AIRE) sources.

The Organic Matter Content was found to range between 0.4% and 8.4% across the whole investigation area and GAC pertinent to this organic matter content was selected where appropriate. The average pH ranged between 7.29 and 10.76.

Risk of chemical attack on buried concrete will be assessed by comparing water soluble sulphate and pH levels in the soil with table C2 of BRE Special Digest 1:2005.

5.2 Statistical Analysis of Data

Where appropriate, chemical data for soils can be considered statistically in general accordance with the guidelines given in Chartered Institute of Environmental Health Publication *Guidance on Comparing Soil Contamination Data with a Critical Concentration* (May 2008).

5.3 Limitations

It should be noted that the interpretation of the results of the physical area is based on a limited number of investigation points and GDG did not supervise the works, with exception to two trial pits. The locations and numbers of the investigation locations are governed by cost-benefit, structure and accessibility etc. Although reasonable inferences will be made during the interpretation, variances in the distribution and physical/chemical characteristics of the strata present may exist between the investigation locations.

6 Results and Screening

Full results are provided in Appendix C and are summarised in Table 6-1 for determinands which were measured above the Limit of Detection (LOD). The Generic Assessment Criteria (GAC) threshold values, number of exceedances, and the number of tests are included in Table 6-1.

Table 6-1 Soil Test Results

Determinand	Maximum Determinand (mg/kg)	Generic Assessment Criteria (mg/kg)	Source	Number of exceedances
Heavy Metals				
Antimony	6.00	-	-	-(17)
Arsenic	38.00	170	S4UL 2015	0(147)
Barium	269.00	-	-	-(17)
Beryllium	3.60	63	S4UL 2015	0(137)
Cadmium	5.30	560	S4UL 2015	0(147)
Chromium (III)	82.50	8600	S4UL 2015	0(147)
Copper	375.00	44000	S4UL 2015	0(151)
Lead	401.00	Min: 580 Max: 1400	S4UL 2015	0(147)
Mercury	1.80	240	S4UL 2015	0(147)
Molybdenum	6.60	-	-	-(17)
Nickel	177.70	3400	S4UL 2015	0(147)
Selenium	5.00	1800	S4UL 2015	0(147)
Water Soluble Boron	2.90	-	-	-(137)
Zinc	469.00	17000	S4UL 2015	0(151)
Magnesium	3289.00	-	-	-(4)
Manganese	1581.00	-	-	-(6)
Phosphorus	1336.00	-	-	-(3)
Potassium	2156.00	-	-	-(4)
Other				
Asbestos	Chrysotile Fiber Bundles	Presence	HSA	2(147)
Sulphate (Water Soluble)	576.1 mg/l	500 mg / l	BRE SD1:2005	1(157)
Phenol	0.03	1500	S4UL 2015	0(136)
TPH				
Aliphatic >C8-C10 (HS_1D_AL)	1.80	18000	S4UL 2015	0(147)
Aliphatic >C10-C12 (EH_CU_1D_AL)	23.90	230000	S4UL 2015	0(147)
Aliphatic >C12-C16 (EH_CU_1D_AL)	140.00	25000	S4UL 2015	0(147)
Aliphatic >C16-C21 (EH_CU_1D_AL)	307.00	3800	S4UL 2015	0(147)
Aliphatic >C21-C35 (EH_CU_1D_AL)	609.00	3800	S4UL 2015	0(147)
Aliphatic >C35-C40 (EH_1D_AL)	26.00	250000	S4UL 2015	0(147)
Aliphatic >C6-C10 (HS_1D_AL)	1.10	-	S4UL 2015	-(11)
Aliphatic >C10-C25 (EH_1D_AL)	39.00	-	S4UL 2015	-(11)

Determinand	Maximum Determinand (mg/kg)	Generic Assessment Criteria (mg/kg)	Source	Number of exceedances
Aliphatic >C25-C35 (EH_1D_AL)	87.00	-	S4UL 2015	-(11)
Aromatic >EC8-EC10 (HS_1D_AR)	0.20	8500	S4UL 2015	0(147)
Aromatic >EC10-EC12 (EH_CU_1D_AR)	5.60	9700	S4UL 2015	0(147)
Aromatic >EC12-EC16 (EH_CU_1D_AR)	109.00	10000	S4UL 2015	0(147)
Aromatic >EC16-EC21 (EH_CU_1D_AR)	307.00	7700	S4UL 2015	0(147)
Aromatic >EC21-EC35 (EH_CU_1D_AR)	302.00	7800	S4UL 2015	0(147)
Aromatic >EC35-EC40 (EH_1D_AR)	130.00	7800	S4UL 2015	0(147)
Aromatic >EC6-EC10 (HS_1D_AR)	10.00	-	-	-(11)
Aromatic >EC10-EC25 (EH_1D_AR)	125.00	-	-	-(11)
Aromatic >EC25-EC35 (EH_1D_AR)	153.00	-	-	-(10)
PCBs				
PCB 28	0.016	-	-	-(76)
PCB 52	0.01	-	-	-(76)
PCB 101	0.036	-	-	-(76)
PCB 118	0.01	-	-	-(76)
PCB 138	0.077	-	-	-(76)
PCB 153	0.115	-	-	-(76)
PCB 180	0.138	-	-	-(76)
Monoaromatics & Oxygenates				
MTBE	0.078	-	-	-(180)
Benzene	0.023	11	S4UL 2015	0(180)
Toluene	0.043	95000	S4UL 2015	0(180)
Ethylbenzene	0.019	22000	S4UL 2015	0(180)
m/p-Xylene	0.036	-	S4UL 2015	-(180)
o-Xylene	0.02	24000	S4UL 2015	0(180)
PAHs				
Naphthalene	0.64	76.4 sol	S4UL 2015	0(178)
Acenaphthylene	0.55	30000	S4UL 2015	0(180)
Acenaphthene	1.86	30000	S4UL 2015	0(180)
Fluorene	1.55	20000	S4UL 2015	0(180)
Phenanthrene	11.53	6200	S4UL 2015	0(180)
Anthracene	2.53	150000	S4UL 2015	0(180)
Fluoranthene	9.57	6300	S4UL 2015	0(180)

Determinand	Maximum Determinand (mg/kg)	Generic Assessment Criteria (mg/kg)	Source	Number of exceedances
Pyrene	8.96	15000	S4UL 2015	0(180)
Benzo(a)anthracene	4.64	56	S4UL 2015	0(180)
Chrysene	4.68	110	S4UL 2015	0(180)
Benzo(bk)fluoranthene	8.98	-	-	-(180)
Benzo(a)pyrene	5.21	12	S4UL 2015	0(180)
Indeno(123cd)pyrene	3.27	170	S4UL 2015	0(180)
Dibenzo(ah)anthracene	0.75	-	-	-(180)
Benzo(ghi)perylene	3.03	1500	S4UL 2015	0(175)
Coronene	0.47	-	-	0(180)
Benzo(b)fluoranthene	6.47	1500	S4UL 2015	0(180)
Benzo(k)fluoranthene	2.51	15	S4UL 2015	0(180)
Benzo(j)fluoranthene	125.00	410	S4UL 2015	0(33)
VOC MS				
Dichloromethane (DCM)	0.024	-	-	-(18)
Toluene	0.008	95000	S4UL 2015	0(18)
Tetrachloroethene (PCE)	0.055	-	-	-(18)
Chlorobenzene	0.004	2000	S4UL 2015	0(18)
Ethylbenzene	0.007	22000	S4UL 2015	0(18)
m/p-Xylene	0.009	-	-	-(18)
1,3,5-Trimethylbenzene	0.023	-	-	-(18)
1,2,4-Trimethylbenzene	0.048	-	-	-(18)
sec-Butylbenzene	0.01	-	-	-(18)
4-Isopropyltoluene	0.049	-	-	-(18)
n-Butylbenzene	0.01	-	-	-(18)
Naphthalene	0.054	76.4 sol	-	0(18)
SVOC MS				
4-Methylphenol	0.106	-	-	-(18)
Carbazole	0.094	-	-	-(18)
Dibenzofuran #	0.09	-	-	-(18)
Bis(2-ethylhexyl) phthalate	1.599	-	-	-(18)
Di-n-Octyl phthalate	0.122	-	-	-(18)
Diethyl phthalate	0.1	-	-	-(18)

When screening the results, the following determinands were tested for but results showed that these were all below the limit of detection:

VOC MS

- | | | |
|--------------------------------|-----------------------------|-------------------------------|
| • Dichlorodifluoromethane | • Carbon tetrachloride | • Bromoform |
| • Methyl Tertiary Butyl Ether | • 1,2-Dichloroethane | • Isopropylbenzene |
| • Chloromethane | • Benzene | • 1,1,2,2-Tetrachloroethane |
| • Vinyl Chloride | • Trichloroethene (TCE) | • Bromobenzene |
| • Bromomethane | • 1,2-Dichloropropane | • 1,2,3-Trichloropropane |
| • Chloroethane | • Dibromomethane | • Propylbenzene |
| • Trichlorofluoromethane | • Bromodichloromethane | • 2-Chlorotoluene |
| • 1,1-Dichloroethene (1,1 DCE) | • cis-1-3-Dichloropropene | • 4-Chlorotoluene |
| • trans-1-2-Dichloroethene | • trans-1-3-Dichloropropene | • tert-Butylbenzene |
| • 1,1-Dichloroethane | • 1,1,2-Trichloroethane | • 1,3-Dichlorobenzene |
| • cis-1-2-Dichloroethene | • 1,3-Dichloropropane | • 1,4-Dichlorobenzene |
| • 2,2-Dichloropropane | • Dibromochloromethane | • 1,2-Dichlorobenzene |
| • Bromochloromethane | • 1,2-Dibromoethane | • 1,2-Dibromo-3-chloropropane |
| • Chloroform | • 1,1,1,2-Tetrachloroethane | • 1,2,4-Trichlorobenzene |
| • 1,1,1-Trichloroethane | • o-Xylene | • Hexachlorobutadiene |
| • 1,1-Dichloropropene | • Styrene | • 1,2,3-Trichlorobenzene |

SVOC

- | | | |
|----------------------|---------------------------|---------------------|
| • 2-Chlorophenol | • 2,4-Dimethylphenol | • 4-Nitrophenol |
| • 2-Methylphenol | • 2,4,5-Trichlorophenol | • Pentachlorophenol |
| • 2-Nitrophenol | • 2,4,6-Trichlorophenol | |
| • 2,4-Dichlorophenol | • 4-Chloro-3-methylphenol | |

Other SVOCs

- | | | |
|--------------------------|------------------------------|-----------------------------|
| • 1,2-Dichlorobenzene | • 4-Bromophenylphenylether | • Hexachlorobutadiene |
| • 1,2,4-Trichlorobenzene | • 4-Chloroaniline | • Hexachlorocyclopentadiene |
| • 1,3-Dichlorobenzene | • 4-Chlorophenylphenylether | • Hexachloroethane |
| • 1,4-Dichlorobenzene | • 4-Nitroaniline | • Isophorone |
| • 2-Nitroaniline | • Azobenzene | • N-nitrosodi-n-propylamine |
| • 2,4-Dinitrotoluene | • Bis(2-chloroethoxy)methane | • Nitrobenzene |
| • 2,6-Dinitrotoluene | • Bis(2-chloroethyl)ether | |
| • 3-Nitroaniline | • Hexachlorobenzene | |

TPH

- Aliphatic >C5-C6 (HS_1D_AL)
- Aliphatic >C6-C8 (HS_1D_AL)
- Aromatics >C5-EC7 (HS_1D_AR)
- Aromatics >EC7-EC8 (HS_1D_AR)

PAHs

- 2-Chlorophthalene

6.1 Discussion of Results

6.1.1 Human Health – End User & Construction Workers

As the receptor is human health the principle pathways of concern are:

- Dermal contact,
- Ingestion, and
- Inhalation.

Generally, in the assessment for future site users, only samples taken from the top 1.0m are considered, as contact with deeper samples is highly unlikely.

Risks to construction and maintenance workers are considered as part of the exposure assessment although the GAC typically only apply to the protection of health for long-term chronic exposure. Construction workers are more likely to be at risk from a high single exposure, i.e., an acute dose, which can result in contamination poisoning.

Reviewing Table 6-1 which screens the broad range of the broad range of contaminants against the GAC, there are no significant or harmful levels of heavy metal, SVOCs or TPH contamination with regards to the conservative Public Open Space (Park) GQRA Generic Assessment Criteria. With regards to soil screening for human health, the majority of determinands were found to be at levels that would not be harmful.

Asbestos was detected at two locations during laboratory analysis, it was potentially visually identified at exploratory hole location LF-RC-2011, there is no laboratory analysis to confirm. Olfactory evidence of hydrocarbon contamination was encountered at a single location noted in the field notes, which is discussed in the following sections. The GDG site engineer observed a waste odour whilst supervising exploratory hole locations LF-TP-2010 and LF-TP-2011.

6.1.1.1 Asbestos

Chrysotile was identified as fiber bundles within two samples in two different exploratory hole locations LF-CPRC-2010 and LF-TP-3001, both at 0.5m bgl. Quantification of the asbestos has shown that the amount of asbestos accounts for <0.1% in both samples.

Location LF-CPRC-2010 ground conditions have been discussed previously in Section 4.2 and is in Tolka Valley Park. At 0.5m bgl strata in the field log is described as “dark brown slightly sandy slightly gravelly clay with occasional fragments of red brick”.

Location LF-TP-3001 (Map 17) strata at 0.5m bgl is described in the field log as “slightly sandy and gravelly clay with many red brick and plastic fragments”. This location is out-with the Tolka Valley Park and St Helena’s Roads sections, although at this depth and on the basis that asbestos is not widespread the risk to future site users is negligible.

Construction workers should be briefed on the possible presence of localised asbestos. Contact with soils should be avoided wherever possible and appropriate training and Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) be provided to mitigate the risk of inhalation of asbestos.

6.1.1.2 Evidence of Contamination

As described in Section 4.1.1 and Section 3.6, evidence of contamination was encountered during the site investigation works.

The presence of domestic waste materials in the ground at Tolka Valley Park was identified.

In LF-TP-2010 in the Tolka Valley Park, olfactory evidence of hydrocarbons was encountered, the thickness of the product was not measurable and indicative of minor impact from residual hydrocarbons in soils in the area rather than the presence of significant impact. Test results confirm this, results did not show levels of PAH or TPH that exceeded the GQRA Public Open Space (Park) screening values. The risk to future site users is therefore considered to be very low.

Potential asbestos containing material (ACM) was observed by the drillers in exploratory hole location LF-CPRC-2011 at 1.20m bgl. The location is out with the focus area of this report. No sample of the suspected material was collected to confirm the identification. This ACM is considered to be sufficiently deep so that there is negligible risk to site users and increased risk to construction workers in the case where soils are disturbed.

Appropriate mitigation measures (avoid contact with soils, appropriate training, appropriate PPE and RPE) will reduce the risk to construction workers during development of the tramline.

6.1.2 Building, Structures & Services

6.1.2.1 Aggressive Ground

Along the Luas route, soluble sulphate at the investigation points was found to be less than 500mg/l with exception to one location, LF-CPRC-1022. This is located in the Tolka Valley Park region. At a depth of 2.0m bgl the water-soluble sulphate exceeded the screening value of 500 mg/l with a value of 576.1 mg/l. This is a marginal exceedance of the BRE Special Digest 1:2005 criteria. At the location at 2.0m bgl the stratigraphy is described in the field notes as possible Made Ground "Stiff brown sandy slightly gravelly clay with frequent subangular cobbles".

The average pH ranged between 7.29 and 10.76.

On the basis that soluble sulphate was <500mg/l and pH was >6.5 along the majority of the route, a design sulphate class of DS-1 and ACEC Class of AC-1 is likely to be adequate. The structural designer may consider increasing the design sulphate and ACEC class of concrete local to LF-CPRC-1022 (2.0m bgl).

7 Conceptual Site Model

The environmental risks associated with the existing and historic uses of the site have been reviewed, and a site investigation undertaken with geo-environmental analysis of soils. This allows an assessment in the form of a Conceptual Site Model (CSM) to be undertaken.

A CSM identifies the potential sources of contamination and potential pathways that these may use, ultimately ending in the impact of a receptor. The receptors are determined by identifying the proposed end use of the site.

7.1 Sources

- **S1: Contamination from Made Ground on-site** – the previous use of the site, including the use of a historic quarry as a landfill. Screening of soil analysis data against Generic Assessment Criteria (GAC) for Public Open Space (Park) has not identified exceedances in any of the 201 samples selected for analysis, with exception to 2 localised instances of asbestos (<0.1%) at 0.5m bgl and one potential identification at 1.20m bgl.
- **S2: Aggressive ground conditions** associated with elevated sulphate / acidic ground conditions. Soluble sulphate levels were found to be <500mg/l in all but one of the 154 samples tested. pH was above 5.5 in all samples.

7.2 Receptors

Review of historic data has identified the following potential receptors:

- **R1: Human Health** – The risk to human health during the construction phase and end-use as a tram line and public park.
- **R2: Building, Structures & Services** – Permanent structures are proposed in the formation of the tramline.

7.3 Pathways

Pathways that may be present on this site, following development include:

- **P1:** Direct contact, ingestion, and inhalation of gas and dust, including asbestos
- **P2:** Chemical attack on buried concrete associated with aggressive ground conditions

7.4 Source-Pathway-Receptor Linkages

Figure 7-1 to Figure 7-2 present the Source-Pathway-Receptor linkages (S-P-R) considered for St. Helena's Road and Tolka Valley Park.

7.4.1 S-P-R Human Health

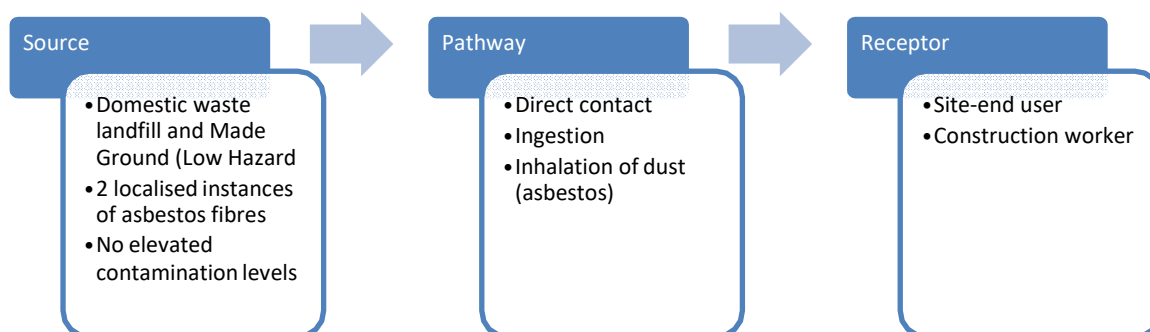


Figure 7-1 S-P-R linkage for human health

7.4.1.1 Risk Assessment

Landfill materials consistent with domestic waste were encountered in the Tolka Valley Park investigation locations, with localised instances of olfactory evidence of contamination. No visual evidence of hydrocarbon contamination or asbestos was described in the field logs. Screening against the GAC for human health (Public Open Space – Park) indicates that the soils are unlikely to pose a risk to the future end user. One instance of asbestos in the Tolka Valley Park region was identified at 0.5mbgl, and another instance was encountered in the south-east portion of the Luas route. This is considered to pose a very low risk to the end user on the basis that asbestos in the materials is not pervasive, and exposure to this material is extremely unlikely.

Soils along the St Helena's Road route did not exhibit any evidence of contamination or landfill materials. Made Ground was present; however no GAC were exceeded for the human health Public Open Space – Park scenario. The risk of exposure to contaminants of concern to future end user is considered negligible.

It is considered that the risk construction workers will be managed by the contractor, with appropriate training and adequate PPE provided when direct material handling cannot be avoided.

7.4.2 S-P-R Aggressive ground

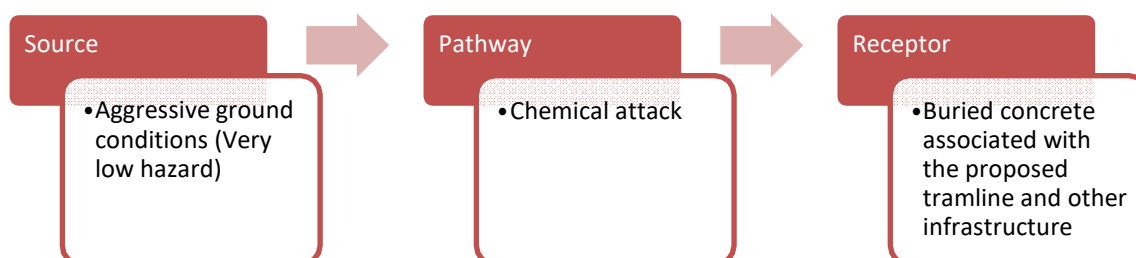


Figure 7-2 S-P-R linkage for built environment

7.4.2.1 Risk Assessment

The likelihood of chemical attack on buried concrete along the proposed tram route is considered to be very low following soluble sulphate and pH testing of soils and Made Ground. The structural designer is to confirm the appropriate concrete class, however at this time DS-1 ACEC-1 is considered likely to be sufficient.

8 Material Reuse & Disposal

8.1 Material Reuse

Circular economy and material re-use are key aspects of the Luas Finglas design brief.

The analysis of soils in Tolka Valley Park and the St Helena's Road section, and screening against the GAC for human health, has indicated that the Made Ground and shallow soils along the route of the proposed Luas route are not harmful and are therefore suitable for reuse from an environmental perspective. Screening may need to be undertaken to make soils reusable from a geotechnical perspective, however.

The landfill waste material in Tolka Valley Park unlikely to be viable for reuse due to the nature of the waste and would require disposal to landfill.

Ultimately, the contractor and supervising engineer shall be responsible for segregating and screening soils to determine which material is suitable for reuse, using best practice. Where domestic waste is excavated within the Tolka Valley Park region, it is likely that these materials will need to be disposed of, although the contractor may use discretion with regards ground condition and screen where deemed appropriate with aim to reducing disposal volume as much as practicable.

Where unidentified contamination (such as potential asbestos containing material or free phase hydrocarbon product) is encountered, material should be segregated and stockpiled on a low permeability surface with bunding and be covered to allow further testing of the impacted soils to enable specification of treatment and reuse, or disposal.

8.2 Material Disposal

Table 8-1 shows a summary of the WAC and waste classification and the likely Waste Category with regards Irish Landfill Acceptance Criteria, as defined by EU Council Decision 2003/33/EC of establishing criteria for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1991/31/EC (Landfill Directive). These criteria are included in Appendix F for reference.

WAC testing and waste classification testing are both required to enable assessment of Waste Category B1 and above, therefore it is not possible to provide a classification for all samples in this regard.

8.2.1 Waste Classification

Sixty eight soil samples and fourteen samples deemed representative of likely municipal waste were taken during the site investigations and tested for a broad range of contaminants including heavy metals and organics. The samples have been taken along the entire proposed route, i.e. we have included all samples, not just the St Helena's Road and Tolka Valley Park samples.

Results of the testing are included in Appendix C and a summary table is provided in Table 8-1.

Following receipt of results all materials were classified (hazardous / non-hazardous) via the Hazwasteonline tool (<https://www.hazwasteonline.com/>) which is compliant with the Environment Agency WM3 v1.1 guidance.

It is considered that the soils would be classified as 17 05 04 (Soil and stones other than those mentioned in 17 05 03) in the List of Waste, even in the case of the municipal waste. However, for ease of reference, two waste classification reports have been generated, one for non-municipal waste soils, and one for soils that were deemed likely to be municipal waste in the Tolka Valley Park area. The waste classification reports are included in Appendix D.

All samples analysed have been found to be Non-Hazardous.

If soils are to be excavated and disposed off-site, it is recommended that the waste classification data be included in the development of a detailed soil management plan.

8.2.2 Waste Acceptance Criteria

Sixty-six laboratory certificates from the Waste Acceptance Criteria (WAC) testing are included in Appendix E and summarised in Table 8-1. This assessment of the soils is for indicative purposes only. Soils are indicated to be predominantly Inert, however WAC certificates should be provided to the receiving landfill to determine the classification, as there may be local differences in criteria.

Soils designated for disposal should be tested prior to disposal to confirm their WAC classification and disposed of in accordance with industry guidance. It is recognised that Irish landfills do not generally accept soils with trace asbestos.

Table 8-1 WAC, Waste Classification & Waste Category

Location ID	Depth (m BGL)	Anthropogenic materials present? **	Landfill area?	WAC	Waste Classification	Waste Category
LF-CPRC-1001	1.00			Inert	-	A
LF-CPRC-1003	0.50			Inert	Non Hazardous	B1
LF-CPRC-1004	1.00			Inert	-	A
LF-CPRC-1004	0.50			-	Non Hazardous	A

Location ID	Depth (m BGL)	Anthropogenic materials present?*	Landfill area?	WAC	Waste Classification	Waste Category
LF-CPRC-1004	2.00			-	Non Hazardous	A
LF-CPRC-1005	0.50	✓		Inert	-	N/A
LF-CPRC-1005	1.00			-	Non Hazardous	A
LF-CPRC-1006	0.50	✓		Inert	Non Hazardous	B1
LF-CPRC-1006	1.00	✓		-	Non Hazardous	N/A
LF-CPRC-1007	0.50	✓		Inert	-	N/A
LF-CPRC-1009	0.50			Inert	-	A
LF-CPRC-1010	0.50	✓		Inert	-	N/A
LF-CPRC-1012	0.50	✓		-	Non Hazardous	N/A
LF-CPRC-1014	1.00	✓	✓	-	Non Hazardous	N/A
LF-CPRC-1014	3.00	✓	✓	Inert	-	N/A
LF-CPRC-1014	0.50	✓	✓	-	Non Hazardous	N/A
LF-CPRC-1014	2.00	✓	✓	-	Non Hazardous	N/A
LF-CPRC-1014	4.00	✓	✓	-	Non Hazardous	N/A
LF-CPRC-1014	5.00		✓	-	Non Hazardous	A
LF-CPRC-1017	0.50	✓	✓	Inert	Non Hazardous	B1
LF-CPRC-1017	1.70		✓	-	Non Hazardous	A
LF-CPRC-1018	2.00	✓	✓	Inert	-	N/A
LF-CPRC-1018	3.00	✓	✓	-	Non Hazardous	N/A
LF-CPRC-1018	4.00	✓	✓	-	Non Hazardous	N/A
LF-CPRC-1018	3.00	✓		-	Non Hazardous	N/A
LF-CPRC-1020	1.00	✓		Inert	-	N/A
LF-CPRC-1020	0.50	✓		-	Non Hazardous	N/A

Location ID	Depth (m BGL)	Anthropogenic materials present?*	Landfill area?	WAC	Waste Classification	Waste Category
LF-CPRC-1020	2.00			-	Non Hazardous	A
LF-CPRC-1021	0.40	✓		Inert	-	N/A
LF-CPRC-1021	1.20	✓		-	Non Hazardous	N/A
LF-CPRC-1022	1.00			Inert	-	A
LF-CPRC-1022	3.00			Inert	Non Hazardous	A
LF-CPRC-1022	2.00			-	Non Hazardous	A
LF-CPRC-1024	1.00			Inert	-	A
LF-CPRC-1024	2.00			-	Non Hazardous	A
LF-CPRC-1027	1.00			Non Hazardous	Non Hazardous	C
LF-CPRC-1028	0.50	✓		Inert	-	N/A
LF-CPRC-1028	1.00	✓		-	Non Hazardous	N/A
LF-CPRC-1031	2.00	✓		Inert*	-	N/A
LF-CPRC-1031	2.60			-	Non Hazardous	A
LF-CPRC-1032	3.00			-	Non Hazardous	A
LF-CPRC-2003	0.50	✓		Inert	-	N/A
LF-CPRC-2003	2.00			-	Non Hazardous	A
LF-CPRC-2005	2.00	✓		Hazardous	-	N/A
LF-CPRC-2006	0.50		✓	Inert	-	A
LF-CPRC-2010	2.00	✓	✓	Inert	Non Hazardous	B1
LF-CPRC-2010	4.00	✓	✓	Inert	Non Hazardous	B1
LF-CPRC-2010	0.50	✓	✓	-	Non Hazardous	N/A
LF-CPRC-2010	1.00		✓	-	Non Hazardous	A
LF-CPRC-2010	5.00		✓	-	Non Hazardous	A

Location ID	Depth (m BGL)	Anthropogenic materials present?*	Landfill area?	WAC	Waste Classification	Waste Category
LF-CPRC-2011	0.50	✓		-	Non Hazardous	N/A
LF-CPRC-2011	1.00	✓		-	Non Hazardous	N/A
LF-CPRC-2012	1.00	✓		-	Non Hazardous	N/A
LF-CPRC-3002	1.00	✓		-	Non Hazardous	N/A
LF-CPRC-1023	0.50	✓		-	Non Hazardous	N/A
LF-TP-1004	1.00			Inert	Non Hazardous	A
LF-TP-1005	1.00			-	Non Hazardous	A
LF-TP-1006	0.50			Inert	-	A
LF-TP-1007	1.00	✓		Inert	-	N/A
LF-TP-1008	0.50			-	Non Hazardous	A
LF-TP-2001	0.50	✓		Inert	Non Hazardous	B1
LF-TP-2001	1.00			-	Non Hazardous	A
LF-TP-2002	1.00			-	Non Hazardous	A
LF-TP-2003	0.50	✓		-	Non Hazardous	N/A
LF-TP-2003	1.00			-	Non Hazardous	A
LF-TP-2004	1.00			Inert	-	A
LF-TP-2005	0.50	✓		-	Non Hazardous	N/A
LF-TP-2005	1.00	✓		-	Non Hazardous	N/A
LF-TP-2005	3.00			-	Non Hazardous	A
LF-TP-2006	1.00			Inert	-	A
LF-TP-2007	1.00	✓		Inert	-	N/A
LF-TP-2007	3.00	✓		Inert*	-	N/A
LF-TP-2008	2.00	✓		Inert	-	N/A
LF-TP-2008	4.00			Inert	-	A
LF-TP-2009	0.50	✓		Inert	-	N/A
LF-TP-2009	1.00	✓		-	Non Hazardous	N/A
LF-TP-2009	3.00	✓		-	Non Hazardous	N/A

Location ID	Depth (m BGL)	Anthropogenic materials present?***	Landfill area?	WAC	Waste Classification	Waste Category
LF-TP-2010	1.00	✓	✓	Inert	-	N/A
LF-TP-2010	3.00	✓	✓	Inert	-	N/A
LF-TP-2011	0.50	✓	✓	Inert	-	N/A
LF-TP-2011	3.00	✓	✓	Inert	-	N/A
LF-TP-3001	1.00	✓		Inert	-	N/A
LF-TP-3001	0.50	✓		-	Non Hazardous	N/A
LF-TP-3001	2.00			-	Non Hazardous	A
LF-TP-3002	2.00			-	Non Hazardous	A
LF-WS-1001	0.50			Inert	Non Hazardous	B1
LF-WS-1003	1.00			-	Non Hazardous	N/A
LF-WS-1004	0.50	N/A		-	Non Hazardous	N/A
LF-WS-1005	1.00			Inert	-	A
LF-WS-1005	0.50			-	Non Hazardous	A
LF-WS-1006	0.50	✓		Inert	Non Hazardous	B1
LF-WS-1007	1.00			Inert	-	A
LF-WS-1007	0.50	✓		-	Non Hazardous	N/A
LF-WS-1007	1.50	✓		-	Non Hazardous	N/A
LF-WS-1007	2.50	✓		-	Non Hazardous	N/A
LF-WS-1008	0.50			-	Non Hazardous	N/A
LF-WS-1010	2.00			-	Non Hazardous	A
LF-WS-1011	0.50	✓		-	Non Hazardous	N/A
LF-WS-1012	0.50	✓		Inert	Non Hazardous	B1
LF-WS-1012	1.20-1.70			-	Non Hazardous	A
LF-WS-1013	1.20-1.90	✓		-	Non Hazardous	N/A
LF-WS-1013	2.80-3.00	✓		-	Non Hazardous	N/A

Location ID	Depth (m BGL)	Anthropogenic materials present?***	Landfill area?	WAC	Waste Classification	Waste Category
LF-WS-1018	1.00	✓	✓	Inert	-	N/A
LF-WS-1022	1.40	✓		-	Non Hazardous	N/A
LF-WS-1023	0.10-1.10	✓		Inert	-	N/A
LF-WS-1023	0.10	✓		-	Non Hazardous	N/A
LF-WS-2002	0.50	✓		Inert	-	N/A
LF-WS-2006	1.00			-	Non Hazardous	N/A
LF-WS-2007	0.50	N/A		Inert	-	N/A
LF-WS-2007	1.00	N/A		-	Non Hazardous	N/A
LF-WS-2008	0.50			-	Non Hazardous	N/A
LF-WS-2010	1.00	✓		Inert	-	N/A
LF-WS-2010	0.50	✓		-	Non Hazardous	N/A
LF-WS-2010	1.50			-	Non Hazardous	A
LF-WS-2010	2.50	✓		-	Non Hazardous	N/A
LF-WS-2011	0.50-1.00	✓		Inert	Non Hazardous	B1
LF-WS-3002	1.00	✓		Inert	Non Hazardous	C

* Inert Landfill - Increased Limits from IMS Hollywood Landfill Acceptance Criteria

** According to field logs

9 Conclusions and Recommendations

GDG have been provided with the field logs, locations, and environmental analysis data to review and assess with regards environmental risks posed to human health and the structures associated with the proposed Luas tram extension route through Tolka Valley Park and St Helena's Road.

Ground Investigation Ireland Ltd. (GII) carried out site investigations between October 2021 to January 2022. GDG attended the site investigation observing the investigation of LF-TP-2010 and LF-TP-2011 in the Tolka Valley region.

Domestic landfill waste was identified in the Tolka Valley region. Made Ground was encountered along St. Helena's Road however is not consistent with a landfill waste. Thickness of the landfill and Made Ground was found to be up to 5.7m. There was no visual evidence of hydrocarbon or asbestos contamination, and localised instances of hydrocarbon / waste odours, in the Tolka Valley Park area only.

Soil samples were collected by GII and scheduled for geoenvironmental analysis with assistance from GDG. GDG have analysed the results and a GQRA has been completed.

Soils were tested for a broad suite of contaminants including asbestos, hydrocarbons, and chlorinated solvents. Elevated levels of heavy metals, TPH, PAH, PCB, VOC and SVOCs were identified in the soils. However, screening of the results has shown no exceedances against the industry criteria for human health in a Public Open Space (Park) scenario, indicating that the soils at shallow depth along the proposed Luas route are unlikely to pose a risk to the future end user.

Asbestos was encountered at 2 of 144 samples tested. One instance was identified at 0.5mbgl at <0.1% in Tolka Valley Park, whilst the other was at the same depth and concentration in the south-east portion (Map 17) of the Luas route. This poses a very low risk to the future end user as exposure to these soils is considered extremely unlikely. Potential asbestos containing material (ACM) was encountered out-with the focus area of this report, however the material was encountered at 1.2m bgl, and therefore poses a negligible risk to site users.

Construction works should be undertaken in a manner to avoid contact between construction workers and ground material wherever possible. Where contact is absolutely necessary, staff should be trained in dealing with contaminated land and equipped with appropriate PPE and/or RPE to ensure that risk to health remains low.

Across the whole site, ground conditions have not been found to be aggressive with regards buried concrete, based on the analysis of soils to data. Final concrete design should be confirmed by the structural designer.

With exception to existing landfill waste, shallow soils on site indicated to be suitable for reuse from an environmental perspective as no GAC were exceeded during the laboratory analysis, however screening may be required in order to enable reuse of the Made Ground materials to remove components such as brick, metal, plastic, etc.

Waste classification of the available data indicates that soils are Non-Hazardous, whilst WAC testing has shown soils are predominantly Inert, with one instance of Non-Hazardous and one instance of Hazardous materials. The waste classification report and WAC certificates pertinent to those soils being disposed of should be provided to the receiving landfill prior to disposal to ensure that they will accept the waste. Depending on the volume of soils that require to be disposed of, further testing may be required to meet the receiving landfill test frequency requirements.

References

British Standards Institute (2011). Investigation of potentially contaminated sites. Code of practice. British Standards Institute publication BS 10175:2011+A2:2017

British Standards Institute (2015) Code of practice for site investigations. British Standards Institute publication BS 5930:2015

British Standards Institution (2004). B.S.-EN 1997-1:2004 -Eurocode 7: Geotechnical design: Part 1: General Rules. London, British Standards Institution. (Including British National Annex 2004)

Building Research Establishment Special Digest 1 (2005). Concrete in aggressive ground, 3rd Ed. Building Research Establishment Construction Division, UK

Contaminated Land: Applications in Real Environments (2010). Soil Generic Assessment Criteria for Human Health Risk Assessment.

Environment Agency (2009). Soil Guideline Values for [arsenic, cadmium, nickel, mercury, selenium, phenol, benzene, ethylbenzene, toluene, xylene] in soil. Science Report SC050021 [arsenic, cadmium, nickel, mercury, selenium, phenol, benzene, ethylbenzene, toluene, xylene] SGV

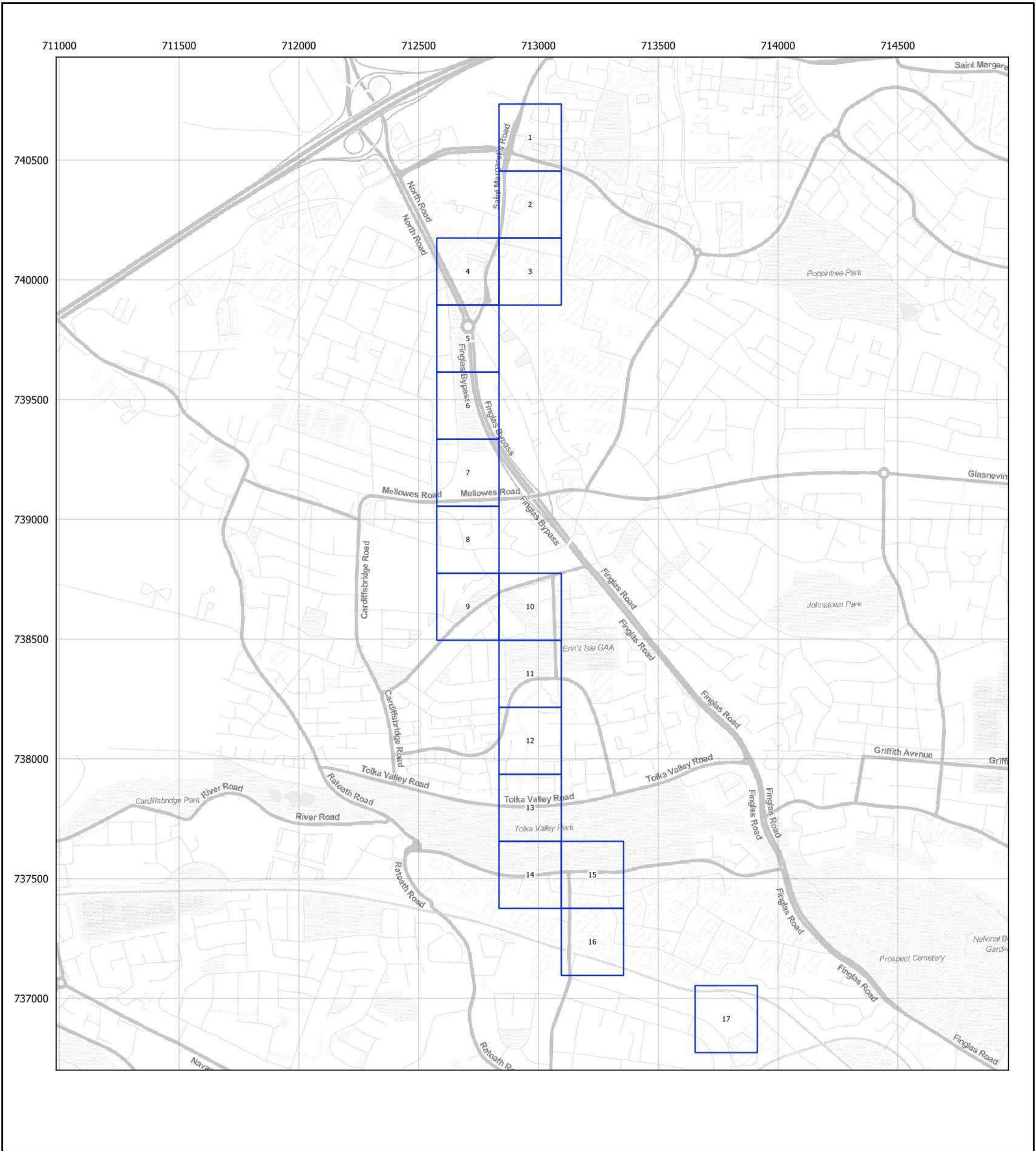
Environment Agency WM3 Technical Guidance: Guidance on the classification and assessment of waste, v1.1.NI

Health and Safety Executive (2012). Asbestos: the survey guide. HSG264 (second edition)

Land Quality Management/Chartered Institute of Environmental Health (2015). Suitable 4 Use Levels for Human Health Risk Assessment. Land Quality Press publication.

Statutory Instrument No. 386/2006 - Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006

Appendix A – Exploratory Hole Location Plan



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION - LOCALITY PLAN

SCALE: 1:15,000@ A3

CRS: EPSG:2157

REV CODE: P07

CREATED: MC

APPROVED: DO

DATE: 10/04/2022



712850

712900

712950

713000

713050

740700

740650

740600

740550

740500



Map Sheet No.1

0 25 50 75 100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07

CREATED: MC

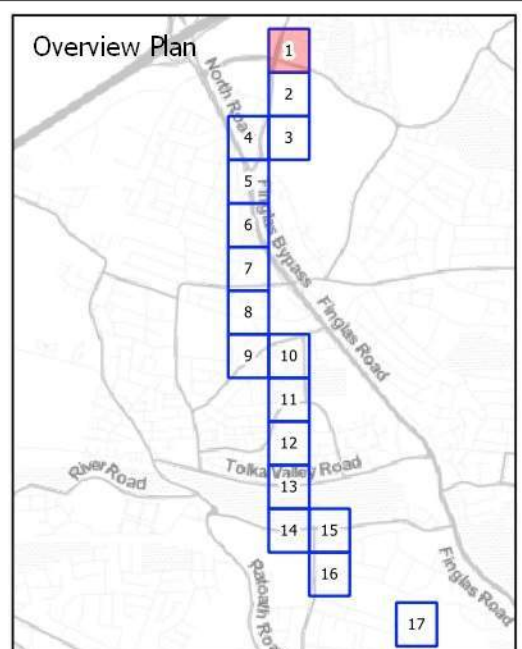
APPROVED: DO

DATE: 10/04/2022

Legend

Exploratory Hole Types

-  Borehole (CP/RC)
-  Trial Pit (TP)
-  Windowless Sampler (WS)
-  Dynamic Probe (DP)



712850

712900

712950

713000

713050

740450

740400

740350

740300

740250

740200

LF-CPRC-1001

LF-CPRC-1003

LF-TP-2012

LF-TP-1003

LF-TP-1004

Map Sheet No.2

0 25 50 75 100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07

CREATED: MC

APPROVED: DO

DATE: 10/04/2022

Legend

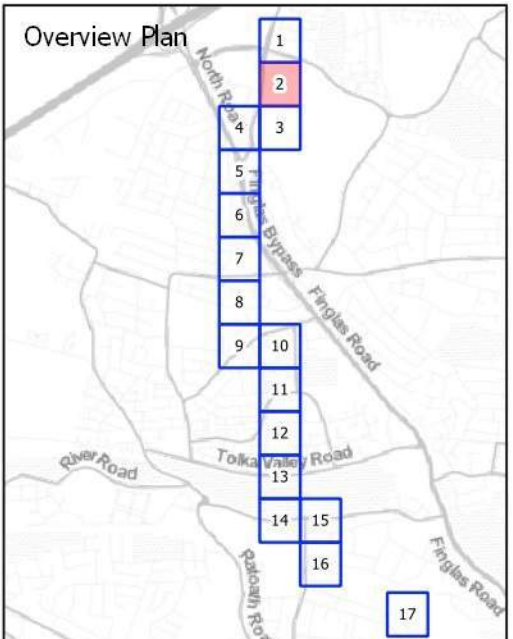
Exploratory Hole Types

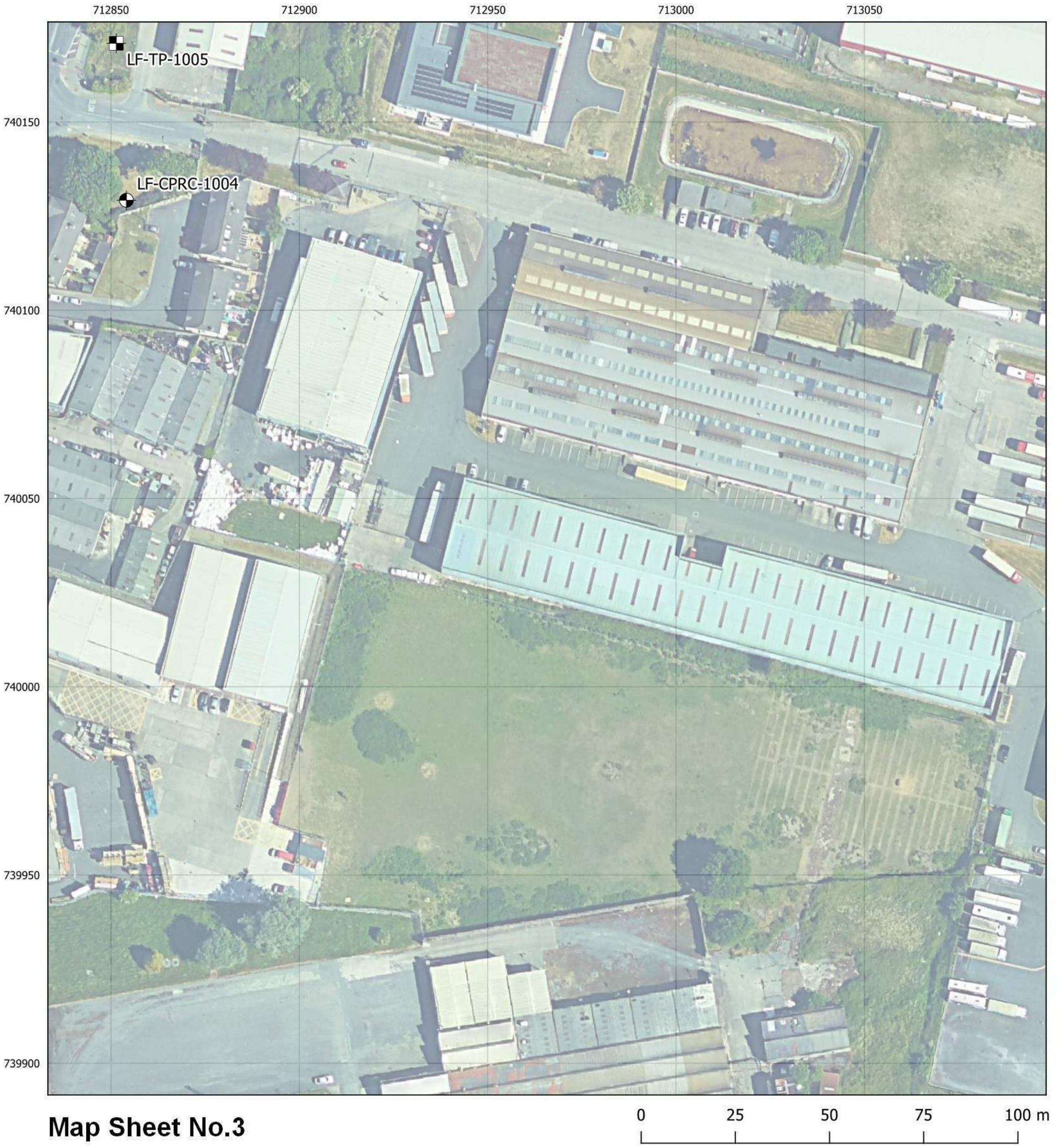
Borehole (CP/RC)

Trial Pit (TP)

Windowless Sampler (WS)

Dynamic Probe (DP)





PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

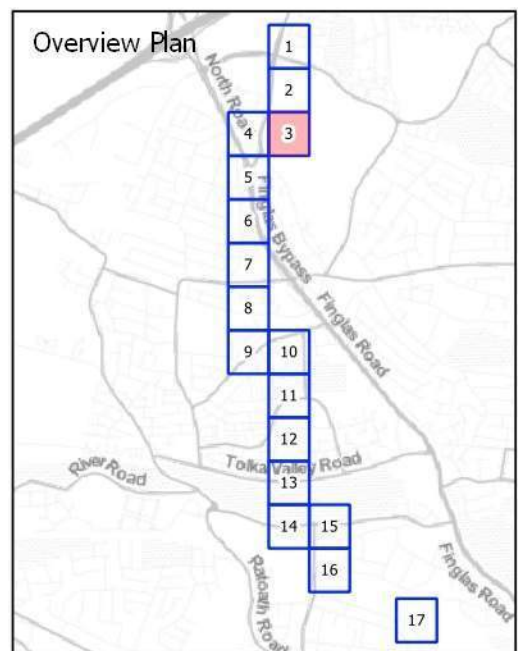
REV CODE: P07

CREATED: MC

APPROVED: DO

DATE: 10/04/2022

- Legend**
- Exploratory Hole Types
- Borehole (CP/RC)
 - Trial Pit (TP)
 - Windowless Sampler (WS)
 - Dynamic Probe (DP)



712600 712650 712700 712750 712800

740150

740100

740050

740000

739950

739900



Map Sheet No.4

0 25 50 75 100 m



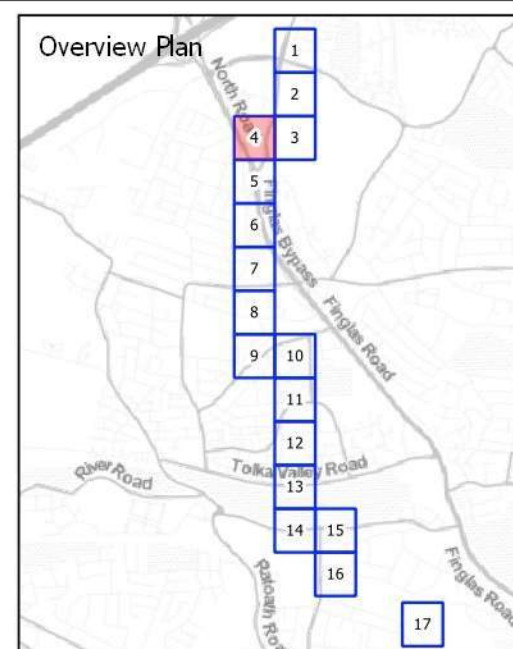
PROJECT:
LUAS FINGLAS
MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3
CRS: EPSG:2157
REV CODE: P07
CREATED: MC
APPROVED: DO
DATE: 10/04/2022

Legend

Exploratory Hole Types

- Borehole (CP/RC)
- Trial Pit (TP)
- ▼ Windowless Sampler (WS)
- ⊙ Dynamic Probe (DP)





PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07

CREATED: MC

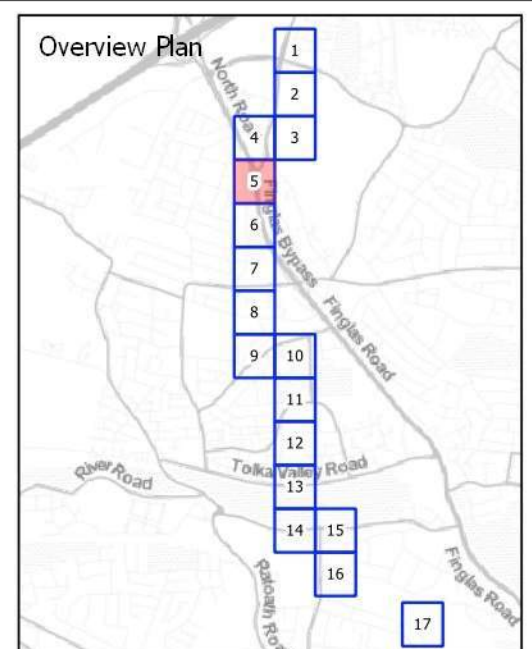
APPROVED: DO

DATE: 10/04/2022

Legend

Exploratory Hole Types

- Borehole (CP/RC)
- Trial Pit (TP)
- Windowless Sampler (WS)
- Dynamic Probe (DP)



712600 712650 712700 712750 712800

739600
739550
739500
739450
739400
739350



Map Sheet No.6

0 25 50 75 100 m

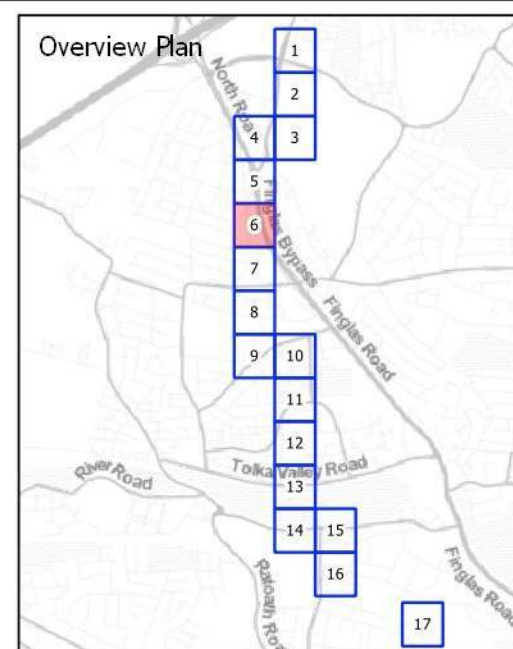


PROJECT:
LUAS FINGLAS
MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3
CRS: EPSG:2157
REV CODE: P07
CREATED: MC
APPROVED: DO
DATE: 10/04/2022

Legend

- Exploratory Hole Types
- Borehole (CP/RC)
 - Trial Pit (TP)
 - ▼ Windowless Sampler (WS)
 - ⊙ Dynamic Probe (DP)





PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07

CREATED: MC

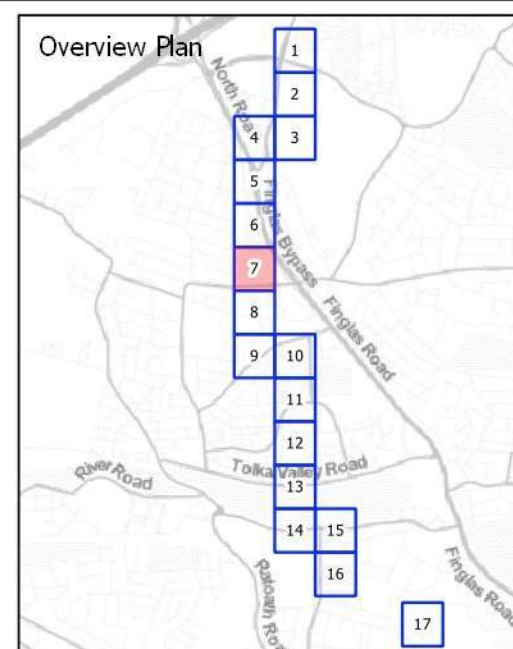
APPROVED: DO

DATE: 10/04/2022

Legend

Exploratory Hole Types

-  Borehole (CP/RC)
-  Trial Pit (TP)
-  Windowless Sampler (WS)
-  Dynamic Probe (DP)

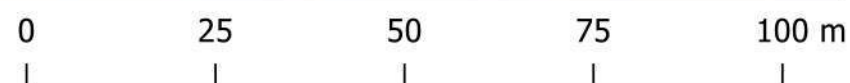


712600 712650 712700 712750 712800

739050
739000
738950
738900
738850
738800



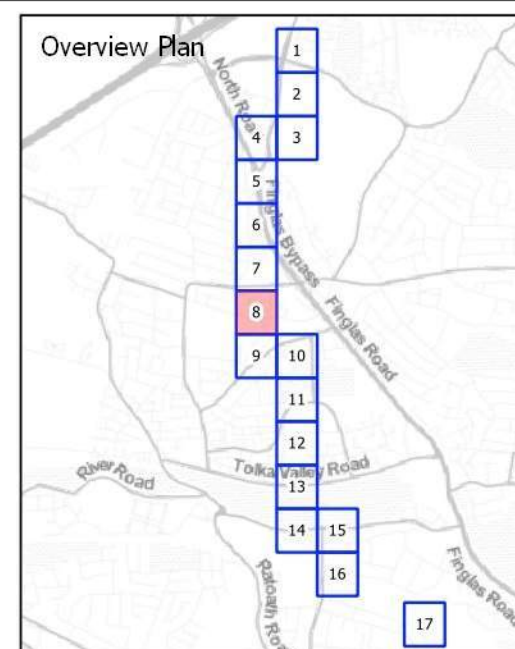
Map Sheet No.8



PROJECT:
LUAS FINGLAS
MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3
CRS: EPSG:2157
REV CODE: P07
CREATED: MC
APPROVED: DO
DATE: 10/04/2022

Legend
Exploratory Hole Types
● Borehole (CP/RC)
■ Trial Pit (TP)
▼ Windowless Sampler (WS)
⊙ Dynamic Probe (DP)



712600

712650

712700

712750

712800

738750

738700

738650

738600

738550

738500

LF-WS-2011

LF-DP-2011

LF-CPRC-1011

Map Sheet No.9

0 25 50 75 100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07

CREATED: MC

APPROVED: DO

DATE: 10/04/2022

Legend

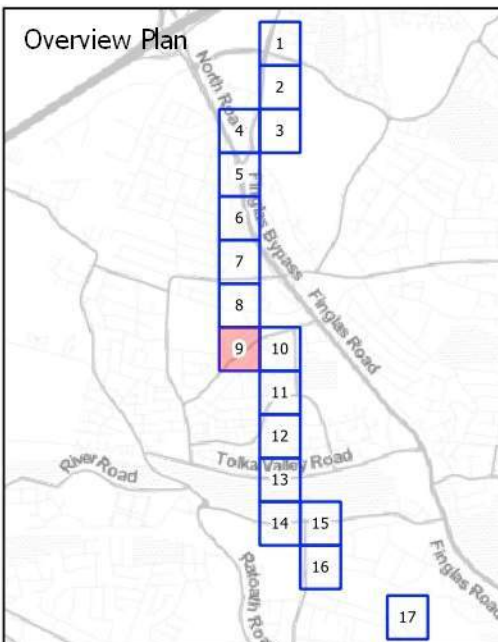
Exploratory Hole Types

Borehole (CP/RC)

Trial Pit (TP)

Windowless Sampler (WS)

Dynamic Probe (DP)



712850

712900

712950

713000

713050

738750

738700

738650

738600

738550

738500

LF-TP-2002

LF-DP-1010

LF-WS-1010

LF-TP-2003

LF-DP-1011

LF-WS-1011

LF-TP-2004

LF-WS-1012

LF-DP-1012

Map Sheet No.10

0 25 50 75 100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07



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APPROVED: DO

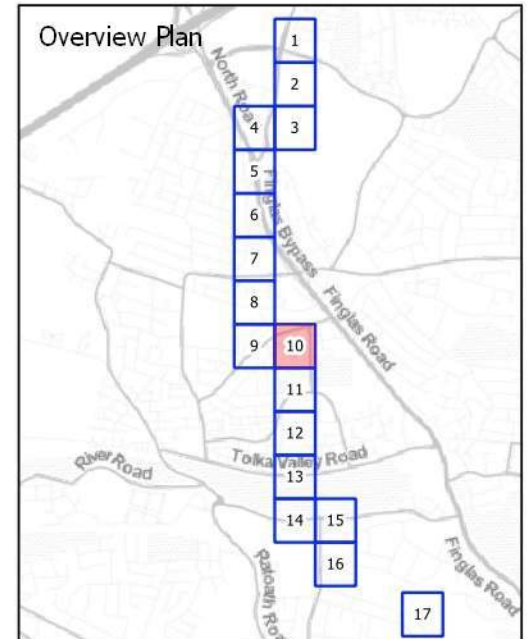
DATE: 10/04/2022

Legend

Exploratory Hole Types

 Borehole (CP/RC) Trial Pit (TP) Windowless Sampler (WS) Dynamic Probe (DP)

Overview Plan



712850

712900

712950

713000

713050

738450

738400

738350

738300

738250

LF-CPRC-1012

LF-DP-1013

LF-WS-1013

LF-TP-2005

LF-CPRC-2004

LF-WS-1014

LF-DP-1014

Map Sheet No.11

0 25 50 75 100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07



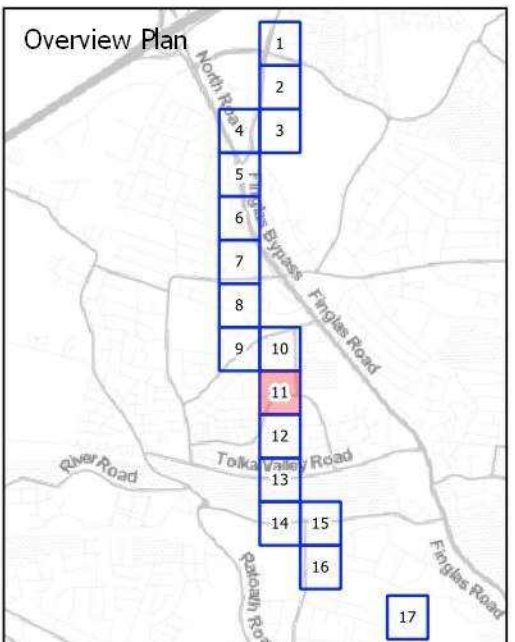
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APPROVED: DO

DATE: 10/04/2022

Legend

Exploratory Hole Types

 Borehole (CP/RC) Trial Pit (TP) Windowless Sampler (WS) Dynamic Probe (DP)

712850

712900

712950

713000

713050

738200

738150

738100

738050

738000

737950

LF-TP-2006

LF-CPRC-1013

LF-TP-2007

LF-WS-1016

LF-DP-1016

LF-TP-2008

LF-DP-1015

LF-WS-1015

Map Sheet No.12

0

25

50

75

100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07



CREATED: MC

APPROVED: DO

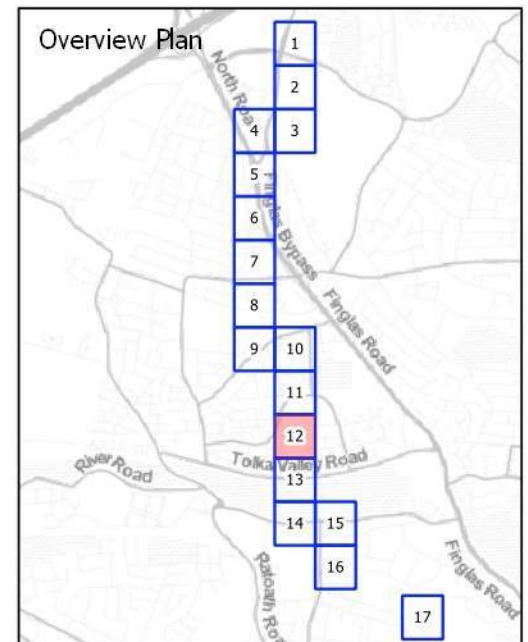
DATE: 10/04/2022

Legend

Exploratory Hole Types

 Borehole (CP/RC) Trial Pit (TP) Windowless Sampler (WS) Dynamic Probe (DP)

Overview Plan



712850

712900

712950

713000

713050

737900

737850

737800

737750

737700

LF-CPRC-2005

LF-DP-1017

LF-WS-1017

LF-TP-2009

LF-CPRC-1014

LF-WS-1018

LF-DP-1018

LF-CPRC-2010

LF-TP-2010

LF-CPRC-2009

LF-CPRC-1017

LF-DP-1019

LF-WS-1019

LF-TP-2011

LF-CPRC-1015

Map Sheet No.13

0 25 50 75 100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07

CREATED: MC

APPROVED: DO

DATE: 10/04/2022

Legend

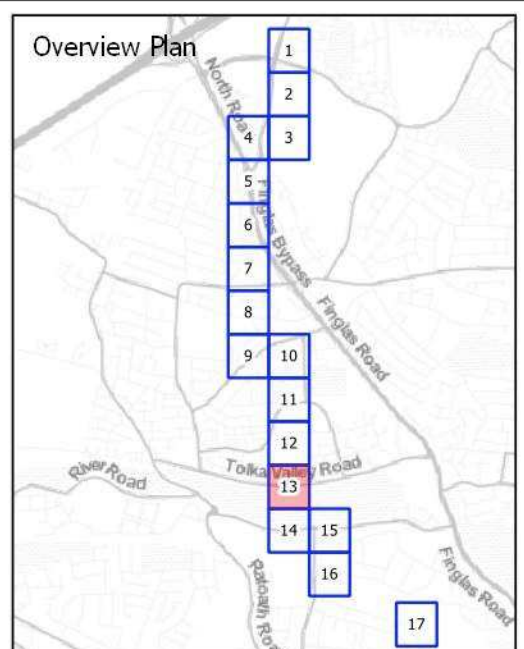
Exploratory Hole Types

Borehole (CP/RC)

Trial Pit (TP)

Windowless Sampler (WS)

Dynamic Probe (DP)



712850

712900

712950

713000

713050

737650

737600

737550

737500

737450

737400

LF-DP-1020

LF-WS-1020

LF-WS-1021A

LF-WS-1021

LF-CPRC-2006

LF-CPRC-1016

LF-CPRC-2007

Map Sheet No.14

0 25 50 75 100 m



PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07


CREATED: MC

APPROVED: DO

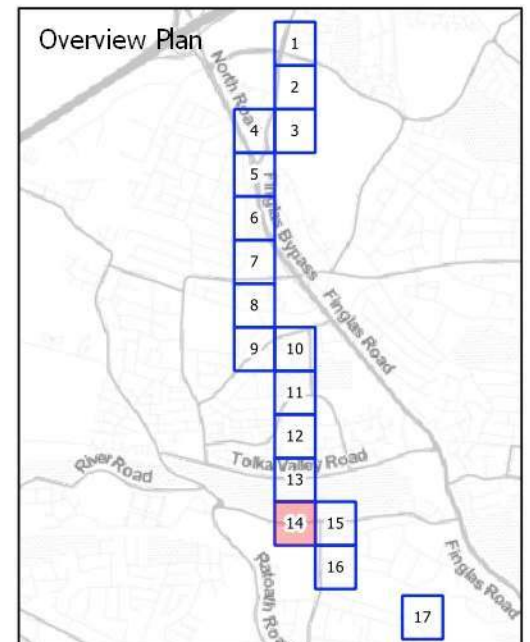
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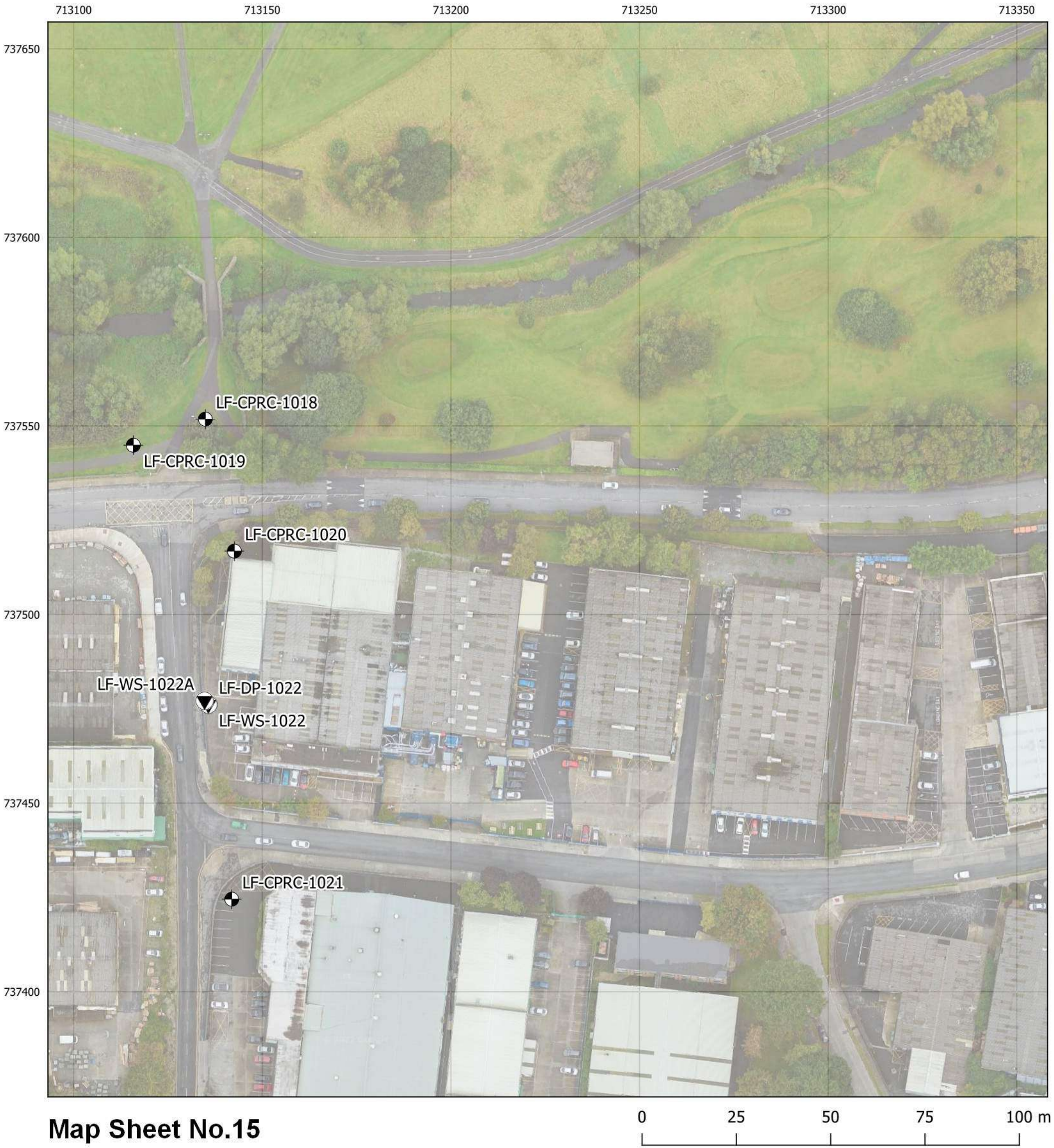
Legend

Exploratory Hole Types

 Borehole (CP/RC) Trial Pit (TP) Windowless Sampler (WS) Dynamic Probe (DP)

Overview Plan





PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

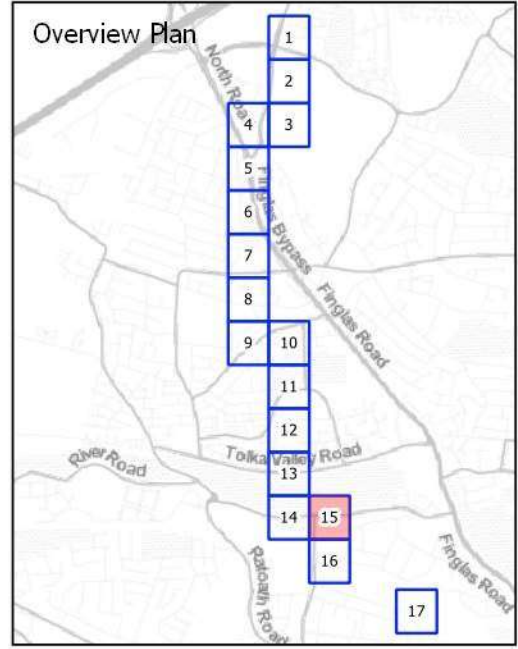
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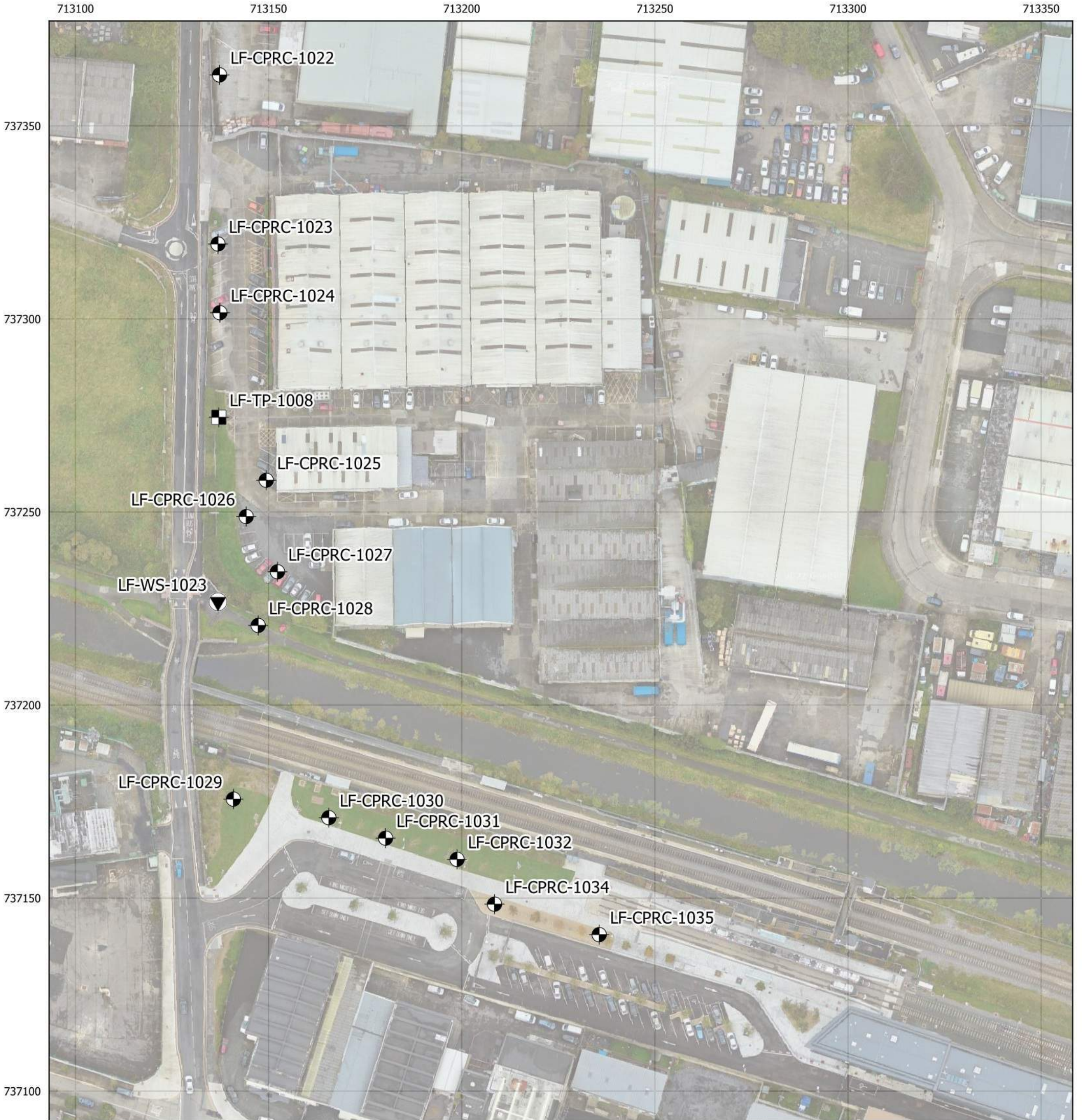
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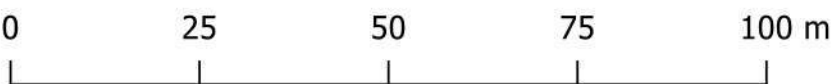
DATE: 10/04/2022

- Legend**
- Exploratory Hole Types
- Borehole (CP/RC)
 - Trial Pit (TP)
 - Windowless Sampler (WS)
 - Dynamic Probe (DP)





Map Sheet No.16

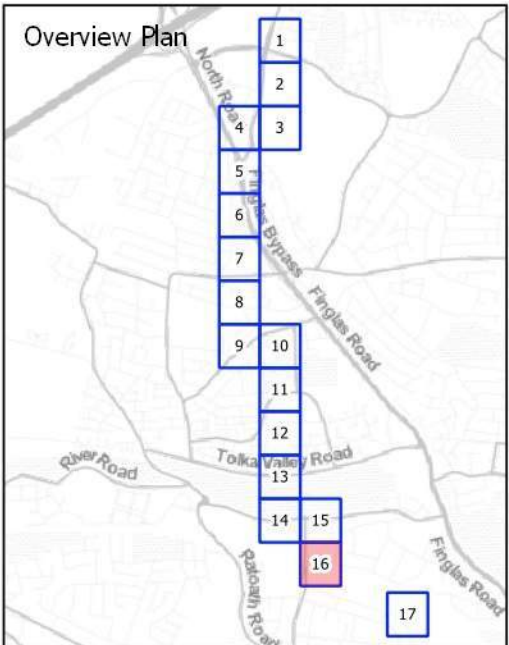


PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3
CRS: EPSG:2157
REV CODE: P07
CREATED: MC
APPROVED: DO
DATE: 10/04/2022

- Legend**
- Exploratory Hole Types
- Borehole (CP/RC)
 - Trial Pit (TP)
 - ▼ Windowless Sampler (WS)
 - ⊙ Dynamic Probe (DP)





PROJECT:
LUAS FINGLAS

MAP TITLE:
GROUND INVESTIGATION PLAN

SCALE: 1:1,000 @ A3

CRS: EPSG:2157

REV CODE: P07





CREATED: MC

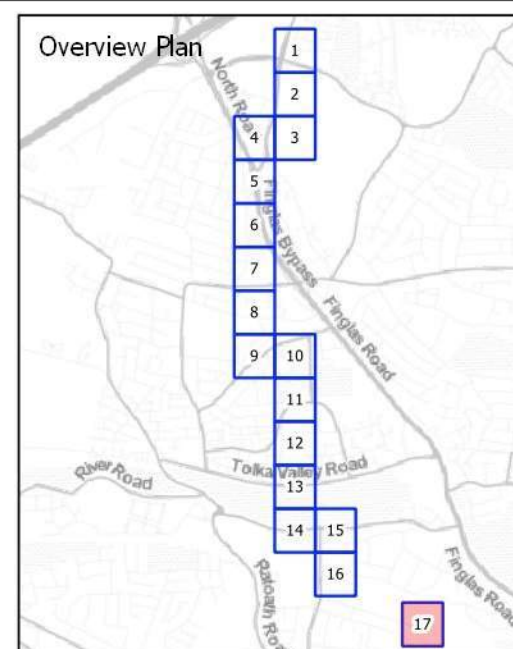
APPROVED: DO

DATE: 10/04/2022

Legend

Exploratory Hole Types

-  Borehole (CP/RC)
-  Trial Pit (TP)
-  Windowless Sampler (WS)
-  Dynamic Probe (DP)



Appendix B – Ground Investigation Logs



Ground Investigations Ireland Ltd

www.gii.ie

Site
Luas Finglas

Trial Pit Number
LF-TP-1001

<div>Machine : JCB 3CX</div> <div>Method : Trial Pit</div>	<div>Dimensions</div> <div>3.40m x 0.45m x 3.25m (l x w x d)</div>	<div>Ground Level (mOD)</div> <div>64.56</div>	<div>Client</div> <div>Transport Infrastructure Ireland</div>	<div>Job Number</div> <div>10892-07-21</div>
	<div>Location</div> <div>712805.9 E 740069.4 N</div>	<div>Dates</div> <div>17/01/2022</div>	<div>Project Contractor</div> <div>GII</div>	<div>Sheet</div> <div>1/1</div>

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			64.46 64.41	(0.10) 0.10 0.15	TARMACADAM Dark grey clayey angular fine to coarse crushed rock FILL		
1.00 1.00 1.00	B2 EN2 T2			63.96	0.60	MADE GROUND: Brown slightly sandy gravelly Clay with red brick fragments and a water pipe POSSIBLE MADE GROUND: Brown slightly sandy gravelly Clay with occasional cobbles and boulders		
2.00 2.00 2.00	B3 EN3 T3			62.96	1.60	Firm to stiff grey/brown slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
3.00 3.00	B4 T4		Fast ingress(1) at 3.00m.	61.96 61.46 61.31	2.60 (0.50) 3.10 (0.15) 3.25	Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders Grey angular fine to coarse GRAVEL with many cobbles of LIMESTONE Complete at 3.25m		∇1

Plan										Remarks		
.	Groundwater encountered at 3.00m BGL as fast ingress Trial pit stable Complete at 3.25m BGL Trial pit backfilled upon completion		
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.			
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.			
										Scale (approx)	Logged By	Figure No.
										1:25	EB	



Ground Investigations Ireland Ltd

www.gii.ie

Site
Luas Finglas

Trial Pit Number
LF-TP-1003

Machine : JCB 3CX Method : Trial Pit	Dimensions 3.00m x 0.40m x 3.00m (l x w x d)	Ground Level (mOD) 65.99	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712863.5 E 740275.4 N	Dates 06/12/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			65.89	(0.10) 0.10	Dark brown slightly sandy TOPSOIL		
					(0.60)	Firm brown mottled grey slightly sandy gravelly CLAY		
1.00 1.00 1.00	B2 EN2 T2			65.29	0.70	Stiff grey/brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders		
					(1.20)			
2.00 2.00	B3 T3			64.09	1.90	Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
					(1.10)			
3.00 3.00	B4 T4		Slow seepage(1) at 3.00m.	62.99	3.00	Complete at 3.00m		▽1

Plan					Remarks		
.	.	.	.	.	Groundwater encountered at 3.00m BGL as slow seepage		
.	.	.	.	.	Trial pit stable		
.	.	.	.	.	Complete at 3.00m BGL		
.	.	.	.	.	Trial pit backfilled upon completion		
.			
.			
					Scale (approx)	Logged By	Figure No.
					1:25	EB	



Site
Luas Finglas

Trial Pit Number	LF-TP-1004
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Machine : JCB 3CX
Method : Trial Pit

Dimensions 3.00m x 0.40m x 3.10m (l x w x d)
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Ground Level (mOD)	65.41
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Client	Transport Infrastructure Ireland
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Job Number	10892-07-21
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Location	712856.6 E 740224.9 N
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Dates	06/12/2021
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Project Contractor
GII

Sheet
1/1

Plan 	Remarks Groundwater encountered at 1.70m BGL as fast ingress Trial pit collapse from 1.70m BGL Complete at 3.10m BGL Trial pit backfilled upon completion		
	Scale (approx) 1:25	Logged By EB	Figure No.



Ground Investigations Ireland Ltd

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Site
Luas Finglas

Trial Pit Number
LF-TP-1005

Machine : JCB 3CX Method : Trial Pit		Dimensions 3.30m x 0.40m x 3.50m (l x w x d)	Ground Level (mOD) 65.57	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712851.4 E 740170.9 N	Dates 06/12/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			65.42	(0.15) 0.15	Dark brown slightly gravelly TOPSOIL		
						MADE GROUND: Brown slightly sandy gravelly Clay		
					(0.70)			
						Pipe at 0.70m		
				64.72	0.85	Firm to stiff brown slightly sandy gravelly CLAY with occasional cobbles and boulders		
1.00 1.00 1.00	B2 EN2 T2				(0.95)			
				63.77	1.80	Stiff dark brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
2.00 2.00	B3 T3				(1.00)			
				62.77	2.80	Grey/brown very clayey slightly sandy fine to coarse angular to subrounded GRAVEL of Mudstone		✓1
3.00 3.00	B4 T4		Moderate ingress(1) at 2.80m.		(0.70)			
				62.07	3.50	Complete at 3.50m		

Plan					Remarks		
.	Groundwater encountered at 2.80m BGL as moderate ingress Trial pit spalling from 1.80m BGL Complete at 3.50m BGL Trial pit backfilled upon completion		
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					Scale (approx)	Logged By	Figure No.
					1:25	EB	



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Site
Luas Finglas

Trial Pit Number
LF-TP-1006

Machine : JCB 3CX Method : Trial Pit	Dimensions 2.00m x 0.40m x 2.90m (l x w x d)	Ground Level (mOD) 64.39	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712700.4 E 739675.4 N	Dates 30/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			64.19	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL		
0.50 0.50 0.50	B1 EN1 T2					MADE GROUND: Reworked brown/grey very gravelly Clay		
1.00 1.00 1.00	B2 EN2 T3				(1.70)			
2.00 2.00 2.00	B3 EN3 T4			62.49	1.90	Stiff brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders		
					(1.00)			
3.00 3.00 3.00	B4 EN4 T5		Slow seepage(1) at 3.10m.	61.49	2.90 (0.30)	Dark grey very clayey gravelly fine to coarse SAND with occasional subangular to subrounded cobbles		▽1
				61.19	3.20	Stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders		
					(0.80)			
4.00	B5			60.39	4.00			

Plan .	Remarks Groundwater encountered at 3.10m BGL as slow seepage Trial pit sidewalls stable Complete at 4.00m BGL Trial pit backfilled upon completion		
	Scale (approx) 1:25		
	Logged By EB & JS		
	Figure No.		



Site	Luas Finglas
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Trial Pit Number	LF-TP-1006
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Machine : JCB 3CX
Method : Trial Pit

Dimensions
2.00m x 0.40m x 2.90m (l x w x d)

Ground Level (mOD)	64.39
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Client	Transport Infrastructure Ireland
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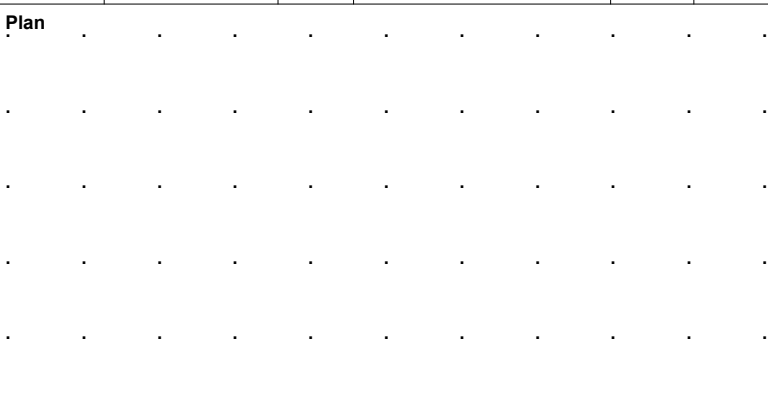
Job Number	10892-07-21
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Location	712700.4 E 739675.4 N
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Dates	30/09/2021
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Project Contractor
GII

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Plan 	Remarks		
	Scale (approx) 1:25	Logged By EB & JS	Figure No.



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Site
Luas Finglas

Trial Pit Number
LF-TP-1007

Machine : JCB 3CX Method : Trial Pit	Dimensions 2.00m x 0.40m x 2.90m (l x w x d)	Ground Level (mOD) 63.15	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712778.5 E 739285.8 N	Dates 30/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			62.95	(0.20)	Brown slightly sandy slightly gravelly TOPSOIL		
0.50	B1			62.75	0.20	MADE GROUND: Dark grey anular fine to coarse Gravel (Crushed rock fill)		
0.50	EN1			62.75	0.40	MADE GROUND: Brown slightly sandy slightly gravelly Clay with plastic fragments		
0.50	T2			62.15	(0.60)			
1.00	B2			61.65	1.00	MADE GROUND: Grey/brown slightly sandy gravelly Clay with red brick fragments		
1.00	EN2			61.65	(0.50)			
1.00	T3			60.55	1.50	MADE GROUND: Grey slightly sandy gravelly Clay with some metal and mortar fragments		
2.00	B3			60.55	(1.10)			
2.00	EN3			59.75	2.60	Stiff light brown/grey slightly sandy gravelly CLAY		
2.00	T4			59.75	(0.80)			
3.00	B4			59.75	3.40	Stiff brown mottled grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
3.00	EN4							
3.00	T5							
4.00	B5				(1.10)			

Plan					Remarks		
.	Groundwater encountered at 4.50m BGL as slow seepage. Trial pit sidewalls stable Complete at 4.50m BGL Trial pit backfilled upon completion		
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					Scale (approx)	Logged By	Figure No.
					1:25	EB & JS	



Site
Luas Finglas

Trial Pit Number	LF-TP-1007
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Machine : JCB 3CX
Method : Trial Pit

Dimensions
2.00m x 0.40m x 2.90m (l x w x d)

Ground Level (mOD)	63.15
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Client	Transport Infrastructure Ireland
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Job Number 10892-07-21

Location
712778.5 E 739285.8 N

Dates	30/09/2021
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Project Contractor
GII

Sheet
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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00 4.00	EN5 T6							
			Slow seepage(1) at 4.50m.	58.65	4.50	Complete at 4.50m		▽1

Plan

Remarks

Scale (approx)

1:25

Logged By

EB & JS

Figure No.



Site
Luas Finglas

<p>Trial Pit Number</p> <p>LF-TP-1008</p>

Machine : JCB 3CX
Method : Trial Pit

Dimensions
3.30m x 0.40m x 4.00m (l x w x d)

Ground Level (mOD)

Client	Transport Infrastructure Ireland
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














Job Number	10892-07-21
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Location
713137.1 E 737274.5 N

Dates	07/12/2021
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Project Contractor
GII

Sheet
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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1				(0.20)	Brown slightly sandy slightly gravelly TOPSOIL		
					0.20	MADE GROUND: Brown slightly sandy slightly gravelly Clay		
					(0.30)			
0.50	B1				0.50	Cast Iron pipe encountered at 0.50m BGL		
0.50	EN1				(0.30)	POSSIBLE MADE GROUND: Grey/brown slightly sandy slightly gravelly Clay		
0.50	T2				0.80	Firm grey/brown slightly sandy gravelly CLAY		
								
1.00	B2							
1.00	EN2				(0.70)			
1.00	T3							
					1.50	Firm grey mottled brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
								
					(0.70)			
2.00	B3							
2.00	T4				2.20	Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
			Slow(1) at 2.40m.					
								
					(1.40)			
3.00	B4							
3.00	T5							
								
					3.60	Stiff grey slightly sandy gravelly CLAY with some angular to subrounded cobbles		
					(0.40)			
4.00	B5				4.00			

Plan

Remarks

Groundwater encountered at 2.40m BGL as slow seepage
Trial pit spalling from 1.30m BGL
Terminated at 4.00m BGL due to extents
Trial pit backfilled upon completion

Scale (approx)

1:25

Logged By

EB

Figure No.



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Site
Luas Finglas
Trial Pit Number
LF-TP-1008

Machine : JCB 3CX Method : Trial Pit		Dimensions 3.30m x 0.40m x 4.00m (l x w x d)		Ground Level (mOD)		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
		Location 713137.1 E 737274.5 N		Dates 07/12/2021		Project Contractor GII		Sheet 2/2	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00	T6							

<div>Plan</div> <div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>	<div>Remarks</div>			
	<div>Scale (approx)</div> <div>1:25</div>			<div>Logged By</div> <div>EB</div>



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Site
Luas Finglas

Trial Pit Number
LF-TP-2001

Machine : JCB 3CX Method : Trial Pit	Dimensions 3.50m x 0.5`0m x 4.50m (l x w x d)	Ground Level (mOD) 56.26	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712741.7 E 738802.3 N	Dates 07/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			56.06	(0.20) 0.20 (0.60)	Dark brown slightly gravelly TOPSOIL MADE GROUND: Black/brown slightly sandy gravelly Clay with plastic and rope fragments		
1.00 1.00 1.00	B2 EN2 T2			55.46 55.21	0.80 (0.25) 1.05	POSSIBLE MADE GROUND: Reddish brown slightly sandy gravelly Clay with occasional cobbles Firm to stiff grey mottled brown sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders with sand lenses		
2.00 2.00 2.00	B3 EN3 T3		Moderate ingress(1) at 1.80m.		(1.45)			∇1
3.00 3.00 3.00	B4 EN4 T4		Moderate ingress(2) at 2.90m.	53.76	2.50	Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		∇2
4.00	B5				(1.70)			

Plan					Remarks		
.	Groundwater encountered at 1.80m and 2.90m BGL as moderate ingresses Trial Pit collapse from 0.80m BGL Complete at 4.50m BGL Trial Pit backfilled upon completion		
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					Scale (approx)	Logged By	Figure No.
					1:25	EB & JS	



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Site
Luas Finglas

Trial Pit Number
LF-TP-2001

Machine : JCB 3CX Method : Trial Pit		Dimensions 3.50m x 0.5*0m x 4.50m (l x w x d)	Ground Level (mOD) 56.26	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712741.7 E 738802.3 N	Dates 07/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00	T5			52.06 51.86 51.76	4.20 (0.20) 4.40 (0.10) 4.50	Dark grey very clayey very gravelly fine to coarse SAND Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders Complete at 4.50m	 	

Plan					Remarks		
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.	Scale (approx) 1:25 Logged By EB & JS Figure No.		



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Site
Luas Finglas

Trial Pit Number
LF-TP-2002

Machine : JCB 3CX Method : Trial Pit		Dimensions 3.50m x 0.5*0m x 3.30m (l x w x d)	Ground Level (mOD) 53.44	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712869 E 738681.7 N	Dates 07/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			53.24	(0.20) 0.20	Dark brown slightly gravelly TOPSOIL		
0.50 0.50 0.50	B1 EN1 T2			52.74	(0.50) 0.70	MADE GROUND: Light brown very clayey angular to subrounded Gravel with red brick fragments		
1.00 1.00 1.00	B2 EN2 T3			51.54	(1.20) 1.90	Stiff grey mottled brown slightly sandy gravelly CLAY		
2.00 2.00 2.00	B3 EN3 T4			50.94	(0.60) 2.50	Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
3.00 3.00 3.00	B4 EN4 T5			50.14	(0.80) 3.30	Dark grey very clayey slightly sandy angular to subrounded fine to coarse GRAVEL with many cobbles and boulders		
						Complete at 3.30m		

Plan					Remarks			
.	.	.	.	.	No groundwater encountered			
.	.	.	.	.	Trial Pit stable			
.	Terminated at 3.30m BGL due to cobbles and boulders			
.	Trial Pit backfilled upon completion			
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					Scale (approx)	Logged By	Figure No.	
					1:25	EB & JS		



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Site
Luas Finglas

Trial Pit Number
LF-TP-2003

Machine : JCB 3CX Method : Trial Pit	Dimensions 3.80m x 0.50m x 4.30m (l x w x d)	Ground Level (mOD) 51.02	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712949.2 E 738593.9 N	Dates 06/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			50.77	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL		
						MADE GROUND: Grey/brown slightly sandy gravelly Clay with metal and plastic fragments		
1.00 1.00 1.00	B2 EN2 T2			50.17	(0.60) 0.85	Firm to stiff grey mottled brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
				49.62	1.40	Stiff brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
					(0.70)			
2.00 2.00 2.00	B3 EN3 T3		Slow seepage(1) at 2.40m.	48.92	2.10	Soft to firm brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders		
				48.52	2.50	Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
					(0.90)			
3.00 3.00 3.00	B4 EN4 T4			47.62	3.40	Firm dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders (wet)		
					(0.50)			
4.00	B5		Slow seepage(2) at 3.90m.	47.12	3.90	Stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		

Plan					Remarks		
.	Groundwater encountered at 2.40m and 3.90m BGL as slow seepages Trial Pit spalling from 1.40m BGL and 3.40m BGL, collapsing from 1.80m - 2.60m BGL Complete at 4.30m BGL Trial pit backfilled upon completion		
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					Scale (approx)	Logged By	Figure No.
					1:25	EB & JS	



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Site
Luas Finglas
Trial Pit
Number
LF-TP-2003

Machine : JCB 3CX Method : Trial Pit		Dimensions 3.80m x 0.50m x 4.30m (l x w x d)	Ground Level (mOD) 51.02	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712949.2 E 738593.9 N	Dates 06/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00	T5			46.82 46.72	(0.30) 4.20 (0.10) 4.30	Dark grey very clayey very gravelly fine to coarse SAND with some cobbles and boulders Complete at 4.30m		

Plan .					Remarks			
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					Scale (approx) 1:25	Logged By EB & JS	Figure No.	



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Site
Luas Finglas

Trial Pit Number
LF-TP-2004

Machine : JCB 3CX Method : Trial Pit	Dimensions 3.80m x 0.50m x 4.50m (l x w x d)	Ground Level (mOD) 49.66	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713013.9 E 738531.8 N	Dates 06/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			49.46	(0.20)	Brown slightly sandy slightly gravelly TOPSOIL		
0.50 0.50 0.50	B1 EN1 T2				0.20	MADE GROUND: Brown gravelly Clay with some red brick fragments		
1.00 1.00 1.00	B2 EN2 T3			48.76	0.90	Firm grey mottled brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles		
2.00 2.00 2.00	B3 EN3 T4			47.96	1.70	Stiff brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles		
3.00 3.00 3.00	B4 EN4 T5			47.36	2.30	Very stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
				47.16	2.50	Dark grey very clayey gravelly fine to coarse SAND		
				46.86	2.80	Very stiff dark grey slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
4.00	B5				(1.70)			

Plan 	Remarks No groundwater encountered Trial pit sidewalls stable Complete at 4.50m BGL Trial pit backfilled upon completion		
	Scale (approx) 1:25	Logged By EB & JS	Figure No.



Site	Luas Finglas
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Trial Pit Number	LF-TP-2004
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Machine : JCB 3CX
Method : Trial Pit

Dimensions
3.80m x 0.5`0m x 4.50m (l x w x d)

Ground Level (mOD)	49.66
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Client	Transport Infrastructure Ireland
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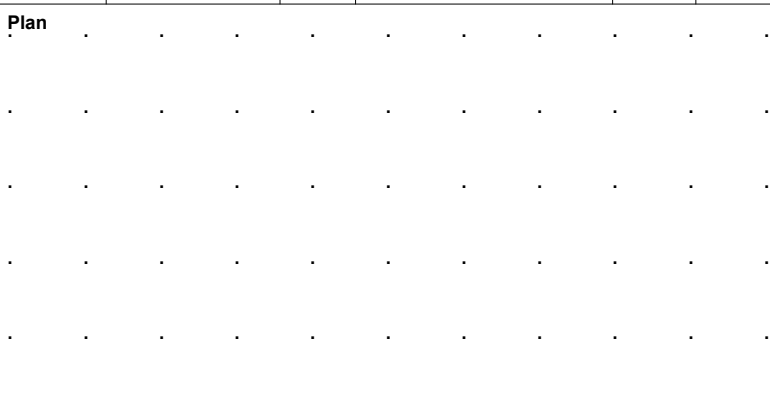
Job Number	10892-07-21
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Location	713013.9 E 738531.8 N
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Dates	06/10/2021
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Project Contractor
GII

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2/2

Plan 	Remarks		
	Scale (approx) 1:25	Logged By EB & JS	Figure No.



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Site
Luas Finglas

Trial Pit Number
LF-TP-2005

Machine : JCB 3CX Method : Trial Pit	Dimensions 3.50m x 0.5`0m x 4.50m (l x w x d)	Ground Level (mOD) 48.74	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713018.7 E 738355.4 N	Dates 05/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			48.44	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL		
0.50 0.50 0.50	B1 EN1 T2			47.84	0.30 (0.60)	MADE GROUND: Brown very clayey sandy subangular to subrounded fine to coarse Gravel with concrete and metal fragments		
1.00 1.00 1.00	B2 EN2 T3			47.24	0.90 (0.60)	MADE GROUND: Brown slightly sandy gravelly Clay with red brick fragments		
2.00 2.00 2.00	B3 EN3 T4				1.50 (1.80)	Grey very clayey very gravelly fine to coarse SAND with occasional cobbles		
3.00 3.00 3.00	B4 EN4 T5			45.44	3.30	Brown very clayey very gravelly fine to coarse SAND with occasional cobbles		
4.00	B5				(1.20)			

Plan .	Remarks Groundwater encountered at 4.40m BGL as moderate ingress Trial pit sidewalls stable Complete at 4.50m BGL Trial pit backfilled upon completion							
						Scale (approx) 1:25	Logged By EB & JS	Figure No.



Site
Luas Finglas

Trial Pit Number	LF-TP-2005
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Machine : JCB 3CX
Method : Trial Pit

Dimensions
3.50m x 0.5`0m x 4.50m (l x w x d)

Ground Level (mOD)	48.74
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Client	Transport Infrastructure Ireland
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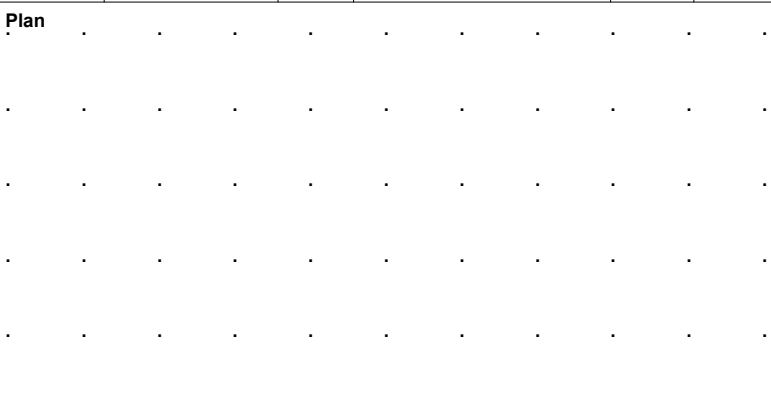
Job Number	10892-07-21
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Location
713018.7 E 738355.4 N

Dates	05/10/2021
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Project Contractor
GII

Sheet
2/2

Plan 	Remarks		
	Scale (approx) 1:25	Logged By EB & JS	Figure No.



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Site
Luas Finglas

Trial Pit Number
LF-TP-2006

Machine : JCB 3CX Method : Trial Pit		Dimensions 2.00m x 0.40m x 4.50m (l x w x d)	Ground Level (mOD) 48.32	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712937.4 E 738199.7 N	Dates 22/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			48.12	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL		
0.50 0.50 0.50	B1 EN1 T2			47.67	(0.45) 0.65	MADE GROUND: Light grey/brown clayey sandy subangular to rounded fine to coarse Gravel		
1.00 1.00 1.00	B2 EN2 T3			47.02	(0.65) 1.30	MADE GROUND: Grey/brown clayey sandy subangular to subrounded fine to coarse Gravel		
2.00 2.00 2.00	B3 EN3 T4			46.12	(0.90) 2.20	MADE GROUND: Dark grey/brown slightly sandy gravelly Clay with red brick fragments Concrete sewer encountered at 1.60m BGL		
3.00 3.00 3.00	B4 EN4 T5				(1.70)	MADE GROUND: Soft to firm brown slightly sandy gravelly Clay with some subangular to subrounded cobbles		
4.00	B5			44.42	3.90	MADE GROUND: Grey/brown slightly sandy gravelly Clay with occasional cobbles and boulders (Backfill)		

Plan					Remarks			
.	No groundwater encountered Trial pit sidewalls stable Complete at 4.50m BGL Trial pit backfilled upon completion			
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					Scale (approx)	Logged By	Figure No.	
					1:25	EB & JS		



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Site
Luas Finglas
Trial Pit
Number
LF-TP-2006

Machine : JCB 3CX Method : Trial Pit		Dimensions 2.00m x 0.40m x 4.50m (l x w x d)	Ground Level (mOD) 48.32	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712937.4 E 738199.7 N	Dates 22/09/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00 4.00	EN5 T6			43.82	(0.60) 4.50	Complete at 4.50m		

Plan .					Remarks			
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					Scale (approx) 1:25	Logged By EB & JS	Figure No.	



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Site
Luas Finglas

Trial Pit Number
LF-TP-2007

Machine : JCB 3CX Method : Trial Pit	Dimensions 4.50m x 0.70m x 4.50m (l x w x d)	Ground Level (mOD) 44.27	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712955.8 E 738118.3 N	Dates 23/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			44.07	(0.20) 0.20 (0.30)	Brown slightly sandy slightly gravelly TOPSOIL		
				43.77	0.50 (0.40)	MADE GROUND: Light brown very clayey sandy subangular to subrounded fine to coarse Gravel		
1.00 1.00 1.00	B2 EN2 T2			43.37	0.90	MADE GROUND: Grey/brown very clayey sandy subangular to subrounded fine to coarse Gravel with metal and piping		
2.00 2.00 2.00	B3 EN3 T3				(2.10)	MADE GROUND: Dark grey slightly sandy gravelly Clay with timber and plastic		
3.00 3.00 3.00	B4 EN4 T4		Moderate ingress(1) at 3.00m.	41.27	3.00 (0.60)	MADE GROUND: Grey clayey very sandy subangular to subrounded fine to coarse Gravel with plastic		▽1
4.00	B5			40.67	3.60	Stiff brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles		

Plan .	Remarks Groundwater encountered at 3.00m BGL as moderate ingress Trial pit sidewalls stable Complete at 4.50m BGL Trial pit backfilled upon completion		
	Scale (approx) 1:25	Logged By EB & JS	Figure No.



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Site
Luas Finglas
Trial Pit
Number
LF-TP-2007

Machine : JCB 3CX Method : Trial Pit		Dimensions 4.50m x 0.70m x 4.50m (l x w x d)	Ground Level (mOD) 44.27	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712955.8 E 738118.3 N	Dates 23/09/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00 4.00	EN5 T5				(0.90)			
				39.77	4.50	Complete at 4.50m		

Plan					Remarks			
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					Scale (approx)	Logged By	Figure No.	
					1:25	EB & JS		



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Site
Luas Finglas

Trial Pit Number
LF-TP-2008

Machine : JCB 3CX Method : Trial Pit	Dimensions 4.50m x 0.70m x 4.50m (l x w x d)	Ground Level (mOD) 40.45	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712937.9 E 738006.3 N	Dates 23/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			40.15	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL		
0.50 0.50 0.50	B1 EN1 T2			39.85	0.30 (0.30)	MADE GROUND: Grey/brown very clayey sandy subangular to subrounded fine to coarse Gravel		
1.00 1.00 1.00	B2 EN2 T3			39.25	0.60 (0.60)	MADE GROUND: Brown very clayey sandy subangular to subrounded fine to coarse Gravel		
2.00 2.00 2.00	B3 EN3 T4				1.20 (2.70)	MADE GROUND: Soft grey slightly sandy silty Clay with plastic, metal and timber		
3.00 3.00 3.00	B4 EN4 T5			36.55	3.90	MADE GROUND: Grey very clayey very sandy subangular to subrounded fine to coarse Gravel		∇1
			Moderate ingress(1) at 3.90m.					

Plan					Remarks			
.	Groundwater encountered at 3.90m BGL as moderate ingress Trial pit sidewalls stable Complete at 4.50m BGL Trial pit backfilled upon completion			
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					Scale (approx)	Logged By	Figure No.	
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Site
Luas Finglas
Trial Pit
Number
LF-TP-2008

Machine : JCB 3CX Method : Trial Pit		Dimensions 4.50m x 0.70m x 4.50m (l x w x d)	Ground Level (mOD) 40.45	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712937.9 E 738006.3 N	Dates 23/09/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00 4.00 4.00	B5 EN6 T7			35.95	(0.60) 4.50	Complete at 4.50m		

Plan					Remarks			
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					Scale (approx)	Logged By	Figure No.	
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Site
Luas Finglas

Trial Pit Number
LF-TP-2009

Machine : JCB 3CX		Dimensions 4.50m x 0.70m x 4.50m (l x w x d)		Ground Level (mOD)		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
Method : Trial Pit		Location		Dates 13/10/2021		Project Contractor GII		Sheet 1/2	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1				(0.25)	Dark brown slightly gravelly TOPSOIL		
0.50 0.50 0.50	B1 EN1 T2				(0.60)	MADE GROUND: Light brown slightly sandy gravelly Clay with some red brick and metal fragments		
1.00 1.00 1.00	B2 EN2 T3				(0.95)	MADE GROUND: Brown slightly sandy gravelly Clay with many metal and concrete fragments		
2.00 2.00 2.00	B3 EN3 T4				(0.80)	Black peaty slightly gravelly OLD TOPSOIL with tree roots and plastic bags		
3.00 3.00 3.00	B4 EN4 T5				(1.30)	MADE GROUND: Grey/brown slightly sandy gravelly Clay with red/yellow sand lenses and metal fragments		
4.00	B5				3.90	Grey very clayey very sandy fine to coarse subangular to rounded GRAVEL with occasional cobbles and boulders		

Plan					Remarks			
.	Groundwater encountered at 4.40m BGL as moderate ingress Trial pit sidewalls stable Complete at 4.50m BGL Trial pit backfilled upon completion			
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					Scale (approx)		Logged By	Figure No.
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Site
Luas Finglas

Trial Pit Number	LF-TP-2009
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Machine : JCB 3CX
Method : Trial Pit

Dimensions
4.50m x 0.70m x 4.50m (l x w x d)

Ground Level (mOD)

Client	Transport Infrastructure Ireland
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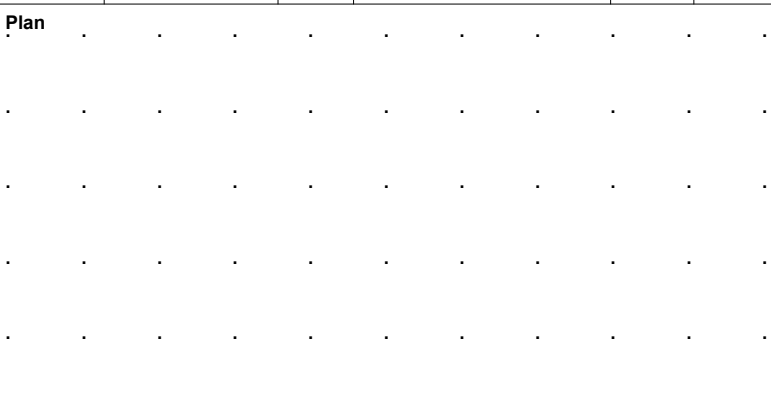
Job Number	10892-07-21
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Location

Dates	13/10/2021
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Project Contractor
GII

Sheet
2/2

Plan 	Remarks		
	Scale (approx)	Logged By	Figure No.
	1:25	EB	



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Site
Luas Finglas

Trial Pit Number
LF-TP-2010

Machine : JCB 3CX Method : Trial Pit	Dimensions 4.50m x 0.70m x 4.35m (l x w x d)	Ground Level (mOD) 32.90	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712932.8 E 737719.2 N	Dates 27/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			32.60	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL		
1.00 1.00 1.00	B2 EN2 T2			31.90	(0.70) 1.00	MADE GROUND: Brown slightly sandy gravelly Clay with red brick		
2.00 2.00 2.00	B3 EN3 T3				(1.60)	MADE GROUND: Brown slightly sandy gravelly Clay with metal and red brick fragments		
3.00 3.00 3.00	B4 EN4 T4			30.30	2.60	MADE GROUND: Grey/dark grey slightly sandy slightly gravelly Clay with many fragments of red brick, metal, plastic, glass and ceramics		
4.00	B5				(1.75)			

Plan					Remarks			
.	No groundwater encountered Trial pit sidewalls stable Complete at 4.35m BGL Trial pit backfilled upon completion			
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					Scale (approx)		Logged By	Figure No.
					1:25		EB & JS	



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Site
Luas Finglas
Trial Pit Number
LF-TP-2010

Machine : JCB 3CX Method : Trial Pit		Dimensions 4.50m x 0.70m x 4.35m (l x w x d)	Ground Level (mOD) 32.90	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location 712932.8 E 737719.2 N	Dates 27/09/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00 4.00	EN5 T5			28.55	4.35	Complete at 4.35m		

Plan .					Remarks			
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					Scale (approx) 1:25	Logged By EB & JS	Figure No.	



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Site
Luas Finglas

Trial Pit Number
LF-TP-2011

Machine : JCB 3CX Method : Trial Pit	Dimensions 3.50m x 0.70m x 3.20m (l x w x d)	Ground Level (mOD) 26.56	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713003.9 E 737661.3 N	Dates 27/09/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	T1			26.36	(0.20)	Brown slightly sandy slightly gravelly TOPSOIL		
0.50	B1			26.06	0.20	MADE GROUND: Grey/brown very clayey sandy subangular to subrounded fine to coarse Gravel with plastic		
0.50	EN1				(0.30)			
0.50	T2				0.50	MADE GROUND: Brown very clayey sandy subangular to subrounded fine to coarse Gravel with plastic		
					(0.60)			
1.00	B2			25.46	1.10	MADE GROUND: Brown slightly sandy gravelly Clay with many red brick fragments		
1.00	EN2							
1.00	T3							
					(1.60)			
2.00	B3			23.86	2.70	MADE GROUND: Dark brown slightly sandy gravelly Clay with occasional cobbles and boulders and plastic fragments		
2.00	EN3				(0.40)			
2.00	T4							
3.00	B4			23.46	3.10	MADE GROUND: Dark grey very clayey sandy angular fine to coarse Gravel with some cobbles and boulders		
3.00	EN4			23.36	(0.10)			
3.00	T5				3.20	Complete at 3.20m		

Plan					Remarks		
.	No groundwater encountered Trial pit sidewalls stable Complete at 3.20m BGL Trial pit backfilled upon completion		
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					Scale (approx)	Logged By	Figure No.
					1:25	EB & JS	



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Site
Luas Finglas

Trial Pit Number
LF-TP-2012

Machine : JCB 3CX Method : Trial Pit		Dimensions 1.90m x 0.40m x 2.10m (l x w x d)	Ground Level (mOD)	Client Transport Infrastructure Ireland	Job Number 10892-07-21
		Location	Dates 06/12/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.10	Dark brown slightly sandy TOPSOIL		
					0.10	Firm brown mottled grey slightly sandy slightly gravelly CLAY		
					(0.50)			
					0.60	Firm to stiff grey/brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
					(1.50)			
					2.10	Complete at 2.10m		

Plan					Remarks			
.	.	.	.	.	No groundwater encountered			
.	.	.	.	.	Trial pit stable			
.	Complete at 2.10m BGL			
.	Soakaway test completed			
.	Trial pit backfilled upon completion			
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					Scale (approx)	Logged By	Figure No.	
					1:25	EB		



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Site
Luas Finglas

Trial Pit Number
LF-TP-3001

Machine : JCB 3CX		Dimensions 3.90m x 0.70m x 4.50m (l x w x d)		Ground Level (mOD)		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
Method : Trial Pit		Location		Dates 14/12/2021		Project Contractor GII		Sheet 1/2	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1				(0.20) 0.20	Dark brown slightly gravelly TOPSOIL with many rootlets		
1.00 1.00 1.00	B2 EN2 T2				(1.20)	MADE GROUND: Brown slightly sandy gravelly Clay with many red brick and plastic fragments		
2.00 2.00 2.00	B3 EN3 T3				1.40 (2.10)	Firm to stiff brown slightly sandy gravelly CLAY with some angular to subrounded cobbles and boulders		
3.00 3.00	B4 T4				3.50	Very stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders		
4.00	B 5							

Plan

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Remarks No groundwater encountered Trial pit collapsing from surface Complete at 4.50m BGL Trial pit backfilled upon completion		
Scale (approx) 1:25	Logged By EB	Figure No.



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Site
Luas Finglas
Trial Pit
Number
LF-TP-3001

Machine : JCB 3CX Method : Trial Pit		Dimensions 3.90m x 0.70m x 4.50m (l x w x d)		Ground Level (mOD)		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
		Location		Dates 14/12/2021		Project Contractor GII		Sheet 2/2	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00	T5				(1.00)			
					4.50	Complete at 4.50m		

Plan					Remarks			
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					Scale (approx)	Logged By	Figure No.	
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Site
Luas Finglas

Trial Pit Number
LF-TP-3002

Machine : JCB 3CX		Dimensions 3.90m x 0.70m x 4.50m (l x w x d)		Ground Level (mOD)		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
Method : Trial Pit		Location		Dates 14/12/2021		Project Contractor GII		Sheet 1/2	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1				(0.30) 0.30 (0.40)	Brown slightly sandy slightly gravelly TOPSOIL MADE GROUND: Light brown slightly sandy slightly gravelly Clay with occasional red brick and plastic fragments		
1.00 1.00 1.00	B2 EN2 T2				0.70 (0.50) 1.20	MADE GROUND: Brown slightly sandy gravelly Clay with occasional plastic fragments Firm brown/grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
2.00 2.00 2.00	B3 EN3 T3				(1.00) 2.20			
3.00 3.00	B4 T4				(1.60) 3.80	Stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders and Sand lenses		
4.00	B 5					Very stiff dark grey slightly sandy gravelly CLAY with many subangular to subrounded cobbles and boulders		





Plan					Remarks			
.	No groundwater encountered Trial pit collapsing from 1.00m BGL Complete at 4.50m BGL Trial pit backfilled upon completion			
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					Scale (approx)		Logged By	Figure No.
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Site
Luas Finglas
Trial Pit
Number
LF-TP-3002

Machine : JCB 3CX Method : Trial Pit		Dimensions 3.90m x 0.70m x 4.50m (l x w x d)		Ground Level (mOD)		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
		Location		Dates 14/12/2021		Project Contractor GII		Sheet 2/2	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
4.00	T5				(0.70)		   	
					4.50	Complete at 4.50m		

Plan					Remarks			
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					Scale (approx)	Logged By	Figure No.	
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**Luas Finglas
Trial Pit Photographs**



LF-TP-1002



LF-TP-1003



LF-TP-1003



LF-TP-1003



LF-TP-1004



LF-TP-1004



LF-TP-1004



LF-TP-1004



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LF-TP-2009



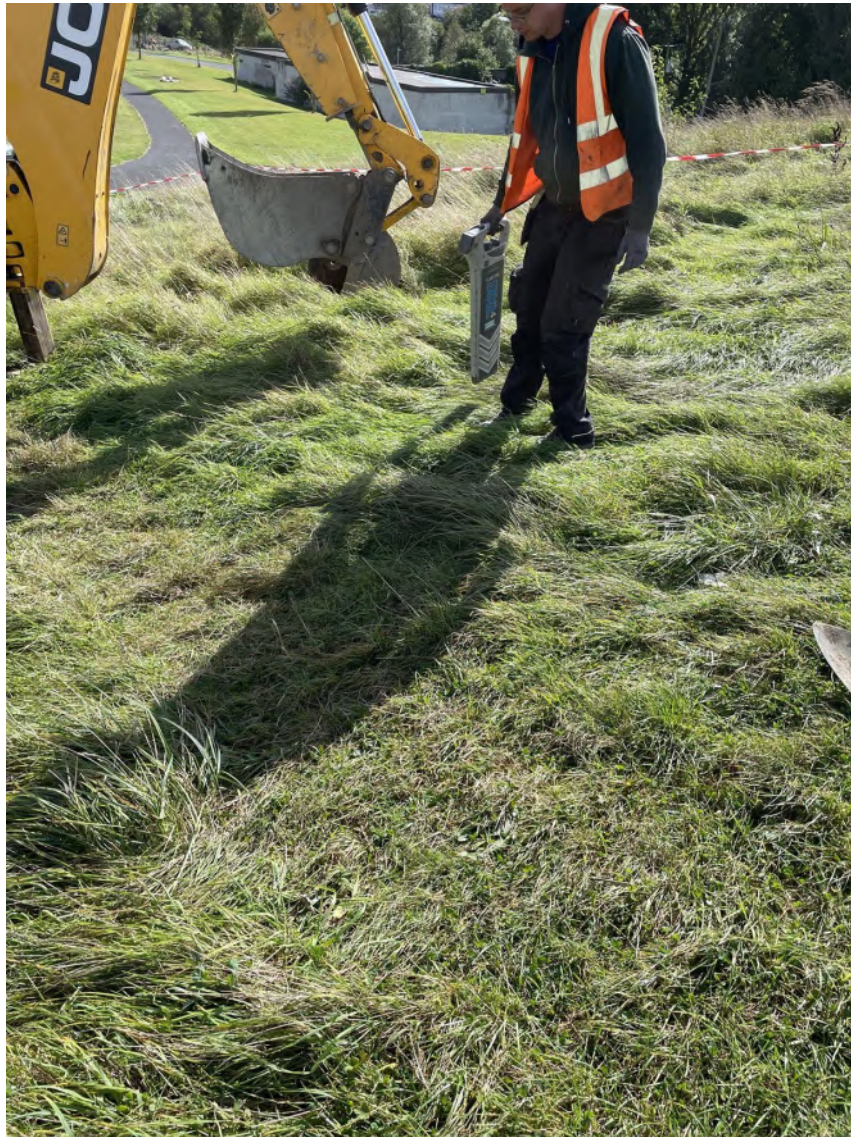
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LF-TP-2010



LF-TP-2011



LF-TP-2011



LF-TP-2011



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LF-TP-2012



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LF-TP-3001



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LF-TP-3001



LF-TP-3002



LF-TP-3002



LF-TP-3002



LF-TP-3002



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Site
Luas Finglas

Number
LF-WS-1001

Machine : Tecop Tec10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 2.80m	Ground Level (mOD) 67.32	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712901.2 E 740510.5 N	Dates 06/12/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50	B1 EN1			67.12	(0.20) 0.20	Brown slightly sandy gravelly TOPSOIL		
						MADE GROUND: Grey/dark brown very clayey sandy fine to coarse angular to Gravel		
1.00 1.00	B2 EN2			66.27	(0.85)			
1.20-1.80	B3			66.12	1.05 (0.15)	Soft to firm brown slightly sandy gravelly CLAY		
					1.20	Very stiff brown mottled grey slightly sandy slightly gravelly CLAY with occasional angular to subrounded black cobbles. Gravel is subangular to subrounded fine to coarse.		
					(0.60)			
1.80-2.80	B4			65.52	1.80	Firm dark grey to black slightly sandy gravelly CLAY with rare black cobbles. Gravel is subangular to subrounded fine to coarse. (Wet stratum)		
					(1.00)			
				64.52	2.80	Refusal at 2.80m		

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out adjacent to dynamic probe. 1.20m - 2.0m BGL: 100% Recovery. 2.0m - 2.80m BGL: 63% Recovery. Refusal at 2.80m BGL. Borehole backfilled on completion.	Scale (approx) 1:25	Logged By CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1003

Machine : Tecop Tec10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.00m	Ground Level (mOD) 64.27	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712798.8 E 740046.4 N	Dates 06/12/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.20-1.70	B1			64.19	(0.08)	TARMACADAM		
				64.12	(0.07)	MADE GROUND: Dark grey slightly sandy very clayey Gravel with crushed rock fill		
1.70-2.00	B2					Soft to firm brown slightly sandy slightly gravelly CLAY		
					(1.05)			
				63.07	1.20	Stiff brown mottled grey slightly sandy gravelly CLAY with occasional angular black cobbles. Gravel subangular to subrounded fine to coarse.		
					(0.50)			
1.70-2.00	B2			62.57	1.70	Firm black slightly sandy slightly gravelly CLAY with occasional angular black cobbles. Gravel is subangular to subrounded fine to coarse.		
					(0.30)			
				62.27	2.00	Refusal at 2.00m		

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out adjacent to dynamic probe. 1.20m - 2.0m BGL: 94% Recovery. Refusal at 2.0m BGL. Borehole backfilled on completion.	Scale (approx) 1:25	Logged By CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1005

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 1.70m	Ground Level (mOD) 63.40	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712791.2 E 739994.9 N	Dates 05/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	BB1 ESEN1			63.05	(0.35)	Dark brown slightly sandy slightly gravelly TOPSOIL		
0.50					0.35	Stiff light brown slightly sandy slightly gravelly CLAY		
1.00	BB2 ESEN2			62.40	1.00	Firm brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
1.20-1.45	BB3			61.95	(0.45)			
1.30	ESEN3				1.45	Very stiff dark brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
1.45-1.70	BB4			61.70	1.70	Complete at 1.70m		

Remarks Inspection pit carried out to 1.20m BGL 1.20 - 1.70m BGL: 100% recovery Refusal at 1.70m BGL	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1006

Excavation Method Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 2.60m	Ground Level (mOD) 62.23	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712734 E 739788.4 N	Dates 25/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	EN1			62.13	(0.10) 0.10	Dark brown slightly sandy slightly gravelly TOPSOIL		
						MADE GROUND: Brown slightly sandy gravelly Clay with rare pieces of plastic		
1.00	EN2				(1.10)			
1.20-1.70	B1			61.03	1.20	MADE GROUND: Brown mottled orange slightly sandy gravelly Clay with occasional cobbles and rare rootlets. Gravel is angular to subrounded fine to coarse. (Reworked)		
					(0.50)			
1.70-2.00	B2			60.53	1.70	MADE GROUND: Red and grey slightly sandy gravelly CLAY with occasional cobbles and rare rootlets. Gravel is subangular to subrounded fine to coarse. (Reworked)		
					(0.30)			
2.00-2.60	B3			60.23	2.00	MADE GROUND: Dark grey and brown slightly sandy slightly gravelly Clay with occasional rootlets and rare grass. (Reworked)		
					(0.60)			
				59.63	2.60	Refusal at 2.60m		

Remarks [Inspection pit carried out to 1.20m BGL.] 1.20 - 2.00m BGL: 94% recovery. 2.00 - 2.60m BGL: 92% recovery. Dynamic probe carried out adjacent to window sample. Refusal at 2.60m BGL. Borehole backfilled on completion.	Scale (approx) 1:25	Logged By CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1007

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 3.00m	Ground Level (mOD) 63.69	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712722.3 E 739480.3 N	Dates 08/10/2021- 21/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1			63.39	0.30 (0.30)	Brown slightly gravelly TOPSOIL			
				63.09	0.60 (0.30)	MADE GROUND: Light brown slightly sandy gravelly Clay with red brick fragments			
1.00 1.00 1.00 1.20-2.00	B2 EN2 T2 B3			62.49	1.20 (0.60)	MADE GROUND: Brown mottled grey slightly sandy gravelly Clay with occasional cobbles			
1.50	EN3				(1.20)	MADE GROUND: Brown mottled grey/light brown slightly silty slightly sandy slightly gravelly Clay with occasional fragments of mortar, ash, charcoal, red brick, plastic and glass.			
2.00-2.40	B4								
2.40-3.00 2.50	B5 EN4			61.29	2.40 (0.60)	MADE GROUND: Greyish brown slightly silty slightly sandy slightly gravelly Clay with rare fragments of red brick, mortar and plastic.			
				60.69	3.00	Complete at 3.00m			

Remarks Inspection pit carried out to 1.20m BGL 1.20m - 2.00m BGL: 100% Recovery 2.00m - 3.00m BGL: 93% Recovery Window sample carried out in through backfilled inspection pit	Scale (approx) 1:25	Logged By EB & JS / JMD
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1008

Excavation Method Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 2.50m	Ground Level (mOD) 56.62	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712741 E 738855.4 N	Dates 29/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	EN1			56.48	(0.14) 0.14	Brown slightly sandy gravelly TOPSOIL		
					(0.36)	POSSIBLE MADE GROUND: Brown sandy gravelly Clay with rootlets. Gravel is subangular to subrounded fine to coarse.		
				56.12	0.50	Firm to stiff brown sandy gravelly CLAY with occasional cobbles and boulders.		
					(0.70)			
1.00	EN2							
1.20-1.60	B1			55.42	1.20	Soft brown sandy gravelly CLAY with occasional cobbles and boulders.		
				55.22	1.40	Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse.		
					(0.20)			
1.60-2.50	B2			55.02	1.60	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is angular to subrounded fine to coarse.		
				54.82	1.80	Stiff dark grey slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is angular to subrounded fine to coarse.		
					(0.70)			
				54.12	2.50	Refusal at 2.50m		

Remarks Inspection pit carried out to 1.20m BGL. 1.20 - 2.00m BGL: 100% recovery. 2.00 - 2.50m BGL: 90% recovery. Dynamic probe carried out adjacent to window sample. Refusal at 2.50m BGL. Borehole backfilled on completion.	Scale (approx) 1:25	Logged By CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1009

Excavation Method Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 2.40m	Ground Level (mOD) 55.48	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712776.8 E 738789.8 N	Dates 26/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	EN1			55.18	0.30	Brown slightly sandy slightly gravelly TOPSOIL.		
					0.60	MADE GROUND: Brown slightly sandy gravelly Clay with redbrick and glass fragments. Gravel is subangular to subrounded fine to coarse.		
1.00	EN2			54.58	0.90	POSSIBLE MADE GROUND: Grey brown slightly sandy gravelly Clay with occasional cobbles. Gravel is subangular to subrounded fine to coarse.		
1.20-1.70	B1		Water strike(1) at 1.10m.	54.28	1.20	Firm greyish brown sandy gravelly CLAY with occasional fine to coarse sand and gravel lenses and rare rootlets. Gravel is angular to subrounded fine to coarse.		
					0.50			
1.70-2.00	B2			53.78	1.70	Stiff dark grey slightly sandy gravelly CLAY with occasional cobbles. Gravel is subangular to subrounded fine to coarse.		
					0.30			
2.00-2.40	B3			53.48	2.00	Very stiff slightly sandy gravelly CLAY with occasional medium to coarse sand lenses. Gravel is subangular to subrounded fine to coarse.		
					0.40			
				53.08	2.40	Refusal at 2.40m		

Remarks Inpection pit carried out to 1.20m BGL. 1.20 - 2.00m BGL: 100% recovery. 2.00 - 2.40m BGL: 75% recovery. Dynamic probe carried out adjacent to window sample. Refusal at 2.40m BGL. Borehole backfilled on completion.	Scale (approx) 1:25	Logged By CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1010

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 3.00m	Ground Level (mOD) 52.10	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712901.7 E 738639 N	Dates 08/10/2021- 26/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			51.90	(0.20) 0.20 (0.60)	Brown slightly gravelly TOPSOIL MADE GROUND: Light brown slightly sandy gravelly Clay with red brick fragments		
1.00 1.00 1.00 1.20-2.05	B2 EN2 T2 B3			51.30 51.10 50.90	0.80 (0.20) 1.00 (0.20) 1.20	Firm brown mottled grey slightly sandy gravelly CLAY with occasional cobbles Stiff brown mottled grey slightly sandy gravelly CLAY with occasional cobbles Firm brown mottled grey slightly sandy gravelly CLAY with occasional cobbles		
2.00 2.05-3.00	EN3 B4			50.40 49.70 49.10	(0.50) 1.70 (0.70) 2.40 (0.60) 3.00	Stiff brown mottled grey slightly sandy slightly gravelly CLAY with rare cobbles. Gravel is fine to coarse subangular to rounded Very stiff grey/black slightly silty slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded Refusal at 3.00m		

Remarks Inspection pit carried out to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit 0.00m - 1.00m BGL - 85% Recovery 1.00m - 2.00m BGL - 90% Recovery 2.00m - 3.00m BGL - 100% Recovery Refusal at 3.00m BGL	Scale (approx) 1:25	Logged By EB & JS / CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1011

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions	Ground Level (mOD)	Client	Job Number
	88mm to 3.0m 66mm to 3.6m	50.48	Transport Infrastructure Ireland	10892-07-21
	Location	Dates	Project Contractor	Sheet
	712968.8 E 738562.9 N	07/10/2021- 26/10/2021	GII	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			50.28	(0.20) 0.20	Brown slightly gravelly TOPSOIL		
						MADE GROUND: Brown slightly sandy gravelly Clay with plastic fragments		
1.00 1.00 1.00 1.20-1.80	B2 EN2 T2 B3			49.68	(0.60) 0.80	Firm brown mottled grey slightly sandy gravelly CLAY		
				49.28	(0.40) 1.20	Firm brown mottled grey slightly sandy slightly gravelly CLAY with rare cobbles. Gravel is fine to coarse angular to subrounded		
1.80-2.20	B4			48.68	(0.60) 1.80	Firm brownish grey grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded		
2.20-3.00	B5			48.28	(0.40) 2.20	Very stiff greyish black slightly silty slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded		
				47.58	(0.70) 2.90	Stiff greyish black slightly silty slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded		
3.00-3.60	B6			46.88	(0.70) 3.60	Refusal at 3.60m		

Remarks Inspection pit carried out to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit 0.00m - 1.00m BGL - 90% Recovery 1.00m - 2.00m BGL - 95% Recovery 2.00m - 3.00m BGL - 100% Recovery 3.00m - 3.60m BGL - 100% Recovery Refusal at 3.60m BGL	Scale (approx)	Logged By
	1:25	EB & JS / CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1012

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 3.50m	Ground Level (mOD) 49.26	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713023.3 E 738505.1 N	Dates 04/10/2021-20/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			48.96	0.30 (0.30)	Dark brown slightly sandy slightly gravelly TOPSOIL		
				48.46	0.80 (0.50)	MADE GROUND: Grey/brown clayey very sandy subangular to subrounded fine to coarse Gravel with plastic fragments		
1.00 1.00 1.00 1.20-1.70 1.20-1.70	B2 EN2 T2 B3 EN3			48.06	1.20 (0.40)	Firm brown mottled grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles		
				47.56	1.70 (0.50)	Soft brownish grey mottled orange slightly silty slightly sandy slightly gravelly CLAY.		
1.70-2.20	B4			47.26	2.00 (0.30)	Loose grey/brown slightly sandy clayey fine to medium angular to subrounded GRAVEL.		
				47.06	2.20 (0.20)	Medium dense grey/brown slightly sandy clayey fine to medium angular to subrounded GRAVEL.		
2.20-3.10	B5			46.46 46.36	2.80 (0.10) 2.90	Firm brownish grey slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.		
				45.96	3.30 (0.60)	Stiff brownish grey slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.		
3.10-3.50	B6			45.76	3.50 (0.20)	Very stiff grey/brown slightly silty slightly sandy gravelly CLAY. Gravel is fine to medium angular to subrounded.		
						Complete at 3.50m		

Remarks Inspection pit carried out to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit 0.00 - 1.00m BGL: 85% Recovery 1.00 - 2.00m BGL: 75% Recovery 2.00 - 3.00m BGL: 62% Recovery 3.00 - 3.50m BGL: 100% Recovery	Scale (approx) 1:25	Logged By EB & JS / JMD
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1013

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.0m 66mm to 3.0m	Ground Level (mOD) 48.69	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713058 E 738399.9 N	Dates 04/10/2021- 20/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			48.39	0.30 (0.30)	Brown slightly sandy slightly gravelly TOPSOIL		
1.00 1.00 1.00 1.20-1.90	B2 EN2 T2 B3			47.49	1.20 (0.90)	MADE GROUND: Grey brown clayey very sandy subangular to subrounded fine to coarse Gravel with plastic fragments		
1.90 1.90-3.00	EN3 B4			46.79	1.90 (0.90)	MADE GROUND: Brown mottled grey slightly silty slightly sandy gravelly Clay with rare plastic fragments and rare rootlets. Gravel is fine to coarse angular to subrounded		
2.80 3.00	EN4 EN5			45.89 45.69	2.80 (0.20) 3.00	MADE GROUND: Greyish black slightly sandy gravelly Clay with occasional probable coal fragments and rare red brick fragments. Gravel is fine to coarse subangular to subrounded		
						Refusal at 3.00m		

Remarks Inspection pit carried out to 1.20m BGL 0.00m - 1.00m BGL - 80% Recovery 1.00m - 2.00m BGL - 97% Recovery Window sample carried out from ground level through backfilled inspection pit 2.00m - 3.00m BGL - 100% Recovery Refusal at 3.00m BGL	Scale (approx) 1:25	Logged By EB & JS / CE
	Figure No.	



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Site Luas Finglas	Number LF-WS-1014
Client Transport Infrastructure Ireland	Job Number 10892-07-21
Project Contractor GII	Sheet 1/1

Machine : Tecopsa TEC10	Dimensions 88mm to 4.00m 68mm to 5.00m	Ground Level (mOD) 50.86
Method : Drive-in Windowless Sampler	Location 712971.8 E 738253 N	Dates 04/10/2021

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1			50.66 50.36	(0.20) 0.20 (0.30) 0.50	Brown slightly sandy slightly gravelly TOPSOIL MADE GROUND: Light grey/brown clayey sandy subangular to rounded fine to coarse Gravel MADE GROUND: Grey/brown clayey sandy subangular to rounded fine to coarse Gravel			
1.00 1.00 1.00 1.20-2.00 1.20-2.00	B2 EN2 T2 B3 EN3			49.71 49.66	(0.65) 1.15 1.20	MADE GROUND: Reworked grey slightly sandy gravelly Clay MADE GROUND: Dark grey slightly sandy slightly gravelly Clay with plaster and red brick fragments			
2.00-3.00 2.00-3.00	B4 EN4			48.86	2.00	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional plaster and red brick fragments			
3.00-4.40 3.00-4.40	B5 EN5			47.86	3.00	MADE GROUND: Dark brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles and red brick and concrete fragments			
4.40-5.00 4.40-5.00	B6 EN6			46.46 46.16 45.86	4.40 (0.30) 4.70 (0.30) 5.00	Soft brown slightly sandy slightly gravelly CLAY Firm brown slightly sandy slightly gravelly CLAY			

Remarks

Inspection pit carried out to 1.20m BGL.
Window sample carried out from ground level through backfilled inspection pit
0.00 - 1.00m BGL: 60% recovery
1.00 - 2.00m BGL: 100% recovery.
2.00 - 3.00m BGL: 65% recovery.
3.00 - 4.00m BGL: 70% recovery.
4.00 - 5.00m BGL: 60% recovery.
Slotted standpipe installed from 5.00m BGL to 1.00m BGL with a pea gravel surround and geotextile sleeve, with a plain standpipe installed from 1.00m BGL to GL with a bentonite seal and a flush cover.

Scale (approx) 1:25	Logged By EB & JS
Figure No.	



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Site
Luas Finglas

Number
LF-WS-1015

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 5.00m	Ground Level (mOD) 39.37	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712929.9 E 737960.1 N	Dates 04/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.25	B1					Brown slightly sandy slightly gravelly TOPSOIL			
0.25-1.00	B2			39.07	0.30	MADE GROUND: Grey/brown clayey sandy subangular to subrounded fine to coarse Gravel			
0.50 0.50 0.50	B3 EN1 T2			38.77	0.60	MADE GROUND: Dark grey/brown clayey very sandy subangular to subrounded fine to coarse Gravel			
1.00 1.00 1.00 1.00-2.00	B4 EN1 T2 B5			38.37	1.00	MADE GROUND: Reworked greyish brown/ grey slightly sandy gravelly Clay with occasional subangular to subrounded cobbles, plant matter and red brick fragments			
2.00-3.00	B6				(3.00)				
3.00-4.00	B7								
4.00-5.00	B8			35.37	4.00	Medium dense grey/greyish brown slightly clayey sandy angular to subrounded fine to coarse GRAVEL			
					(1.00)				
				34.37	5.00				

Remarks No groundwater encountered Window sample carried out from ground level through backfilled inspection pit Inspection pit carried out to 1.20m BGL 0.00m BGL to 1.00m BGL: 52%, 1.00m BGL to 2.00m BGL: 72%, 2.00m BGL to 3.00m BGL: 85%, 3.00m BGL to 4.00m BGL: 85%, 4.00m BGL to 5.00m BGL: 55% Complete at 5.00m BGL	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1016

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 4.0m	Ground Level (mOD) 42.25	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712938.1 E 738062 N	Dates 04/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.25	B1				(0.25)	Brown slightly sandy slightly gravelly TOPSOIL			
0.25-0.60	B2			42.00	0.25 (0.35)	MADE GROUND: Brown clayey very sandy subangular to subrounded fine to coarse Gravel			
0.50 0.50 0.50 0.60-1.10	B3 EN1 T1 T2			41.65	0.60 (0.50)	MADE GROUND: Dark brown clayey very sandy subangular to subrounded fine to coarse Gravel			
1.00 1.00 1.00 1.20-1.65	B4 EN2 T3 B5			41.15 41.05	1.10 (0.10) 1.20	MADE GROUND: Brown slightly sandy gravelly Clay with occasional metal fragments			
					(0.45)	MADE GROUND: Grey slightly sandy slightly gravelly Clay with glass, plastic, charcoal and plant fragments			
1.65-2.05	B6			40.60	1.65 (0.40)	MADE GROUND: Brown/grey slightly sandy slightly gravelly Clay with occasional red brick fragments			
2.05-3.20	B7			40.20	2.05 (1.15)	MADE GROUND: Redworked light brown mottled greyish brown slightly sandy slightly gravelly Clay with occasional subangular cobbles			
3.20-4.00	B8			39.05	3.20 (0.50)	Medium dense grey/greyish brown slightly clayey sandy angular to subrounded fine to coarse GRAVEL			
				38.55	3.70 (0.30)	Dense grey/greyish brown slightly clayey sandy angular to subrounded fine to coarse GRAVEL			
				38.25	4.00	Terminated at 4.00m			

Remarks Inspection pit carried out to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit No groundwater encountered 0.00m BGL to 1.00m BGL: 50%, 1.00m BGL to 2.00m BGL: 80%, 2.00m BGL to 3.00m BGL: 100%, 3.00m BGL to 4.00m BGL: 70% Refusal at 4.00m BGL	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1017

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 4.00m 68mm to 5.00m	Ground Level (mOD) 35.65	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712928.4 E 737858.6 N	Dates 05/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.20	B1				(0.20)	Brown slightly sandy slightly gravelly TOPSOIL			
0.20-1.10	B2			35.45	0.20	MADE GROUND: Grey/brown clayey very sandy subangular to subrounded fine to coarse Gravel			
0.50 0.50 0.50	B3 EN1 T1				(0.90)				
1.00 1.00 1.00 1.10-2.00	B4 EN2 T2 B5			34.55	1.10	MADE GROUND: Reworked grey/brown slightly sandy slightly gravelly Clay with occasional angular to subangular cobbles, plant matter, and tarmacadam and red brick fragments			
2.00-3.00	B6								
3.00-4.00	B7				(3.60)				
4.00-4.70	B8								
4.70-5.00	B9			30.95 30.85 30.65	4.70 (0.10) 4.80 (0.20) 5.00	Dense grey/greyish brown slightly clayey sandy angular to subrounded fine to coarse GRAVEL Very stiff grey slightly sandy slightly gravelly CLAY			

Remarks Inspection pit carried out to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit No groundwater encountered 0.00m BGL to 1.00m BGL: 81%, 1.00m BGL to 2.00m BGL: 87%, 2.00m BGL to 3.00m BGL: 85%, 3.00m BGL to 4.00m BGL: 42%, 4.00m BGL to 5.00m BGL: 89% Complete at 5.00m BGL	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site Luas Finglas	Number LF-WS-1018
Client Transport Infrastructure Ireland	Job Number 10892-07-21
Project Contractor GII	Sheet 1/1

Machine : Tecopsa TEC10	Dimensions 88mm to 4.00m	Ground Level (mOD) 31.49
Method : Drive-in Windowless Sampler	Location 712946.7 E 737740.4 N	Dates 04/10/2021

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1			31.29	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL			
						MADE GROUND: Brown slightly sandy gravelly Clay with plastic			
1.00 1.00 1.00 1.20-2.40 1.20-2.40	B2 EN2 T2 B3 EN3			30.59	(0.70) 0.90	MADE GROUND: Dark grey slightly sandy gravelly Clay with red brick and plastic fragments			
					(1.50)				
2.40-3.00 2.40-3.00	B4 EN4			29.09	2.40	POSSIBLE MADE GROUND: Brown mottled grey slightly sandy slightly gravelly Clay			
					(0.60)				
3.00-4.00	B5			28.49	3.00	Stiff brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles			
3.50	EN5				(1.00)				
				27.49	4.00	Complete at 4.00m			

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out from ground level through backfilled inspection pit 0.00 - 1.00m BGL: 90% recovery.. 2.00 - 3.00m BGL: 90% recovery. 3.00 - 4.00m BGL: 90% recovery. Slotted standpipe installed from 4.00m BGL to 1.00m BGL with a pea gravel surround and geotextile sleeve, with a plain standpipe installed from 1.00m BGL to GL with a bentonite seal and a flush cover. Dynamic probe carried out adjacent to window sample.	Scale (approx) 1:25	Logged By EB & JS
Figure No.		



Number
LF-WS-1019

Job Number 10892-07-21

Sheet
1/1

Remarks Inspection pit carried out to 0.65m BGL. Window sample carried out from ground level through backfilled inspection pit Obstruction at 0.65m BGL: Possible boulder or bedrock. 0.00 - 1.00m BGL: 50% recovery. 1.00 - 1.70m BGL: 75% recovery. Slotted standpipe installed from 1.70m BGL to 1.00m BGL with a pea gravel surround and geotextile sleeve, with a plain standpipe installed from 1.00m BGL to GL with a bentonite seal and a flush cover. Refusal at 1.70m BGL.	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1020

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 1.20m	Ground Level (mOD) 26.08	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713046.9 E 737642.6 N	Dates 05/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1			25.83	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.			
						MADE GROUND: Grey/brown very clayey sandy subangular to subrounded fine to coarse Gravel.			
					(0.75)				
1.00 1.00-1.20 1.00-1.20	T2 B2 EN2			25.08	1.00	MADE GROUND: Stiff dark grey slightly sandy slightly gravelly Clay (Old Topsoil).			
				24.88	(0.20) 1.20				
						Complete at 1.20m			

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out from ground level through backfilled inspection pit 0.00 - 1.00m BGL: 80% recovery. 1.00 - 1.20m BGL: 100% recovery. Refusal at 1.20m BGL. Dynamic probe carried out adjacent to window sample.	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-1021

Machine : Techop 10 Method : Drive-in Windowless Sampler	Dimensions	Ground Level (mOD) 26.10	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713088.3 E 737639.3 N	Dates 05/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1				(0.25) 25.85 0.25 (0.25) 25.60 0.50 (0.50) 25.10 1.00 25.09 1.01	Brown slightly sandy slightly gravelly TOPSOIL MADE GROUND: Brown slightly sandy gravelly Clay MADE GROUND: Brown clayey angular fine to coarse Gravel CONCRETE Complete at 1.01m	 	




Remarks Inspection pit carried out to 1.01m BGL Obstruction at 1.01m BGL due to concrete slab	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas
Number
LF-WS-1021A

Machine : Techop 10 Method : Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
		Location		Dates 05/10/2021		Project Contractor GII		Sheet 1/1	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1				(0.25) 0.25 (0.65) 0.90 0.91	Brown slightly sandy slightly gravelly TOPSOIL MADE GROUND: Brown very clayey sandy subangular to subrounded fine to coarse Gravel with plastic fragments CONCRETE Complete at 0.91m	  	

Remarks Inspection pit carried out to 0.91m BGL Obstruction at 0.91m BGL due to concrete slab							Scale (approx) 1:25	Logged By EB & JS
							Figure No.	



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Site
Luas Finglas

Number
LF-WS-1022

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 1.70m	Ground Level (mOD) 28.58	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713135.7 E 737476.1 N	Dates 05/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50	B1 EN1			28.43	(0.15) 0.15	CONCRETE		
				28.23	(0.20) 0.35	MADE GROUND: Brown sandy very clayey angular to subrounded fine to coarse Gravel with many angular cobbles		
						MADE GROUND: Brown slightly sandy slightly gravelly CLAY with red brick and concrete fragments		
1.00-1.20 1.00-1.20	B2 EN2				(1.35)			
1.20-1.70	B3							
1.40	EN3			26.88	1.70	Complete at 1.70m		

Remarks Inspection pit carried out to 1.20m BGL 1.20 - 1.70m BGL: 100% recovery Refusal at 1.70m BGL	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site Luas Finglas	Number LF-WS-1022A
Client Transport Infrastructure Ireland	Job Number 10892-07-21
Project Contractor GII	Sheet 1/1

Machine : Tecopsa TEC10	Dimensions 88mm to 1.50m	Ground Level (mOD)
Method : Drive-in Windowless Sampler	Location	Dates 05/11/2021

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.20-1.50	B1				(0.15)	CONCRETE		
					0.15	MADE GROUND: Brown sandy very clayey angular to subrounded fine to coarse Gravel with many angular cobbles		
					(0.20)			
					0.35	MADE GROUND: Brown slightly sandy slightly gravelly CLAY with red brick and concrete fragments		
					(1.15)			
1.30	EN1				1.50	Complete at 1.50m		

Remarks Inspection pit carried out to 1.20m BGL 1.20 - 1.50m BGL: 100% recovery Refusal at 1.50m BGL	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site Luas Finglas		Number LF-WS-1023
Client Transport Infrastructure Ireland		Job Number 10892-07-21
Project Contractor GII		Sheet 1/1

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions	Ground Level (mOD)
	Location	Dates 26/11/2021

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.07) 0.07	Tar		
					(1.03) 1.10	MADE GROUND: Brown slightly sandy slightly gravelly CLAY with red brick and rootlets		
						Complete at 1.10m		

Remarks Inspection pit carried out to 1.10m BGL Exploratory hole cancelled due to presence of a possible historical wall							Scale (approx)	Logged By
							1:25	EB & JS
							Figure No.	



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Site
Luas Finglas

Number
LF-WS-2001

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 68mm to 2.55m	Ground Level (mOD) 64.32	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712692.3 E 739624 N	Dates 06/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			64.07	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.		
1.00 1.00 1.00 1.20-2.10	B2 EN2 T2 B3			63.12	(0.95) 1.20	MADE GROUND: Grey/brown sandy very clayey subangular to subrounded fine to coarse Gravel with occasional cobbles and boulders, and metal fragments.		
2.00 2.10-2.55	EN3 B4			62.62	(0.50) 1.70	Firm to stiff brown mottled grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
				61.92	(0.70) 2.40	Stiff brown mottled grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
				61.77	(0.15) 2.55	Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
						Complete at 2.55m		

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out from ground level through backfilled inspection pit 0.00 - 1.00m BGL: 95% recovery. 1.00 - 2.00m BGL: 100% recovery. 2.00 - 2.55m BGL: 100% recovery. Refusal at 2.55m BGL. Dynamic probe carried out adjacent to window sample.	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-2002

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 4.00m 68mm to 5.00m	Ground Level (mOD) 64.01	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712696.7 E 739527.6 N	Dates 06/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Brown slightly sandy slightly gravelly TOPSOIL.		
0.50 0.50 0.50	B1 EN1 T1			63.76	(0.25) 0.25	MADE GROUND: Grey/brown sandy very clayey subangular to subrounded fine to coarse Gravel with occasional cobbles and boulders, and metal fragments.		
1.00 1.00 1.00 1.20-2.00 1.20-2.00	B2 EN2 T2 B3 EN3			62.81	(0.95) 1.20	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular cobbles, red brick, concrete, and ceramic fragments. Organic odour.		
2.00-3.00 2.00-3.00	B4 EN4			62.01	2.00	MADE GROUND: Brown mottled grey slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles and some glass and concrete fragments.		
3.00-3.90 3.00-3.90	B5 EN5			61.01	(1.00) 3.00	POSSIBLE MADE GROUND: Dark brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles. Organic odour.		
3.90-5.00 3.90-5.00	B6 EN6			60.11	(0.90) 3.90	Firm dark grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
				59.91	(0.20) 4.10	Stiff dark grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
					(0.70)			
				59.21	4.80	Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
				59.01	(0.20) 5.00			

Remarks

Inspection pit carried out to 1.20m BGL.
 Window sample carried out from ground level through backfilled inspection pit
 0.00 - 1.00m BGL: 80% recovery
 1.00 - 2.00m BGL: 90% recovery
 3.00 - 4.00m BGL: 85% recovery
 Dynamic probe carried out adjacent to window sample.
 Complete at 5.0m BGL.

Scale (approx)
1:25

Logged By
EB & JS

Figure No.



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Site
Luas Finglas

Number
LF-WS-2003

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.80m	Ground Level (mOD) 63.87	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712726.8 E 739421.8 N	Dates 06/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Brown slightly sandy slightly gravelly TOPSOIL.		
0.50	B1			63.62	0.25	MADE GROUND: Grey/brown sandy very clayey subangular to subrounded fine to coarse Gravel with occasional cobbles and boulders, and metal fragments.		
0.50	EN1							
0.50	T1				(0.95)			
1.00	B2			62.67	1.20	MADE GROUND: Brown mottled grey slightly sandy slightly gravelly Clay with occasional red brick and ceramic fragments.		
1.00	EN2				(0.25)			
1.00	T2							
1.20-1.45	B3			62.42	1.45	MADE GROUND: Grey fine to coarse subrounded to rounded Gravel.		
1.20-1.45	EN3				(0.65)			
1.45-2.10	B4							
				61.77	2.10	Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
2.10-2.80	B5				(0.70)			
2.50	EN4			61.07	2.80	Refusal at 2.80m		

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out from ground level through backfilled inspection pit 0.00 - 1.00m BGL: 90% recovery. 1.00 - 2.00m BGL: 80% recovery. 2.00 - 2.80m BGL: 75% recovery. Refusal at 2.80m BGL. Dynamic probe carried out adjacent to window sample.	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-2004

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 1.60m	Ground Level (mOD) 63.60	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712754.3 E 739336.1 N	Dates 05/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B1			63.40	(0.20)	Brown slightly sandy slightly gravelly TOPSOIL		
0.50	EN1				0.20	MADE GROUND: Brown sandy very clayey subangular to subrounded fine to coarse Gravel with occasional cobbles and boulders, and metal fragments		
0.50	T1				(0.70)			
1.00	B2			62.70	0.90	MADE GROUND: Brown clayey slightly gravelly fine Sand		
1.00	EN2				(0.20)			
1.00	T2			62.50	1.10	MADE GROUND: Grey/brown slightly sandy gravelly Clay with occasional plastic fragments		
1.20-1.50	B3			62.40	(0.10)			
1.20-1.50	EN3				1.20	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles		
1.50-1.60	B4			62.10	(0.30)			
1.50-1.60	EN4				1.50	POSSIBLE MADE GROUND: Dark brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles		
				62.00	(0.10)			
					1.60	Complete at 1.60m		

Remarks Inspection pit carried out to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit Refusal at 1.60m BGL	Scale (approx) 1:25	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-2005

Machine : Tecopsa TEC10 Method : Drive-in Windowless Sampler	Dimensions	Ground Level (mOD)	Client	Job Number
	88mm to 4.00m 68mm to 5.00m	62.46	Transport Infrastructure Ireland	10892-07-21
	Location	Dates	Project Contractor	Sheet
	712794.8 E 739232.4 N	05/10/2021	GII	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	B1 EN1 T1			62.26	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL.		
1.00 1.00 1.00 1.20-2.00 1.20-2.00	B2 EN2 T2 B3 EN3			61.26	(1.00) 1.20	MADE GROUND: Brown slightly sandy gravelly Clay with some cobbles and boulders, and tarmacadam fragments.		
2.00-3.00 2.00-3.00	B4 EN4				(1.80)	MADE GROUND: Dark grey slightly sandy gravelly Clay with occasional concrete and red brick fragments.		
3.00-4.30 3.00-4.30	B5 EN5			59.46	3.00	Stiff brown sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
					(0.60)			
				58.86	3.60	Sand lens present from 3.50m BGL to 3.70m BGL		
					(0.70)	Very stiff brown sandy gravelly CLAY with occasional subangular to subrounded cobbles.		
4.30-5.00	B6			58.16	4.30	Firm dark grey slightly sandy gravelly CLAY.		
4.70	EN6				(0.70)			
				57.46	5.00			

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out from ground level through backfilled inspection pit 0.00 - 1.00m BGL: 85% recovery. 1.00 - 2.00m BGL: 90% recovery. 2.00 - 3.00m BGL: 75% recovery. 4.00 - 5.00m BGL: 80% recovery. Complete at 5.0m BGL. Dynamic probe carried out adjacent to window sample.	Scale (approx)	Logged By
	1:25	EB & JS
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-2006

Machine : Tecop Tec10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 3.00m	Ground Level (mOD)	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location	Dates 08/12/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50	B1 EN1				(0.30) 0.30	Brown sandy gravelly TOPSOIL		
1.00 1.00	B2 EN2				(0.90)	Firm brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is subangular to subrounded fine to coarse		
1.20-1.60	B3				1.20 (0.40)	Firm orange brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.		
1.60-3.00	B4				1.60 (0.80)	Firm grey mottled brown slightly sandy gravelly CLAY with rare fine to medium sandy lenses. Gravel is subangular to subrounded fine to coarse.		
					2.40 (0.60)	Very stiff grey mottled brown slightly sandy gravelly CLAY with rare fine to medium sandy lenses. Gravel is subangular to subrounded fine to coarse.		
					3.00	Refusal at 3.00m		

Remarks Inspection pit carried out to 1.20m BGL. Window sample carried out adjacent to dynamic probe. 1.20m - 2.0m BGL: 100% Recovery. 2.0m - 3.0m BGL: 90% Recovery. Refusal at 3.0m BGL. Borehole backfilled on completion.							Scale (approx) 1:25	Logged By CE
							Figure No.	



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Site
Luas Finglas

Number
LF-WS-2008

Machine : Tecop Tec10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 2.00m 66mm to 2.40m	Ground Level (mOD)	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location	Dates 08/12/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	TARMAC		
					0.15	Dary grey clayey angualr fine to coarse Crushed Rock FILL		
					(0.25)			
					0.40	MADE GROUND: Brown slightly sandy gravelly Clay with some cobbles		
					(0.70)			
					1.10			
1.20-1.50	B1				(0.10)	Stiff dark grey slightly sandy gravelly CLAY with occasional subangualr to subrounded cobbles		
					1.20			
					(0.30)	Stiff grey brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.		
1.50-1.90	B2				1.50			
					(0.40)	Very stiff grey brown sandy gravelly CLAY with occasional Sand and Gravel lenses. Gravel is subangular to subrounded fine to coarse. (Wet stratum)		
1.90-2.40	B3				1.90			
					(0.50)	Very stiff grey to black slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse. (Wet stratum)		
					2.40			
						Refusal at 2.40m		

Remarks Inspeiton pit carried out to 1.20m BGL. Window sample carried out from ground level through backfilled inspection pit 1.20m - 2.0m BGL: 94% Recovery. 2.0m - 2.40m BGL: 90% Recovery. Refusal at 2.40m BGL. Borehole backfilled on completion.	Scale (approx)	Logged By
	1:25	CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-2009

Machine : Tecop Tec10	Dimensions 88mm to 2.00m 66mm to 2.40m	Ground Level (mOD) 62.15	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Drive-in Windowless Sampler	Location 712662.8 E 739018 N	Dates 10/01/2022	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	B3				(0.30)	Brown slightly sandy slightly gravelly TOPSOIL.		
0.50	B1			61.85	0.30	MADE GROUND: Brown slightly sandy gravelly Clay with some angular cobbles.		
0.50	EN1			61.55	0.60	MADE GROUND: Grey very clayey sandy fine to coarse angular to subrounded Gravel with occasional plastic twine and metal fragments.		
1.00	B2				(0.60)			
1.00	EN2			60.95	1.20	Recovery consists of soft greyish brown slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is angular to subrounded fine to coarse. (Wet stratum)		
1.00-2.40	B4		Slow seepage(1) at 1.10m.		(0.80)			
				60.15	2.00	Recovery consists of soft grey slightly sandy gravelly CLAY with with occasional angular to subrounded cobbles. Gravel is angular to subrounded fine to coarse. (Wet stratum)		
				59.75	2.40	Refusal at 2.40m		

Remarks Inspection pit carried out to 1.20m BGL. Groundwater encountered at 1.10m BGL as slow seepage. Window sample refusal at 2.40m BGL. Dynamic probe carried out adjacent to window sample. 0.0m - 1.0m BGL: 43% recovery. 1.0m - 2.0m BGL: 15% recovery. 2.0m - 2.40m BGL: 45% recovery. Borehole backfilled on completion.	Scale (approx) 1:25	Logged By CE
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-2010

Machine : Tecop TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 3.00m	Ground Level (mOD) 59.14	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712704.8 E 738915.8 N	Dates 21/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-1.20	B1			58.99	(0.15) 0.15	Dark brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
0.50	EN1				(1.05)	MADE GROUND: Light brown slightly sandy slightly gravelly silty Clay with occasional fragments of plastic, glass and red brick.		
1.20-1.80	B2			57.94	1.20	MADE GROUND: Brown mottled grey slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles.		
1.50	EN2				(0.60)			
1.80-3.00	B3			57.34	1.80	MADE GROUND: Dark brownish grey slightly sandy slightly gravelly Clay with rare cobbles and rare fragments of red brick, mortar and plastic.		
2.50	EN3				(1.20)			
				56.14	3.00	Complete at 3.00m		

Remarks Window sample carried out from ground level through backfilled inspection pit No groundwater encountered Inspection pit carried out to 1.20m BGL 0.00m - 1.00m BGL: 95% Recovery 1.00m - 2.00m BGL: 100% Recovery 2.00m - 3.00m BGL: 100% Recovery	Scale (approx) 1:25	Logged By JMD
	Figure No.	



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Site
Luas Finglas

Number
LF-WS-2011

Machine : Tecop TEC10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 1.80m	Ground Level (mOD)	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712804.9 E 738755.3 N	Dates 25/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-1.20	B1				(0.15) 0.15	Dark brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
0.50	EN1				(0.45) 0.60	MADE GROUND: Light brown slightly sandy slightly gravelly silty Clay with occasional fragments of plastic, glass and red brick.		
1.20-1.80	B2				(0.60) 1.20	Firm brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded		
1.50	EN2				(0.60) 1.80	Very stiff brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded		
						Complete at 1.80m		

Remarks No groundwater encountered Inspection pit carried out to 1.20m BGL 0.00m - 1.00m BGL: 95% Recovery 1.00m - 2.00m BGL: 100% Recovery 2.00m - 3.00m BGL: 100% Recovery	Scale (approx) 1:25	Logged By JMD
	Figure No.	



Number
LF-WS-3001

Job Number	10892-07-21
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Sheet
1/1

Remarks Inspection pit carried to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit Refusal at 2.80m BGL. 0.0m - 1.0m BGL: 82% recovery. 1.0m - 2.0m BGL: 28% recovery. 2.0m - 2.80m BGL: 100% recovery. Borehole backfilled on completion.	Scale (approx)	Logged By
	1:25	CE
	Figure No.	



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Site
Luas Finglas

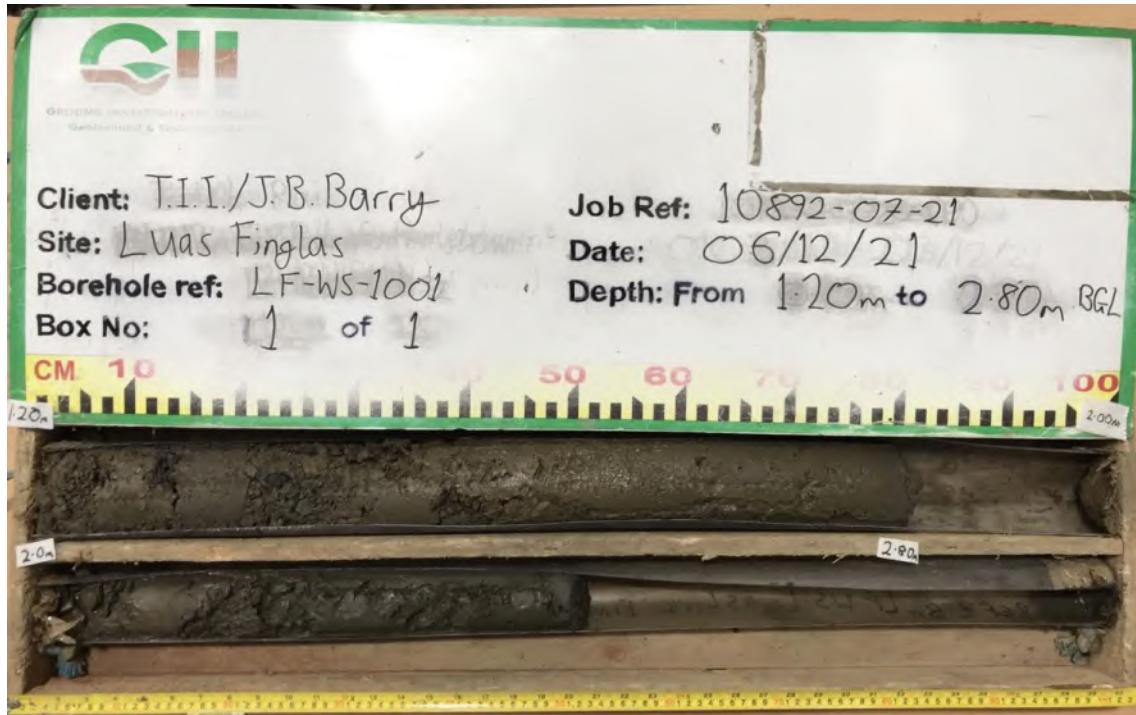
Number
LF-WS-3002

Machine : Tecop Tec10 Method : Drive-in Windowless Sampler	Dimensions 88mm to 3.00m 66mm to 4.50m	Ground Level (mOD)	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location	Dates 05/01/2022	Project Contractor GII	Sheet 1/1

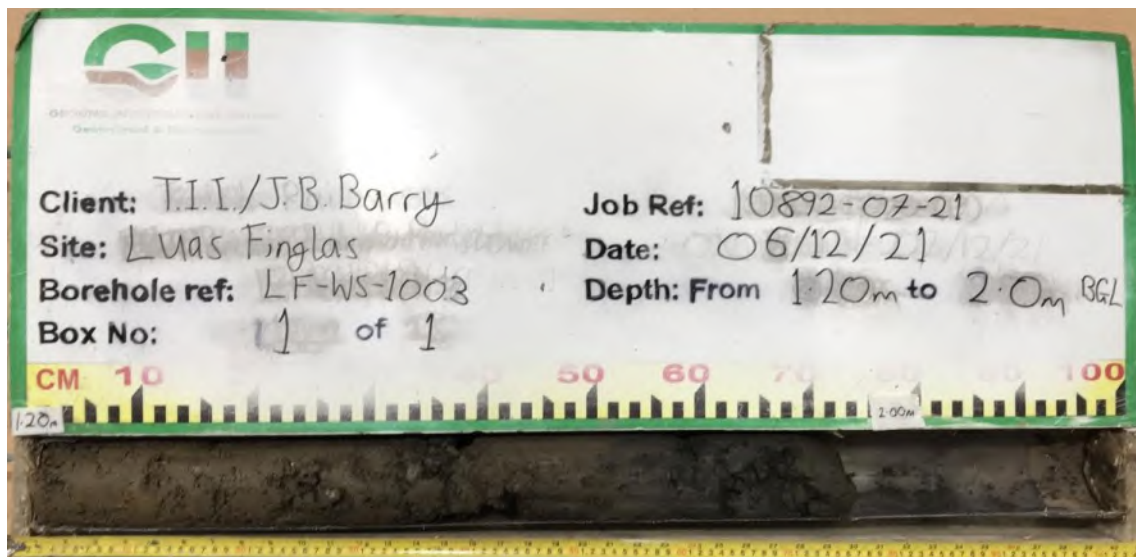
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	B1				(1.00)	MADE GROUND: Dark brown to black slightly sandy slightly gravelly Clay with occasional rootlets, shell fragments, and some wood, red brick, and plastic fragments. Gravel is subangular to subrounded fine to coarse.		
1.00-2.05	B2				1.00 (1.05)	MADE GROUND: Greyish brown slightly sandy gravelly Clay with occasional rootlets and shell fragments, and rare red brick, plastic, and possibel charcoal fragments. Gravel is angular to subrounded fine to coarse.		
2.05-2.55	B3				2.05 (0.50)	Brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.		
2.55-3.90	B4				2.55 (1.35)	Brownish grey slightly sandy gravelly CLAY with occasional cobbles. Gravel is subangular to subrounded fine to coarse.		
3.90-4.50	B5				3.90 (0.60) 4.50	Dark grey to black slightly sandy gravelly CLAY with occasional cobbles. Gravel is angular to subrounded fine to coarse.		
						Refusal at 4.50m		

Remarks Inpsection pit carried out to 1.20m BGL Window sample carried out from ground level through backfilled inspection pit 0.0m - 1.0m BGL: 45% recovery. 1.0m - 2.0m BGL: 55% recovery. 2.0m - 3.0m BGL: 90% recovery. 3.0m - 4.0m BGL: 85% recovery. 4.0m - 4.50m BGL: 100% recovery. Refusal at 4.50m BGL.							Scale (approx)	Logged By
							1:25	CE
							Figure No.	

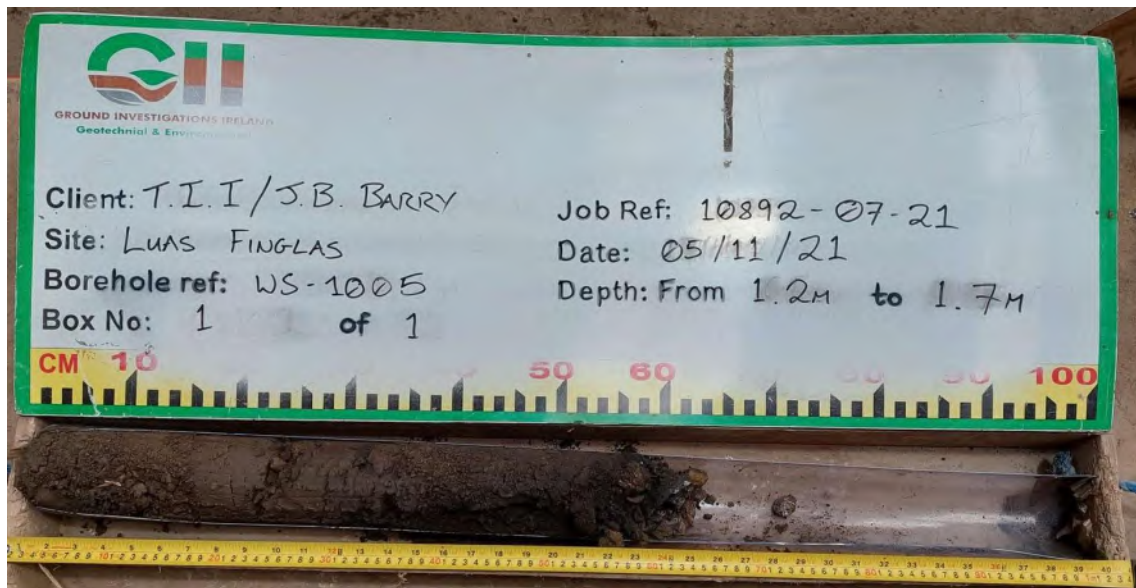
**Luas Finglas
Window Sample Photographs**



LF-WS-1001



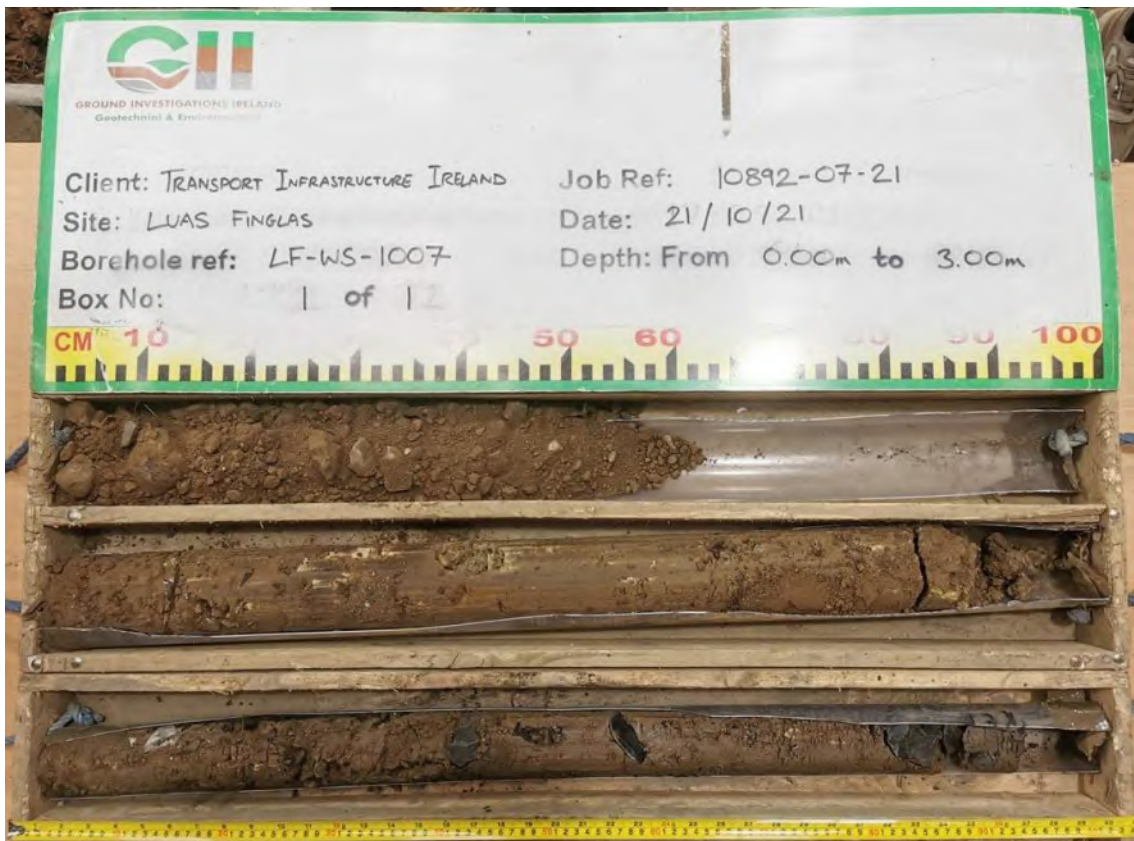
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LF-WS-1005



LF-WS-1006



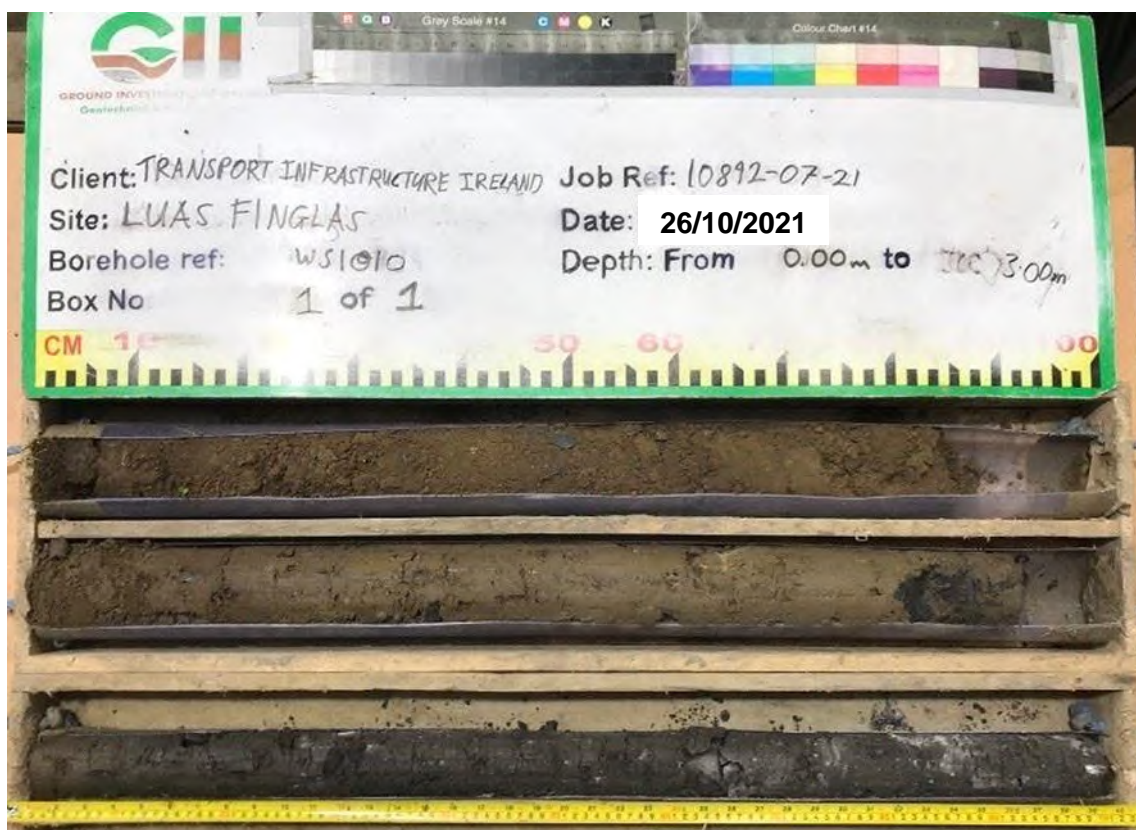
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LF-WS-1008



LF-WS-1009



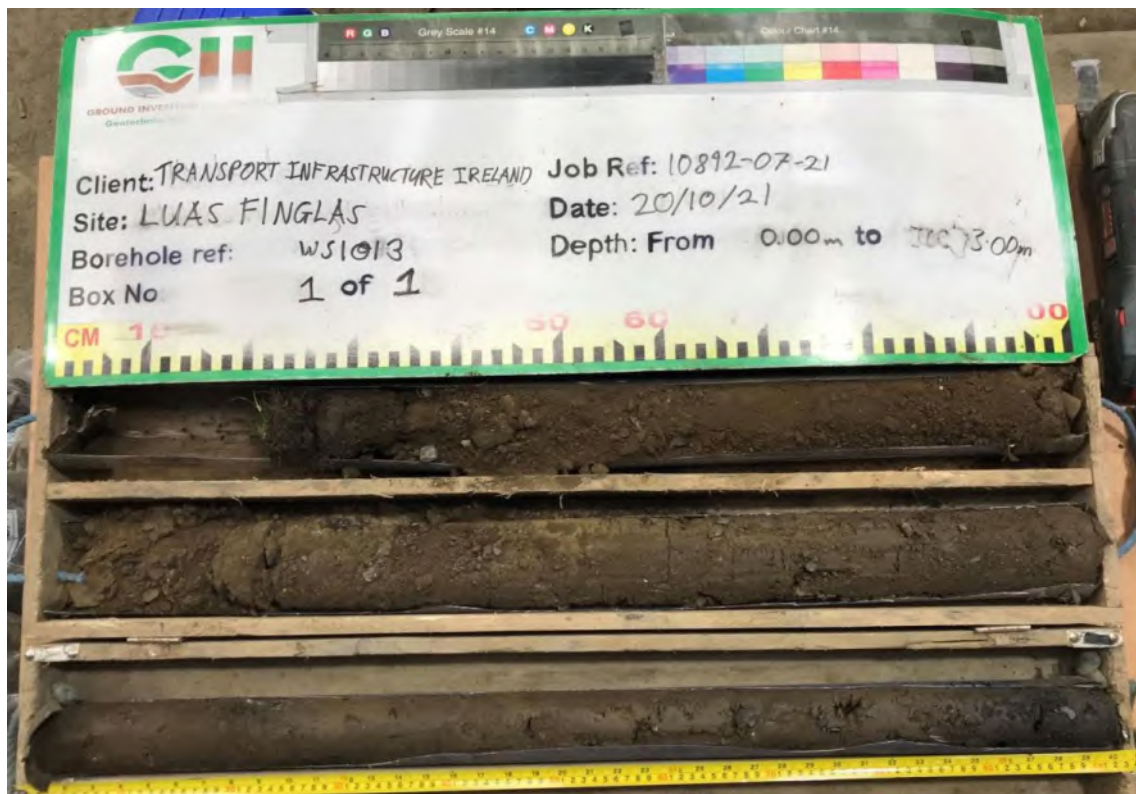
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LF-WS-1011



LF-WS-1012



LF-WS-1013



LF-WS-1014



LF-WS-1014



LF-WS-1015



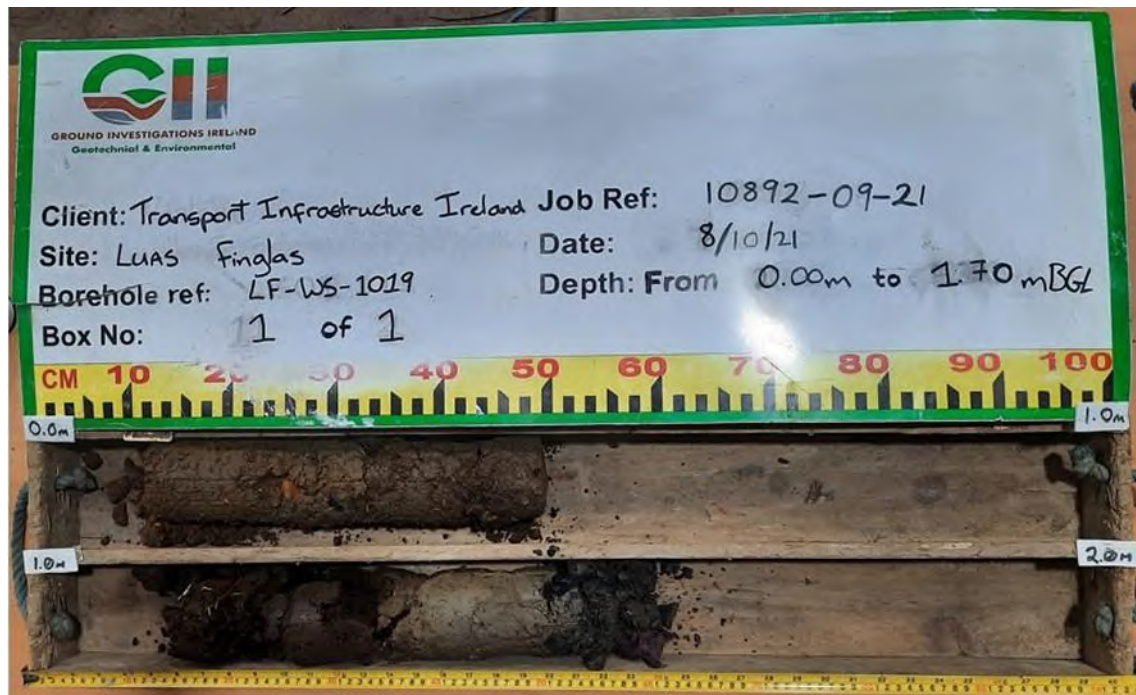
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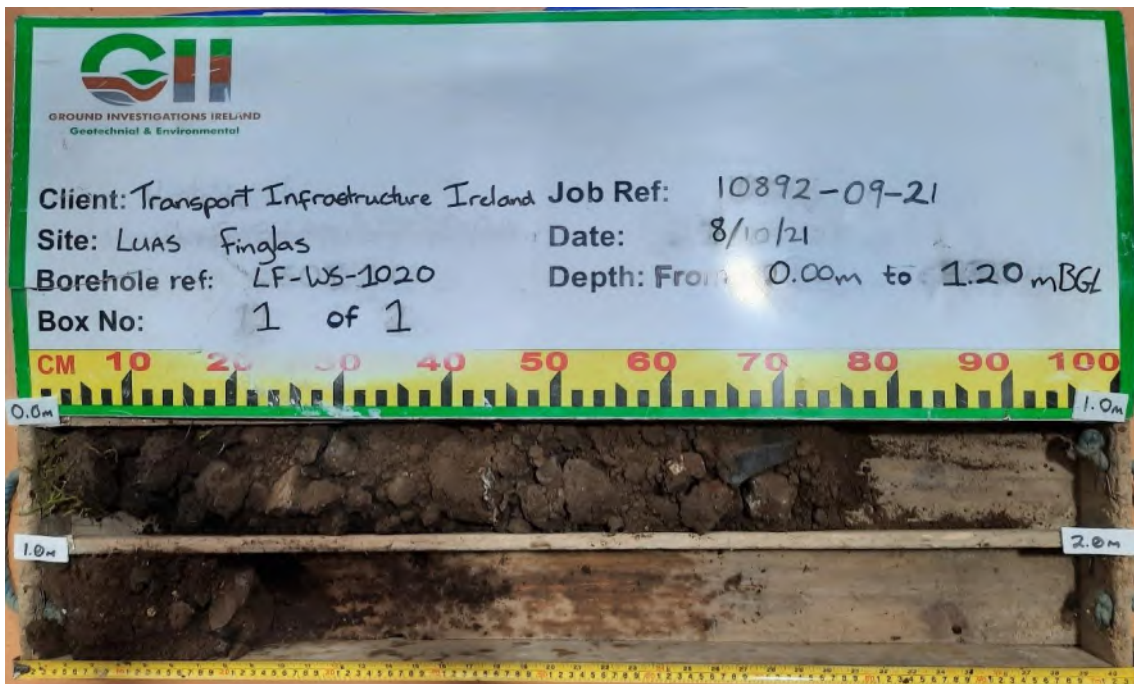
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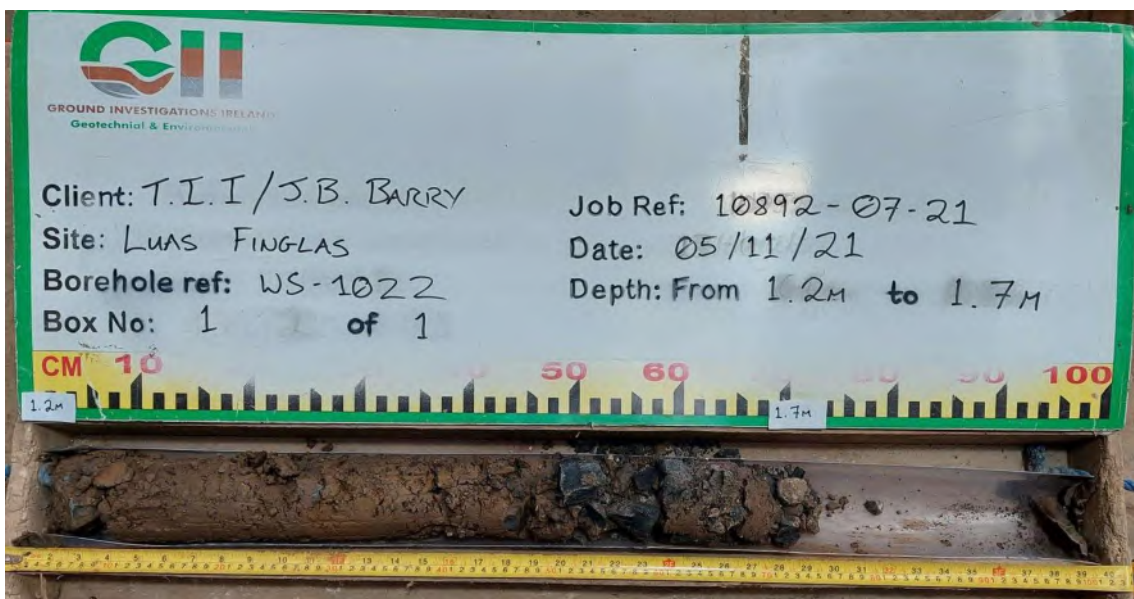
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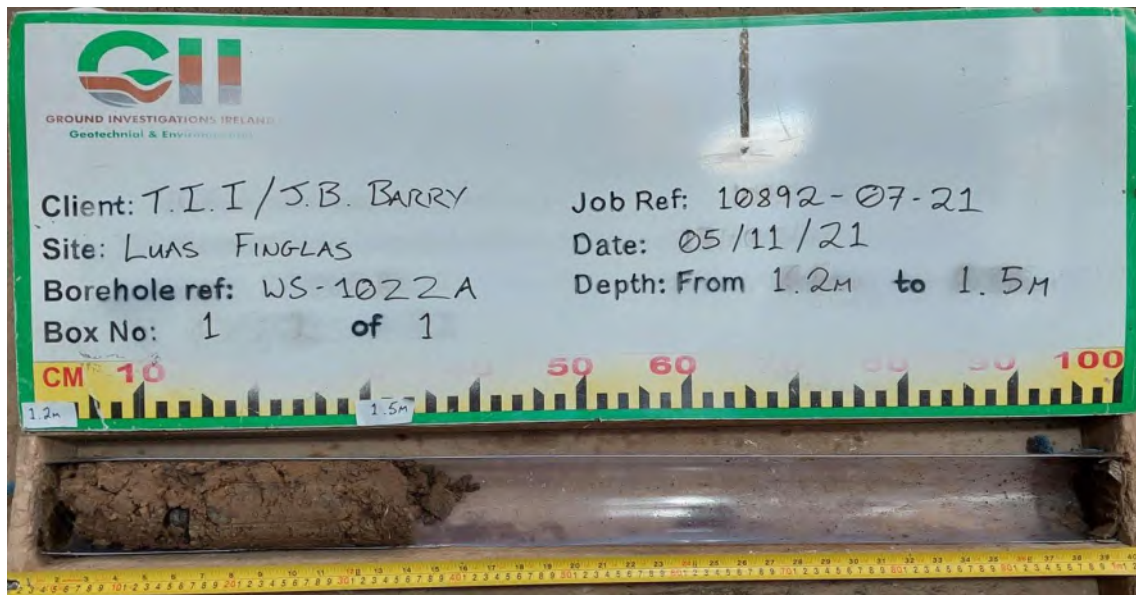
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LF-WS-1020



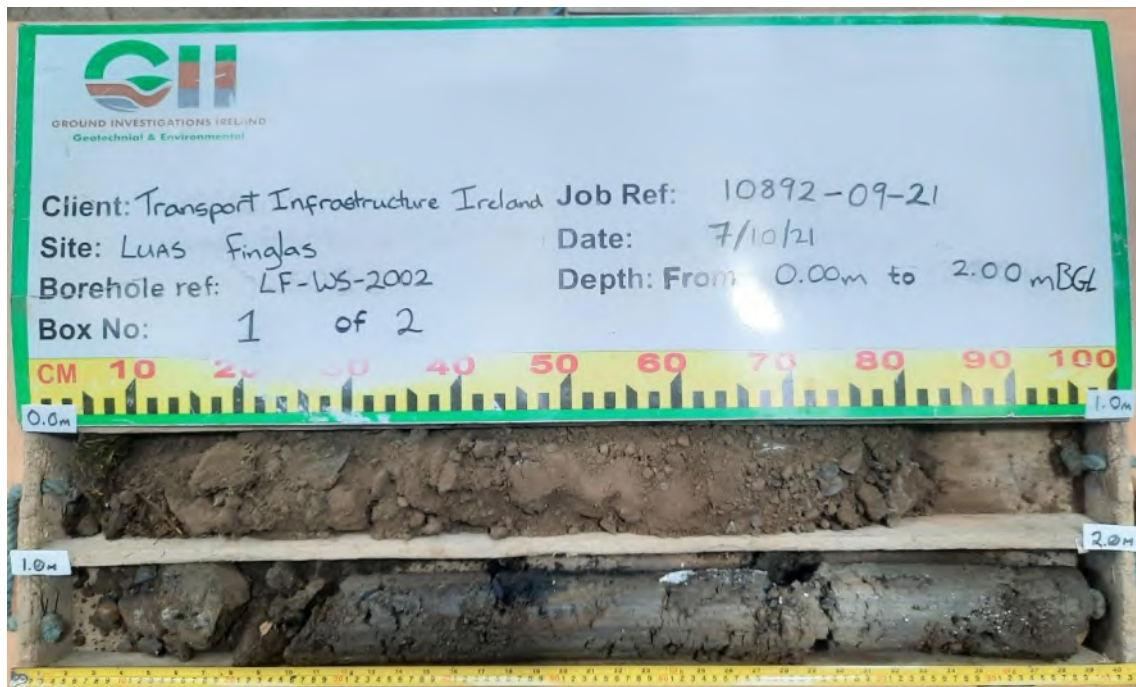
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LF-WS-1022A



LF-WS-2001



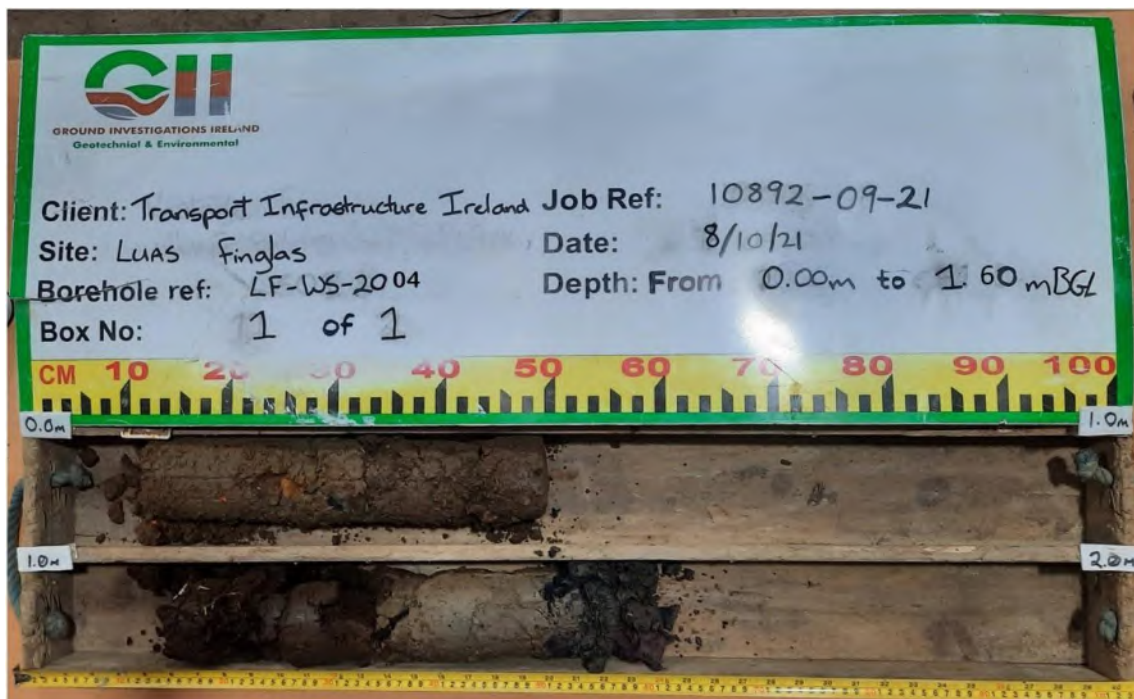
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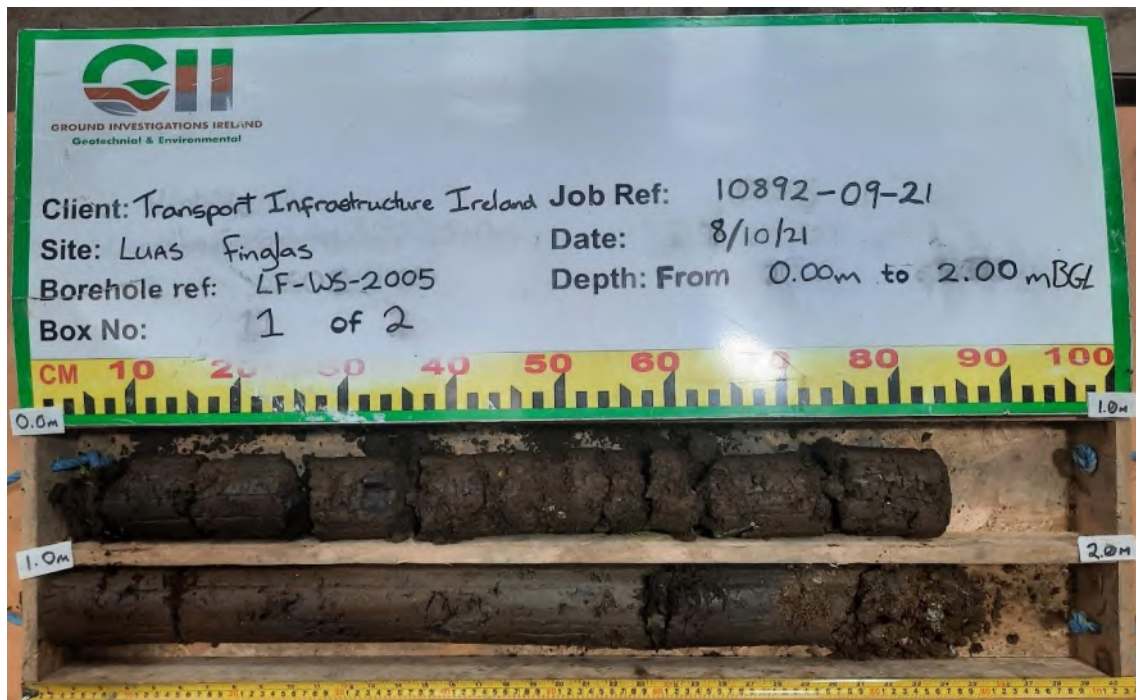
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LF-WS-2003



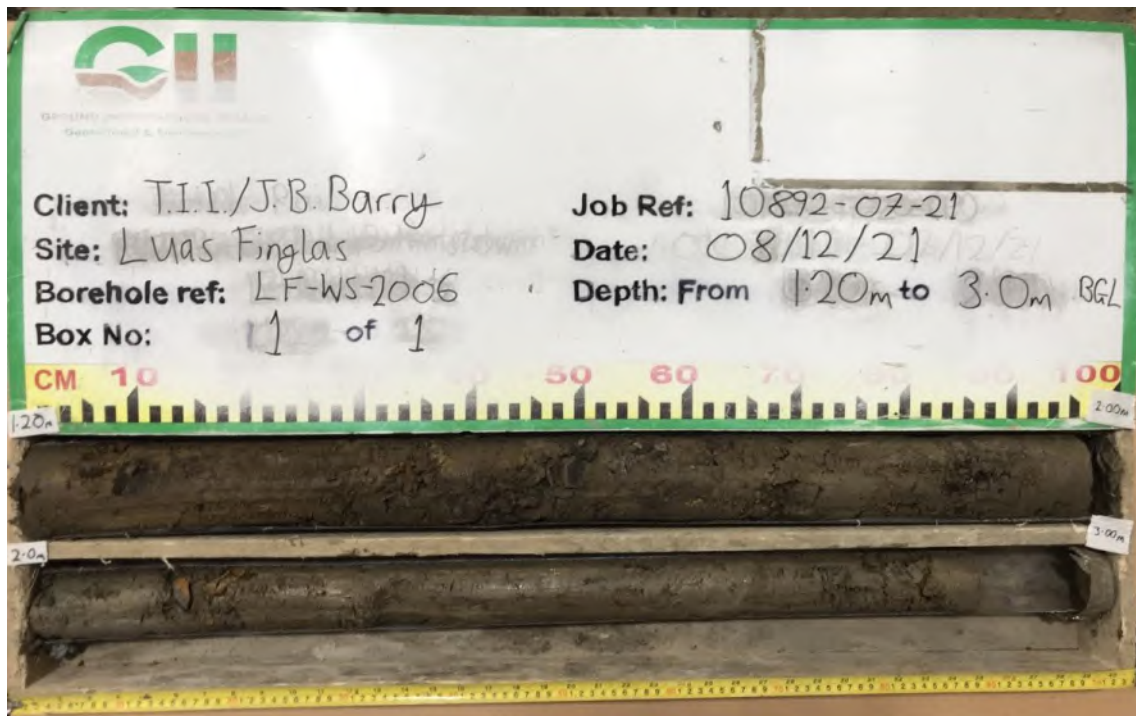
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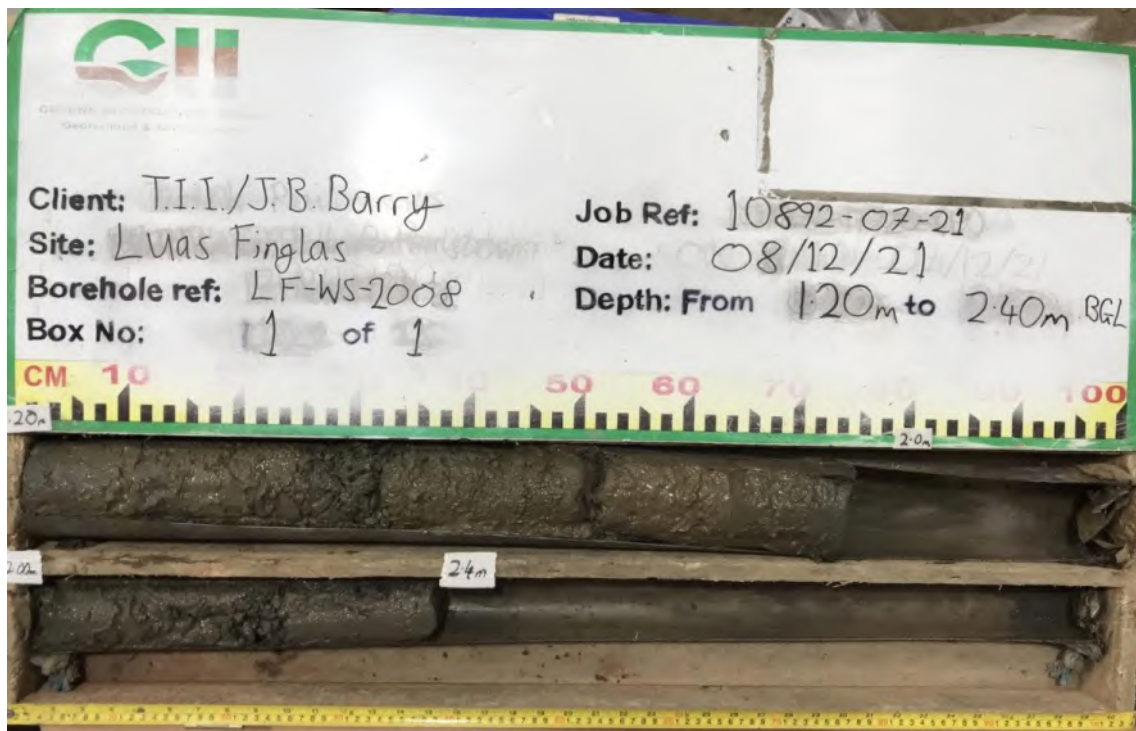
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LF-WS-2005



LF-WS-2006



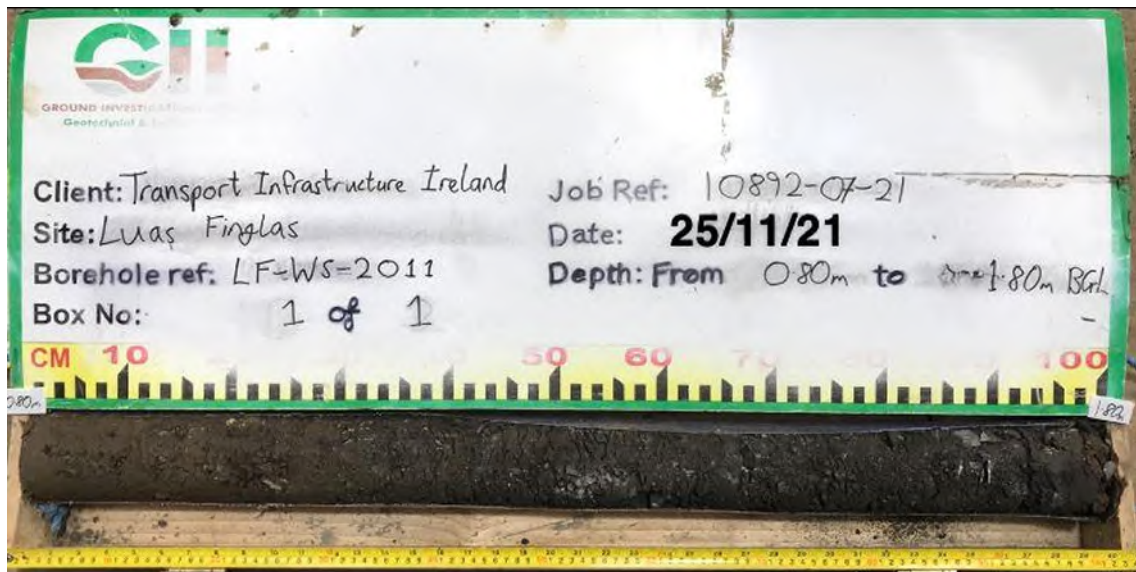
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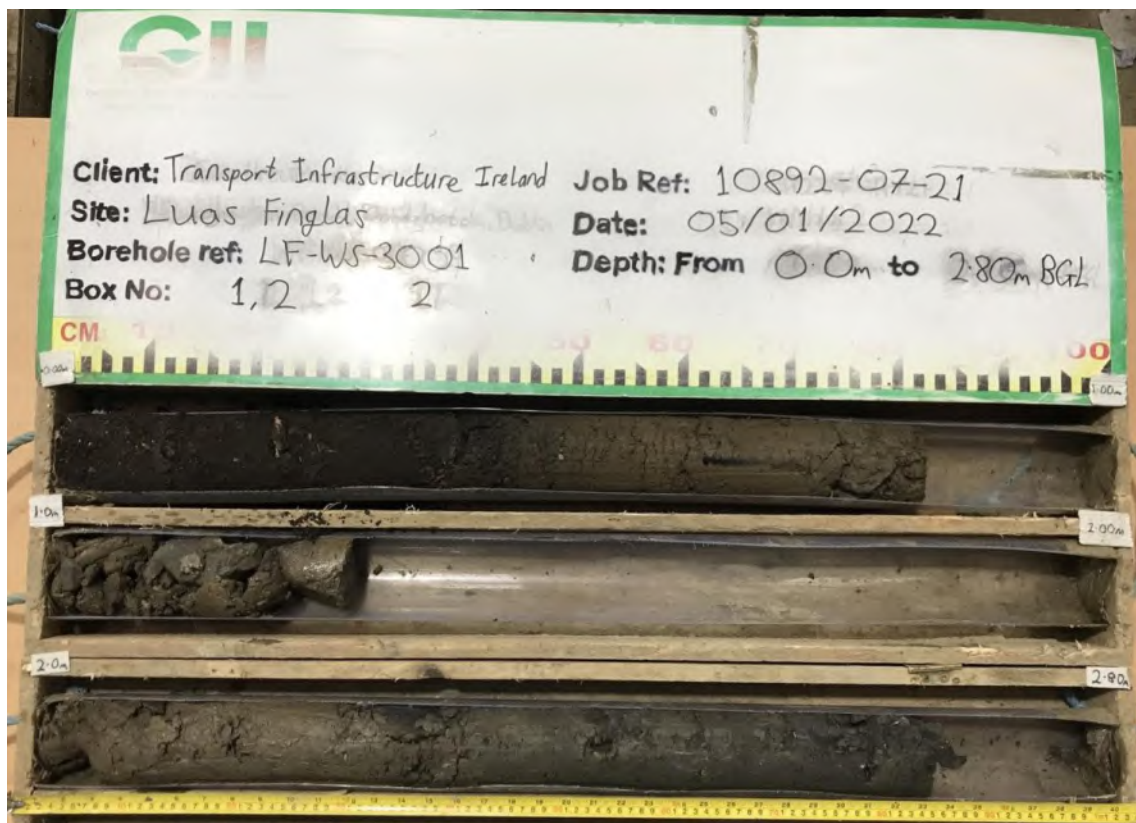
LF-WS-2009



LF-WS-2010



LF-WS-2011



LF-WS-3001



LF-WS-3002



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Site
Luas Finglas

Borehole Number
LF-CPRC-1001

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm to 7.40m 146mm to 12.50m	Ground Level (mOD) 66.92	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712867.1 E 740438.6 N	Dates 15/11/2021- 13/12/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	B1 EN1				66.72 66.47 66.37	(0.20) 0.20 (0.25) 0.45 0.55	Brown slightly gravelly TOPSOIL. MADE GROUND: Brown slightly sandy gravelly Clay. Gravel is subangular to subrounded fine to coarse.			
1.20-1.65	SPT(C) N=14			2,2/3,3,3,5	65.97 65.72 65.22	(0.40) 0.95 (0.25) 1.20 (0.50) 1.70	MADE GROUND: Grey very clayey angular fine to coarse Gravel. MADE GROUND: Grey brown slightly sandy gravelly Clay with occasional cobbles and boulders. Gravel is subangular to subrounded fine to coarse. Firm to stiff brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=40 B2 EN2 T1			5,4/7,9,10,14			Stiff grey mottled brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
3.00-3.35 3.00 3.00	SPT(C) 50/200 B3 T2			17,17/21,29			Very stiff grey slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
4.00-4.55 4.00 4.00	SPT(C) 50/400 B4 T3			10,14/16,20,14		(5.70)				
5.00-6.35 5.00 5.00	SPT(C) 50/1200 B5 T4			9,10/17,22,11						
6.00-6.70 6.00 6.00	SPT(C) 50/550 B6 T5			12,16/22,28						
7.00 7.00-7.25 7.00	T6 SPT(C) 50/100 B7			50,50/50						
7.40	TCR	SCR	RQD	FI	59.52	7.40	Very strong thinly laminated dark grey fine-grained LIMESTONE with clay smearing. Partially weathered. Interbedded with a medium strong thinly laminated black fine-grained MUDSTONE with occasional clay banding. Partially weathered.			
8.30				7		(2.40)	7.40m - 9.80m BGL: 3 fracture sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, smooth planar to rough planar, with clay smearing. F2: Fractures are dipping 30 - 50 degrees, closely spaced, smooth planar to rough stepped, clean. F3: Fractures are dipping 70 - 85 degrees, very closely to medium spaced, rough planar.			
9.80					57.12	9.80	Strong thinly laminated grey fine-grained			

Remarks Inspection pit carried out to 1.20m BGL. Cable percussion carried out to 7.40m BGL with rotary core follow-on carried out to 12.50m BGL. Groundwater not encountered. Borehole complete at 12.50m BGL. Standpipe installed in borehole upon completion. Bentonite seal installed from 12.50m - 11.50m BGL, with a slotted standpipe installed from 11.50m - 8.50m BGL with a pea gravel surround. Plain standpipe installed from 8.50m BGL to GL with a bentonite seal and a flush cover. Chiselling from 7.40m to 7.40m for 1 hour.	Scale (approx)	Logged By
	1:50	EB / CE
	Figure No.	






























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Site
Luas Finglas

Borehole
Number
LF-CPRC-1001

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm to 7.40m 146mm to 12.50m	Ground Level (mOD) 66.92	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712867.1 E 740438.6 N	Dates 15/11/2021- 13/12/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	100	32	25	16			(2.70)	LIMESTONE with clay smearing. Partially to distinctly weathered. Interbedded with a weak thinly laminated black fine-grained MUDSTONE with clay banding and fault gouge. 9.80m - 12.50m BGL: 3 fracture sets - F1: Fractures are dipping 0 - 30 degrees, very closely spaced, smooth planar to rough planar, with clay banding and breccia. F2: Fractures are dipping 30 - 60 degrees, very closely to closely spaced, rough planar to rough stepped. F3: Fractures are dipping 70 - 85 degrees, closely spaced, rough planar to rough stepped.	                          		
12.50	100	55	48	11		54.42	12.50	Complete at 12.50m			

Remarks	Scale (approx) 1:50	Logged By EB / CE
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1003

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with Rotary Core follow on	Casing Diameter 146mm to 9.80m 200mm to 3.80m	Ground Level (mOD) 66.45	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712871.7 E 740325.4 N	Dates 17/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B 1 EN1 T1				66.05	(0.40) 0.40	Brown slightly gravelly TOPSOIL			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=8			3,3/2,3,1,2		(1.70)	MADE GROUND: Brown gravelly Clay with occasional red brick and glass fragments			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=10 B3 EN3 T3			1,1/1,2,3,4 Water strike(1) at 2.10m, rose to 1.80m in 20 mins.	64.35	2.10	Very stiff brown slightly sandy gravelly CLAY with occasional cobbles		▼1 ▽1	
3.00-3.45 3.00 3.00	SPT(C) N=25 B4 T4			3,4/5,4,7,9		(1.70)				
3.80	TCR	SCR	RQD	FI	62.65	3.80	Grey very clayey angular to subrounded fine to coarse GRAVEL.		▼2 ▽2	
4.35	97	32	22		62.10	4.35	Very strong thinly laminated grey fine-grained LIMESTONE with calcite veining. Unweathered to partially weathered. Interbedded with a medium strong thinly laminated black fine-grained MUDSTONE with clay banding and smearing. Partially to distinctly weathered.			
5.30				12			4.35m - 9.80m BGL: 3 fracture sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, smooth planar to smooth undulating, with some clay smearing and infilling. F2: Fractures are dipping 30 - 50 degrees, closely spaced, smooth planar to rough planar, with occasional clay smearing. F3: Fractures are dipping 70 - 85 degrees, medium spaced, smooth planar to rough undulating, clean.			
6.05	99	33	31							
6.80	100	86	63	5		(5.45)				
8.30 8.50	100	43	16	8						
9.80					56.65	9.80	Complete at 9.80m			

Remarks

Inspection pit carried out to 1.20m BGL.
 Cable Percussion refusal at 3.80m BGL. Rotary Core follow-on carried out to 9.80m BGL.
 Groundwater encountered at 2.10 and 3.80m BGL.
 Borehole complete at 9.80m BGL.
 Borehole backfilled on completion.
 Chiselling from 3.80m to 3.80m for 1 hour.

Scale (approx)
1:50

Logged By
EB

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1004

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm to 3.00m 146mm to 8.30m	Ground Level (mOD) 65.22	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with Rotary Core follow-on	Location 712854.1 E 740129.2 N	Dates 28/10/2021- 04/11/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1					(0.90)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with rootlets and rare fragments of red brick, ceramic, plastic, wood, and charcoal.			
1.00 1.00 1.00 1.20-1.65 1.20	B2 EN2 T2 SPT(C) N=8 U1 Failed - 0% Recovery			2,4/3,1,2,2	64.32 64.02	0.90 (0.30) 1.20	Brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to subangular.			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=15 B3 EN3 T3			1,2/3,3,3,6	63.42	1.80	Soft to firm brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to subangular.			
3.00-3.23 3.00 3.00 3.00	TCR SCR RQD FI			20.50/50 SPT(C) 50/75 Water strike(1) at 3.00m, rose to 2.40m in 20 mins. B4 T4	62.22	3.00	Firm brown mottled grey/orange slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to subangular.			
3.50 3.80	100 23		14		61.72	3.50	Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
4.50 5.00 5.30	93 25 15		11 NI				Weak thinly laminated black fine-grained MUDSTONE with clay banding and infilling. Distinctly weathered. Interbedded with a strong thinly laminated grey fine-grained LIMESTONE with iron, clay smearing and calcite veining. Partially weathered.			
6.80 7.00	100 7 0 16					(4.80)	3.50m - 4.50m BGL: 3 Fracture sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, smooth planar to rough planar, with clay infilling. F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, rough planar, with clay smearing and iron staining. F3: Fractures are dipping 70 - 85 degrees, closely spaced, rough planar to rough stepped, with clay smearing. 4.50m - 5.0m BGL: Non-Intact Zone. 5.0m - 8.30m BGL: 3 Fracture sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, smooth planar to rough planar, with clay infilling. F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, rough planar, with clay smearing and iron staining. F3: Fractures are dipping 70 - 85 degrees, closely spaced, rough planar to rough stepped, with clay smearing.			
8.30	100 22 20 9				56.92	8.30	Complete at 8.30m			

Remarks Inspection Pit carried out to 1.20m BGL. Cable Percussion Refusal at 3.00m BGL. Rotary core follow-on carried out to 8.30m BGL. Cable Percussion borehole backfilled on completion, then re-drilled for Rotary Core. Groundwater encountered at 3.00m BGL. Borehole complete at 8.30m BGL. Standpipe installed in borehole upon completion. Bentonite seal installed from 8.30m - 3.50m BGL, with a slotted standpipe installed from 3.50m - 1.50m BGL with a pea gravel surround. Plain standpipe installed from 1.50m BGL to GL with a bentonite seal and a flush cover.	Scale (approx) 1:50	Logged By JMD
Figure No.		



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Site
Luas Finglas

Borehole Number
LF-CPRC-1005

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion	Casing Diameter 200mm cased to 1.70m 146mm cased to 6.80m	Ground Level (mOD) 63.27	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712796.8 E 739941.7 N	Dates 29/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B1 EN1 T1 B2 EN2 T2 SPT(C) 50/225			T3 2,7/9,14,27 B3 EN3	63.17	0.10	TARMACADAM			
0.50					62.87	(0.30)	MADE GROUND: Hardcore Fill.			
0.50						0.40	MADE GROUND: Greyish brown slightly sandy slightly gravelly silty Clay with rare fragments of tar, charcoal and mortar.			
1.70					62.27	1.00	Greyish brown mottled grey slightly silty slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular.			
1.00					62.07	(0.20)				
1.00	TCR	SCR	RQD	FI		(0.40)	Stiff greyish brown mottled grey slightly silty slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular.			
1.00-1.58					61.67	1.60	Stiff dark grey slightly silty slightly sandy gravelly CLAY with occasional angular to subangular cobbles. Gravel is fine to coarse angular to subrounded.			
1.70	83	8	0		61.57	1.70	Strong thin laminated grey fine-grained LIMESTONE with clay smearing and banding. Partially weathered. Interbedded with a weak thin laminated black fine-grained MUDSTONE with many clay bands and infilling. Distinctly weathered to destructured.			
2.80	100	21	20	18			1.70m - 6.80m BGL: 3 fracture sets - F1: Fractures are dipping 0 - 30 degrees, very closely to closely spaced, rough planar to rough undulating, with clay smearing. F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, rough planar to rough stepped, with clay smearing and infilling. F3: Fractures are dipping 70 - 85 degrees, closely to medium spaced, rough planar to rough stepped, with clay smearing.			
3.80						(5.10)				
4.00	100	29	19							
5.30				14						
	100	73	31							
6.80					56.47	6.80	Complete at 6.80m			

Remarks Inspection Pit carried out to 1.20m BGL. No groundwater encountered. Cable Percussion Refusal at 1.70m BGL with rotary core follow-on carried out to 6.80m BGL. Borehole complete at 6.80m BGL. Borehole backfilled on completion Chiselling from 1.70m to 1.70m for 1 hour.	Scale (approx)	Logged By
	1:50	JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1006

Machine : Beretta T44	Casing Diameter 146mm to 6.30m	Ground Level (mOD) 63.45	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : Water	Location 712781.8 E 739841.8 N	Dates 02/11/2021	Project Contractor GII	Sheet 1/1
Core Dia : 102 mm				
Method : Rotary Cored				

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.30	69					62.15	(1.30)	MADE GROUND: Brown gravelly Clay with some red brick and plastic fragments		
2.30	100	25	0				1.30	Medium strong thinly laminated dark grey fine grained partially weathered LIMESTONE interbedded with weak thinly laminated black fine grained destructured to distinctly weathered MUDSTONE with many clay bands and smearing		
3.80	100	37	23	15			(3.55)	1.30m - 6.30m BGL: 3 Fracture Sets - FS1: 0 - 20 degrees very closely to closely spaced smooth planar to rough planar with clay smearing, FS2: 30 - 50 degrees very closely to medium spaced rough planar, FS3: 70 - 85 degrees closely to medium spaced rough undulating to rough stepped with oxide and clay smearing		
5.30	100	11	9			58.60	4.85	Medium strong to strong thinly to thickly laminated dark grey fine grained partially weathered LIMESTONE with iron staining and many calcite veins interbedded with weak thinly laminated black fine grained distinctly weathered MUDSTONE with clay bands and smearing		
6.30	100	25	0				(1.45)	4.85m - 6.30m BGL: 1 Fracture Set - FS4: 70 - 85 degrees closely spaced rough undulating with oxide smearing		
						57.15	6.30	Complete at 6.30m		

Remarks Inspection Pit carried out to 1.20m BGL. Rotary Core carried out to 6.30m BGL. No groundwater encountered. Borehole complete at 6.30m BGL. Borehole backfilled on completion								Scale (approx)	Logged By
								1:50	CE
								Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1007

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 6.30m 146mm cased to 11.80m	Ground Level (mOD) 62.67	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on	Location 712695.8 E 739764.4 N	Dates 01/10/2021- 21/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				62.42	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=42			9,10/11,12,9,10	61.67 61.47	(0.75) (1.00) (0.20) 1.20	MADE GROUND: Grey/brown slightly sandy clayey subangular to subrounded fine to coarse Gravel with rebar.			
2.00-2.45 2.00 2.00 2.00 2.00	SPT(C) N=46 B3 EN3 T3 U1 Failed - 0% Recovery			7,12/10,10,12,14		(1.70)	MADE GROUND: Grey/brown slightly sandy clayey subangular to subrounded fine to coarse Gravel.			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=50 B4 EN4 T4			9,11/10,14,14,12	59.77	2.90	MADE GROUND: Grey/brown slightly sandy slightly gravelly Clay with frequent angular to subrounded cobbles (Very Stiff).			
4.00-4.45 4.00 4.00	SPT(C) N=50 B5 T5			8,10/9,16,14,11			Very stiff grey slightly sandy gravelly CLAY with occasional angular to subangular cobbles. Gravel is of limestone angular to subangular fine to coarse.			
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T6			10,4/12,14,19,5		(3.60)				
6.00 6.00 6.00-6.15	T7 B7 SPT(C) 50/0			Water strike(1) at 21,19/50 6.30m, rose to 5.70m in 20 mins.						
6.30	TCR	SCR	RQD	FI						
6.80-7.03 6.80	66			24,24/24,26 SPT(C) 50/75	56.17	6.50	Weak thinly laminated black fine grained MUDSTONE with many clay bands. Deconstructed to residually weathered.			
8.30 8.50	93	12	8	NI		(3.30)				
	100	11	11	1620			8.50m - 9.80m BGL: 3 Fracture sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, planar smooth to planar rough with clay smearing, F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, stepped smooth to undulating smooth with clay smearing, F3: Fractures are dipping 70 - 85 degrees, closely to medium spaced, undulating smooth to planar rough.			
9.80					52.87	9.80	Strong thinly laminated dark grey fine grained			

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 6.30m BGL with Rotary core follow on carried out to 11.80m BGL. Groundwater encountered at 6.30m BGL. Borehole complete at 11.80m BGL. Standpipe installed in borehole upon completion: Borehole sealed to 6.50m BGL with bentonite. Slotted standpipe installed from 6.50m BGL to 3.50m BGL with gravel pack. Plain standpipe installed from 3.50m BGL to GL with bentonite surround and a raised cover. Chiselling from 6.30m to 6.30m for 1 hour.	Scale (approx) 1:50	Logged By JS / JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1007

Machine : Dando 2000 & Beretta T44 Flush : water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 6.30m 146mm cased to 11.80m	Ground Level (mOD) 62.67	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712695.8 E 739764.4 N	Dates 01/10/2021-21/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.10 11.30 11.80	100	42	42	5		51.57	(1.30)	LIMESTONE with oxide staining and calcite veining. Distinctly weathered.			
							11.10	9.80m - 11.10m BGL: 2 Fracture Sets - F1: Fractures are dipping 30 - 50 degrees, closely spaced, planar rough to stepped rough with oxide staining, F2: Fractures are dipping 70 - 85 degrees, medium spaced, planar rough with clay and oxide staining.			
	100	0	0	16			(0.70)	Weak thinly laminated black fine grained MUDSTONE. Destructured to residually weathered.			
						50.87	11.80	11.10m - 11.80m BGL: 3 Fracture sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, planar smooth to planar rough with clay smearing, F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, stepped smooth to undulating smooth with clay smearing, F3: Fractures are dipping 70 - 85 degrees, closely to medium spaced, undulating smooth to planar rough.			
Complete at 11.80m											

Remarks

Scale (approx)
1:50

Logged By
JS / JMD

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1008

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 6.30m 146mm cased to 12.00m	Ground Level (mOD) 63.93	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on	Location 712694.4 E 739579.9 N	Dates 01/10/2021- 26/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				63.68	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65 1.20	B2 EN2 T2 SPT(C) N=8 U1 Failed - 0% Recovery			2,1/2,2,2,2	62.98 62.73	0.95 (0.25) 1.20	MADE GROUND: Brown slightly sandy very clayey subangular to subrounded fine to coarse Gravel with duct. MADE GROUND: Light brown slightly sandy slightly gravelly Clay with concrete fragments.			
2.00-2.45 2.00 2.00 2.00 2.00	SPT(C) N=20 B3 EN3 T3 U2 Failed - 0% Recovery			3,3/4,4,5,7	61.93	2.00 (0.80)	Firm brown mottled grey slightly silty slightly sandy slightly gravelly CLAY with occasional angular to subangular cobbles. Stiff brown mottled grey slightly silty slightly sandy slightly gravelly CLAY with occasional angular to subangular cobbles.			
3.00-3.45 3.00 3.00	SPT(C) N=50 B4 T4			8,9/10,14,13,13	61.13 60.93	2.80 (0.20) 3.00	Stiff brownish grey slightly silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments. Very stiff brownish grey slightly silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments.			
4.00-4.45 4.00 4.00	SPT(C) N=50 B5 T5			10,9/12,12,16,10		(3.00)				
5.00-5.38 5.00 5.00	SPT(C) 50/225 B6 T6			9,11/14,19,17						
6.00 6.00 6.00-6.30	T7 B7 SPT(C) 50/150			Water strike(1) at 19,24/39,11 6.30m, rose to 5.90m in 20 mins.	57.93	6.00 (0.30)	Very stiff grey slightly silty slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse.		▼1	
6.30	TCR	SCR	RQD	FI	57.63	6.30 (0.50)	Very stiff grey brown sandy gravelly CLAY.		▽1	
6.80	100				57.13	6.80	Weak thinly laminated black fine grained MUDSTONE with many clay bands. Distinctly weathered to destructured. Interbedded with strong thinly laminated grey fine grained LIMESTONE. Partially weathered.			
8.30	96	53	0	15			6.80m - 12.0m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, planar rough to planar smooth with many clay infills and smearing, F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, planar rough with clay infilling, F3: Fractures are dipping 70 - 85 degrees, medium spaced, planar rough to undulating rough with clay smearing			
9.80	100	95	38			(5.20)				

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 6.30m BGL with rotary core follow on carried out to 12.0m BGL. Groundwater encountered at 6.30m BGL. Borehole complete at 12.0m BGL. Piezometer installed in borehole upon completion: Borehole sealed from 12.0m BGL to 11.0m BGL with bentonite seal. Piezometer tip installed from 9.50m BGL to 9.00m BGL with a sand surround from 11.0m BGL to 8.00m BGL. Plain piezometer installed from 8.00m BGL to GL with bentonite surround and a flush cover. Chiselling from 6.30m to 6.30m for 1 hour.	Scale (approx) 1:50	Logged By JS / JMD
Figure No.		



Site
Luas Finglas

Borehole Number	LF-CPRC-1008
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Machine :	Dando 2000 & Beretta T44
Flush :	water
Core Dia:	102 mm
Method :	Cable Percussion with rotary core follow on

Casing Diameter
200mm cased to 6.30m
146mm cased to 12.00m

Ground Level (mOD)	63.93
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Client	Transport Infrastructure Ireland
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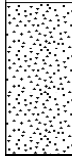

**Job
Number**
10892-07-21

Location	712694.4 E 739579.9 N
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Dates	01/10/2021- 26/10/2021
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Project Contractor
GII

Sheet
2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	100	38	31	10							
	100	7	0								
12.00						51.93	12.00	Complete at 12.00m			

Remarks

Scale (approx)

1:50

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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1009

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 10.00m 146mm cased to 15.80m	Ground Level (mOD) 63.78	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on	Location 712738.6 E 739379.4 N	Dates 01/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				63.53	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65 1.20 1.20 1.20	B2 EN2 T2 SPT(C) N=14 B3 EN3 T3			2,3/3,4,4,3	62.68 62.58 62.18	(0.85) 1.10 1.20 (0.40) 1.60 (0.40)	MADE GROUND: Reworked brown slightly sandy very clayey angular to subrounded fine to coarse Gravel . MADE GROUND: Brown gravelly Clay with occasional concrete fragments. MADE GROUND: Brown slightly sandy gravelly Clay with rare fragments of mortar and concrete. Gravel is angular to subrounded fine to coarse (Firm).			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=35 B4 EN4 T4			2,4/6,8,10,11	61.78	2.00	Firm grey slightly sandy gravelly CLAY with rare cobbles. Gravel is angular to subrounded fine to coarse.			
3.00-3.38 3.00 3.00	SPT(C) 50/225 B5 T5			6,9/17,19,14			Very stiff grey slightly sandy gravelly CLAY with rare cobbles. Gravel is angular to subrounded fine to coarse.			
4.00-4.38 4.00 4.00	SPT(C) 50/225 B6 T6			7,8/13,17,20						
5.00-5.38 5.00 5.00	SPT(C) 50/225 B7 T7			10,11/16,17,17						
6.00-6.38 6.00 6.00	SPT(C) 50/225 B8 T8			7,8/12,20,18						
7.00-7.38 7.00 7.00	SPT(C) 50/225 B9 T9			9,16/21,27,2		(9.50)				
8.00-8.30 8.00 8.00	SPT(C) 50/150 B10 T10			17,25/41,9						
9.00-9.30 9.00 9.00	SPT(C) 50/150 B11 T11			8,12/21,29						
10.00										

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion complete at 10.0m BGL with rotary core follow on carried out to 15.8m BGL. No groundwater encountered. Borehole complete at 15.80m BGL. Slotted standpipe installed from 10.00m BGL to 3.00m BGL with a pea gravel surround. Plain standpipe installed from 3.00m BGL to GL with a bentonite seal and a flush cover.								Scale (approx)	Logged By
								1:50	JS / JMD
								Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1009

Machine : Dando 2000 & Beretta T44 Flush : water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 10.00m 146mm cased to 15.80m	Ground Level (mOD) 63.78	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712738.6 E 739379.4 N	Dates 01/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.30					T 12 B12 SPT(C) 50/150 17,21/38,12						
11.50-11.95	66				7,6/6,7,5,6 SPT(C) N=24	52.28	11.50 (0.40)	Grey angular fine to coarse GRAVEL of Limestone			
11.90	80	5	0	NI		51.88	11.90	Weak fine grained thinly laminated black MUDSTONE distinctly weathered to destructured with many Clay bands interbedded with Medium strong fine grained thinly laminated dark grey LIMESTONE partially to distinctly weathered with Clay smearing Fracture set 1: 0 - 25 degrees, very closely to closely spaced, rough planar to smooth planar with Clay infilling. Fracture set 2: 30 - 50 degrees, very closely to closely spaced, rough stepped to rough planar. Fracture set 3: 70 - 85 degrees, closely to medium spaced, rough planar			
13.00				15							
13.70	87	0	0	NI			(3.90)				
14.30											
14.50	100	37	8	15							
15.80						47.98	15.80	Complete at 15.80m			

Remarks	Scale (approx) 1:50	Logged By JS / JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1010

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 10.00m 146mm cased to 20.00m	Ground Level (mOD) 62.29	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on		Location 712797.8 E 739202.8 N	Dates 29/09/2021-03/11/2021	Project Contractor GII	Sheet 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B1				62.04	(0.25)	Brown slightly sandy slightly gravelly TOPSOIL.			
0.50	EN1				61.79	0.25	MADE GROUND: Grey slightly clayey rounded to subrounded Gravel.			
0.50	T1					0.50	MADE GROUND: Brown slightly sandy gravelly Clay with plastic and concrete fragments.			
1.00	B2				61.09	(0.70)				
1.00	EN2					1.20	MADE GROUND: Grey/brown slightly gravelly sandy Clay with rare fragments of red brick, ceramic and concrete (Firm).			
1.00	T2			1,3/4,2,3,1		(0.80)				
1.20-1.65	SPT(C) N=10				60.29	2.00	MADE GROUND: Grey/brown slightly gravelly sandy Clay with rare fragments of red brick, ceramic and concrete (Stiff).			
1.20	B3					(0.80)				
1.20	T3				59.49	2.80	Soft to firm brown mottled grey slightly silty slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse.			
2.00-2.45	SPT(C) N=20			10,14/9,7,2,2						
2.00	B4					2.00				
2.00	EN3					(0.80)				
2.00	T4									
3.00	B5									
3.00	EN4									
3.00	T5									
3.00	U1 65% Recovery					(1.70)				
4.00-4.45	SPT(C) N=8			2,2/2,2,2,2						
4.00	B6				57.79	4.50	Soft to firm grey slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
4.00	T6					(0.50)				
5.00-5.45	SPT(C) N=20			2,2/4,4,5,7	57.29	5.00	Stiff grey slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
5.00	B7					(1.00)				
5.00	T7									
6.00-6.45	SPT(C) N=40			4,7/9,10,10,11	56.29	6.00	Very stiff grey slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
6.00	B8									
6.00	T8									
7.00-7.45	SPT(C) N=50			6,9/11,12,14,13						
7.00	B9									
7.00	T9									
8.00-8.45	SPT(C) N=50			7,8/10,14,17,9		(4.00)				
8.00	B10									
8.00	T10									
9.00-9.38	SPT(C) 50/225			11,16/22,27,1						
9.00	B11									
9.00	T11									
10.00										

Remarks

Inspection pit carried out to 1.20m BGL.
No groundwater encountered.
Cable Percussion complete at 10.00m BGL with rotary core follow on carried out to 20.00m BGL.
Borehole complete at 20.0m BGL.
Standpipe installed in borehole upon completion: Slotted standpipe installed from 20.0m BGL to 15.0m BGL with a pea gravel surround, plain standpipe installed from 15.0m BGL to GL with a bentonite seal and a raised cover.

Scale (approx)
1:50

Logged By
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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1010

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 10.00m 146mm cased to 20.00m	Ground Level (mOD) 62.29	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712797.8 E 739202.8 N	Dates 29/09/2021-03/11/2021	Project Contractor GII	Sheet 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.38	100				SPT(C) 50/225 7,12/16,20,14	52.29	10.00	Stiff brown slightly sandy gravelly CLAY with cobble and boulder fragments.			
11.50-11.95	77				8,8/9,11,9,0 SPT(C) N=29		(3.00)				
13.00-13.45	17				11,11/8,10,8,9 SPT(C) N=35	49.29	13.00	Very stiff brown slightly sandy gravelly CLAY with cobble and boulder fragments.			
14.50-14.80	97	25	9		14,17/26,24 SPT(C) 50/150	47.79	14.50	Strong thinly to thickly laminated dark grey fine grained LIMESTONE partially to distinctly weathered with clay smearing and infilling of fractures interbedded with weak thinly laminated black fine grained MUDSTONE distinctly weathered with clay bands and infilling of fractures.			
16.00	100	55	45				(4.50)	14.50m - 19.0m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 20 degrees, very closely to closely spaced, planar smooth to planar rough with clay smearing, F2: Fractures are dipping 30 - 50 degrees, closely spaced, planar rough to undulating rough, F3: Fractures are dipping 70 - 85 degrees, medium spaced, planar rough to undulating rough.			
17.50	100	42	36	19							
19.00	100	98	98	4		43.29	19.00	Very strong thinly to thickly laminated dark grey fine grained LIMESTONE partially weathered with pyrite laminations.			
20.00							(1.00)	19.0m - 20.0m BGL: 2 Fracture Sets - F1: Fractures are dipping 0 - 25 degrees, closely to medium spaced, planar rough, F2: Fractures are dipping 60 - 80 degrees,			

Remarks	Scale (approx)	Logged By
	1:50	JS / JMD
Figure No.		



Site
Luas Finglas

**Borehole
Number**
LF-CPRC-1010

Machine :	Dando 2000 & Beretta T44
Flush :	Water
Core Dia:	102 mm
Method :	Cable Percussion with rotary core follow on

Casing Diameter

200mm cased to 10.00m
146mm cased to 20.00m

Ground Level (mOD)	62.29
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Client	Transport Infrastructure Ireland
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**Job
Number**
10892-07-21

Location	712797.8 E 739202.8 N
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Dates	29/09/2021- 03/11/2021
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Project Contractor
GII

Sheet
3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						42.29	20.00	medium to widely spaced, planar rough. Complete at 20.00m			

Remarks

Scale (approx)

1:50

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By

JS / JMD

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1011

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 3.60m 146mm cased to 20.30m	Ground Level (mOD) 54.63	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712812.5 E 738703.6 N	Dates 08/10/2021-28/10/2021	Project Contractor GII	Sheet 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				54.38	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20	B2 EN2 T2 U1 95% Recovery				53.73 53.43	(0.65) 0.90 (0.30) 1.20	MADE GROUND: Brown slightly sandy gravelly Clay with occasional red brick fragments. Gravel is angular to subangular fine to coarse.			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=50 B3 EN3 T3			6,8/10,12,13,15	52.73	1.90	Stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders. Gravel is angular to subangular fine to coarse.			
3.00-3.38 3.00 3.00	SPT(C) 50/225 B4 T4			8,20/18,17,15		(1.70)	Brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders. Gravel is angular to subangular fine to coarse.			
3.60	TCR	SCR	RQD	FI	51.03	3.60	Very stiff dark grey slightly sandy gravelly CLAY with occasional cobble and boulder fragments. Gravel is angular to subangular fine to coarse.			
5.00-5.38 5.00	86			20,20/20,26,4 SPT(C) 50/225		(4.25)				
6.50-6.88 6.50	83			16,16/16,25,9 SPT(C) 50/225						
8.30-8.68 8.30	100			18,18/18,26,6 SPT(C) 50/225	46.78	7.85	Very stiff brown slightly sandy gravelly CLAY with occasional cobble and boulder fragments. Gravel is angular to subangular fine to coarse.			
9.80-10.18 9.80				20,20/20,27,3 SPT(C) 50/225						

Remarks

Inspection pit carried out to 1.20m BGL.
 No groundwater encountered.
 Cable Percussion Refusal at 3.60m BGL with rotary core follow on carried out to 20.30m BGL.
 Borehole complete at 20.30m BGL.
 Standpipe installed in borehole upon completion: Slotted standpipe installed from 20.30m to 3.0m BGL with a pea gravel surround, plain standpipe installed from 3.0m BGL to GL with bentonite pellet surround and a flush cover.
 Chiselling from 3.60m to 3.60m for 1 hour.

Scale (approx)
1:50

Logged By
JS / JMD

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1011

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 3.60m 146mm cased to 20.30m	Ground Level (mOD) 54.63	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712812.5 E 738703.6 N	Dates 08/10/2021-28/10/2021	Project Contractor GII	Sheet 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30-11.68 11.30	100				12,12/16,25,9 SPT(C) 50/225						
12.80-13.10 12.80	100				27,27/27,23 SPT(C) 50/150		(8.05)				
14.30-14.60 14.30	100				26,26/26,24 SPT(C) 50/150						
15.80-16.10 15.80	100				29,29/29,21 SPT(C) 50/150						
17.30-17.60 17.30	97				28,28/28,22 SPT(C) 50/150	38.73	15.90	Very dense grey very clayey sandy angular to subrounded fine to coarse GRAVEL.			
						38.23	16.40	Very stiff brown slightly sandy gravelly CLAY with occasional cobble fragments. Gravel is angular to subangular fine to coarse.			
							(0.90)				
						37.33	17.30	Very stiff greyish brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse.			
	73						(2.00)				
18.80						35.33	19.30	Light brown CLAY.			
	70						(1.00)				

Remarks	Scale (approx)	Logged By
		1:50 JS / JMD
	Figure No.	



Site
Luas Finglas

Borehole Number	LF-CPRC-1011
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Machine :	Dando 2000 & Beretta T44
Flush :	Water
Core Dia:	102 mm
Method :	Cable Percussion with rotary core follow on

Casing Diameter
200mm cased to 3.60m
146mm cased to 20.30m

Ground Level (mOD)	54.63
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Client	Transport Infrastructure Ireland
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**Job
Number**
10892-07-21

Location
712812.5 E 738703.6 N

Dates	08/10/2021- 28/10/2021
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Project Contractor
GII

Sheet
3/3

[illegible]

Remarks

Scale (approx)

1:50

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By

JS / JMD

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1012

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 8.80m 146mm cased to 15.30m	Ground Level (mOD) 48.87	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on	Location 713055.4 E 738455 N	Dates 05/10/2021-29/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				48.47	(0.40) 0.40	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=32			3,7/7,8,9,8	47.82	1.05 (0.65)	MADE GROUND: Brown very gravelly Clay with occasional ceramic fragments. Gravel is angular to subangular fine to coarse.			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=11 B3 T3 U1 Failed - 0% Recovery			2,2/3,3,2,3	46.87	2.00 (0.80)	Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse.			
3.00-3.45 3.00 3.00	SPT(C) N=21 B4 T4			3,4/4,5,5,7	46.07 45.87	2.80 (0.20) 3.00	Firm grey slightly silty slightly sandy slightly gravelly CLAY with rare cobbles. Gravel is angular to subangular fine to coarse.			
4.00-4.45 4.00 4.00	SPT(C) N=29 B5 T5			3,4/5,6,8,10 Water strike(1) at 4.20m, no rise after 20 mins.		(2.00)	Stiff grey slightly silty slightly sandy slightly gravelly CLAY with rare cobbles. Gravel is angular to subangular fine to coarse.			
5.00-5.45 5.00 5.00	SPT(C) N=38 B6 T6			4,4/5,10,11,12	43.87	5.00	Very stiff grey slightly silty slightly sandy slightly gravelly CLAY with rare cobbles. Gravel is angular to subangular fine to coarse.			
6.00-6.45 6.00 6.00	SPT(C) N=47 B7 T7			8,10/10,10,14,13						
7.00-7.45 7.00 7.00	SPT(C) N=50 B8 T8			5,7/10,14,21,5		(3.80)				
8.00-8.38 8.00 8.00	SPT(C) 50/225 B9 T9			10,14/22,17,11						
8.80 8.80 8.80	TCR SCR RQD FI			B10 T10	40.07	8.80 (0.40)	Brown slightly sandy slightly gravelly CLAY with occasional subangular to rounded cobbles and rare organic matter. Gravel is angular to subangular fine to coarse.			
9.20	100				39.67	9.20 (1.10)	Brown slightly sandy gravelly CLAY with occasional subrounded to subangular cobbles. Gravel is angular to subrounded fine to coarse.			

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 8.80m BGL with Rotary Core follow-on from 8.80m to 15.30m BGL. Borehole complete at 15.30m BGL. Groundwater encountered at 4.20m BGL. Borehole backfilled on completion. Chiselling from 8.80m to 8.80m for 1 hour.								Scale (approx) 1:50	Logged By JS / JMD
								Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1012

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 8.80m 146mm cased to 15.30m	Ground Level (mOD) 48.87	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713055.4 E 738455 N	Dates 05/10/2021-29/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.30				NI		38.57	10.30	Moderately weak to strong thinly laminated to very thinly bedded dark grey fine grained argillaceous LIMESTONE with clay smearing and banding and rare calcite veins. Partially weathered. Interbedded with weak to moderately weak thinly laminated black fine grained MUDSTONE.			
10.87	100	45	31	4			(1.00)	10.30m - 10.87m BGL: Non-intact zone.			
11.30				6		37.57	11.30	10.87m - 11.30m BGL: 1 Fracture Set - F1: Fractures are dipping 0 - 20 degrees, close to medium spaced, planar smooth with some clay infilling.			
12.30	100	90	90					Strong to very strong thinly laminated to very thinly bedded dark grey fine grained argillaceous LIMESTONE with some clay smearing and calcite veins. Unweathered to partially weathered. Interbedded with moderately weak thinly laminated black fine grained MUDSTONE.			
12.80				8				11.30m - 15.30m BGL: 2 Fracture Sets - F1: Fractures are dipping 0 - 20 degrees, close to medium spaced, planar smooth with some clay infilling. F2: Fractures are dipping 60 - 85 degrees, widely spaced, undulating rough with some clay infilling.			
13.30	100	93	72	7			(4.00)				
14.30				5							
15.30	100	78	66			33.57	15.30	Complete at 15.30m			

Remarks	Scale (approx)	Logged By
	1:50	JS / JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1013

Machine : Dando 2000	Casing Diameter 200mm cased to 8.30m 146mm cased to 18.10m	Ground Level (mOD) 44.79	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 712951.8 E 738158.9 N	Dates 22/09/2021- 30/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				44.59	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 U1 95% recovery				44.29	(0.30) 0.50	MADE GROUND: Brown slightly sandy gravelly Clay with some metal fragments. Gravel is angular to subrounded fine to coarse.			
					43.79	(0.50) 1.00	MADE GROUND: Dark brown slightly sandy gravelly Clay with plastic fragments. Gravel is angular to subrounded fine to coarse.			
					43.59	(0.20) 1.20	MADE GROUND: Reworked dark grey slightly gravelly slightly sandy Clay. Gravel is angular to subrounded fine to coarse.			
						(0.80)	MADE GROUND: Brown slightly sandy slightly gravelly Clay. Gravel is angular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00	SPT(C) N=18 B3 T3			2,2/2,4,6,6	42.79	2.00	MADE GROUND: Greyish brown slightly gravelly slightly sandy Clay with red brick, pottery, and mortar fragments. Gravel is angular to subrounded fine to coarse. (Stiff)			
						(1.50)				
3.00-3.45 3.00 3.00	SPT(C) N=17 B4 T4			2,3/4,4,4,5						
					41.29	3.50	MADE GROUND: Grey/brown slightly clayey gravelly fine to coarse Sand. Gravel is subangular to subrounded and fine to coarse. (Stiff)			
						(1.00)				
4.00-4.45 4.00 4.00	SPT(C) N=16 B5 T5			2,3/4,5,3,4	40.29	4.50	Medium dense brown slightly silty fine to medium SAND.			
						(0.50)				
5.00-5.45 5.00 5.00	SPT(C) N=40 B6 T6			6,8/9,9,10,12	39.79	5.00	Dense brown slightly silty fine to medium SAND.			
						(0.70)				
					39.09	5.70	Very stiff brownish grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T7			8,9/11,12,14,13						
						(2.60)				
7.00-7.45 7.00 7.00	SPT(C) N=50 B8 T8			6,8/12,14,18,6						
8.00 8.00-8.38 8.00 8.00	TCR SCR RQD FI			8,12/15,15,20 B9 SPT(C) 50/225 T9	36.49	8.30 (0.20) 8.50	Very stiff brownish grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
					36.29		Grey/brown very sandy fine to coarse subangular to subrounded GRAVEL			
						(1.30)				
9.80-9.95 9.80				18,7/50 SPT(C) 50/0	34.99	9.80	Very stiff brown slightly sandy slightly gravelly			

Remarks Inspection pit carried out to 1.30m BGL. Cable Percussion refusal at 8.30m BGL (Possible boulder or bedrock) with Rotary Core follow-on carried out to 18.1m BGL. No groundwater encountered. Borehole complete at 18.1m BGL. Chiselling from 8.30m to 8.30m for 1 hour.								Scale (approx) 1:50	Logged By EB & JS
								Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1013

Machine : Dando 2000		Casing Diameter 200mm cased to 8.30m 146mm cased to 18.10m		Ground Level (mOD) 44.79	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : Water		Location 712951.8 E 738158.9 N		Dates 22/09/2021- 30/09/2021	Project Contractor GII	Sheet 2/2
Core Dia: 98 mm						
Method : Cable Percussion						

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30-11.47 11.30	100				17.8/50 SPT(C) 50/20		(3.30)	CLAY with occasional subangular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
12.80-13.03 12.80	100				12.13/50 SPT(C) 50/75						
13.10	100	21	21	10		31.69	13.10	Very strong fine grained thinly laminated grey LIMESTONE unweathered to partially weathered with occasional weak Mudstone bands with Clay smearing 13.1m - 14.3m BGL: Fracture set 1: 0 - 25 degrees, closely spaced, rough planar to rough stepped. Fracture set 2: 70 - 85 degrees, very closely to closely spaced, rough planar to rough undulose			
14.30								14.3m - 18.1m BGL: Fracture set 1: 0 - 30 degrees, closely spaced, rough planar to smooth planar with occasional Clay smearing. Fracture set 2: 70 - 85 degrees, moderately to widely spaced, rough planar			
15.80	97	79	75	4			(5.00)				
16.40	100	72	52	8							
17.30											
18.10	100	91	88	4		26.69	18.10	Complete at 18.10m			

Remarks									Scale (approx) 1:50	Logged By EB & JS
									Figure No.	



Machine : Dando 2000 & Beretta T44		Casing Diameter 200mm to 6.60m 146mm to 13.50m		Ground Level (mOD) 33.69		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
Method : Cable Percussion with rotary core follow on		Location 712922.1 E 737765.1 N		Dates 13/10/2021- 14/10/2021		Project Contractor GII		Sheet 1/2	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				33.44	(0.25) 0.25	Dark brown slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65 1.20	B2 EN2 T2 SPT(C) N=16 U1 Failed - 0 % Recovery			2,4/7,3,2,4	32.84 32.49	(0.60) 0.85 (0.35) 1.20	MADE GROUND: Brown very clayey very sandy fine to coarse subangular to subrounded Gravel with fragments of red brick. MADE GROUND: Brown slightly sandy gravelly Clay with many fragments of red brick and concrete. MADE GROUND: Greyish brown slightly sandy gravelly Clay with occasional angular to subrounded cobbles, boulders, and rare fragments of red brick, plastic, glass, wood, and ceramic.			
2.00-2.45 2.00 2.00 2.00 2.50	SPT(C) N=18 B3 EN3 T3 U2 Failed - 0% Recovery			2,3/3,4,4,7		(3.10)				
3.00-3.45 3.00 3.00 3.00	SPT(C) N=28 B4 EN4 T4			8,7/7,8,7,6						
4.00-4.45 4.00 4.00 4.00	SPT(C) N=25 B5 EN5 T5			4,3/4,6,8,7	29.39	4.30	Stiff dark brownish grey slightly silty slightly sandy gravelly CLAY with occasional angular to subangular cobbles. Gravel is fine to coarse angular to subrounded.			
5.00-5.45 5.00 5.00 5.00	SPT(C) N=15 B6 EN6 T6			4,3/4,3,4,4	28.69	5.00	Firm to stiff dark brownish grey slightly silty slightly sandy gravelly CLAY with occasional angular to subangular cobbles. Gravel is fine to coarse angular to subrounded.			
6.00 6.00 6.00 6.00-6.58	T7 B7 EN7 SPT(C) 50/425			7,8/10,17,23 Water strike(1) at 6.00m, rose to 5.90m in 20 mins, sealed at 6.30m. B8	27.69	6.00	Very stiff dark brownish grey slightly silty slightly sandy gravelly CLAY with occasional angular to subangular cobbles. Gravel is fine to coarse angular to subrounded.			
6.60 6.60 6.60 6.60	TCR SCR RQD FI			EN8 T8	27.09	6.60	Grey brown very clayey fine to coarse angular to subrounded GRAVEL.			
7.20	100			NI	26.49	7.20	Very weak thinly laminated grey brown fine grained LIMESTONE / MUDSTONE with some clay bands. Residually weathered.			
8.20						(1.65)				
8.85	100	7	7		24.84	8.85	Medium strong thinly laminated grey fine grained LIMESTONE. Distinctly weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with many clay infills and fractures. Reworked.			
9.70				16						

Remarks Inspection Pit carried out to 1.20m BGL Groundwater encountered at 6.00m BGL Cable Percussion Refusal at 6.60m BGL with rotary core follow on until 13.50m BGL Borehole complete at 13.50m BGL Standpipe installed in borehole upon completion: Borehole sealed with bentonite to 7.0m BGL with a slotted standpipe installed from 7.0m BGL to 3.0m BGL with a pea gravel surround. Plain standpipe installed from 3.0m BGL to GL with a bentonite seal and a flush cover. Chiselling from 6.60m to 6.60m for 1 hour.								Scale (approx) 1:50	Logged By JS / JMD
								Figure No.	



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Site
Luas Finglas

Borehole
Number
LF-CPRC-1014

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm to 6.60m 146mm to 13.50m	Ground Level (mOD) 33.69	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712922.1 E 737765.1 N	Dates 13/10/2021- 14/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.05	93	34	34				(2.20)	8.85m - 11.05m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 30 degrees, very closely to closely spaced, planar rough to undulating rough with clay infill, F2: Fractures are dipping 35 - 55 degrees, very closely to closely spaced, stepped rough to undulating rough with clay smearing, F3: Fractures are dipping 70-85 degrees, closely spaced, planar rough to stepped rough.			
11.30						22.64	11.05	Strong thickly to thinly laminated grey fine grained LIMESTONE. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with occasional clay bands. Distinctly weathered.			
12.80	100	88	59	7			(2.45)	11.05m - 13.50m BGL: 2 Fracture Sets - F1: Fractures are dipping 0 - 30 degrees, very closely to closely spaced, planar smooth to planar rough, F2: Fractures are dipping 70 - 85 degrees, medium spaced, stepped rough to undulating rough.			
13.50	100	73	58			20.19	13.50	Complete at 13.50m			

Remarks	Scale (approx)	Logged By
	1:50	JS / JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1015

Machine : Dando 2000 & Beretta T44		Casing Diameter 200mm cased to 1.80m 146mm cased to 8.30m		Ground Level (mOD) 26.49		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
Method : Cable Percussion with rotary core follow on		Location 713017.9 E 737663.2 N		Dates 24/09/2021- 07/10/2021		Project Contractor GII		Sheet 1/1	

Depth (m)	Sample / Tests		Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				B3	26.29	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65 1.80	B2 EN2 T2 U1 40% recovery					25.79	(0.50) 0.70 (0.40)	MADE GROUND: Brown slightly clayey sandy subangular to subrounded fine to coarse Gravel with occasional subangular to subrounded cobbles, plastic sheeting, plastic fragments, glass bottle, glass fragments.			
						25.39	1.10 (0.70)	MADE GROUND: Greyish brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles, plastic fragments, glass bottles.			
1.80	TCR	SCR	RQD	FI		24.69	1.80	MADE GROUND: Grey slightly sandy slightly gravelly Clay with plastic and mortar fragments.			
	52	8	5				(0.50)	Strong thinly laminated grey fine grained LIMESTONE. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with clay bands. Distinctly weathered. 1.80m - 3.10m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, planar rough to planar smooth with clay smearing, F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, undulating rough to planar rough, F3: Fractures are dipping 70 - 85 degrees, closely to medium spaced, stepped rough.			
2.30				18		24.19	2.30				
3.10	100	41	16				(1.50)				
3.80				10		22.69	3.80	Strong thinly laminated grey fine grained LIMESTONE. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with clay bands. Distinctly weathered.			
	100	58	44					Very strong thickly to thinly laminated grey fine grained LIMESTONE. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with clay smearing and with silt from 5.30m to 6.80m BGL. Partially weathered.			
5.30				9				3.10m - 8.30m BGL: 2 Fracture Sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, planar rough with occasional clay smearing, F2: Fractures are dipping 65 - 85 degrees, medium spaced, planar rough to undulating rough.			
6.30	100	61	60				(4.50)				
6.80				6							
	100	84	76								
8.30						18.19	8.30	Complete at 8.30m			

Remarks No groundwater encountered. Inspection pit carried out to 1.30m BGL. Cable Percussion refusal at 1.80m BGL: Possible boulder or bedrock. Rotary core follow on carried out to 8.30m BGL. Standpipe installed in borehole upon completion: Borehole sealed to 1.80m BGL with bentonite. Slotted standpipe installed from 1.80m BGL to 1.0m BGL with a pea gravel surround. Plain standpipe installed from 1.0m BGL to GL with a bentonite seal and a flush cover. Chiselling from 1.80m to 1.80m for 1 hour.									Scale (approx)	Logged By
									1:50	EB / CE
									Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1016

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with Rotary Core follow on	Casing Diameter 200mm to 3.50m 146mm to 11.30m	Ground Level (mOD) 25.48	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713082 E 737626.4 N	Dates 23/09/2021-24/09/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1					(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=12			5,6/3,3,3,3		(0.95)	MADE GROUND: Brown sandy very clayey angular to subrounded fine to coarse Gravel with occasional cobbles, boulders, and plastic bags.			
2.00-2.45 2.00 2.00	SPT(C) N=14 B3 T3			3,4/3,3,4,4		24.28 1.20	MADE GROUND: Dark grey mottled brown slightly sandy gravelly Clay with occasional angular to subangular cobbles, plastic and red brick fragments. Gravel is subangular to subrounded fine to coarse. (Firm)			
3.00 3.00-3.30 3.00 3.50 3.50 3.50	T4 SPT(C) 27/150 B4			5,4/2,25		(1.10)	MADE GROUND: Dark grey mottled brown slightly sandy gravelly Clay with occasional angular to subangular cobbles, plastic and red brick fragments. Gravel is subangular to subrounded fine to coarse. (Very stiff)			
3.80	TCR 51	SCR 0	RQD 0	FI NI		23.18 2.30	POSSIBLE MADE GROUND: Brownish grey slightly silty slightly sandy slightly gravelly Clay. Gravel is subangular to subrounded fine to coarse. (Very stiff)			
						(0.90)	Strong thinly laminated grey fine grained LIMESTONE with clay smearing. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with clay infilling. Distinctly weathered.			
5.30	100	21	0	14		22.28 3.20	Strong thinly laminated grey fine grained LIMESTONE with clay smearing. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with clay infilling. Distinctly weathered.			
						(0.30)	3.80m - 6.80m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, undulating rough to planar rough with clay smearing. F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, planar rough to stepped rough. F3: Fractures are dipping 70 - 85 degrees, medium spaced, undulating rough.			
6.80	100	26	0			21.98 3.50	Strong thinly to thickly laminated grey fine grained LIMESTONE with occasional clay smearing. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with occasional clay infilling and smearing. Distinctly weathered.			
8.30	96	68	51			21.68 3.80	6.80m - 11.30m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 25 degrees, very closely to closely spaced, planar rough with clay smearing. F2: Fractures are dipping 30 - 50 degrees, medium spaced, planar rough to stepped rough. F3: Fractures are dipping 70 - 85 degrees, medium spaced, stepped rough to undulating rough.			
9.80	83	37	30	10		(4.50)				

Remarks No groundwater encountered. Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 3.50m BGL: Possible boulder or bedrock. Rotary core follow on carried out to 11.30m BGL. Borehole complete at 11.30m BGL. Standpipe installed in borehole upon completion: Borehole sealed to 4.0m BGL with bentonite. Slotted standpipe installed from 4.0m to 2.0m BGL with pea gravel surround. Plain standpipe installed from 2.0m BGL to GL with bentonite seal and a flush cover. Chiselling from 3.50m to 3.50m for 1 hour.	Scale (approx)	Logged By
	1:50	EB / CE
	Figure No.	



Site
Luas Finglas

**Borehole
Number**
LF-CPRC-1016

Machine : Dando 2000 & Beretta T44
Flush : Water
Core Dia: 102 mm
Method : Cable Percussion with Rotary Core follow on

Casing Diameter
200mm to 3.50m
146mm to 11.30m

Ground Level (mOD)	25.48
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Client	Transport Infrastructure Ireland
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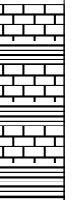

Job Number
10892-07-21

Location	713082 E 737626.4 N
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Dates	23/09/2021- 24/09/2021
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Project Contractor
GII

Sheet
2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	100	54	30			14.18	11.30				
							Complete at 11.30m				

Remarks

Scale (approx)

1:50

Logged
By

EB / CE

Figure No.



Borehole Number	LE-CPBC-1017
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Job Number	10892-07-21
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Sheet
1/1

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 1.70m BGL with rotary core follow on carried out to 6.80m BGL. No groundwater encountered. Borehole complete at 6.80m BGL. Borehole backfilled with bentonite and gravel on completion and finished with clay and sod at GL.	Scale (approx) 1:50	Logged By EB / JMD
	Figure No.	
	(Empty space for Figure No.)	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1018

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion	Casing Diameter 200mm cased to 10.00m 146mm cased to 17.30m	Ground Level (mOD) 25.93	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713134.9 E 737551.8 N	Dates 28/09/2021- 15/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B1					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL.			
0.50	EN1				25.63	0.30	MADE GROUND: Brown very clayey sandy subangular to subrounded fine to coarse Gravel.			
0.50	T1				25.18	0.75	MADE GROUND: Brown slightly sandy Clay with many metal, plastic and tarmacadam fragments.			
1.00	B2					(0.50)				
1.00	EN2				24.68	1.25	MADE GROUND: Brown slightly gravelly sandy Clay with occasional angular to subangular cobbles and rare fragments of mortar and red brick (Soft).			
1.00	T2			5,2/4,1,1,1		(0.75)				
1.20-1.65	SPT(C) N=7									
1.20	B3									
1.20	T3									
1.20	U1 Failed - 0% Recovery									
2.00-2.45	SPT(C) N=15			10,2/4,4,3,4	23.93	2.00	MADE GROUND: Brown slightly gravelly sandy Clay with occasional angular to subangular cobbles and rare fragments of mortar and red brick (Firm).			
2.00	B4									
2.00	EN3									
2.00	T4									
3.00-3.45	SPT(C) N=11			2,3/2,3,3,3		(1.80)				
3.00	B5									
3.00	EN4									
3.00	T5									
4.00	B6			Water strike(1) at 4.00m, rose to 3.10m in 20 mins, sealed at 6.00m. 1,2/2,1,2,1	22.13	3.80	MADE GROUND: Grey/brown slightly clayey sandy angular to subrounded fine to coarse Gravel with occasional angular to subrounded cobbles and rare fragments of plastic and red brick (Loose).			
4.00	EN5					(1.10)				
4.00	T6									
4.00-4.45	SPT(C) N=6				21.03	4.90	MADE GROUND: Brown mottled grey slightly silty slightly sandy slightly gravelly Clay with occasional angular to subangular cobbles and rare fragments of mortar and red brick (Soft to Firm).			
5.00-5.45	SPT(C) N=9			1,2/2,2,2,3		(0.90)				
5.00	B7									
5.00	EN6									
5.00	T7									
6.00-6.45	SPT(C) N=18			2,3/4,4,5,5	20.13	5.80	Firm greyish brown mottled light brown slightly silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments. Gravel is subangular to subrounded fine to coarse.			
6.00	B8				19.93	(0.20)				
6.00	EN7					6.00				
6.00	T8									
7.00-7.45	SPT(C) N=39			7,8/8,9,12,10	18.93	7.00	Stiff greyish brown mottled light brown slightly silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments. Gravel is subangular to subrounded fine to coarse.			
7.00	B9					(0.30)				
7.00	T9				18.63	7.30	Very stiff greyish brown mottled light brown slightly silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments. Gravel is subangular to subrounded fine to coarse.			
8.00-8.38	SPT(C) 50/225			8,10/14,22,14						
8.00	B10									
8.00	T10									
9.00-9.30	SPT(C) 50/150			9,12/20,30						
9.00	B11									
9.00	T11									
10.00										

Remarks Inspection pit carried out to 1.25m BGL. Cable Percussion complete at 10.00m BGL. Rotary Core follow-on from 10.00m to 17.30m BGL. Groundwater encountered at 4.00m and 10.00m BGL. Borehole complete at 17.30m BGL. Standpipe installed in borehole upon completion: Borehole sealed to 15.0m BGL with bentonite. Slotted standpipe installed from 15.0m BGL to 12.0m BGL with a pea gravel surround. Plain standpipe installed from 12.0m BGL to GL with bentonite surround and a flush cover.	Scale (approx) 1:50	Logged By EB / JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1018

Machine : Dando 2000 & Beretta T44 Flush : Polymer Core Dia : 102 mm Method : Cable Percussion	Casing Diameter 200mm cased to 10.00m 146mm cased to 17.30m	Ground Level (mOD) 25.93	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713134.9 E 737551.8 N	Dates 28/09/2021-15/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.23					Water strike(2) at 10.00m, rose to 7.60m in 20 mins. SPT(C) 50/75 27,13/50 B12 T12	15.93	10.00	Very stiff brown slightly silty slightly gravelly sandy Clay with occasional angular to subrounded cobbles.		V2	
10.00 10.00	50						(1.30)				
11.30-11.75 11.30	83	0	0	NI	7,7/8,8,8,9 SPT(C) N=33	14.63	11.30	Strong thinly to thickly laminated dark grey fine to coarse grained fossiliferous LIMESTONE interbedded with weak black thinly laminated fine grained calcareous MUDSTONE. Unweathered.			
11.60	92	88	28								
12.80	100	91	66	7							
14.30 14.38 14.50	100	81	57	NI			(6.00)				
15.80	93	80	52	11				11.30m - 11.60m BGL: Non-intact zone 11.60m - 14.50m BGL: 2 Fracture Sets - F1: Fractures are dipping 10 - 20 degrees, closely to medium spaced, undulating rough with occasional clay smearing. F2: Fractures are dipping 45 - 60 degrees, closely to medium spaced, undulating rough with occasional clay smearing.			
17.30						8.63	17.30				
								Complete at 17.30m			

Remarks	Scale (approx) 1:50	Logged By EB / JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1019

Machine : Beretta T44 Flush : Polymer Core Dia : 102 mm Method : Rotary Cored	Casing Diameter 146mm to 15.80m	Ground Level (mOD) 25.70	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713115.8 E 737544.9 N	Dates 19/10/2021-20/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50 0.50	65				B1 EN1 T1	25.40	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL		
1.00 1.00 1.00					B2 EN2 T2	25.10	0.30	MADE GROUND: Brown very gravelly Clay with metal and red brick fragments		
						24.90	(0.20)	MADE GROUND: Light brown slightly sandy gravelly Clay with metal fragments		
	75					24.50	(0.40)	MADE GROUND: Brown slightly sandy gravelly Clay with occasional metal fragments		
							1.20	MADE GROUND: Dark brown slightly clayey angular to subrounded fine to coarse Gravel with concrete fragments		
							(1.10)			
2.30 2.30-2.75	62				5,6/6,7,7,8 SPT(C) N=28	23.40	2.30	MADE GROUND: Brown slightly sandy gravelly Clay with many concrete and red brick fragments (Stiff)		
							(1.50)			
3.80 3.80-4.25	34				8,8/9,9,10,11 SPT(C) N=39	21.90	3.80	MADE GROUND: Black gravelly Clay with metal plastic and ceramic fragments (Very stiff). Possible landfill.		
							(0.85)			
						21.05	4.65	Stiff to very stiff light brown slightly sandy slightly gravelly CLAY with some cobble and boulder fragments. Gravel is angular to subrounded fine to coarse. Driller notes small recovery due to large boulder in mouth of inner barrel causing clay to wash away		
5.30 5.30-5.75	94				5,6/6,7,8,9 SPT(C) N=30		(2.15)			
6.80 6.80-7.25	95				10,12/15,19,16 SPT(C) N=50	18.90	6.80	Very stiff brown slightly sandy slightly gravelly CLAY with some cobble and boulder fragments. Gravel is angular to subrounded fine to coarse		
8.30 8.30-8.75					19,25/27,23 SPT(C) N=50		(3.30)			
9.80 9.80-10.25					27,27/27,23 SPT(C) N=50					

Remarks Inspection pit carried out to 1.20m BGL Rotary Core carried out to 16.3m BGL. Borehole complete at 16.30m BGL Piezometer installed in borehole upon completion: Borehole sealed to 5.00m BGL with bentonite. Piezometer tip installed from 4.5m BGL to 4.0m BGL with a sand surround from 5.00m BGL to 3.00m BGL. Plain piezometer installed from 3.00m BGL to GL with a bentonite surround and a flush cover.	Scale (approx) 1:50	Logged By JS / CE
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1019

Machine : Beretta T44		Casing Diameter 146mm to 15.80m	Ground Level (mOD) 25.70	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : Polymer					
Core Dia : 102 mm		Location 713115.8 E 737544.9 N	Dates 19/10/2021- 20/10/2021	Project Contractor GII	Sheet 2/2
Method : Rotary Cored					

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.65	100	38	30			15.60	10.10	Black very clayey angular fine to coarse GRAVEL with cobble and boulder fragments		
							(0.55)			
11.30				9		15.05	10.65	Strong thickly to thinly laminated dark grey fine grained partially weathered LIMESTONE with occasional clay smearing and banding and rare calcite veins interbedded with weak thinly laminated to thinly bedded black fine grained MUDSTONE		
11.65								10.65m - 11.30m BGL: 1 Fracture Set. F1: 0 - 20 degrees, close to medium spaced, planar, smooth to rough, occasional clay infilling fractures		
	98	76	44	14				11.30m - 14.35m BGL: 2 Fracture Sets. F1 and F2: 65 - 85 degrees, medium to widely spaced, undulating, rough, rare clay infilling fractures		
12.65										
12.80				6			(5.15)			
13.65	100	66	45	8						
14.30				NI				14.35m - 14.50m BGL: Non-intact zone		
14.35								14.50m - 15.25m BGL: 1 Fracture Set. F1 0 - 20 degrees, close to medium spaced, planar, smooth to rough, occasional clay infilling fractures		
14.50	100	68	60	7				15.25m - 15.80m BGL: 2 Fracture Sets. F1 and F2: 65 - 85 degrees, medium to widely spaced, undulating, rough, rare clay infilling fractures		
15.80						9.90	15.80	Complete at 15.80m		

Remarks	Scale (approx) 1:50	Logged By JS / CE
		Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1020

Machine : Dando 2000 & Beretta T44		Casing Diameter 200mm to 9.30m 104mm to 21.00m		Ground Level (mOD) 28.13	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on		Location 713142.6 E 737516.8 N		Dates 21/10/2021- 15/11/2021	Project Contractor GII	Sheet 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				28.03	0.10 (0.50)	TARMACADAM.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=10			3,4/7,1,1,1	27.53	0.60 (0.40)	MADE GROUND: Greyish brown slightly sandy clayey fine to coarse angular to subrounded Gravel (Crushed Rock Fill) with occasional angular to subangular cobbles.			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=5 B3 EN3 T3			1,2/1,2,1,1	27.13	1.00 (1.60)	MADE GROUND: Brown slightly sandy gravelly Clay with frequent angular to subangular cobbles and rare fragments of plastic and red brick. Gravel is fine to coarse angular to subrounded.			
3.00-3.45 3.00 3.00 3.00 3.50	SPT(C) N=6 B4 EN4 T4 U1 100% Recovery			2,1/1,2,1,2	25.53	2.60 (1.40)	POSSIBLE MADE GROUND: Brown mottled grey slightly sandy slightly gravelly silty Clay with occasional angular to subrounded cobbles (Soft to firm).			
4.00-4.45 4.00 4.00	SPT(C) N=13 B5 T5			3,4/2,3,4,4	24.13	4.00 (0.70)	Soft brown slightly sandy slightly gravelly silty CLAY with occasional angular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
5.00-5.45 5.00 5.00	SPT(C) N=38 B6 T6			7,9/10,10,11,7	23.43 23.13	4.70 (0.30) 5.00 (1.00)	Firm brown slightly sandy slightly gravelly silty CLAY with occasional angular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T7			8,9/10,14,11,15	21.13	7.00 (1.00)	Firm brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse.			
7.00-7.45 7.00 7.00	SPT(C) N=50 B8 T8			3,9/8,16,10,16	20.13	8.00 (1.30)	Very stiff brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse.			
8.00-8.30 8.00 8.00	SPT(C) 50/150 B9 T9			4,14/22,28	18.83	9.30 (0.50)	Very stiff greyish brown slightly silty slightly gravelly sandy CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
9.00 9.00 9.00-9.23	T10 B10 SPT(C) 50/75			7,15/50	18.33	9.80	Grey slightly sandy gravelly CLAY			
9.30	TCR	SCR	RQD	FI						
9.80	90									

Remarks Inspection Pit carried out to 1.20m BGL. No groundwater encountered. Cable Percussion Refusal at 9.30m BGL with Rotary Core follow-on carried out to 21.0m BGL. Borehole complete at 21.0m BGL. Borehole backfilled on completion. Chiselling from 9.30m to 9.30m for 1 hour.								Scale (approx) 1:50	Logged By JMD
								Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1020

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm to 9.30m 104mm to 21.00m	Ground Level (mOD) 28.13	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713142.6 E 737516.8 N	Dates 21/10/2021-15/11/2021	Project Contractor GII	Sheet 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	93					17.68	(0.65) 10.45	Grey/brown slightly sandy gravelly CLAY with occasional cobbles fragments			
12.80	70					16.68	(1.00) 11.45	Grey sandy angular fine to coarse GRAVEL of Mixed Lithology with occasional cobble fragments.			
14.30	83					15.78	(0.90) 12.35	Brown slightly clayey fine to coarse SAND			
15.40	73	2	0			14.33	(1.45) 13.80	Brown slightly sandy clayey SILT			
15.80			15			13.13	(1.20) 15.00	Grey slightly gravelly silty CLAY			
17.30	100	29	45	12		12.73	(0.40) 15.40	Strong fine grained thinly laminated grey LIMESTONE partially to distinctly weathered with occasional calcite veining interbedded with a Weak to medium strong fine grained thinly laminated black MUDSTONE distinctly weathered with occasional Clay bands 15.40 - 17.80m BGL: Fracture set 1: 0 - 25 degrees, very closely to closely spaced, rough planar to smooth planar with Clay smearing. Fracture set 2: 30 - 50 degrees, very closely to closely spaced, rough planar to rough stepped. Fracture set 3: 70 - 85 degrees, closely to medium spaced, rough planar			
17.80	100	75	63			10.33	(2.40) 17.80	Strong fine grained thinly laminated grey LIMESTONE partially weathered interbedded with a Weak to medium strong fine grained thinly laminated dark grey/black MUDSTONE partially to distinctly weathered with occasional Clay bands			
18.80	100	85	58	11			(3.20)	17.80 - 21.00m BGL: Fracture set 1: 0 - 25 degrees, very closely to closely spaced, rough planar with clay smearing. Fracture set 2: 30 - 50 degrees, medium spaced, rough planar			

Remarks	Scale (approx) 1:50	Logged By JMD
	Figure No.	



Site	Luas Finglas
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Borehole Number	LF-CPRC-1020
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Machine :	Dando 2000 & Beretta T44
Flush :	Water
Core Dia:	102 mm
Method :	Cable Percussion with rotary core follow on

Casing Diameter
200mm to 9.30m
104mm to 21.00m

Ground Level (mOD)	28.13
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Client	Transport Infrastructure Ireland
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**Job
Number**
10892-07-21

Location	713142 6 E 737516 8 N
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Dates	21/10/2021- 15/11/2021
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Project Contractor	GII
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Sheet
3/3

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Remarks

Scale (approx)

1:50

Logged
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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1021

Machine : Dando 2000	Casing Diameter 200mm to 9.00m 146mm to 15.80m	Ground Level (mOD) 29.93	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 713141.9 E 737424.5 N	Dates 15/10/2021- 18/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00 0.00 0.00	B1 EN1 T1				29.83	0.10 (0.30)	TAR.			
					29.53	0.40 (0.80)	MADE GROUND: Crushed rock fill with large cobbles.			
							MADE GROUND: Brown mottled grey slightly sandy gravelly Clay with occasional cobbles and rare fragments of tar. Gravel is fine to coarse angular to subrounded cobbles are angular to subrounded.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=14			2,3/3,4,3,4	28.73	1.20 (0.60)	Firm to stiff brown mottled grey slightly silty slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular.			
2.00-2.45 2.00 2.00 2.00 2.00	SPT(C) N=36 B3 EN3 T3 U1 Failed - 0%			7,7/8,7,10,11	28.13 27.93	1.80 (0.20) 2.00	Very stiff brown mottled grey slightly silty slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular.			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=50 B4 EN4 T4			3,7/10,13,20,7			Very stiff grey slightly sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse angular to subangular cobbles are angular to subangular.			
4.00-4.45 4.00 4.00	SPT(C) N=45 B5 T5			7,10/10,10,14,11						
5.00-5.38 5.00 5.00	SPT(C) 50/225 B6 T6			10,14/12,17,21	24.93	5.00	Very stiff brown slightly sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse angular to subangular cobbles are angular to subangular.			
6.00 6.00 6.00-6.45	B7 T7 SPT(C) N=48			Water strike(1) at 5.70m, rose to 5.50m in 20 mins, sealed at 6.90m. 17,8/11,16,17,4						
7.00-7.23 7.00 7.00	SPT(C) 50/75 B8 T8			25,38/50		(4.00)				
8.00 8.00-8.30 8.30	B9 SPT(C) 50/150 TCR SCR RQD FI			16,24/33,17						
9.00-9.23 9.00 9.80	54			50,50/50 SPT(C) 50/75 B10	20.93	9.00	Grey/brown sandy angular to subrounded fine to coarse GRAVEL with many cobbles and boulders fragments			

Remarks Inspection Pit dug to 1.20m BGL. Cable Percussion Refusal at 9.00m BGL with Rotary Core follow-on carried out to 15.8m BGL. Groundwater encountered at 5.70m BGL. Borehole complete at 15.80m BGL. Borehole backfilled on completion. Chiselling from 9.00m to 9.00m for 1 hour.								Scale (approx) 1:50	Logged By CE	Figure No.
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Site
Luas Finglas

Borehole Number
LF-CPRC-1021

Machine : Dando 2000		Casing Diameter 200mm to 9.00m 146mm to 15.80m		Ground Level (mOD) 29.93	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : Water		Location 713141.9 E 737424.5 N		Dates 15/10/2021- 18/10/2021	Project Contractor GII	Sheet 2/2
Core Dia: 98 mm						
Method : Cable Percussion						

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	90					19.08	(1.85)				
11.95	100	14	0			17.98	10.85	Grey weathered angular to subrounded fine to coarse GRAVEL of Limestone with occasional cobbles and boulders fragments and Clay bands			
12.80							(1.10)				
14.30	100	65	42	7			11.95	Very strong fine grained thinly laminated grey LIMESTONE partially weathered with Clay smearing interbedded with a Medium strong fine grained thinly laminated black MUDSTONE partially to distinctly weathered with occasional Clay bands Fracture set 1: 30 - 50 degrees, closely to moderately spaced, rough planar to rough undulose with Clay smearing. Fracture set 2: 0 - 20 degrees, very closely to closely spaced, rough planar to rough stepped with occasional Clay bands and smearing. Fracture set 3: 70 - 85 degrees, moderately spaced, rough undulose			
15.80	100	49	37				(3.85)				
						14.13	15.80	Refusal at 15.80m			

Remarks									Scale (approx) 1:50	Logged By CE
									Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1022

Machine : Dando 2000	Casing Diameter 200mm to 9.10m 146mm to 13.80m	Ground Level (mOD) 30.66	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 713137.3 E 737363.2 N	Dates 18/10/2021- 19/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				30.46	(0.20) 0.20	CONCRETE.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=4			1,2/1,1,1,1	30.06	(0.40) 0.60	MADE GROUND: Grey slightly clayey slightly sandy crushed rock Fill. Gravel is subangular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00 2.00 2.00	SPT(C) N=20 B3 EN3 T3 U1 Failed - 0%			2,3/4,4,5,7	29.46	(0.60) 1.20	MADE GROUND: Loose grey slightly clayey slightly sandy crushed rock Fill. Gravel is subangular to subrounded fine to coarse.			
						(0.70)	POSSIBLE MADE GROUND: Soft brown sandy slightly gravelly Clay with frequent subrounded cobbles.			
					28.76 28.66	1.90 2.00	POSSIBLE MADE GROUND: Stiff brown sandy slightly gravelly Clay with frequent subangular cobbles.			
						(0.70)	Stiff brown slightly gravelly sandy CLAY with rare cobbles. Gravel is subangular to subrounded fine to coarse.			
					27.96	2.70				
						(0.30)	Stiff brown slightly gravelly sandy CLAY with rare cobbles. Gravel is subangular to subrounded fine to coarse.			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=41 B4 EN4 T4			7,8/10,10,10,11	27.66	3.00				
							Very stiff brownish grey slightly silty slightly sandy gravelly CLAY with occasional subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
4.00-4.45 4.00 4.00	SPT(C) N=48 B5 T5			9,10/12,12,14,10		(2.20)				
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T6			8,12/13,16,17,4	25.46	5.20				
							Very stiff greyish brown slightly silty slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
6.00-6.38 6.00 6.00	SPT(C) 50/225 B7 T7			8,12/16,21,13		(1.50)				
7.00-7.30 7.00 7.00	SPT(C) 50/150 B8 T8			5,14/22,28	23.96	6.70				
						(1.60)	Very stiff greyish brown slightly silty slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
8.00 8.00 8.00-8.30	T9 B9 SPT(C) 50/150			8,16/19,31						
8.30	TCR	SCR	RQD	FI	22.36	8.30				
						(0.50)	Very stiff brown slightly sandy slightly gravelly desiccated CLAY			
8.80	100	8	0		21.86	8.80				
							Strong fine grained grey LIMESTONE partially weathered with Clay smearing interbedded with a Weak to medium strong fine grained thinly laminated black MUDSTONE distinctly weathered with occasional Clay bands Fracture set 1: 0 - 25 degrees, very closely to closely spaced, rough planar to smooth planar with occasional Clay bands. Fracture set 2: 30 - 50 degrees, closely spaced, rough planar			
9.80										

Remarks Inspection Pit carried out to 1.20m BGL. Cable Percussion Refusal at 8.30m BGL with Rotary Core follow-on carried out to 13.8m BGL. Groundwater not encountered. Borehole complete at 13.80m BGL. Borehole backfilled on completion. Chiselling from 8.30m to 8.30m for 1 hour.								Scale (approx) 1:50	Logged By CE
								Figure No.	



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Site
Luas Finglas

Borehole
Number
LF-CPRC-1022

Machine : Dando 2000 Flush : Water Core Dia : 98 mm Method : Cable Percussion			Casing Diameter 200mm to 9.10m 146mm to 13.80m			Ground Level (mOD) 30.66		Client Transport Infrastructure Ireland			Job Number 10892-07-21	
			Location 713137.3 E 737363.2 N			Dates 18/10/2021- 19/10/2021		Project Contractor GII			Sheet 2/2	

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	93	45	36	12			(5.00)	with Clay smearing. Fracture set 3: 70 - 85 degrees, moderately spaced, rough planar to rough stepped			
11.80	100	23	20								
12.80			47	7							
13.00	100	70									
13.80						16.86	13.80	Complete at 13.80m			

Remarks	Scale (approx)		Logged By
	1:50		CE
	Figure No.		



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Site
Luas Finglas

Borehole Number
LF-CPRC-1023

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm to 9.00m 146mm to 18.10m	Ground Level (mOD) 32.14	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713136.9 E 737319.4 N	Dates 25/11/2021- 14/12/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	B1 EN1				31.94 31.69	(0.20) 0.20 (0.25) 0.45	CONCRETE. MADE GROUND: Grey slightly sandy very clayey angular fine to coarse Gravel (Crushed rock fill). MADE GROUND: Brown slightly sandy gravelly Clay.			
1.00 1.00 1.20-1.65	B2 EN2 SPT(C) N=5			1,2/1,1,2,1	30.84	1.30	Soft brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
2.00-2.45 2.00 2.00 2.00 2.00	SPT(C) N=6 B3 EN3 T1 U1 Failed - 0 % Recovery			1,2/2,1,1,2	29.64	2.50	Soft reddish brown slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
3.00-3.45 3.00 3.00	SPT(C) N=44 B4 T2			4,6/8,11,11,14	29.24	2.90	Very stiff greyish brown slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
4.00-4.45 4.00 4.00	SPT(C) N=43 B5 T3			5,7/9,10,14,10						
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T4			9,10/12,14,16,8		(4.40)				
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T5			9,11/17,21,12						
7.00 7.00 7.00-7.45	B8 T6 SPT(C) N=50			Water strike(1) at 7.00m, rose to 4.20m in 20 mins. 16,16/24,19,7	24.84	7.30	Dense grey gravelly fine to coarse SAND with occasional angular to subangular cobbles. Gravel is angular to subrounded and fine to coarse.			
8.00-8.45 8.00 8.00	SPT(C) N=50 B9 T7			17,22/29,21		(1.40)				
9.00 9.00-9.05 9.00	B10 TCR SCR			50/50 50/0 SPT(C) 50*/50 T8	23.44 23.14	8.70 (0.30) 9.00	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
9.20 9.60-9.60 9.60	75			16,16/22,28 SPT(C)			Very stiff dark greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			

Remarks

Inspection pit carried out to 1.20m BGL.
Cable Percussion refusal at 9.00m BGL with rotary core follow-on.
Rotary Core complete at 18.10m BGL
Borehole backfilled on completion.
Chiselling from 9.00m to 9.00m for 1 hour.

Scale (approx)
1:50

Logged By
EB & JS

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1023

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm to 9.00m 146mm to 18.10m	Ground Level (mOD) 32.14	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713136.9 E 737319.4 N	Dates 25/11/2021-14/12/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.10	100						(3.40)				
12.60	97					19.74	12.40 (0.30)	Very stiff dark greyish brown slightly gravelly SILT/CLAY. Gravel is subangular to subrounded fine to coarse.			
12.70				18		19.44	12.70 (0.50)	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with clay banding and calcite mineralisation. Distinctly weathered.			
13.20	97	90	65			18.94	13.20	12.70m - 18.10m BGL: 2 fracture sets - F1: Fractures are dipping 0 - 15 degrees, very closely to medium spaced, smooth planar to rough undulating, with clay smearing and occasional clay fill. F2: Fractures are dipping 70 - 90 degrees, widely spaced, rough undulating, with clay smearing.			
14.10				7				Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with clay banding and calcite mineralisation. Partially weathered.			
14.90	100	89	63								
15.60				20			(4.90)				
17.10	100	91	87								
17.10	100	96	90	5							
18.10						14.04	18.10	Complete at 18.10m			

Remarks	Scale (approx) 1:50	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1024

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with Rotary Core follow on	Casing Diameter 200mm to 7.00m 146mm to 17.30m	Ground Level (mOD) 32.16	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713137.4 E 737301.6 N	Dates 01/12/2021-14/12/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1			Water strike(1) at 0.30m, sealed at 2.90m.	32.01 31.86	(0.15) (0.15) (0.30)	CONCRETE		▽1	
1.00 1.00 1.00 1.20-1.65 1.20	B2 EN2 T2 SPT(C) N=14 U1 Failed - 0 % Recovery			3,2/4,4,3,3		(2.60)	MADE GROUND: Grey angular to subangular fine to coarse Gravel (Crushed rock fill) MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles (Firm)			
2.00-2.45 2.00 2.00	SPT(C) N=15 B3 T3			2,3/3,4,4,4						
3.00-3.45 3.00 3.00	SPT(C) N=46 B4 T4			7,9/12,10,10,14	29.26	2.90	Very stiff brownish grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles			
4.00-4.45 4.00 4.00	SPT(C) N=50 B5 T5			8,12/12,14,16,8						
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T6			9,10/10,16,20,4		(4.10)			▽2	
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T7			8,10/21,24,5						
7.00-7.45 7.00 7.00 7.00	TCR SCR RQD FI			19,22/50 SPT(C) N=50 Water strike(2) at 7.00m, rose to 5.00m in 20 mins. B8 T8	25.16	7.00	Grey subangular to subrounded fine to coarse GRAVEL (Dense). Drillers notes: Sand washed away.		▽2	
8.30-8.45 8.30	0			19,25/50 SPT(C) 50/0	23.86	8.30	Very stiff brown slightly sandy gravelly CLAY with occasional cobble and boulder fragments			
9.80-9.95 9.80	100			25/50 SPT(C) 50/0	22.26	9.90				

Remarks Inspection pit carried out to 1.20m BGL Cable Percussion refusal at 7.00m BGL with Rotary Core follow on Rotary Core complete at 17.30m BGL Groundwater encountered at 0.30m BGL and 7.00m BGL	Scale (approx)	Logged By
	1:50	EB & JS
	Figure No.	



**Borehole
Number**
LF-CPRC-1024

Casing Diameter	200mm to 7.00m 146mm to 17.30m
Location	713137.4 E 737301.6 N

Ground Level (mOD)	32.16
Dates	01/12/2021- 14/12/2021

Client	Transport Infrastructure Ireland
Project Contractor	GII

**Job
Number**
10892-07-21

Sheet
2/2

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Site
Luas Finglas

Borehole Number
LF-CPRC-1025

Machine : Beretta T44	Casing Diameter 104mm cased to 14.80m	Ground Level (mOD) 33.18	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : Water				
Core Dia : 102 mm	Location 713149.4 E 737258.2 N	Dates 02/12/2021-15/12/2021	Project Contractor GII	Sheet 1/2
Method : Rotary Cored				

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00						33.13	0.05	TAR.		
							(0.45)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with many cobbles and mortar fragments.		
						32.68	0.50	No Recovery. Driller notes soft brown CLAY.		
	22						(1.80)			
2.00-2.45					5,6/5,5,6,10 SPT(C) N=26					
2.30						30.88	2.30	Stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
							(0.40)			
	100					30.48	2.70	Very stiff dark greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
3.80										
	100									
5.30							(5.80)			
	100									
6.80										
	97									
8.30						24.68	8.50	Very stiff dark greyish brown slightly gravelly SILT/CLAY. Gravel is subangular to subrounded fine to coarse.		
							(0.40)			
	80	8	8			24.28	8.90	Very stiff dark greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
							(0.30)			
9.40						23.98	9.20	Very stiff dark greyish brown slightly gravelly SILT/CLAY. Gravel is subangular to subrounded fine to coarse.		
							(0.20)			
9.80						23.78	9.40	Very stiff dark greyish brown slightly gravelly SILT/CLAY. Gravel is subangular to subrounded fine to coarse.		
								Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with clay banding		

Remarks Inspection pit carried out to 1.20m BGL. Borehole complete at 14.80m BGL. Borehole backfilled on completion.	Scale (approx)	Logged By
	1:50	EB
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1025

Machine : Beretta T44	Casing Diameter 104mm cased to 14.80m	Ground Level (mOD) 33.18	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : Water				
Core Dia : 102 mm	Location 713149.4 E 737258.2 N	Dates 02/12/2021-15/12/2021	Project Contractor GII	Sheet 2/2
Method : Rotary Cored				

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.10	100	57	57	24		22.08	(1.70)	and calcite mineralisation. Distinctly weathered.		
11.30							11.10	9.40m - 14.80m BGL: 2 Fracture sets - F1: Fractures are dipping 0 - 10 degrees, very closely to medium spaced, smooth planar to rough undulating, with clay smearing, infilling, and calcite coating. F2: Fractures are dipping 70 - 80 degrees, medium to widely spaced, smooth undulating to rough undulating, with clay smearing and infilling.		
12.80	100	59	59	12			(3.70)	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with calcite mineralisation. Distinctly weathered.		
14.30	100	43	26	8						
14.80	80	80	64			18.38	14.80	Complete at 14.80m		

Remarks	Scale (approx)	Logged By
	1:50	EB
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1026

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm cased to 7.10m 146mm cased to 14.30m	Ground Level (mOD) 33.50	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713144.2 E 737248.8 N	Dates 02/12/2021-08/12/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				33.40 33.20	0.10 (0.20) 0.30	TARMACADAM.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=6			2,2/2,1,2,1		(2.20)	MADE GROUND: Grey angular to subangular fine to coarse Gravel (Crushed rock fill). MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles.			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=30 B3 T3 U1 Failed - 0 % Recovery			2,2/7,7,7,9	31.00	2.50	Very stiff brownish grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
3.00-3.45 3.00 3.00	SPT(C) N=46 B4 T4			7,9/10,12,12,12						
4.00-4.45 4.00 4.00	SPT(C) N=50 B5 T5			8,10/12,12,15,11		(4.50)				
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T6			10,10/13,19,18						
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T7			6,10/15,20,15						
7.00 6.80 7.00-7.45 7.00	TCR SCR RQD FI			12,12/11,9,6,5 SPT(C) N=31 B8 Water strike(1) at 7.00m, rose to 5.40m in 20 mins. T8	26.50 26.40	7.00 7.10	Dense grey gravelly fine to coarse SAND with occasional subangular to subrounded cobbles. Gravel is angular to subrounded and fine to coarse.			
	0					(1.20)	No recovery. Driller notes core fell out of inner barrel.			
8.30-8.75 8.30				5,6/8,7,8,20 SPT(C) N=43	25.20	8.30	Very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
	90					(0.80)				
					24.40	9.10	Dark brownish grey slightly sandy gravelly CLAY with some angular to subangular cobbles and boulders. Gravel is subangular to subrounded fine to coarse (Weathered rock).			
9.80										

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 7.10m BGL with rotary core follow-on carried out to 14.30m BGL. Borehole complete at 14.30m BGL. Standpipe installed in borehole upon completion. Borehole filled with bentonite seal from 14.30m to 9.0m BGL. Slotted standpipe installed from 9.0m to 6.0m BGL with a pea gravel surround. Plain standpipe installed from 6.0m BGL to GL with a bentonite seal and a flush cover.	Scale (approx) 1:50	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1026

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 102 mm Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm cased to 7.10m 146mm cased to 14.30m	Ground Level (mOD) 33.50	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713144.2 E 737248.8 N	Dates 02/12/2021-08/12/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.00	96						(1.90)				
11.10						22.50	11.00	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with occasional clay banding.			
12.70	94	62	52	15			(3.30)	11.0m - 14.30m BGL: 2 fracture sets - F1: Fractures are dipping 0 - 10 degrees, closely to medium spaced, smooth planar to rough undulating with occasional clay banding. F2: Fractures are dipping 70 - 90 degrees, medium to widely spaced, smooth planar to rough undulating with clay smearing.			
14.30	94	54	46			19.20	14.30	Complete at 14.30m			

Remarks	Scale (approx) 1:50	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1027

Machine : Dando 2000 and Beretta T44 Method : Cable Percussion with Rotary follow on	Casing Diameter 200mm cased to 7.70m 146mm cased to 14.30m	Ground Level (mOD) 33.94	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713152.3 E 737234.5 N	Dates 29/11/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B1				33.84	0.10	TARMACADAM			
0.50	EN1				33.74	0.20	MADE GROUND: Brown angular to subangular fine to coarse Gravel (Crushed rock fill)			
0.50	T1				33.69	0.25	MADE GROUND: Grey angular to subangular fine to coarse Gravel (Crushed rock fill)			
1.00	B2				33.04	0.90	MADE GROUND: Grey slightly sandy gravelly Clay			
1.00	EN2			Water strike(1) at 1.10m.		(0.70)	Firm grey mottled green slightly sandy gravelly CLAY			
1.00	T2				32.34	1.60	Stiff greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles			
2.00-2.45	SPT(C) N=25			3,4/4,5,7,9		(1.40)				
2.00	B3									
2.00	T3									
3.00-3.45	SPT(C) N=50			7,10/11,11,16,12	30.94	3.00	Very stiff greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles			
3.00	B4									
3.00	T4									
4.00-4.45	SPT(C) N=50			10,12/17,20,13		(3.50)				
4.00	B5									
4.00	T5									
5.00-5.45	SPT(C) N=50			9,15/21,25,4						
5.00	B6									
5.00	T6									
6.00-6.45	SPT(C) N=50			17,21/21,29						
6.00	B7				27.44	6.50	Very stiff grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles			
6.00	T7									
7.00-7.45	SPT(C) N=50			14,24/31,19		(1.20)				
7.00	B8									
7.00	T8									
7.70	TCR	SCR	RQD	FI	26.24	7.70	No recovery. Driller notes soft brown gravelly CLAY.			
8.30-8.45	0			29,29/29,21		(0.60)				
8.30				SPT(C) 50/0	25.64	8.30	Very stiff dark grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
	97					(1.60)				
9.80										
9.90					24.04	9.90				

Remarks

Inspection pit carried out to 1.20m BGL.
 Cable Percussion refusal at 7.70m BGL with Rotary Core follow-on carried out to 14.3m BGL.
 Borehole complete at 14.3m BGL.
 Borehole backfilled on completion.
 Chiselling from 7.70m to 7.70m for 1 hour.

Scale (approx)
1:50

Logged By
EB & JS

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1027

Machine : Dando 2000 and Beretta T44 Flush : Core Dia : mm Method : Cable Percussion with Rotary follow on	Casing Diameter 200mm cased to 7.70m 146mm cased to 14.30m	Ground Level (mOD) 33.94	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713152.3 E 737234.5 N	Dates 29/11/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	100	52	25	17		22.04	(2.00)	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with some clay banding. Distinctly weathered. 9.90m - 14.30m BGL: 2 fracture sets - F1: Fractures are dipping 0 - 20 degrees, very closely to medium spaced, smooth planar to rough undulating with clay smearing and some clay infilling. F2: Fractures are dipping 70 - 85 degrees, medium to widely spaced, smooth planar to rough undulating, with clay smearing, infilling, and calcite coating.			
12.80	100	63	45				11.90	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with occasional clay banding and calcite mineralisation. Partially weathered.			
14.30	100	67	62				(2.40)				
						19.64	14.30	Not Finished at 14.30m			

Remarks	Scale (approx)	Logged By
	1:50	EB & JS
Figure No.		



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Site
Luas Finglas

Borehole Number
LF-CPRC-1028

Machine : Dando 2000	Casing Diameter 200mm to 12.10m 146mm to 17.60m	Ground Level (mOD) 36.43	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 713147.3 E 737220.6 N	Dates 20/12/2021- 10/01/2022	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				36.18	(0.25) 0.25	Dark brown TOPSOIL			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=6			Water strike(1) at 1.10m. 1,2/1,1,2,2	35.53 35.23	(0.65) 0.90 (0.30) 1.20	MADE GROUND: Dark brown/black slightly sandy gravelly Clay with occasional mortar and red brick fragments			
2.00-2.45 2.00 2.00	SPT(C) N=13 B3 T3			1,2/3,3,4,3		(2.50)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with red brick and mortar fragments			
3.00-3.45 3.00 3.00	SPT(C) N=28 B4 T4			2,3/4,4,10,10			Soft to stiff brown slightly sandy gravelly CLAY with occasional cobbles			
4.00-4.45 4.00 4.00	SPT(C) N=43 B5 T5			7,8/10,11,11,11	32.73	3.70	Very stiff greyish brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles			
5.00-5.42 5.00 5.00	SPT(C) 50/265 B6 T6			9,10/12,14,17,7						
6.00-6.43 6.00 6.00	SPT(C) 50/275 B7 T7			7,9/11,14,19,6		(5.10)				
7.00-7.31 7.00 7.00	SPT(C) 50/160 B8 T8			10,10/19,21,10						
8.00-8.29 8.00 8.00	SPT(C) 50/135 B9 T9			17,19/22,28						
9.00-9.24 9.00 9.00	SPT(C) 50/85 B10 T10			21,21/34,16	27.63	8.80	Very stiff dark grey slightly sandy gravelly CLAY with occasional angular to subrounded cobbles			
10.00-10.28	SPT(C) 50/125			12,17/30,20						

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 12.10m BGL with Rotary Core follow-on carried out to 17.6m BGL. No groundwater encountered. Borehole complete at 17.6m BGL. Standpipe installed in borehole upon completion. Borehole sealed to 15.0m BGL with bentonite. Slotted standpipe installed from 15.0m - 12.0m BGL with a pea gravel surround. Plain standpipe installed from 12.0m BGL to GL with a bentonite seal and a flush cover.								Scale (approx) 1:50	Logged By EB	Figure No.
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Site
Luas Finglas

Borehole Number
LF-CPRC-1028

Machine : Dando 2000	Casing Diameter 200mm to 12.10m 146mm to 17.60m	Ground Level (mOD) 36.43	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 713147.3 E 737220.6 N	Dates 20/12/2021- 10/01/2022	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00 10.00	B11 T11					(3.30)				
11.00-11.12 11.00 11.00	SPT(C) 25*/115 50/0 B12 T12			14,11/50						
12.00-12.03 12.00 12.00 12.10	TCR SCR RQD FI			25/50 50/0 SPT(C) 25*/25 B13 T13	24.33	12.10 (0.50)	Dark grey sandy very clayey angular fine to coarse GRAVEL with cobble fragments			
12.60	100				23.83	12.60	Very strong fine grained thinly laminated grey LIMESTONE partially weathered interbedded with a Weak fine grained thinly laminated black MUDSTONE distinctly weathered with some Clay bands and gouge Fracture set 1: 0 - 20 degrees, very closely to closely spaced, smooth planar to rough planar with Clay bands and smearing. Fracture set 2: 30 to 50 degrees, closely spaced, rough planar to rough undulose, with Clay smearing. Fracture set 3: 70 - 85 degrees, closely to moderately spaced, rough planar to rough undulose			
14.10						(3.50)				
14.70	100	41	23	NI						
15.15										
15.60	100	41	0							
16.10	100	19	13	10	20.33	16.10 (1.50)	Very strong fine grained thinly laminated grey LIMESTONE partially weathered interbedded with a Weak fine grained thinly laminated black MUDSTONE distinctly weathered with occasional Clay bands			
17.60					18.83	17.60	Complete at 17.60m			

Remarks Chiselling from 12.10m to 12.10m for 1 hour.	Scale (approx) 1:50	Logged By EB
Figure No.		



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Site
Luas Finglas

Borehole Number
LF-CPRC-1029

Machine : Beretta T44	Casing Diameter 146mm cased to 17.30m	Ground Level (mOD) 37.93	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : water				
Core Dia : 102 mm	Location 713140.9 E 737175.6 N	Dates 30/10/2021-01/12/2021	Project Contractor GII	Sheet 1/2
Method : Rotary Cored				

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								No Recovery. Driller notes FILL.		
	57						(1.40)			
1.40						36.53	1.40	MADE GROUND: Dark grey slightly clayey sandy angular to subangular fine to coarse Gravel with wood fragments.		
	100						(0.90)			
2.30						35.63	2.30	MADE GROUND: Brown grey slightly clayey sandy angular to subangular fine to coarse Gravel with cobbles and concrete fragments.		
	70						(1.50)			
3.80						34.13	3.80	Very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
						33.63	4.30	Very stiff brownish grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse.		
	100									
5.30										
	93									
6.80										
	100						(7.00)			
8.30										
	100									
9.80										

Remarks Borehole complete at 17.30m BGL. Solid rock at 12.80m BGL. Borehole backfilled on completion.	Scale (approx)	Logged By
	1:50	JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1029

Machine : Beretta T44	Casing Diameter 146mm cased to 17.30m	Ground Level (mOD) 37.93	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : water	Location 713140.9 E 737175.6 N	Dates 30/10/2021-01/12/2021	Project Contractor GII	Sheet 2/2
Core Dia : 102 mm				
Method : Rotary Cored				

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.30	100					26.63	11.30	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse.		
	97						(1.50)			
12.80						25.13	12.80	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with clay banding and calcite mineralisation. Distinctly weathered. 12.80m - 17.30m BGL: 2 fracture sets - F1: Fractures are dipping 10 - 20 degrees, closely to medium spaced, smooth planar to rough undulating, with clay smearing and some clay infilling. F2: Fractures are dipping 60 - 80 degrees, medium to widely spaced, rough undulating, with clay smearing and infilling.		
	100	65	48			24.13	13.80			
14.30								Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with clay banding and calcite mineralisation. Partially weathered.		
	100	63	41	12			(3.50)			
15.80										
	100	35	18							
17.30						20.63	17.30	Complete at 17.30m		

Remarks	Scale (approx)	Logged By
	1:50	JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1030

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm cased to 10.30m 146mm cased to 15.80m	Ground Level (mOD) 37.13	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713165.6 E 737170.8 N	Dates 24/11/2021-25/11/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	B1 EN1				36.88	(0.25) 0.25	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.20-1.65	B2 EN2 SPT(C) N=44			7,9/10,10,13,11		(2.25)	MADE GROUND: Grey slightly sandy gravelly Clay with plastic and metal fragments, and occasional subangular to subrounded cobbles.			
2.00 2.00 2.00-2.45	B3 T1 SPT(C) N=15			Water strike(1) at 1.80m, rose to 1.70m in 20 mins, sealed at 3.00m. 8,10/6,3,3,3	34.63	2.50	Firm brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=13 B4 T2 U1 Failed - 0% Recovery			2,3/3,3,4,3		(1.20)				
4.00-4.45 4.00 4.00	SPT(C) N=47 B5 T3			4,7/9,10,12,16	33.43	3.70	Very stiff grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T4			8,10/14,13,17,6						
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T5			10,10/21,20,9						
7.00-7.45 7.00 7.00	SPT(C) N=50 B8 T6			14,17/20,28,2		(6.60)				
8.00-8.45 8.00 8.00	SPT(C) N=50 B9 T7			17,21/24,26						
9.00-9.45 9.00 9.00	SPT(C) N=50 B10 T8			24,33/50						
10.00-10.25	SPT(C) 50/100			41,50/50						

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 10.30m BGL with Rotary Core follow-on carried out to 15.8m BGL. No groundwater encountered. Borehole complete at 15.80m BGL. Borehole backfilled on completion.	Scale (approx) 1:50	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1030

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm cased to 10.30m 146mm cased to 15.80m	Ground Level (mOD) 37.13	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713165.6 E 737170.8 N	Dates 24/11/2021- 25/11/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests		Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.30	TCR	SCR	RQD	FI	B11 T9	26.83	10.30	Dark grey angular to subangular fine to coarse GRAVEL with some angular to subangular cobbles of medium strong to strong thinly laminated dark grey fine-grained argillaceous Limestone. (weathered rock)			
10.30							(0.40)				
10.70	80	28	14			26.43	10.70	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with occasional clay banding and calcite mineralisation. Distinctly weathered. 10.70m - 15.80m BGL: 2 fracture sets - F1: Fractures are dipping 5 - 20 degrees, closely to medium spaced, smooth planar to rough undulating, with clay smearing, infilling, and occasional calcite coating. F2: Fractures are dipping 60 - 80 degrees, medium to widely spaced, smooth undulating to rough undulating, with clay smearing and infilling.			
11.30	100	100	45	7							
12.80	93	69	35	11			(5.10)				
14.30	100	35	23	8							
15.80						21.33	15.80	Complete at 15.80m			

Remarks Chiselling from 10.30m to 10.30m for 1 hour.	Scale (approx) 1:50	Logged By EB & JS
		Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1031

Machine : Dando 2000 and Beretta T44 Method : Cable Percussion with Rotary Follow on	Casing Diameter 200mm cased to 10.30m 146mm cased to 16.30m	Ground Level (mOD) 37.29	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713180.3 E 737165.5 N	Dates 22/11/2021- 24/11/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	B1 EN1				37.09 36.89	(0.20) (0.20) (0.40)	Brown slightly sandy slightly gravelly TOPSOIL. MADE GROUND: Brown slightly sandy gravelly Clay. MADE GROUND: Grey slightly sandy gravelly Clay with some timber and metal fragments, and occasional subangular to subrounded cobbles (Very stiff).			
1.00 1.00 1.20-1.65	B2 EN2 SPT(C) N=40			12,12/9,11,10,10		(2.10)				
2.00-2.45 2.00 2.00	SPT(C) N=26 B3 T1			Water strike(1) at 1.70m. 14,10/9,6,6,5	34.79	2.50	Soft to firm brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
3.00-3.45 3.00 3.00	SPT(C) N=7 B4 T2			1,2/1,2,2,2		(1.50)				
4.00-4.45 4.00 4.00 4.00	SPT(C) N=29 B5 T3 U1 Failed - 0 % Recovery			3,4/5,7,8,9	33.29	4.00	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
5.00-5.45 5.00 5.00	SPT(C) N=42 B6 T4			7,8/8,10,12,12						
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T5			6,8/10,14,19,7						
7.00-7.45 7.00 7.00	SPT(C) N=50 B8 T6			10,14/19,20,11		(6.30)				
8.00-8.45 8.00 8.00	SPT(C) N=50 B9 T7			16,30/44,6						
9.00-9.45 9.00 9.00	SPT(C) N=50 B10 T8			12,16/21,29						
10.00-10.45	SPT(C) N=50			21,27/37,13						

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 10.30m BGL with rotary core follow-on carried out to 16.30m BGL. Borehole complete at 16.30m BGL. Standpipe piezometer installed in borehole upon completion. Borehole was filled with a bentonite seal from 16.30m - 8.0m BGL, with a sandscreen installed from 8.0m - 6.0m BGL. A standpipe piezometer was installed from 7.0m BGL to GL, with the point installed from 6.50m - 7.0m BGL, and with a bentonite seal and a flush cover.	Scale (approx) 1:50	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1031

Machine : Dando 2000 and Beretta T44 Method : Cable Percussion with Rotary Follow on	Casing Diameter 200mm cased to 10.30m 146mm cased to 16.30m	Ground Level (mOD) 37.29	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713180.3 E 737165.5 N	Dates 22/11/2021- 24/11/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests		Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00	T9 B11										
10.00	TCR	SCR	RQD	FI							
10.30	100	20				26.99	10.30 (0.50)	Very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
						26.49	10.80 (0.30)	Dark grey clayey slightly sandy angular to subangular fine to coarse GRAVEL with occasional angular to subangular cobbles of medium strong to strong dark grey thinly laminated fine-grained argillaceous Limestone.			
11.10			20			26.19	11.10				
11.30	93	53	25	10				Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with many clay bands. Distinctly weathered to destructured. 11.10m - 12.80m BGL, 13.70m - 14.60m BGL, and 14.90m - 16.30m BGL: 2 fracture sets - F1: Fractures are dipping 5 - 15 degrees, very closely to medium spaced, smooth planar to rough undulating, with clay smearing and infilling. F2: Fractures are dipping 60 - 80 degrees, closely to widely spaced, smooth planar to rough undulating, with clay smearing and infilling. Non-Intact Zones: 12.80m - 13.70m BGL, and 14.60m - 14.90m BGL.			
12.80				NI							
	100	9	0				(4.50)				
13.70				22							
14.30				NI							
14.60											
14.90	97	19	13								
				11							
15.80	100	90	60			21.69	15.60 (0.70)	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with occasional clay bands. Partially weathered.			
16.30						20.99	16.30	Complete at 16.30m			

Remarks Chiselling from 10.30m to 10.30m for 1 hour.	Scale (approx)	Logged By
	1:50	EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1032

Machine : Dando 2000 and Beretta T44 Method : Cable Percussion	Casing Diameter 200mm cased to 10.30m 146mm cased to 16.30m	Ground Level (mOD) 37.37	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713198.8 E 737160 N	Dates 18/11/2021- 25/11/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	B1 EN1				37.17	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL.			
0.50 1.00	EN2				36.62	(0.55) 0.75	MADE GROUND: Grey/brown slightly sandy slightly gravelly Clay with occasional concrete fragments and occasional subangular to subrounded cobbles.			
1.20-1.65	SPT(C) N=50			12,25/41,9		(1.45)	MADE GROUND: Grey slightly sandy gravelly Clay with occasional metal fragments and occasional subangular to subrounded cobbles.			
2.00 2.00	B2 T1			Water strike(1) at 2.00m, rose to 1.70m in 20 mins, sealed at 5.00m. 7,3/3,2,2,2	35.17	2.20	Firm greyish brown slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
2.00-2.45	SPT(C) N=9									
3.00-3.45 3.00 3.00	SPT(C) N=12 B3 T2			2,3/3,3,2,4		(1.80)				
4.00-4.45 4.00 4.00	SPT(C) N=50 B4 T3			6,6/9,12,12,17	33.37	4.00	Very stiff grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
5.00-5.45 5.00 5.00	SPT(C) N=50 B5 T4			7,10/10,14,16,10						
6.00-6.45 6.00 6.00	SPT(C) N=50 B6 T5			8,12/12,16,19,3		(3.80)				
7.00-7.45 7.00 7.00	SPT(C) N=50 B7 T6			10,14/19,21,10						
8.00-8.45 8.00 8.00	SPT(C) N=50 B8 T7			10,16/24,26	29.57	7.80	Very stiff greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
9.00-9.45 9.00 9.00	SPT(C) N=50 B9 T8			17,22/18,27,5		(2.50)				
10.00-10.45	SPT(C) N=50			21,30/34,16						

Remarks

Inspection pit carried out to 1.20m BGL.
 Cable Percussion refusal at 10.30m BGL with rotary core follow-on carried out to 16.30m BGL.
 Borehole complete at 16.30m BGL.
 Standpipe installed in borehole upon completion. Slotted standpipe installed from 16.30m - 12.0m BGL with a pea gravel surround.
 Plain standpipe installed from 12.0m BGL to GL with a bentonite seal and a flush cover.

Scale (approx)
1:50

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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1032

Machine : Dando 2000 and Beretta T44 Method : Cable Percussion	Casing Diameter 200mm cased to 10.30m 146mm cased to 16.30m	Ground Level (mOD) 37.37	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713198.8 E 737160 N	Dates 18/11/2021-25/11/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests		Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00	T9										
10.00	B10										
10.30	TCR	SCR	RQD	FI		27.07	10.30	Dark brownish grey clayey slightly sandy angular to subangular fine to coarse GRAVEL with some angular to subangular cobbles of medium strong thinly laminated dark grey fine-grained argillaceous Limestone.			
							(0.55)				
10.85	100	10				26.52	10.85	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with frequent clay bands. Distinctly weathered. Non-Intact zones: 10.85m - 11.30m BGL, 12.80m - 13.20m BGL, and 14.80m - 15.90m BGL. 11.30m - 12.80m BGL, 13.20m - 14.80m BGL, and 15.90m - 16.30m BGL: 2 fracture sets - F1: Fractures are dipping 5 - 25 degrees, very closely to medium spaced, smooth planar to rough undulating, with clay smearing and infilling. F2: Fractures are dipping 80 - 90 degrees, widely spaced, smooth planar to rough undulating, with clay smearing and infilling.			
11.30			0	NI							
	100	46	25	16							
12.80				NI							
13.20	97	35	27	16			(5.45)				
14.30											
14.80	97	27	19	NI							
15.80											
15.90	100	16	11	15							
16.30						21.07	16.30				
								Not Finished at 16.30m			

Remarks Chiselling from 10.30m to 10.30m for 1 hour.	Scale (approx)	Logged By
	1:50	EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-1034

Machine : Dando 2000 and Beretta T44 Method : Cable Percussion with Rotary follow on	Casing Diameter 200mm cased to 8.00m 146mm cased to 17.30m	Ground Level (mOD) 37.46	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713208.5 E 737148.4 N	Dates 12/11/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	B1 EN1				37.31	(0.15) 0.15	MADE GROUND: Brown gravelly fine to coarse Sand			
1.00 1.00	B2 EN2					(2.05)	MADE GROUND: Dark grey slightly clayey slightly sandy angular to subangular fine to coarse Gravel (Crushed rock fill)			
2.00-2.45	SPT(C) N=10			8,6/3,2,2,3	35.26	2.20 (0.50)	No recovery: Driller notes CP pushing large boulder			
3.00 3.00 3.00-3.45	B3 T1 SPT(C) N=14			Water strike(1) at 2.90m, rose to 2.70m in 20 mins. 3,3/3,4,4,3	34.76	2.70 (1.80)	Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		▼1 ▽1	
4.00-4.45 4.00 4.00	SPT(C) N=19 B4 T2			4,3/4,3,5,7	32.96	4.50	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles			
5.00-5.45 5.00 5.00	SPT(C) N=50 B5 T3			4,11/16,24,10						
6.00 6.00	B6 T4					(3.50)				
6.50-6.95	SPT(C) N=50			12,24/40,10						
7.00 7.00	B7 T5									
8.00-8.45 8.30	SPT(C) N=50 TCR SCR RQD FI			15,30/50	29.46	8.00	Very stiff greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse.			
	93					(2.90)				
9.80-10.25 9.80				6,10/8,11,23,8 SPT(C) N=50						

Remarks

Inspection pit carried out to 1.20m BGL.
 Cable Percussion refusal at 8.00m BGL with rotary core follow-on carried out to 17.30m BGL.
 Borehole complete at 17.30m BGL.
 Borehole backfilled on completion.
 Chiselling from 1.90m to 2.00m for 0.5 hours.

Scale (approx)
1:50

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EB & JS

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1034

Machine : Dando 2000 and Beretta T44 Flush : Core Dia : mm Method : Cable Percussion with Rotary follow on	Casing Diameter 200mm cased to 8.00m 146mm cased to 17.30m	Ground Level (mOD) 37.46	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713208.5 E 737148.4 N	Dates 12/11/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	100					26.56	10.90	Dark brownish grey clayey slightly sandy angular to subangular fine to coarse GRAVEL with some angular to subangular cobbles and boulders of medium strong to strong dark grey thinly laminated fine-grained argillaceous Limestone.			
11.50						25.96	11.50				
12.30	97	16	0	10				Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with some clay bands. Distinctly weathered.			
12.60				NI							
12.80								11.50m - 12.30m BGL, 12.60m - 14.90m BGL, and 15.40m - 17.30m BGL: 2 fracture sets - F1: Fractures are dipping 0 - 15 degrees, very closely to medium spaced, smooth planar to rough undulating, with clay smearing and infilling. F2: Fractures are dipping 65 - 80 degrees, medium to widely spaced, smooth planar to rough undulating, with clay smearing. Non-Intact Zones: 12.30m - 12.60m BGL, and 14.90m - 15.40m BGL.			
14.30	100	43	29	14			(3.90)				
14.90								Clay bands at 12.30m - 12.60m BGL, and 14.90m - 15.40m BGL.			
15.40	97	16	9	NI							
15.80						22.06	15.40	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE. Partially weathered.			
17.30							(1.90)				
	100	87	53	11				Refusal at 17.30m			
						20.16	17.30				

Remarks	Scale (approx)	Logged By
	1:50	EB & JS
Figure No.		



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Site
Luas Finglas

Borehole Number
LF-CPRC-1035

Machine : Dando 2000 and Beretta T44 Method : Cable Percussion with Rotary follow on	Casing Diameter 200mm cased to 9.70m 146mm cased to 17.30m	Ground Level (mOD) 37.04	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713235.6 E 737140.5 N	Dates 10/11/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	B1 EN1				36.89	(0.15) 0.15	MADE GROUND: Brown gravelly fine to coarse Sand.			
1.00 1.00 1.20-1.65	B2 EN2 SPT(C) N=50			17,24/50	35.74	(1.15) 1.30	MADE GROUND: Dark grey slightly clayey sandy angular fine to coarse Gravel (Crushed rock fill).			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=8 B3 EN3 T1			1,2/2,2,2,2	35.24	(0.50) 1.80	MADE GROUND: Dark grey slightly sandy gravelly Clay with occasional subangular to subrounded cobbles.		▼1	
3.00 3.00 3.00	B4 T2 U1 Failed - 0% Recovery			Water strike(1) at 3.00m, rose to 1.80m in 20 mins, sealed at 3.70m.		(2.20)	Very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.		▼1	
4.00-4.45 4.00 4.00	SPT(C) N=33 B5 T3			6,7/7,8,8,10	33.04	4.00	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.			
5.00-5.45 5.00 5.00	SPT(C) N=48 B6 T4			6,8/10,10,12,16						
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T5			6,10/15,15,20						
7.00-7.45 7.00 7.00	SPT(C) N=50 B8 T6			8,12/16,20,14		(5.70)				
8.00-8.45 8.00 8.00	SPT(C) N=50 B9 T7			10,16/21,27,2						
9.00-9.45 9.00 9.00	SPT(C) N=50 B10 T8			17,22/27,23						
9.80	TCR	SCR	RQD	FI	27.34	9.70	Very stiff dark grey slightly sandy slightly gravelly CLAY with frequent subangular to subrounded			

Remarks

Inspection pit carried out to 1.20m BGL.
Cable Percussion refusal at 9.70m BGL with rotary core follow-on carried out to 17.30m BGL.
Borehole complete at 17.30m BGL.
Borehole backfilled on completion.
Chiselling from 9.70m to 9.70m for 1 hour.

Scale (approx)
1:50

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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-1035

Machine : Dando 2000 and Beretta T44 Flush : Core Dia: mm Method : Cable Percussion with Rotary follow on	Casing Diameter 200mm cased to 9.70m 146mm cased to 17.30m	Ground Level (mOD) 37.04	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713235.6 E 737140.5 N	Dates 10/11/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30-11.45	87				27.27/27.23 SPT(C) 50/0		(1.60)	cobbles and boulders.			
11.30						25.74	11.30	Dark grey clayey slightly sandy angular to subangular fine to coarse GRAVEL with frequent cobbles and boulders of medium strong to strong thinly laminated dark grey fine-grained argillaceous Limestone. (weathered rock)			
12.10	93	15				24.94	12.10	Medium strong to strong thinly laminated dark grey fine-grained argillaceous LIMESTONE with occasional clay banding and calcite mineralisation.			
12.80			9					12.10m - 17.30m BGL: 2 fracture sets - F1: Fractures are dipping 5 - 25 degrees, very closely to medium spaced, smooth planar to rough undulating with clay smearing and occasional clay fill. F2: Fractures are dipping 70 - 90 degrees, medium to widely spaced, smooth planar to rough undulating with clay smearing and occasional clay fill.			
14.30	100	87	40								
15.80				15			(5.20)				
	100	85	61								
17.30											
	100	61	51								
						19.74	17.30	Refusal at 17.30m			

Remarks	Scale (approx)	Logged By
	1:50	EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2001

Machine : Dando 2000 & Beretta T44		Casing Diameter 200mm cased to 8.30m 146mm cased to 13.30m		Ground Level (mOD) 63.62		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
Method : Cable Percussion with rotary core follow on		Location 712698.5 E 739723.2 N		Dates 01/10/2021- 22/10/2021		Project Contractor GII		Sheet 1/2	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				63.37	(0.25) 0.25	Dark brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20	B2 EN2 T2 U1 70% Recovery				62.92	(0.45) 0.70	MADE GROUND: Brown very clayey slightly sandy subangular to subrounded fine to coarse Gravel.			
					62.52	(0.40) 1.10	MADE GROUND: Grey slightly sandy slightly gravelly Clay with red brick fragments.			
					62.42	1.20	MADE GROUND: Reworked brown slightly sandy slightly gravelly Clay.			
2.00-2.45 2.00 2.00	SPT(C) N=7 B3 T3			1,2/1,2,2,2	61.62	(0.80) 2.00	Brown mottled grey silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments. Gravel is subangular to subrounded fine to coarse.			
3.00-3.45 3.00 3.00	SPT(C) N=24 B4 T4			1,2/5,4,8,7	60.62	(1.00) 3.00	Soft brown mottled grey silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments. Gravel is subangular to subrounded fine to coarse.			
4.00 4.00 4.00-4.30	B5 T5 SPT(C) 50/150			Water strike(1) at 3.90m, no rise after 20 mins. 21,19/34,16	60.22	(0.40) 3.40	Stiff brown mottled grey silty slightly sandy slightly gravelly CLAY with rare cobbles and shell fragments. Gravel is subangular to subrounded fine to coarse.			
5.00-5.38 5.00 5.00	SPT(C) 50/225 B6 T6			7,9/12,19,19	59.62	(0.60) 4.00	Stiff grey slightly sandy gravelly CLAY with angular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse.		▼1	
6.00-6.23 6.00 6.00	SPT(C) 50/75 B7 T7			21,25/50		(4.30)	Very stiff grey slightly sandy gravelly CLAY with angular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse.			
7.00-7.38 7.00 7.00	SPT(C) 50/225 B8 T8			7,10/14,17,19						
8.00 8.00 8.00-8.30	T9 B9 SPT(C) 50/150			Water strike(2) at 19,27/33,17 8.30m, rose to 8.00m in 20 mins.	55.32	8.30	Weak fine grained thinly laminated black MUDSTONE distinctly weathered to deconstructed with many Clay bands and fault brecciation interbedded with a Medium strong fine grained thinly laminated dark grey LIMESTONE distinctly weathered with Clay smearing.		▼2	
8.30	TCR	SCR	RQD	FI			8.90m - 10.50m BGL: F1: Fractures are dipping 0 - 20 degrees, very closely to closely spaced, rough planar to smooth planar with Clay infilling. F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, smooth planar with Clay smearing. F3: Fractures are dipping 70 - 85 degrees, closely		▼2	
8.90	100	20	20	NI						
9.80				12						

Remarks

Inspection pit carried out to 1.20m BGL.
Cable Percussion refusal at 8.30m BGL. Rotary core follow on carried out to 13.30m BGL.
Chiselling from 8.30m BGL to 8.30m BGL for 1 hour.
Groundwater encountered at 3.90m and 8.30m BGL.
Borehole complete at 13.30m BGL.
Borehole backfilled on completion.
Chiselling from 8.30m to 8.30m for 1 hour.

Scale (approx)
1:50

Logged By
JS / JMD

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-2001

Machine : Dando 2000 & Beretta T44 Flush : water Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 8.30m 146mm cased to 13.30m	Ground Level (mOD) 63.62	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712698.5 E 739723.2 N	Dates 01/10/2021-22/10/2021	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.50	93	20	15	NI			(5.00)	spaced, rough planar.			
10.85											
11.30	100	13	13	14				10.85m - 13.30m BGL: F1: Fractures are dipping 0 - 20 degrees, closely to medium spaced, smooth planar with Clay smearing and infilling. F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, smooth planar with Clay smearing and infill. F3: Fractures are dipping 70 - 85 degrees, closely spaced, rough stepped to rough undulose.			
12.80											
13.30	100	8	0			50.32	13.30	Complete at 13.30m			

Remarks	Scale (approx) 1:50	Logged By JS / JMD
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2002

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm cased to 11.00m 146mm cased to 16.60m	Ground Level (mOD) 61.74	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712796.3 E 739101.1 N	Dates 16/12/2021- 21/12/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
1.00 1.00 1.00 1.20-1.65	B1 EN1 T1 SPT(C) N=17			Water strike(1) at 0.60m, rose to 0.40m in 20 mins, sealed at 1.40m. 1,2/2,3,5,7	61.64 61.24 60.74 60.34	0.10 (0.40) 0.50 (0.50) 1.00 (0.40) 1.40	TARMACADAM. MADE GROUND: Grey slightly sandy very gravelly Clay Fill. Gravel is angular to subrounded fine to coarse. POSSIBLE MADE GROUND: Grey brown sandy gravelly Clay with rootlets. Gravel is subangular to subrounded fine to coarse. Stiff grey brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse. Very stiff grey slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=36 B2 EN2 T2			Water strike(2) at 2.40m, rose to 0.60m in 20 mins, sealed at 4.00m. 6,7/8,8,10,10	59.34 59.14	2.40 (0.20) 2.60	Dense grey clayey SAND and GRAVEL. Sand is fine, gravel is subangular to subrounded fine to medium. Very stiff grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=40 B3 EN3 T3			4,8/9,9,10,12						
4.00-4.45 4.00 4.00	SPT(C) N=42 B4 T4			3,9/10,14,15,3						
5.00-5.38 5.00 5.00	SPT(C) 50/230 B5 T5			7,10/13,12,20,5						
6.00-6.36 6.00 6.00	SPT(C) 50/210 B6 T6			7,9/16,19,15						
7.00-7.31 7.00 7.00	SPT(C) 50/160 B7 T7			14,19/22,24,4	55.24	6.50	Very stiff grey slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is angular to subrounded fine to coarse.			
8.00-8.28 8.00 8.00	SPT(C) 50/130 B8 T8			16,20/27,23						
9.00-9.27 9.00 9.00	SPT(C) 50/120 B9 T9			18,24/30,20						
10.00-10.24	SPT(C) 50/90			21,27/39,11						

Remarks

Inspection Pit carried out to 1.20m BGL.
 Cable percussion carried out to 11.0m BGL with rotary core follow-on carried out to 16.60m BGL.
 Borehole complete at 16.60m BGL.
 Groundwater encountered at 0.60m BGL and 2.40m BGL.

Scale (approx)
1:50

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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-2002

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with rotary core follow-on	Casing Diameter 200mm cased to 11.00m 146mm cased to 16.60m	Ground Level (mOD) 61.74	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 712796.3 E 739101.1 N	Dates 16/12/2021- 21/12/2021	Project Contractor GII	Sheet 2/2

Depth (m)	Sample / Tests		Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr		
10.00 10.00	B10 T10				50/ B11 SPT(C) 50*/10 T11								
11.00 11.00-11.01 11.00 11.00	TCR	SCR	RQD	FI		50.74	11.00 (0.35)	Grey brown very clayey angular to subrounded fine to coarse GRAVEL.					
11.35	94	21	6	14		50.39	11.35	Very strong thinly to thickly laminated grey fine-grained LIMESTONE. Partially weathered. Interbedded with a medium strong thinly laminated dark grey to black fine-grained MUDSTONE with some pyrite lineations and clay bands. Partially to distinctly weathered. 11.35m - 16.60m BGL: 3 fracture sets - F1: Fractures are dipping 0 - 25 degrees, very closely spaced, rough planar to smooth planar, with occasional clay banding. F2: Fractures are dipping 30 - 50 degrees, very closely to closely spaced, rough planar to smooth planar, with clay smearing. F3: Fractures are dipping 70 - 85 degrees, moderately spaced, rough undulating to rough stepped.					
12.35 12.60													
14.10 14.35	100	51	34	12			(5.25)						
15.60	100	82	52										
16.60						45.14	16.60		Complete at 16.60m				

Remarks Chiselling from 11.00m to 11.00m for 1 hour.	Scale (approx)	Logged By
	1:50	EB
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2003

Machine : Dando 2000	Casing Diameter 200mm to 9.10m	Ground Level (mOD) 61.15	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 712678.6 E 738977.3 N	Dates 13/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				60.95	(0.20) 0.20	Brown slightly gravelly TOPSOIL			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=12			2,2/2,3,4,3	60.45	(0.50) 0.70	MADE GROUND: Light brown slightly sandy gravelly Clay with red brick fragments. Gravel is subangular to subrounded fine to coarse.			
					59.95	(0.50) 1.20	MADE GROUND: Brown slightly sandy slightly gravelly Clay with some red brick and concrete fragments. Gravel is subangular to subrounded fine to coarse.			
					59.75	(0.20) 1.40	MADE GROUND: Firm to stiff brown slightly sandy gravelly Clay. Gravel is subangular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00 2.00 2.00	SPT(C) N=23 B3 EN3 T3 U1 Failed - 0%			2,3/4,5,7,7	58.85	(0.90) 2.30	Stiff brown slightly sandy slightly gravelly CLAY with rare subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
						(0.70)	Stiff grey slightly silty slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=46 B4 EN4 T4			8,7/9,11,12,14	58.15	3.00	Very stiff grey slightly silty slightly sandy gravelly CLAY with occasional angular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
4.00-4.45 4.00 4.00	SPT(C) N=50 B5 T5			9,10/10,12,14,14						
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T6			8,7/11,16,16,7						
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T7			7,12/12,16,17,5		(6.10)				
7.00-7.38 7.00 7.00	SPT(C) 48/225 B8 T8			10,14/19,22,7						
8.00-8.30 8.00 8.00	SPT(C) 50/150 B9 T9			12,20/26,24						
9.00-9.15 9.00 9.00	SPT(C) 50/0 B10 T10			18,11/50	52.05	9.10	Complete at 9.10m			

Remarks Inspection Pit carried out to 1.20m BGL. No groundwater encountered. Cable Percussion Refusal at 9.10m BGL. Borehole backfilled on completion. Chiselling from 9.10m to 9.10m for 1 hour.	Scale (approx) 1:50	Logged By EB / CE
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2004

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 10.00m 146mm cased to 20.30m	Ground Level (mOD) 50.33	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on	Location 713003.4 E 738309.6 N	Dates 22/09/2021 - 29/09/2021	Project Contractor GII	Sheet 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				50.13	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00	B2 EN2 T2				49.73	(0.40) 0.60	MADE GROUND: Light brown slightly sandy gravelly Clay with metal. Gravel is subangular to subrounded fine to coarse.			
					49.38	(0.35) 0.95	MADE GROUND: Brown slightly sandy gravelly Clay with occasional metal. Gravel is subangular to subrounded fine to coarse.			
					49.03	(0.35) 1.30	MADE GROUND: Reworked dark grey slightly sandy slightly gravelly silty Clay. Gravel is subangular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00	SPT(C) N=44 B3 T3			4,7/8,10,12,14		(2.40)	MADE GROUND: Grey brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles and red brick, wood, and plastic fragments (Firm to stiff).			
3.00-3.45 3.00 3.00	SPT(C) N=14 B4 T4			1,2/1,3,5,5						
4.00 4.00 4.00-4.40	B5 T5 U1 90% Recovery				46.63	3.70	MADE GROUND: Greyish brown slightly slightly sandy slightly gravelly Clay with occasional wood and glass fragments. Gravel is subangular to subrounded fine to coarse.			
5.00-5.45 5.00 5.00	SPT(C) N=7 B6 T6			1,2/1,2,2,2	45.33	5.00	MADE GROUND: Brownish grey slightly silty slightly sandy slightly gravelly Clay with occasional charcoal and mortar fragments (Soft). Gravel is subangular to subrounded fine to coarse.			
6.00 6.00 6.00-6.45	B7 T7 SPT(C) N=34			Water strike(1) at 5.90m, rose to 3.40m in 20 mins. 3,7/7,8,9,10	44.43	5.90	Dense brown slightly clayey slightly gravelly silty fine to medium SAND. Gravel is subangular to subrounded fine to coarse.			
7.00-7.45 7.00 7.00	SPT(C) N=24 B8 T8			3,4/4,5,7,8		(1.90)				
8.00-8.45 8.00 8.00	SPT(C) N=43 B9 T9			10,9/10,11,12,10	42.53	7.80	Very stiff grey slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
9.00-9.45 9.00 9.00	SPT(C) N=50 B10 T10			7,9/9,13,17,11		(2.20)				
10.00										

Remarks Inspection pit carried out to 1.30m BGL. Cable Percussion complete at 10.00m BGL. Rotary Core follow-on carried out to 20.30m BGL. Borehole complete at 20.30m BGL. Borehole backfilled on completion.								Scale (approx) 1:50	Logged By JS / JMD
								Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2004

Machine : Dando 2000 & Beretta T44 Flush : Polymer Core Dia : 102 mm Method : Cable Percussion with rotary core follow on	Casing Diameter 200mm cased to 10.00m 146mm cased to 20.30m	Ground Level (mOD) 50.33	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713003.4 E 738309.6 N	Dates 22/09/2021-29/09/2021	Project Contractor GII	Sheet 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.45	0				SPT(C) N=50 8,10/12,14,16,8	40.33	10.00	No Recovery. Driller notes brown fine Sand (Dense).			
11.30-11.75					6,6/7,9,11,14 SPT(C) N=41		(1.30)				
11.30						39.03	11.30	Dense brown slightly gravelly clayey fine to medium SAND. Gravel is subangular to subrounded fine to coarse.			
						38.53	11.80	Very stiff brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse.			
12.80-12.95	90				7,25/50 SPT(C) 50/0	38.13	12.20	Very dense grey slightly clayey slightly sandy fine to coarse angular to subrounded GRAVEL of Limestone with occasional cobbles.			
12.80						37.53	12.80	Very stiff brown slightly sandy gravelly CLAY with frequent cobbles. Gravel is fine to coarse angular to subrounded.			
						36.63	13.70	Very stiff brown slightly sandy slightly gravelly CLAY with rare cobbles. Gravel is subangular to subrounded fine to coarse.			
							(3.50)				
14.30-14.45	100				25,25/50 SPT(C) 50/0						
14.30											
15.80-15.95	100				13,15/50 SPT(C) 50/0						
15.80											
17.30-17.45	100	84	51	10	25,25/50 SPT(C) 50/0	33.13	17.20	Medium strong to strong thinly to thickly laminated dark grey fine to medium grained argillaceous LIMESTONE. Unweathered. Interbedded with weak to medium strong thinly laminated dark grey fine grained calcareous MUDSTONE. Unweathered to partially weathered.			
17.20								17.20m - 17.35m BGL: Non-intact zone.			
17.35								17.35m - 20.30m BGL: 2 Fracture Sets - F1: Fractures are dipping 5 - 20 degrees, very close to medium spaced, planar smooth to undulating rough with clay smearing and infilling, and rare orange oxidation staining. F2: Fractures are dipping 60 - 80 degrees, medium to widely spaced, planar smooth to undulating rough with occasional clay smearing and rare calcite veins parallel to fractures.			
18.80	100	63	19	18							

Remarks

Scale (approx)
1:50

Logged By
JS / JMD

Figure No.



Site
Luas Finglas

Borehole Number	LF-CPRC-2004
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Machine :	Dando 2000 & Beretta T44
Flush :	Polymer
Core Dia:	102 mm
Method :	Cable Percussion with rotary core follow on

Casing Diameter
200mm cased to 10.00m
146mm cased to 20.30m

Ground Level (mOD)	50.33
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Client	Transport Infrastructure Ireland
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Job Number 10892-07-21

Location	713003.4 E 738309.6 N
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Dates	22/09/2021- 29/09/2021
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Project Contractor
GII

Sheet
3/3

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Remarks

Scale (approx)

1:50

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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-2005

Machine : Dando 2000	Casing Diameter 200mm to 6.80m 146mm to 14.80m	Ground Level (mOD) 37.86	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 712928.8 E 737908.7 N	Dates 21/09/2021- 04/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				37.76	0.10	Brown slightly sandy slightly gravelly TOPSOIL.			
						(0.50)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional red brick fragments.			
1.00-1.45 1.00 1.00 1.00	SPT(C) N=7 B2 EN2 T2			3,2/2,1,2,2	37.26	0.60	MADE GROUND: Brown grey slightly sandy slightly gravelly Clay with occasional angular to subangular cobbles and mortar fragments and some red brick fragments (Soft).			
						(0.60)				
2.00-2.45 2.00 2.00	SPT(C) N=4 B3 T3			2,1/1,1,1,1	36.66	1.20	MADE GROUND: Grey brown slightly sandy slightly gravelly Clay with occasional angular to subangular cobbles and mortar, red brick, plastic, and ceramic fragments (Soft to firm).			
						(2.80)				
3.00-3.45 3.00 3.00	SPT(C) N=9 B4 T4			1,1/2,1,3,3						
4.00-4.45 4.00 4.00	SPT(C) N=32 B5 T5			6,6/4,7,11,10	33.86	4.00	POSSIBLE MADE GROUND: Greyish brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse (Very stiff).			
						(0.80)				
5.00-5.45 5.00 5.00	SPT(C) N=50 B6 T6			6,8/4,13,23,10	33.06	4.80	Very stiff brown slightly gravelly sandy CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
				Water strike(1) at 5.30m, no rise after 20 mins.		(0.70)				
6.00-6.45 6.00 6.00	SPT(C) N=44 B7 T7			6,5/4,8,20,12	32.36	5.50	Very stiff grey sandy gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
						(0.70)				
6.80 6.80 6.80				B8 T8	31.66	6.20	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
						(0.60)				
	TCR	SCR	RQD	FI	31.06	6.80	Very stiff dark grey slightly sandy gravelly CLAY with occasional cobbles and boulders fragments			
	100									
8.30-8.47 8.30				8,12/50 SPT(C) 50/20		(3.00)				
	93	0	0							
9.80					28.06	9.80	Strong fine grained thinly laminated grey			

Remarks Inspection Pit carried out to 1.20m BGL. Cable Percussion refusal at 6.80m BGL (Possible boulder or bedrock) with Rotary Core follow-on carried out to 14.8m BGL. Borehole complete at 14.8m BGL. Borehole backfilled with bentonite upon completion. Groundwater encountered at 5.30m BGL. Chiselling from 6.80m to 6.80m for 1 hour.								Scale (approx) 1:50	Logged By EB & JS
								Figure No.	



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Site
Luas Finglas

Borehole
Number
LF-CPRC-2005

Machine : Dando 2000		Casing Diameter 200mm to 6.80m 146mm to 14.80m		Ground Level (mOD) 37.86	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : Water		Location 712928.8 E 737908.7 N		Dates 21/09/2021- 04/10/2021	Project Contractor GII	Sheet 2/2
Core Dia: 98 mm						
Method : Cable Percussion						

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	100	0	0	12		26.56	(1.50)	LIMESTONE partially weathered with occasional sandy Clay bands and calcite veining 9.80 - 11.30m BGL: Fracture set 1: 0 - 25 degrees, very closely to closely spaced, rough planar to rough stepped with Clay smearing. Fracture set 2: 70 - 85 degrees, closely spaced, rough planar to rough undulose			
12.80	100	40	39	9			11.30	Very strong fine grained thinly laminated grey LIMESTONE partially weathered with some calcite veining and pyritic laminations 11.30 - 14.80m: Fracture set 1: 0 - 25 degrees, very closely to closely spaced, rough planar to rough stepped. Fracture set 2: 70 - 85 degrees, moderately spaced, rough planar to rough undulose			
14.30	100	79	67				(3.50)				
14.80	100	96	60			23.06	14.80	Complete at 14.80m			

Remarks	Scale (approx)	Logged By
	1:50	EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2006

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 1.70m 146mm cased to 9.80m	Ground Level (mOD) 25.04	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on	Location 713052.6 E 737623.6 N	Dates 27/09/2021- 08/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B1 EN1 T1				24.84	(0.20)	Brown slightly sandy slightly gravelly TOPSOIL.			
0.50						0.20	MADE GROUND: Grey/brown very clayey sandy subangular to subrounded fine to coarse Gravel.			
0.50					24.24	0.80	MADE GROUND: Brown slightly sandy gravelly Clay with red brick fragments. Gravel is subangular to subrounded fine to coarse.			
1.00	B2 EN2 T2				23.84	1.20	MADE GROUND: Grey/brown slightly silty slightly sandy gravelly Clay. Gravel is angular to subangular fine to coarse.			
1.00					23.34	1.70	MADE GROUND: brown very gravelly Clay with occasional red brick fragments. Gravel is subangular to subrounded fine to coarse.			
1.00					22.74	2.30	Weak thinly laminated dark grey fine grained MUDSTONE with many clay bands and gravel infilling of fractures. Destructured. Interbedded with weak grey LIMESTONE. Distinctly weathered.			
1.70	TCR	SCR	RQD	FI	B3					
1.70	22					(1.50)	2.30m - 3.80m BGL: 2 Fracture Sets - F1: Fractures are dipping 0 - 20 degrees, very closely spaced, planar smooth to planar rough with iron and clay smearing. F2: Fractures are dipping 70 - 85 degrees, closely spaced, undulating rough to undulating smooth with iron and clay smearing.			
2.30	100	4	0	NI		3.80	Strong thinly laminated grey fine grained LIMESTONE with clay smearing. Distinctly weathered. Interbedded with weak thinly laminated black to dark grey fine grained MUDSTONE with clay smearing. Distinctly weathered.			
3.80	93	28	8			(3.50)	3.80m - 8.30m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 30 degrees, very closely to closely spaced, planar smooth to planar rough with clay smearing. F2: Fractures are dipping 35 - 55 degrees, closely spaced, planar rough to undulating rough. F3: Fractures are dipping 70 - 85 degrees, medium spaced, planar rough.			
5.30						7.30	Very strong thinly to thickly laminated grey fine to medium grained LIMESTONE. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with a grey clay band at 9.60m BGL. Distinctly weathered.			
5.85	93	42	17			(2.50)	8.30m - 9.80m BGL: 1 Fracture Set - F1: Fractures are dipping 0 - 35 degrees, closely to medium spaced, planar rough to planar smooth with clay infilling.			
6.80	83	40	35	9		9.80	Complete at 9.80m			
8.30	93	80	71	3						
9.80										

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 1.70m BGL (Possible boulder or bedrock) with Rotary Rore follow on carried out to 9.80m BGL. No groundwater encountered. Borehole complete at 9.80m BGL. Borehole backfilled with bentonite upon completion. Chiselling from 1.70m to 1.70m for 1 hour.	Scale (approx)	Logged By
	1:50	EB / CE
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2007

Machine : Dando 2000 & Beretta T44		Casing Diameter 200mm cased to 5.00m 146mm cased to 11.30m		Ground Level (mOD) 25.34		Client Transport Infrastructure Ireland		Job Number 10892-07-21	
Method : Cable Percussion with rotary core follow on		Location 713091.4 E 737621.8 N		Dates 23/09/2021- 24/09/2021		Project Contractor GII		Sheet 1/2	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				25.14	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=7			1,2/2,2,1,2	24.14	(1.00) 1.20	MADE GROUND: Brown slightly sandy gravelly Clay with some red brick and concrete fragments. Gravel is subangular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00	SPT(C) N=11 B3 T3			2,3/2,4,3,2	23.24	(0.90) 2.10	MADE GROUND: Grey slightly sandy slightly gravelly Clay with occasional angular to subangular cobbles and plastic fragments (Soft). Gravel is subangular to subrounded fine to coarse.			
3.00-3.45 3.00 3.00	SPT(C) N=6 B4 T4			1,2/1,1,2,2		(1.70)	MADE GROUND: Reworked dark grey mottled greyish brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles (Soft to firm). Gravel is subangular to subrounded fine to coarse.			
4.00-4.45 4.00 4.00	SPT(C) N=30 B5 T5			2,4/4,7,9,10	21.54 21.24	3.80 (0.30) 4.10	MADE GROUND: Reworked dark grey mottled greyish brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles (Stiff). Gravel is subangular to subrounded fine to coarse.			
5.00 5.00-5.15 5.00 5.00 5.30	TCR 40	SCR 6	RQD 6	FI 50/50 B6 SPT(C) 50/0 T6	20.34 20.04	(0.90) 5.00 (0.30) 5.30	Very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.			
6.80	100	82	62	7	19.19	(0.85) 6.15	Medium strong thinly laminated grey fine grained LIMESTONE with incipient fractures. Partially weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE. Distinctly weathered.			
8.30	100	98	84			(3.05)	Medium strong thinly laminated grey fine grained LIMESTONE with incipient fractures. Partially weathered. 5.0m - 6.15m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 30 degrees, closely spaced, planar smooth with clay smearing. F2: Fractures are dipping 35 - 55 degrees, closely spaced, planar rough to stepped rough. F3: Fractures are dipping 70 - 85 degrees, medium spaced, stepped rough.			
9.20	96	55	52		16.14	9.20	Strong thinly to thickly laminated grey fine grained LIMESTONE with clay infilling. Partially weathered. 6.15m - 11.30m BGL: 2 Fracture Sets - F1: Fractures are dipping 0 - 25 degrees, closely to medium spaced, planar smooth to planar rough with occasional clay infilling. F2: Fractures are dipping 70 - 85 degrees, widely spaced, undulating rough to stepped rough.			
9.80							Strong thinly to thickly laminated grey fine grained LIMESTONE with pyrite lineations. Partially weathered.			

Remarks

Inspection pit carried out to 1.20m BGL.
Cable Percussion refusal at 5.00m BGL (Possible boulder or bedrock) with Rotary core follow-on carried out to 11.80m BGL.
Borehole complete at 11.80m BGL.
Standpipe installed in borehole upon completion: Borehole sealed to 10.0m BGL with bentonite. Slotted standpipe installed from 10.0m to 6.0m BGL with pea gravel surround.
Plain standpipe installed from 6.0m BGL to GL with bentonite seal and flush cover.
Chiselling from 5.00m to 5.00m for 1 hour.

Scale (approx)
1:50

Logged By
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Figure No.



Site
Luas Finglas

Borehole Number	LF-CPRC-2007
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Machine :	Dando 2000 & Beretta T44
Flush :	water
Core Dia:	102 mm
Method :	Cable Percussion with rotary core follow on

Casing Diameter
200mm cased to 5.00m
146mm cased to 11.30m

Ground Level (mOD)	25.34
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Client	Transport Infrastructure Ireland
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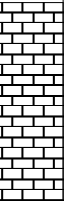

Job Number	10892-07-21
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Location	713091 4 E 737621 8 N
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Dates 23/09/2021-
24/09/2021

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GII

Sheet
2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30	100	94	78	5		14.04	(2.10)				
							11.30	Complete at 11.30m			

Remarks

Scale (approx)

1:50

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Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-2008

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter 200mm cased to 1.20m	Ground Level (mOD) 25.71	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713124.4 E 737547.8 N	Dates 28/09/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B1					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL.			
0.50	EN1				25.41	0.30	MADE GROUND: Brown slightly sandy gravelly Clay with red brick, metal and plastic. Gravel is subangular to subrounded fine to coarse. Pipe encountered at 0.40m BGL.			
0.50	T1					(0.90)				
1.00	B2				24.51	1.20	Complete at 1.20m			
1.00	EN2									
1.00	T2									

Remarks Inspection pit carried out to 1.20m BGL. No groundwater encountered. Pipe encountered at 0.40m BGL. Borehole cancelled due to pipe. Unable to relocate. Inspection pit backfilled on completion.	Scale (approx) 1:50	Logged By EB & JS
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2009

Machine : Dando 2000 & Beretta T44	Casing Diameter 200mm cased to 5.80m 146mm cased to 10.90m	Ground Level (mOD) 33.23	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion with rotary core follow on	Location 712930.8 E 737704.3 N	Dates 27/09/2021- 05/10/2021	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1					(0.25) 0.25 (0.40) 0.65	Brown slightly sandy slightly gravelly TOPSOIL. MADE GROUND: Brown very clayey sandy subangular to subrounded fine to coarse Gravel.			
1.00 1.00 1.00 1.20-1.65 1.20	B2 EN2 T2 SPT(C) N=20 U1 Failed - 0% Recovery			1,3/4,2,7,7		(0.55) 1.20 (0.80)	MADE GROUND: Brown very clayey sandy subangular to subrounded fine to coarse Gravel with some ceramic and red brick fragments. MADE GROUND: Brown mottled grey/orange slightly silty slightly sandy slightly gravelly Clay with occasional angular to subangular cobbles and rare fragments of charcoal, plastic, red brick and tile (Stiff).			
2.00-2.45 2.00 2.00 2.00	SPT(C) N=4 B3 EN3 T3			1,1/1,1,1,1		31.23 2.00 (1.80)	MADE GROUND: Brown mottled grey/orange slightly silty slightly sandy slightly gravelly Clay with occasional angular to subangular cobbles and rare fragments of charcoal, plastic, red brick and tile (Soft).			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=8 B4 EN4 T4			1,2/2,1,2,3						
4.00-4.45 4.00 4.00 4.00	SPT(C) N=26 B5 EN5 T5			2,4/6,6,7,7		29.43 3.80 (0.20) 4.00	MADE GROUND: Grey slightly sandy gravelly Clay with occasional angular to subrounded cobbles and fragments of wood, plastic, red brick, metal, glass, mortar, ash and ceramic. Gravel is angular to subrounded fine to coarse (Soft).			
5.80 5.00-5.45 5.00 5.00 5.80 5.80 5.80	SPT(C) N=23 B6 EN6 T6			T7 2,3/4,7,7,5		(1.80)	MADE GROUND: Grey slightly sandy gravelly Clay with occasional angular to subrounded cobbles and fragments of wood, plastic, red brick, metal, glass, mortar, ash and ceramic. Gravel is angular to subrounded fine to coarse (Stiff).			
	TCR SCR RQD FI			B7 EN7						
	100	44	44	16		27.43 5.80 (1.00)	Weak black to thinly laminated dark grey fine grained LIMESTONE with many clay bands. Distinctly weathered.			
6.80	100	84	50			26.43 6.80 (1.60)	Strong dark thinly laminated grey fine grained LIMESTONE. Partially weathered. Interbedded with medium strong thinly laminated black fine grained MUDSTONE with occasional clay bands and some pyrite lineations. Partially weathered. 5.90m - 8.80m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 30 degrees, very closely to closely spaced, planar smooth to planar rough with clay smearing. F2: Fractures are dipping 35 - 55 degrees, closely to medium spaced, stepped rough. F3: Fractures are dipping 70 - 85 degrees, medium spaced, undulating rough to smooth rough.			
8.30	100	55	45			24.83 8.40 (1.40)	Strong dark thinly laminated grey fine grained LIMESTONE. Partially weathered. Interbedded with medium strong thinly laminated black fine grained MUDSTONE with clay bands from 9.20m to 9.25m BGL and some pyrite lineations. Partially weathered. 8.80m - 10.90m BGL: 3 Fracture Sets - F1: Fractures are dipping 0 - 30 degrees, closely spaced, planar smooth to planar smooth with clay infilling. F2: Fractures are dipping 35 - 55			

Remarks Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 5.80m BGL with rotary core follow on carried out to 10.90m BGL. Borehole complete at 10.90m BGL. No groundwater encountered. Standpipe installed in borehole upon completion: Borehole sealed to 5.50m BGL with bentonite. Slotted standpipe installed from 5.50m to 2.0m BGL with a pea gravel surround. Plain standpipe installed from 2.0m BGL to GL with a bentonite seal and a flush cover. Chiselling from 5.80m to 5.80m for 1 hour.	Scale (approx) 1:50	Logged By JS / JMD
Figure No.		



Site
Luas Finglas

**Borehole
Number**
LF-CPRC-2009

Machine :	Dando 2000 & Beretta T44
Flush :	water
Core Dia:	102 mm
Method :	Cable Percussion with rotary core follow on

Casing Diameter
200mm cased to 5.80m
146mm cased to 10.90m

Ground Level (mOD)	33.23
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Client	Transport Infrastructure Ireland
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
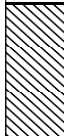

Job Number
10892-07-21

Location	712930 8 E 737704 3 N
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Dates	27/09/2021- 05/10/2021
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Project Contractor	GII
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Sheet
2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.90	95	66	41	7		23.43	9.80 (1.10)	degrees, medium spaced, undulating rough. F3: Fractures are dipping 70 - 85 degrees, medium spaced, planar rough to undulating rough.			
						22.33	10.90	Strong thinly to thickly laminated grey fine grained LIMESTONE with occasional pyrite blebs. Partially weathered. Interbedded with medium strong thinly laminated black fine grained MUDSTONE with clay smearing in fractures. Partially weathered.			
								Complete at 10.90m			

Remarks

Scale (approx)

1:50

Logged
By

JS / JMD

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-2010

Machine : Dando 2000	Casing Diameter 200mm cased to 5.40m	Ground Level (mOD) 33.66	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Method : Cable Percussion	Location 712926.4 E 737739 N	Dates 20/10/2021	Project Contractor GII	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1				33.36	(0.30) 0.30	Brown slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65 1.20	B2 EN2 T2 SPT(C) N=7 U1 Failed - 0% Recovery			1,2/1,2,2,2	32.71 32.46	0.95 (0.25) 1.20	MADE GROUND: Dark brown slightly sandy slightly gravelly Clay with occasional fragments of red brick.			
2.00-2.45 2.00 2.00 2.00 2.00	SPT(C) N=9 B3 EN3 T3 U2 Failed - 0% Recovery			2,2/2,2,2,3	31.66	2.00	MADE GROUND: Greyish brown mottled grey slightly sandy slightly gravelly Clay.			
3.00-3.45 3.00 3.00 3.00	SPT(C) N=12 B4 EN4 T4			2,3/2,3,4,3	30.66	3.00	MADE GROUND: Greyish brown mottled grey slightly sandy slightly gravelly silty Clay with occasional fragments of red brick, plastic, mortar and charcoal (Soft).			
4.00-4.45 4.00 4.00 4.00	SPT(C) N=18 B5 EN5 T5			0,7/4,7,5,2	29.66 29.46	4.00 (0.20) 4.20	MADE GROUND: Greyish brown mottled grey slightly sandy slightly gravelly silty Clay with occasional fragments of plastic, metal, fabric, glass and ceramic (Firm). Faint Hydrocarbon odour.			
5.00-5.15 5.00 5.00 5.00	SPT(C) 50/0 B6 EN6 T6			17,17/50	28.66 28.26	5.00 (0.40) 5.40	MADE GROUND: Greyish brown mottled grey slightly sandy slightly gravelly silty Clay with occasional fragments of plastic, metal, fabric, glass and ceramic (Stiff). Faint Hydrocarbon odour.			
							Stiff greyish brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular.			
							Very stiff greyish brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular.			
							Refusal at 5.40m			

Remarks Inspection Pit carried out to 1.20m BGL. No groundwater encountered. Cable Percussion Refusal at 5.40m BGL. Borehole backfilled on completion. Chiselling from 5.40m to 5.40m for 1 hour.	Scale (approx) 1:50	Logged By EB / JMD
Figure No.		



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Site
Luas Finglas

Borehole Number
LF-CPRC-2011

Machine : Beretta T44	Casing Diameter 146mm cased to 7.00m	Ground Level (mOD) 63.29	Client Transport Infrastructure Ireland	Job Number 10892-07-21
Flush : water				
Core Dia : 102 mm	Location 712788.2 E 739805.7 N	Dates 01/11/2021	Project Contractor GII	Sheet 1/1
Method : Rotary Cored				

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
2.00	42		17				(2.00)	Recovery consists of MADE GROUND: Grey brown clayey sandy angular to subrounded fine to coarse Gravel with tarmac and plastic fragments.		
2.00-2.45					19,19/19,31 SPT(C) N=50	61.29	2.00 (0.45)	Residual Rock recovered as weak to medium strong dark grey MUDSTONE with clay bands.		
	100	17		16		60.84	2.45	Medium strong thinly laminated grey fine grained partially to LIMESTONE with calcite veining. Distinctly weathered. Interbedded with weak thinly laminated black fine grained MUDSTONE with clay bands and infilling. Distinctly weathered to destructured.		
3.50										
	100	60	34							
5.00							(4.55)	2.45m - 7.0m BGL: 3 Fracture Sets - F1: Fractures are dipping from 0 - 20 degrees, very closely to closely spaced, planar rough to planar smooth with clay and oxide smearing. F2: Fractures are dipping from 30 - 50 degrees, very closely to closely spaced, undulating rough to planar rough. F3: Fractures are dipping from 70 - 85 degrees, closely to medium spaced, stepped rough to undulating rough with oxide staining.		
	100	66	55	9						
6.50										
	100	14	0							
7.00						56.29	7.00	Complete at 7.00m		

Remarks Borehole complete at 7.0m BGL Borehole backfilled on completion	Scale (approx)	Logged By
	1:50	EB & CE
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2012

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with Rotary Core follow-on	Casing Diameter 200mm cased to 14.00m 146mm cased to 20.10m	Ground Level (mOD)	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location	Dates 14/12/2021-17/12/2021	Project Contractor GII	Sheet 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50	B1 EN1					0.05 0.15	TARMACADAM.		
1.00 1.00 1.20-1.65	B2 EN2 SPT(C) N=6			1,2/1,2,2,1		(1.75)	MADE GROUND: Grey very clayey sandy Gravel fill. Gravel is subrounded to rounded fine to coarse. MADE GROUND: Grey slightly sandy slightly gravelly Clay Fill with occasional cobbles, roots, and fragments of brick and plastic. Gravel is angular to subrounded fine to coarse.		
2.00 2.00 2.00	B3 T1 U1 50% recovery					1.90 (1.10)	Firm greenish brown slightly silty sandy gravelly CLAY with some organic matter.		
3.00-3.45 3.00 3.00	SPT(C) N=11 B4 T2			1,2/2,3,3,3		3.00 (0.60)	Firm greyish purple silty sandy CLAY.		
4.00-4.45 4.00 4.00	SPT(C) N=16 B5 T3			2,2/2,3,4,7		3.60 (1.80)	Stiff light brown sandy gravelly CLAY with cobbles.		
5.00-5.45 5.00 5.00	SPT(C) N=27 B6 T4			3,4/5,7,7,8		5.40	Stiff to very stiff black slightly sandy gravelly CLAY.		
6.00-6.45 6.00 6.00	SPT(C) N=38 B7 T5			6,7/10,11,11,6					
7.00-7.38 7.00 7.00	SPT(C) 50/230 B8 T6			8,10/12,16,19,3		(3.60)			
8.00-8.37 8.00 8.00	SPT(C) 50/220 B9 T7			7,10/12,16,22					
9.00-9.45 9.00 9.00	SPT(C) N=46 B10 T8			10,10/10,12,12,12		9.00	Very stiff brown slightly sandy gravelly CLAY.		
10.00-10.40	SPT(C) 50/250			8,10/12,14,17,7		(1.70)			

Remarks Inspection Pit carried out to 1.20m BGL. Cable Percussion refusal at 14.0m BGL with Rotary Core follow-on carried out to 20.1m BGL. No groundwater encountered. Borehole complete at 20.1m BGL. Borehole backfilled on completion.	Scale (approx) 1:50	Logged By EB
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-2012

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with Rotary Core follow-on	Casing Diameter 200mm cased to 14.00m 146mm cased to 20.10m	Ground Level (mOD)	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location	Dates 14/12/2021-17/12/2021	Project Contractor GII	Sheet 2/3

Depth (m)	Sample / Tests		Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00 10.00	B11 T9									
11.00-11.34 11.00 11.00	SPT(C) 50/190 B12 T10				10,17/16,21,13		10.70	Very stiff greyish brown slightly sandy gravelly CLAY.		
12.00-12.30 12.00 12.00	SPT(C) 50/150 B13 T11				18,20/24,26		(3.30)			
13.00-13.23 13.00 13.00	SPT(C) 50/80 B14 T12				21,30/44,6					
14.00 14.00-14.04 14.00 14.00	TCR	SCR	RQD	FI	50/ B15 SPT(C) 50*/40 T13		14.00	Very stiff brown slightly sandy very gravelly CLAY with fragments of cobbles and boulders.		
	100						(1.50)			
15.60	100	51	25				15.50	Very strong thinly to thickly laminated grey fine-grained LIMESTONE with occasional clay smearing. Partially weathered. Interbedded with a weak thinly laminated black fine-grained MUDSTONE with some pyrite laminations, clay banding, and fault breccia. Partial to distinctly weathered. 15.5m - 20.1m BGL: 3 Fracture sets - F1: Fractures are dipping 0 - 25 degrees, closely spaced, smooth planar to rough planar with clay smearing. F2: Fractures are dipping 30 - 50 degrees, closely space, rough planar to rough stepped with iron and clay smearing. F3: Fractures are dipping 70 - 85 degrees, moderately to widely spaced, rough stepped.		
17.10	100	63	33	8			(4.60)			
18.60	100	44	7							

Remarks Chiselling from 14.00m to 14.00m for 1 hour.	Scale (approx)	Logged By
	1:50	EB
	Figure No.	



Site
Luas Finglas

Borehole Number	LF-CPRC-2012
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Machine : Dando 2000 & Beretta T44
Flush : Water
Core Dia: 102 mm
Method : Cable Percussion with Rotary Core follow-on

Casing Diameter
200mm cased to 14.00m
146mm cased to 20.10m

Ground Level (mOD)	
Dates	14/12/2021- 17/12/2021

Client	Transport Infrastructure Ireland
Project Contractor	GII

Job Number	10892-07-21
Sheet	3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
20.10							20.10			
							Complete at 20.10m			

Remarks

Scale (approx)	Logged By
1:50	EB

Figure No.



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Site
Luas Finglas

Borehole Number
LF-CPRC-3001

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with Rotary Core follow on	Casing Diameter 200mm cased to 1.80m 146mm cased to 18.80m	Ground Level (mOD) 36.22	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713820 E 736918.2 N	Dates 14/12/2021-06/01/2022	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50 1.00 1.00 1.00 1.20-1.22	B1 EN1 T1 0 B2 EN2 T2 SPT(C) 50*/20			50/	36.02	(0.20) 0.20	CONCRETE			
1.80	TCR 0	SCR	RQD	FI	34.42	1.80	NO RECOVERY: Drillers notes Brown gravelly CLAY (Firm)			
2.30-2.75 2.30	0			1,2/2,2,3,3 SPT(C) N=10		(2.00)				
3.80-4.25 3.80	0			2,2/3,3,3,4 SPT(C) N=13	32.42	3.80	Firm to stiff brown slightly sandy gravelly CLAY with occasional cobbles and boulders fragments			
5.30-5.60 5.30	100			10,12/14,36 SPT(C) 50/150	31.82	4.40	Very stiff dark grey slightly sandy gravelly CLAY with occasional cobbles and boulders fragments			
6.80-6.95 6.80	100			18,7/50 SPT(C) 50/0		(7.00)				
8.30-8.45 8.30	100			16,9/50 SPT(C) 50/0						
9.80-10.10 9.80	100			14,11/25,25 SPT(C) 50/150						

Remarks No groundwater encountered. Inspection pit carried out to 1.20m BGL. Cable Percussion refusal at 1.80m BGL: Possible boulder or bedrock. No recovery from 1.80m BGL to 3.80m BGL Rotary core completion at 18.80m BGL Standpipe installed in borehole upon completion: Borehole sealed to 6.00m BGL with bentonite. Slotted standpipe installed from 6.00m - 3.00m BGL with a pea gravel surround. Plain standpipe installed from 3.00m BGL to GL with a bentonite seal and a flush cover.	Scale (approx) 1:50	Logged By EB
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-3001

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 98 mm Method : Cable Percussion with Rotary Core follow on	Casing Diameter 200mm cased to 1.80m 146mm cased to 18.80m	Ground Level (mOD) 36.22	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713820 E 736918.2 N	Dates 14/12/2021-06/01/2022	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.30-11.45 11.30	100				22.3/50 SPT(C) 50/0						
12.80-12.88 12.80	100				50/ SPT(C) 50*/75	24.82	11.40	Very stiff brown slightly sandy gravelly CLAY with some cobbles and boulders fragments			
							(1.90)				
14.15 14.30	100	0	0			22.92	13.30	Residually weathered fine grained very thinly laminated black MUDSTONE			
							(0.85)				
15.80	100	39	20	10		22.07	14.15	Very strong fine grained thinly laminated grey LIMESTONE partially weathered with calcite veining interbedded with a weak fine grained thinly laminated black MUDSTONE distinctly weathered			
							(2.20)	Fracture set 1: 0 - 25 degrees, very closely to closely spaced, rough planar to rough undulose with Clay smearing. Fracture set 2: 30 - 55 degrees, very closely to closely spaced, smooth planar to rough planar with occasional Clay bands. Fracture set 3: 70 - 85 degrees, closely spaced, smooth planar to rough stepped			
17.30	100	25	25			19.87	16.35	Medium strong fine grained thinly laminated black MUDSTONE partially weathered with occasional gravelly bands			
							(0.95)				
18.80	100	24	24	13		18.92	17.30	Very strong fine grained thinly laminated grey LIMESTONE partially weathered with many calcite veins interbedded with a Medium strong fine grained thinly laminated black MUDSTONE partially weathered with occasional Clay smearing			
							(1.50)	Fracture set 1: 0 - 25 degrees, closely spaced, rough planar. Fracture set 2: 70 - 85 degrees, very closely to closely spaced, rough planar to smooth planar.			
						17.42	18.80	Complete at 18.80m			

Remarks	Scale (approx)	Logged By
	1:50	EB
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-3002

Machine : Dando 2000 & Beretta T44 Method : Cable Percussion with Rotary Core follow on	Casing Diameter 200mm cased to 9.00m 146mm cased to 16.30m	Ground Level (mOD) 34.73	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713766 E 736930.6 N	Dates 14/12/2021-06/01/2022	Project Contractor GII	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50 0.50	B1 EN1 T1					(0.40) 0.40	Dark brown slightly sandy slightly gravelly TOPSOIL.			
1.00 1.00 1.00 1.20-1.65	B2 EN2 T2 SPT(C) N=10			1,1/2,2,3,3		(0.80) 33.53 1.20	MADE GROUND: Grey/brown slightly sandy slightly gravelly Clay with some red brick and mortar fragments. Gravel is angular to subrounded fine to coarse.			
2.00-2.45 2.00 2.00	SPT(C) N=24 B3 T3			5,3/3,6,7,8		(1.20) 32.33 2.40	Stiff brown mottled grey slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded			
3.00-3.45 3.00 3.00	SPT(C) N=26 B4 T4			2,3/4,5,7,10			Stiff to very stiff dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded			
4.00-4.45 4.00 4.00	SPT(C) N=33 B5 T5			2,2/6,7,9,11		(3.60)				
5.00-5.45 5.00 5.00	SPT(C) N=42 B6 T6			5,7/8,10,12,12						
6.00-6.45 6.00 6.00	SPT(C) N=50 B7 T7			6,16/11,11,13,15	28.73	6.00	Stiff to very stiff dark grey slightly sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse subangular to subrounded			
7.00-7.43 7.00 7.00	SPT(C) 50/275 B8 T8			7,8/12,14,14,10		(3.00)				
8.00-8.30 8.00 8.00	SPT(C) 50/145 B9 T9			9,8/14,20,16						
9.00 9.00-9.16 9.00 9.00	TCR SCR RQD FI			11,27/50 B10 SPT(C) 50/5 T10	25.73	9.00	Very stiff brown slightly sandy gravelly CLAY with occasional cobbles and boulders fragments			
9.80-9.95 9.80	100			25/50 SPT(C) 50/0						

Remarks Inspection Pit carried out to 1.20m BGL. Cable Percussion refusal at 9.00m BGL (Possible boulder or bedrock) with Rotary Core follow-on carried out to 16.3m BGL. No groundwater encountered. Borehole complete at 16.3m BGL. Borehole backfilled with bentonite on completion. Chiselling from 8.30m to 8.30m for 1 hour.	Scale (approx) 1:50	Logged By EB
	Figure No.	



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Site
Luas Finglas

Borehole Number
LF-CPRC-3002

Machine : Dando 2000 & Beretta T44 Flush : Water Core Dia : 98 mm Method : Cable Percussion with Rotary Core follow on	Casing Diameter 200mm cased to 9.00m 146mm cased to 16.30m	Ground Level (mOD) 34.73	Client Transport Infrastructure Ireland	Job Number 10892-07-21
	Location 713766 E 736930.6 N	Dates 14/12/2021-06/01/2022	Project Contractor GII	Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.00	100	13					(2.00)				
11.30			13			23.73	11.00	Very weak fine grained thinly laminated black MUDSTONE destructured with interbedded Limestone			
	100	5	0				(1.80)	Fracture set 1: 0 - 25 degrees, very closely spaced, rough planar to rough stepped. Fracture set 2: 30 - 50 degrees, very closely spaced, rough stepped to rough planar with smearing. Fracture set 3: 70 - 85 degrees, medium spaced, smooth planar to smooth undulose Fracture set 4: 70 - 85 degrees, closely to medium spaced, rough planar to rough undulose with Clay smearing			
12.80				18		21.93	12.80	Weak to medium strong fine grained thinly laminated black MUDSTONE distinctly weathered interbedded with a Strong fine grained thinly laminated grey LIMESTONE partially weathered with calcite veining and pyritic laminations			
14.30	100	3	0				(3.50)	Fracture set 1: 0 - 20 degrees, closely spaced, rough planar with occasional gouge. Fracture set 2: 70 - 85 degrees, closely to moderately spaced, smooth planar, Fracture set 3: 30 - 50 degrees, closely spaced, rough planar with occasional smearing and gouge			
14.95	100	11	0								
15.80				8							
	100	72	72								
16.30						18.43	16.30	Complete at 16.30m			

Remarks	Scale (approx)	Logged By
	1:50	EB
Figure No.		

Luas Finglas Rotary Core Photographs



LF-CPRC-1001



LF-CPRC-1003



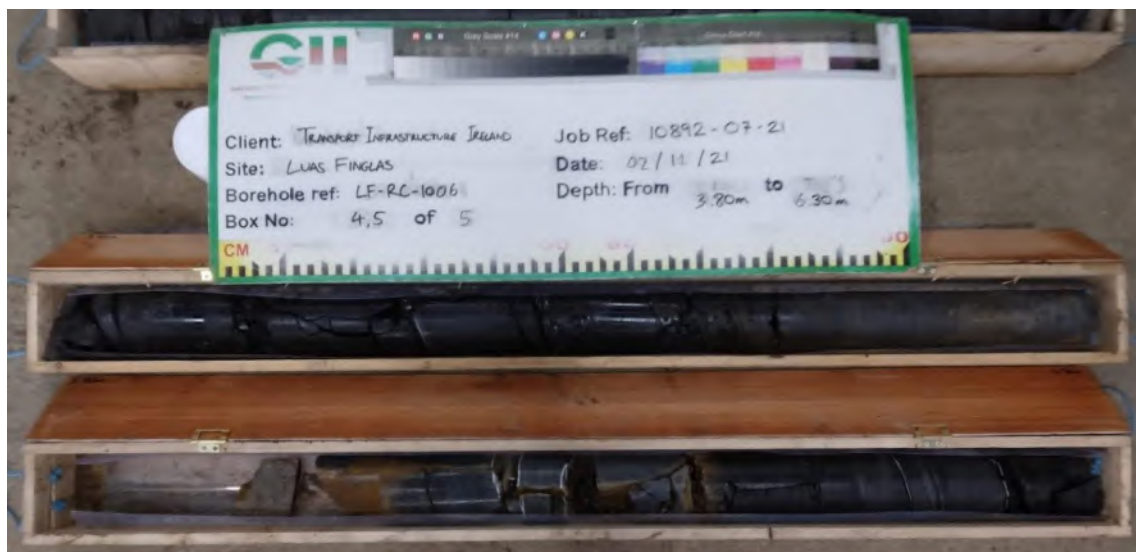
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LF-CPRC-1005



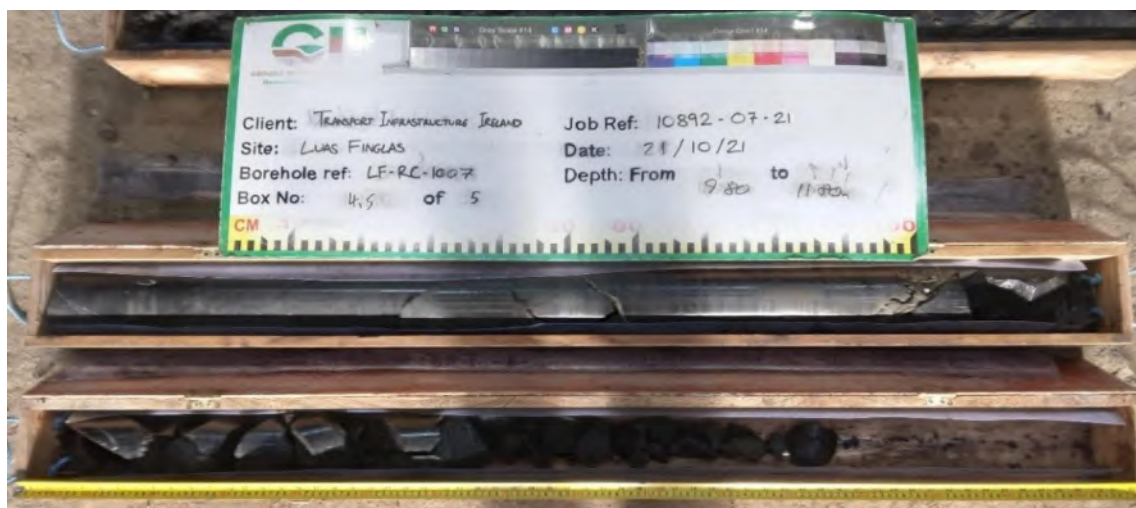
LF-CPRC-1006



LF-CPRC-1006



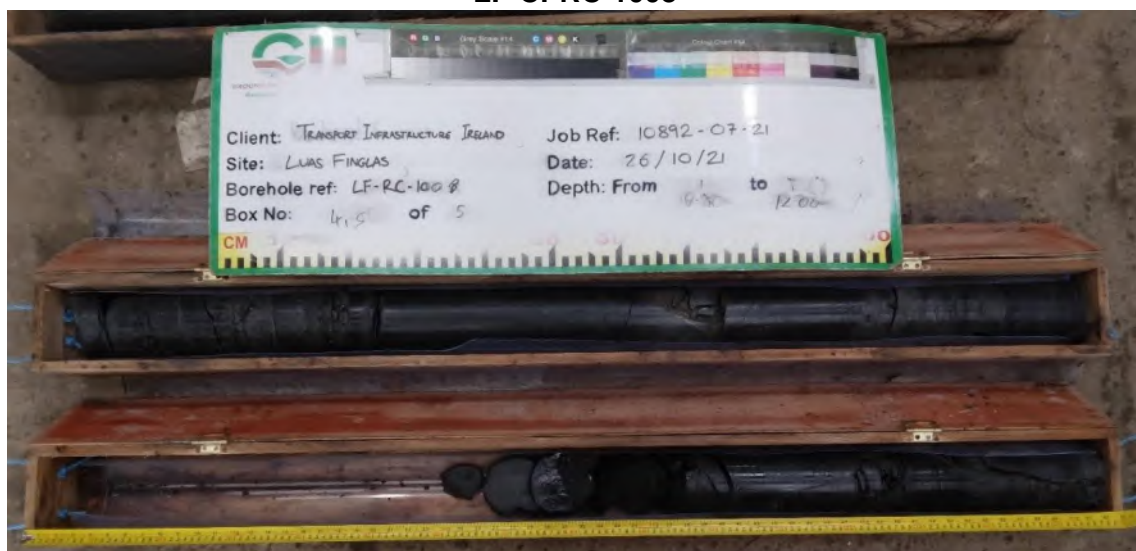
LF-CPRC-1007



LF-CPRC-1007



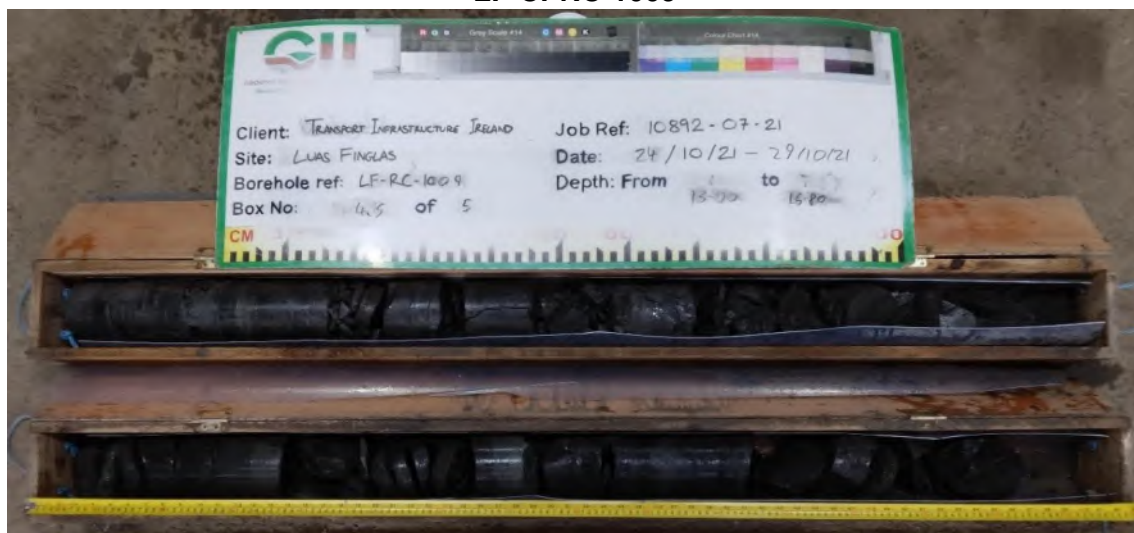
LF-CPRC-1008



LF-CPRC-1008



LF-CPRC-1009



LF-CPRC-1009



LF-CPRC-1010



LF-CPRC-1010



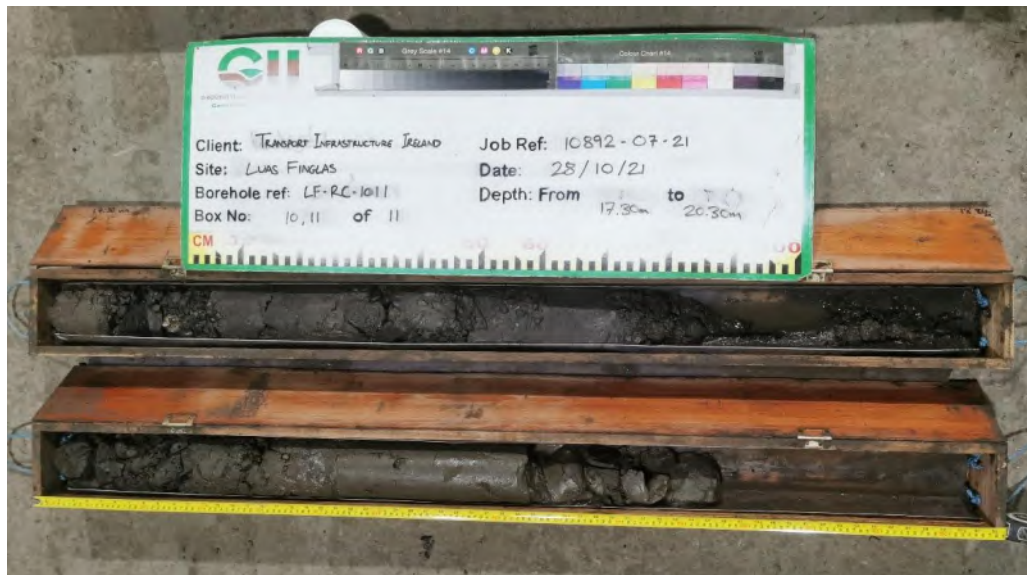
LF-CPRC-1011



LF-CPRC-1011



LF-RC-1011



LF-RC-1011



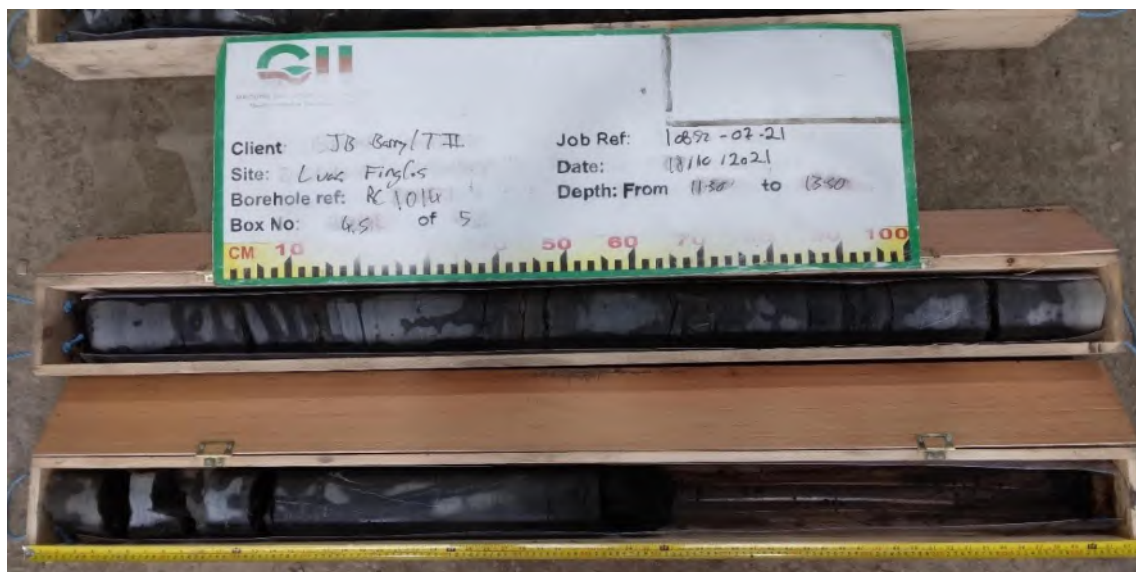
LF-CPRC-1012



LF-CPRC-1012



LF-CPRC-1014



LF-CPRC-1014



LF-CPRC-1015



LF-CPRC-1015



LF-CPRC-1016



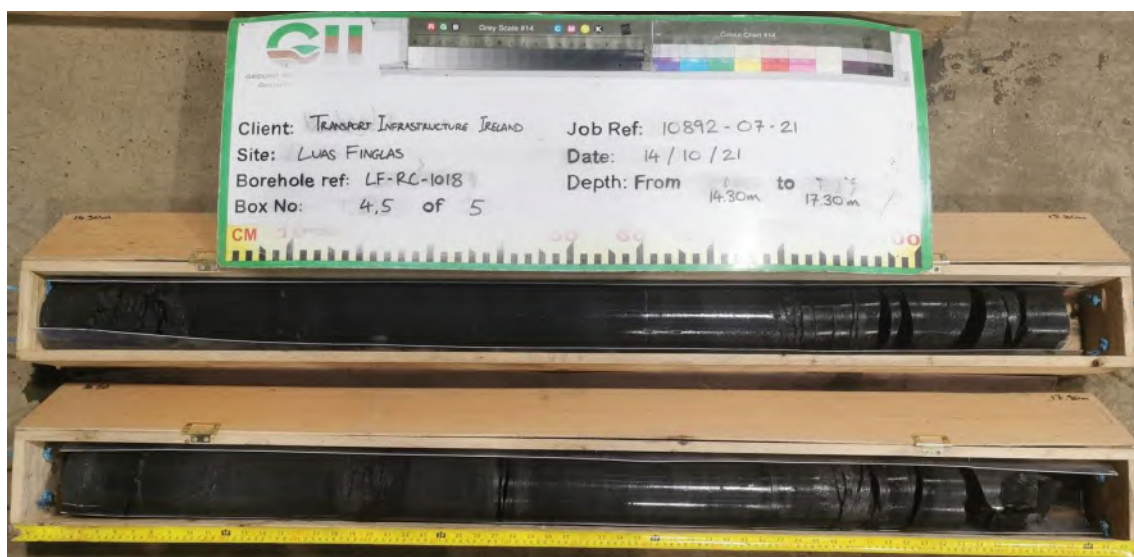
LF-CPRC-1016



LF-CPRC-1017



LF-RC-1018



LF-RC-1018



LF-RC-1019



LF-RC-1019



LF-RC-1019



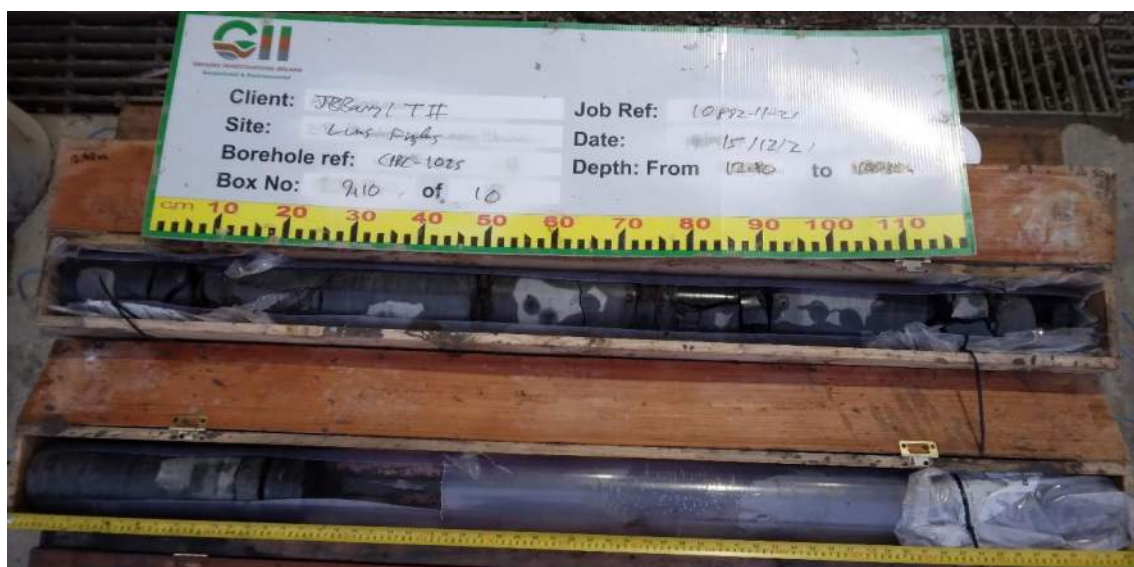
LF-CPRC-1020



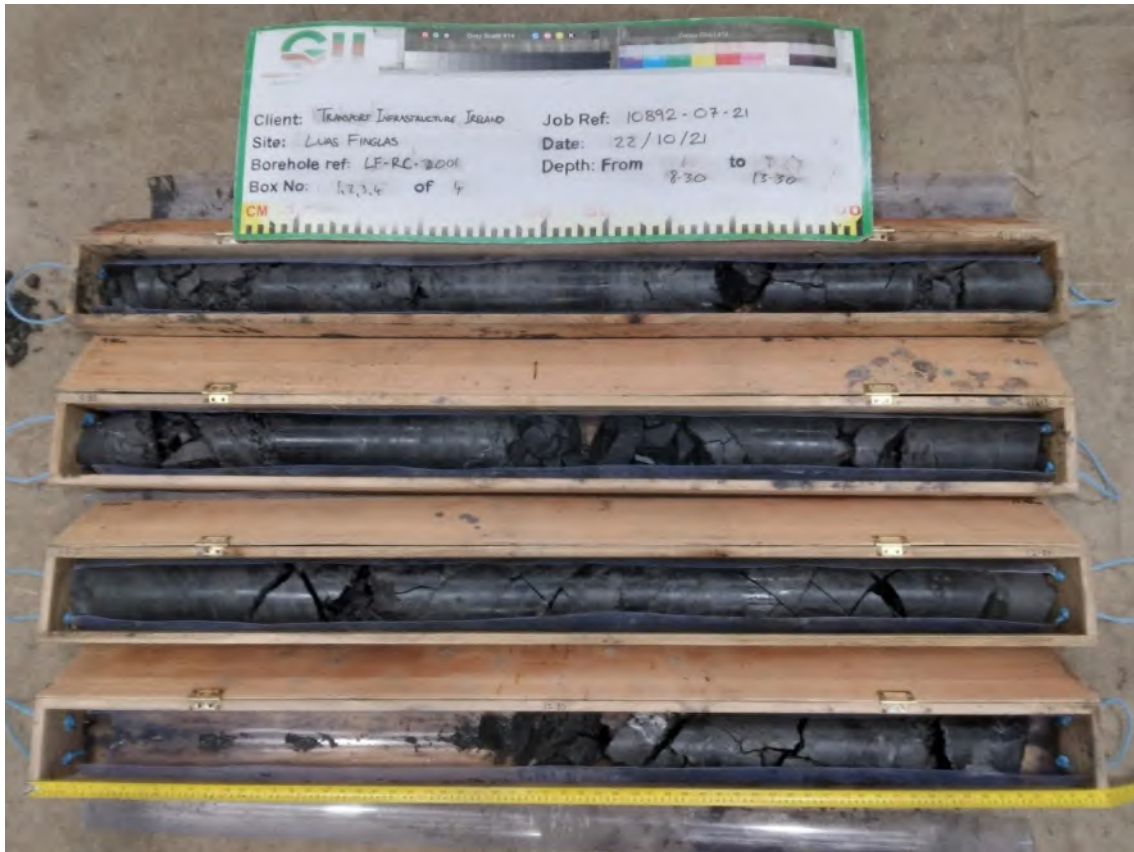
LF-CPRC-1020



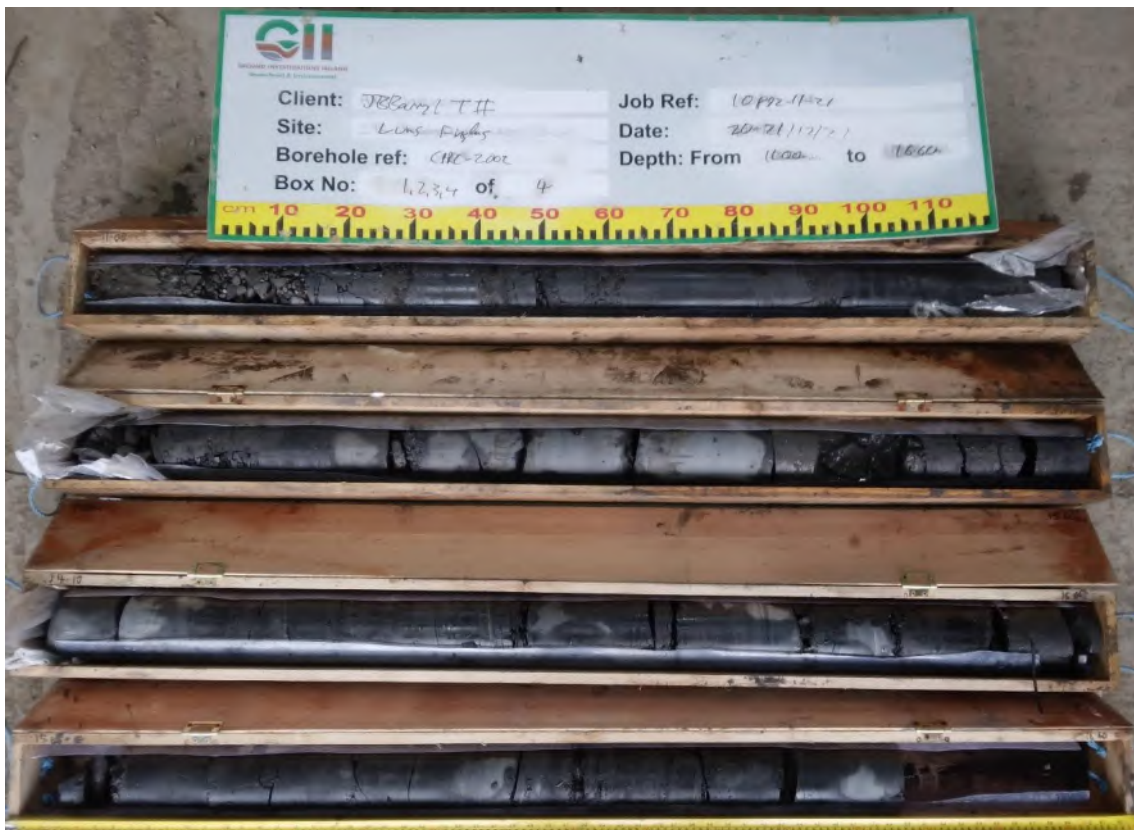
LF-CPRC-1020



LF-CPRC-1025 (9, 10 of 10)



LF-CPRC-2001



LF-CPRC-2002



LF-CPRC-2004



LF-CPRC-2004



LF-CPRC-2006



LF-CPRC-2006



LF-CPRC-2007



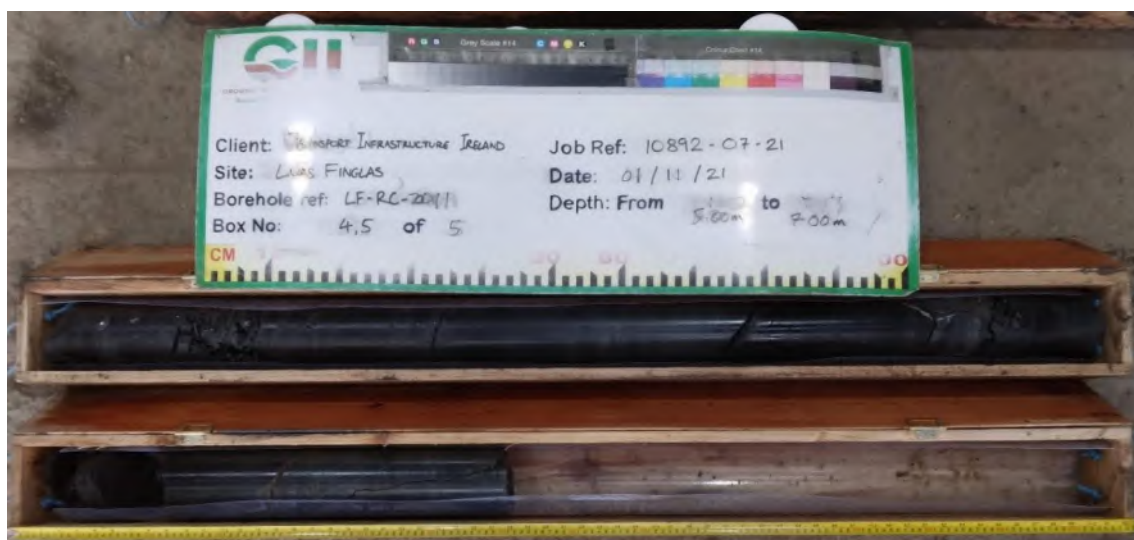
LF-CPRC-2007



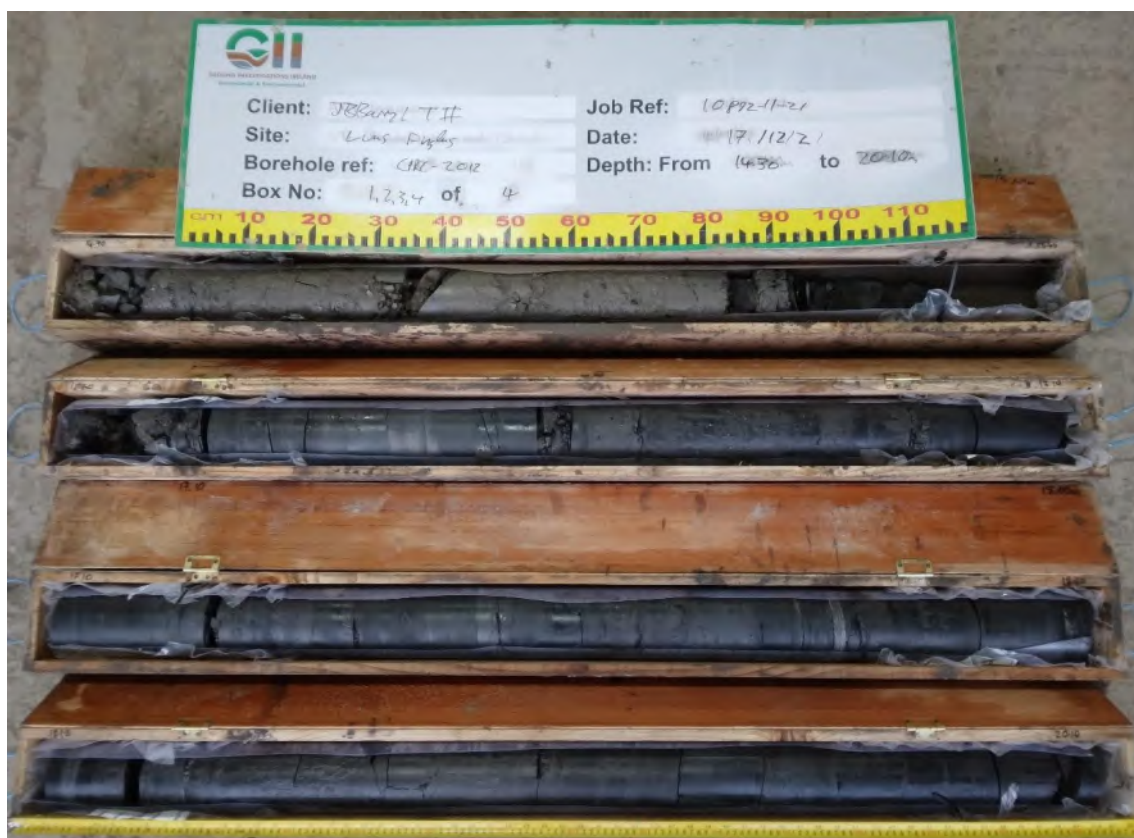
LF-CPRC-2009



LF-CPRC-2011



LF-CPRC-2011



LF-CPRC-2012

Appendix C – Soil Analysis Laboratory Certificates

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Conor Finnerty
Date : 6th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/14841 Batch 1
Location : Luas Finglas - TII
Date samples received : 23rd September, 2021
Status : Final Report
Issue : 1

Six samples were received for analysis on 23rd September, 2021 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/14841

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	16-18						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005								
Depth	0.50	1.00	2.00	3.00	5.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021								
Arsenic #	14.4	15.3	-	14.5	9.3						<0.5	mg/kg	TM30/PM15
Beryllium	0.9	1.2	-	1.2	0.8						<0.5	mg/kg	TM30/PM15
Cadmium #	1.0	1.6	-	1.9	1.6						<0.1	mg/kg	TM30/PM15
Chromium #	28.8	34.1	-	36.4	25.0						<0.5	mg/kg	TM30/PM15
Copper #	32	57	-	79	21						<1	mg/kg	TM30/PM15
Lead #	23	69	-	104	21						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Nickel #	63.2	55.2	-	41.8	32.3						<0.7	mg/kg	TM30/PM15
Selenium #	2	3	-	1	1						<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.4	1.2	-	2.6	0.4						<0.1	mg/kg	TM74/PM32
Zinc #	92	189	-	192	81						<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	0.06	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.06	0.07	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	0.06	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.30	0.83	0.34	<0.03						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.12	0.23	0.10	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	0.68	1.56	0.93	<0.03						<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.62	1.32	0.84	<0.03						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.44	0.79	0.56	<0.06						<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.47	0.85	0.63	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	0.84	1.44	1.08	<0.07						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.50	0.82	0.61	<0.04						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	0.29	0.54	0.40	<0.04						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.06	0.11	0.08	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.31	0.51	0.41	<0.04						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	0.06	0.09	0.08	<0.04						<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	4.75	9.28	6.06	<0.64						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.60	1.04	0.78	<0.05						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.24	0.40	0.30	<0.02						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	105	93	99	94						<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2	-	-	-						<2	ug/kg	TM15/PM10
Benzene #	-	<3	-	-	-						<3	ug/kg	TM15/PM10
Toluene #	-	3	-	-	-						<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3	-	-	-						<3	ug/kg	TM15/PM10
m/p-Xylene #	-	<5	-	-	-						<5	ug/kg	TM15/PM10
o-Xylene #	-	<3	-	-	-						<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	91	-	-	-						<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	77	-	-	-						<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	<30	-	-						<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/14841

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	16-18						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005								
Depth	0.50	1.00	2.00	3.00	5.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021						LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	-	<0.1	0.2						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	-	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	25	-	28	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	-	28	<26						<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	-	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	-	14	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	50	-	96	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	50	-	110	<26						<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	-	138	<52						<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	-	<5 ^{SV}	<5	<5						<5	ug/kg	TM36/PM12
Benzene #	<5	-	<5 ^{SV}	<5	<5						<5	ug/kg	TM36/PM12
Toluene #	<5	-	<5 ^{SV}	<5	<5						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	<5 ^{SV}	<5	<5						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	<5 ^{SV}	<5	<5						<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	<5 ^{SV}	<5	<5						<5	ug/kg	TM36/PM12
PCB 28 #	-	-	<5	-	-						<5	ug/kg	TM17/PM8
PCB 52 #	-	-	<5	-	-						<5	ug/kg	TM17/PM8
PCB 101 #	-	-	<5	-	-						<5	ug/kg	TM17/PM8
PCB 118 #	-	-	<5	-	-						<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5	-	-						<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5	-	-						<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5	-	-						<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	<35	-	-						<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	-	<0.01	<0.01						<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	6.5	15.4	22.0	20.2	11.2						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-	<0.3	<0.3						<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - T11
Contact: Conor Finnerty
EMT Job No: 21/14841

Report: Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	16-18						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005	LF-CPRC-2005								
Depth	0.50	1.00	2.00	3.00	5.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021						LOD/LOR	Units	Method No.
Sulphate as SO ₄ (2:1 Ext) #	0.0062	0.0847	-	0.0895	0.0097						<0.0015	g/l	TM38/PM20
Chromium III	28.8	34.1	-	36.4	25.0						<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	-	<0.5	<0.5						<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	-	-	5.94	-	-						<0.02	%	TM21/PM24
Organic Matter	0.9	3.3	-	4.6	0.4						<0.2	%	TM21/PM24
Acid Reserve	NDP	NDP	-	NDP	NDP						<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	NDP	-	NDP	NDP						<0.000	gNaOH/100g	TM160/PM110
ANC at pH4	-	-	0.06	-	-						<0.03	mol/kg	TM77/PM0
ANC at pH7	-	-	NDP	-	-						<0.03	mol/kg	TM77/PM0
Loss on Ignition #	-	-	9.7	-	-						<1.0	%	TM22/PM0
pH #	8.65	8.24	7.78	7.86	8.64						<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/14841

SVOC Report : Solid

EMT Sample No.	4-6										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2005												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	21/09/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	23/09/2021												
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10 ⁺										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10										<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
2-Nitroaniline	<10										<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
3-Nitroaniline	<10										<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10										<10	ug/kg	TM16/PM8
4-Chloroaniline	<10										<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10										<10	ug/kg	TM16/PM8
4-Nitroaniline	<10										<10	ug/kg	TM16/PM8
Azobenzene	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10										<10	ug/kg	TM16/PM8
Carbazole	<10										<10	ug/kg	TM16/PM8
Dibenzofuran #	<10										<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10										<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10										<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10										<10	ug/kg	TM16/PM8
Hexachloroethane	<10										<10	ug/kg	TM16/PM8
Isophorone #	<10										<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10										<10	ug/kg	TM16/PM8
Nitrobenzene #	<10										<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	103										<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	103										<0	%	TM16/PM8

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/14841

VOC Report : Solid

EMT Sample No.	4-6												
Sample ID	LF-CPRC-2005												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	21/09/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	23/09/2021												
											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7										<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	22										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
m/p-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	91										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	77										<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.0					
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	90.1					
Particle Size <4mm =	>95%							
EMT Job No	21/14841		Landfill Waste Acceptance Criteria Limits					
Sample No	9							
Client Sample No	LF-CPRC-2005							
Depth/Other	2.00							
Sample Date	21/09/2021							
Batch No	1							
Solid Waste Analysis			Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill			
Total Organic Carbon (%)	5.94					3	5	6
Loss on Ignition (%)	9.7					-	-	10
Sum of BTEX (mg/kg)	<0.025					6	-	-
Sum of 7 PCBs (mg/kg)	<0.035					1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30					500	-	-
PAH Sum of 17(mg/kg)	9.28					100	-	-
pH (pH Units)	7.78					-	>6	-
ANC to pH 7 (mol/kg)	NDP					-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.06					-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached			Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg				
	C ₁₀	A ₁₀						
	mg/l	mg/kg						
Arsenic	<0.0025	<0.025	0.5	2	25			
Barium	0.060	0.60	20	100	300			
Cadmium	<0.0005	<0.005	0.04	1	5			
Chromium	<0.0015	<0.015	0.5	10	70			
Copper	<0.007	<0.07	2	50	100			
Mercury	<0.001	<0.01	0.01	0.2	2			
Molybdenum	0.018	0.18	0.5	10	30			
Nickel	0.003	0.03	0.4	10	40			
Lead	<0.005	<0.05	0.5	10	50			
Antimony	0.006	0.06	0.06	0.7	5			
Selenium	<0.003	<0.03	0.1	0.5	7			
Zinc	<0.003	<0.03	4	50	200			
Chloride	1.0	10	800	15000	25000			
Fluoride	0.4	4	10	150	500			
Sulphate as SO4	16.7	167	1000	20000	50000			
Total Dissolved Solids	151	1510	4000	60000	100000			
Phenol	<0.01	<0.1	1	-	-			
Dissolved Organic Carbon	5	50	500	800	1000			

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

10 of 18

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/14841

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/14841

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/14841

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 21/14841

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes

EMT Job No: 21/14841

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Conor Finnerty
Date : 6th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/14972 Batch 1
Location : Luas Finglas-TII
Date samples received : 24th September, 2021
Status : Final Report
Issue : 1

Sixteen samples were received for analysis on 24th September, 2021 of which thirteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/14972

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	24-26	27-29	30-32	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1013	LF-CPRC-1013	LF-CPRC-2004	LF-CPRC-2004	LF-WS-1014	LF-WS-1014	LF-WS-1016	LF-TP-2006	LF-TP-2006	LF-TP-2006			
Depth	0.50	1.00	0.50	1.00	0.50	1.00	0.50	0.50	1.00	2.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021			
Arsenic #	9.0	10.7	11.5	-	10.8	8.8	7.3	11.9	-	11.6	<0.5	mg/kg	TM30/PM15
Beryllium	0.9	1.0	1.8	-	0.9	0.9	0.6	1.0	-	0.8	<0.5	mg/kg	TM30/PM15
Cadmium #	1.4	1.5	1.2	-	1.2	1.9	1.5	1.6	-	1.8	<0.1	mg/kg	TM30/PM15
Chromium #	29.1	40.0	42.7	-	28.7	40.6	26.2	43.3	-	30.3	<0.5	mg/kg	TM30/PM15
Copper #	25	41	27	-	21	24	19	28	-	31	<1	mg/kg	TM30/PM15
Lead #	23	46	21	-	18	17	11	29	-	30	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	35.8	31.7	57.2	-	33.3	33.2	27.2	49.9	-	42.0	<0.7	mg/kg	TM30/PM15
Selenium #	1	1	2	-	2	1	1	2	-	2	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.7	1.5	0.8	-	0.7	0.7	0.5	0.8	-	0.8	<0.1	mg/kg	TM74/PM32
Zinc #	89	94	122	-	68	70	68	112	-	89	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.17	0.08	<0.03	-	0.04	0.32	<0.03	<0.03	0.39	0.08	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	-	<0.04	0.08	<0.04	<0.04	0.09	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.22	0.14	<0.03	-	0.04	0.36	<0.03	0.03	0.61	0.18	<0.03	mg/kg	TM4/PM8
Pyrene #	0.19	0.12	<0.03	-	0.03	0.30	<0.03	0.03	0.57	0.15	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.17	0.14	<0.06	-	<0.06	0.19	<0.06	<0.06	0.35	0.13	<0.06	mg/kg	TM4/PM8
Chrysene #	0.14	0.10	<0.02	-	0.03	0.21	<0.02	0.02	0.41	0.11	<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.18	0.18	<0.07	-	<0.07	0.28	<0.07	<0.07	0.62	0.16	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.10	0.11	<0.04	-	<0.04	0.14	<0.04	<0.04	0.35	0.09	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.06	0.05	<0.04	-	<0.04	0.09	<0.04	<0.04	0.20	0.06	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.06	0.07	<0.04	-	<0.04	0.09	<0.04	<0.04	0.23	0.06	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 17 Total	1.29	0.99	<0.64	-	<0.64	2.06	<0.64	<0.64	3.87	1.02	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.13	0.13	<0.05	-	<0.05	0.20	<0.05	<0.05	0.45	0.12	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.05	0.05	<0.02	-	<0.02	0.08	<0.02	<0.02	0.17	0.04	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	86	93	-	90	91	91	97	92	95	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-	-	-	-	-	<2	-	-	<2	ug/kg	TM15/PM10
Benzene #	-	-	-	-	-	-	-	<3	-	-	<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	-	-	-	<3	-	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	-	-	-	<3	-	-	<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-	-	-	-	-	<5	-	-	<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	-	-	-	<3	-	-	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	-	-	-	98	-	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	-	-	-	90	-	-	<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	-	-	-	-	-	-	<30	-	<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/14972

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	24-26	27-29	30-32	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1013	LF-CPRC-1013	LF-CPRC-2004	LF-CPRC-2004	LF-WS-1014	LF-WS-1014	LF-WS-1016	LF-TP-2006	LF-TP-2006	LF-TP-2006			
Depth	0.50	1.00	0.50	1.00	0.50	1.00	0.50	0.50	1.00	2.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021	LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	-	<0.1 ^{sv}	<0.1	<0.1	<0.1 ^{sv}	-	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	-	<0.1 ^{sv}	<0.1	<0.1	<0.1 ^{sv}	-	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL) #	<0.1	<0.1	<0.1	-	<0.1 ^{sv}	<0.1	<0.1	<0.1 ^{sv}	-	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	-	<4	<4	<4	<4	-	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	-	<7	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7	-	<7	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	<7	-	<7	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	<26	-	<26	<26	<26	<26	-	<26	<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	-	<0.1 ^{sv}	<0.1	<0.1	<0.1 ^{sv}	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	-	<0.1 ^{sv}	<0.1	<0.1	<0.1 ^{sv}	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	-	<0.1 ^{sv}	<0.1	<0.1	<0.1 ^{sv}	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	-	<4	<4	<4	<4	-	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	-	<7	11	<7	<7	-	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	<7	-	<7	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	<7	-	<7	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	<26	-	<26	<26	<26	<26	-	<26	<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	<52	<52	<52	-	<52	<52	<52	<52	-	<52	<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5	-	<5 ^{sv}	<5	<5	-	<5	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	-	<5 ^{sv}	<5	<5	-	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	-	<5 ^{sv}	<5	<5	-	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	-	<5 ^{sv}	<5	<5	-	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	-	<5 ^{sv}	<5	<5	-	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	-	<5 ^{sv}	<5	<5	-	<5	<5	<5	ug/kg	TM36/PM12
PCB 28 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	-	-	-	-	-	-	<35	-	<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	14.2	37.3	14.0	-	11.0	11.2	6.0	10.2	9.6	14.1	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/14972

Report : Solid

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

EMT Sample No.	33-35	36-38	45-47								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2006	LF-WS-1015	LF-WS-1017										
Depth	3.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	22/09/2021	22/09/2021	22/09/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	24/09/2021	24/09/2021	24/09/2021										
Arsenic #	18.0	7.8	8.1								<0.5	mg/kg	TM30/PM15
Beryllium	0.9	0.6	0.6								<0.5	mg/kg	TM30/PM15
Cadmium #	1.8	1.6	1.4								<0.1	mg/kg	TM30/PM15
Chromium #	30.9	31.8	26.3								<0.5	mg/kg	TM30/PM15
Copper #	33	21	23								<1	mg/kg	TM30/PM15
Lead #	28	17	26								<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel #	42.8	31.7	27.7								<0.7	mg/kg	TM30/PM15
Selenium #	2	1	<1								<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.7	0.5	0.6								<0.1	mg/kg	TM74/PM32
Zinc #	101	81	77								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	0.27								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	0.07								<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	0.40								<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	0.36								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	0.23								<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	0.24								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	0.41								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	0.23								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	0.14								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	0.15								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	2.50								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	0.30								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	0.11								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	96	98	98								<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-								<2	ug/kg	TM15/PM10
Benzene #	-	-	-								<3	ug/kg	TM15/PM10
Toluene #	-	-	-								<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-								<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-								<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-								<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-								<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	-								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

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Contact: Conor Finnerty
EMT Job No: 21/14972

Report : Solid

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

EMT Sample No.	33-35	36-38	45-47								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2006	LF-WS-1015	LF-WS-1017										
Depth	3.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	22/09/2021	22/09/2021	22/09/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	24/09/2021	24/09/2021	24/09/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM12
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM12
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM12
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM12
>C35-C40 (EH_1D_AL)	<7	<7	<7								<7	mg/kg	TM5/PM8/PM12
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	<26								<26	mg/kg	TM5/PM8/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM12
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM12
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	22								<7	mg/kg	TM5/PM8/PM12
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	109								<7	mg/kg	TM5/PM8/PM12
>EC35-EC40 (EH_1D_AR)	<7	<7	9								<7	mg/kg	TM5/PM8/PM12
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	140								<26	mg/kg	TM5/PM8/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	140								<52	mg/kg	TM5/PM8/PM12/PM10
MTBE #	<5	<5	<5								<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5								<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5								<5	ug/kg	TM36/PM12
PCB 28 #	-	-	-								<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-								<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-								<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-								<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-								<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-								<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-								<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	-								<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	<0.01								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	12.9	7.2	13.7								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20

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

Please see attached notes for all abbreviations and acronyms

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-Til
Contact: Conor Finnerty
EMT Job No: 21/14972

SVOC Report : Solid

EMT Sample No.	24-26										Please see attached notes for all abbreviations and acronyms				
Sample ID	LF-TP-2006														
Depth	0.50														
COC No / misc															
Containers	V J T														
Sample Date	22/09/2021														
Sample Type	Soil														
Batch Number	1														
Date of Receipt	24/09/2021											LOD/LOR	Units	Method No.	
SVOC MS															
Phenols															
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8		
2-Methylphenol	<10										<10	ug/kg	TM16/PM8		
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8		
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8		
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8		
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8		
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8		
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8		
4-Methylphenol	<10										<10	ug/kg	TM16/PM8		
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8		
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8		
Phenol #	<10										<10	ug/kg	TM16/PM8		
PAHs															
2-Chloronaphthalene #	<10 ⁺										<10	ug/kg	TM16/PM8		
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8		
Phthalates															
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8		
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8		
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8		
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8		
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8		
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8		
Other SVOCs															
1,2-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8		
1,2,4-Trichlorobenzene #	<10										<10	ug/kg	TM16/PM8		
1,3-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8		
1,4-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8		
2-Nitroaniline	<10										<10	ug/kg	TM16/PM8		
2,4-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8		
2,6-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8		
3-Nitroaniline	<10										<10	ug/kg	TM16/PM8		
4-Bromophenylphenylether #	<10										<10	ug/kg	TM16/PM8		
4-Chloroaniline	<10										<10	ug/kg	TM16/PM8		
4-Chlorophenylphenylether	<10										<10	ug/kg	TM16/PM8		
4-Nitroaniline	<10										<10	ug/kg	TM16/PM8		
Azobenzene	<10										<10	ug/kg	TM16/PM8		
Bis(2-chloroethoxy)methane	<10										<10	ug/kg	TM16/PM8		
Bis(2-chloroethyl)ether	<10										<10	ug/kg	TM16/PM8		
Carbazole	<10										<10	ug/kg	TM16/PM8		
Dibenzofuran #	<10										<10	ug/kg	TM16/PM8		
Hexachlorobenzene	<10										<10	ug/kg	TM16/PM8		
Hexachlorobutadiene #	<10										<10	ug/kg	TM16/PM8		
Hexachlorocyclopentadiene	<10										<10	ug/kg	TM16/PM8		
Hexachloroethane	<10										<10	ug/kg	TM16/PM8		
Isophorone #	<10										<10	ug/kg	TM16/PM8		
N-nitrosodi-n-propylamine #	<10										<10	ug/kg	TM16/PM8		
Nitrobenzene #	<10										<10	ug/kg	TM16/PM8		
Surrogate Recovery 2-Fluorobiphenyl	113										<0	%	TM16/PM8		
Surrogate Recovery p-Terphenyl-d14	106										<0	%	TM16/PM8		

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/14972

VOC Report : Solid

EMT Sample No.	24-26												
Sample ID	LF-TP-2006												
Depth	0.50												
COC No / misc													
Containers	V J T												
Sample Date	22/09/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	24/09/2021												
											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7										<7	ug/kg	TM15/PM10
trans-1,2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1,2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1,3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1,3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
m/p-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	98										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	90										<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	5.0
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	95.3
Particle Size <4mm =	>95%		
EMT Job No	21/14972	Landfill Waste Acceptance Criteria Limits	
Sample No	29		
Client Sample No	LF-TP-2006		
Depth/Other	1.00		
Sample Date	22/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.30	3	5
Loss on Ignition (%)	3.7	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	3.87	100	-
pH (pH Units)	8.34	-	>6
ANC to pH 7 (mol/kg)	0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.16	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.012	0.12	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.013	0.13	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.7	7	800
Fluoride	0.4	4	10
Sulphate as SO ₄	20.0	200	1000
Total Dissolved Solids	93	931	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/14972	1	LF-CPRC-1013	0.50	3	29/09/2021	General Description (Bulk Analysis)	soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-CPRC-1013	1.00	6	29/09/2021	General Description (Bulk Analysis)	soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-CPRC-2004	0.50	9	29/09/2021	General Description (Bulk Analysis)	soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-WS-1014	0.50	15	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-WS-1014	1.00	18	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-WS-1016	0.50	21	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-TP-2006	0.50	26	29/09/2021	General Description (Bulk Analysis)	soil/stones
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/14972	1	LF-TP-2006	0.50	26	29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-TP-2006	2.00	32	29/09/2021	General Description (Bulk Analysis)	soil/stones
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-TP-2006	3.00	35	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-WS-1015	0.50	38	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/14972	1	LF-WS-1017	1.00	47	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD

Matrix : Solid

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Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas-TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/14972

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/14972

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/14972

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 21/14972

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes

EMT Job No: 21/14972

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Conor Finnerty
Date : 6th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15093 Batch 1
Location : Lugas Finglas TII
Date samples received : 27th September, 2021
Status : Final Report
Issue : 1

Fifteen samples were received for analysis on 27th September, 2021 of which thirteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

Report : Solid

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

EMT Sample No.	1-3	4-5	6-8	9-11	12-14	15,17,20	16,18-19	21,23,25	22,24,41	26-28	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-CPRC-2007	LF-TP-2007	LF-TP-2007	LF-CPRC-2007	LF-TP-2007			
Depth	0.50	1.00	2.00	3.00	4.00	0.50	0.50	1.00	1.00	2.00			
COC No / misc													
Containers	V J T	J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021			
Arsenic #	10.8	13.6	-	16.4	-	15.0	7.9	-	14.3	12.6	<0.5	mg/kg	TM30/PM15
Beryllium	0.7	0.9	-	1.4	-	1.2	0.8	-	1.1	1.0	<0.5	mg/kg	TM30/PM15
Cadmium #	1.6	1.9	-	2.2	-	2.6	1.4	-	2.3	1.5	<0.1	mg/kg	TM30/PM15
Chromium #	18.1	25.5	-	33.5	-	37.5	22.3	-	29.0	35.2	<0.5	mg/kg	TM30/PM15
Copper #	27	29	-	52	-	56	20	-	46	55	<1	mg/kg	TM30/PM15
Lead #	27	39	-	122	-	77	14	-	61	178	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	-	0.3	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	35.1	49.6	-	47.2	-	51.4	35.7	-	43.9	36.5	<0.7	mg/kg	TM30/PM15
Selenium #	2	3	-	2	-	2	2	-	2	2	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	0.4	-	2.5	-	1.7	0.4	-	1.2	0.8	<0.1	mg/kg	TM74/PM32
Zinc #	89	102	-	157	-	141	74	-	117	192	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	0.09	<0.04	0.64	<0.04	<0.04	0.07	0.07	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	0.17	<0.03	<0.03	<0.03	0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	0.14	<0.05	1.86	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	0.13	<0.04	1.55	<0.04	<0.04	<0.04	0.05	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	1.33	<0.03	11.53	<0.03	0.07	0.27	0.53	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	0.21	<0.04	1.79	<0.04	<0.04	0.07	0.14	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.04	<0.03	<0.03	1.48	<0.03	9.14	<0.03	0.11	0.44	0.89	<0.03	mg/kg	TM4/PM8
Pyrene #	0.04	<0.03	<0.03	1.33	<0.03	8.04	<0.03	0.09	0.42	0.87	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	0.80	<0.06	3.55	<0.06	0.08	0.31	0.53	<0.06	mg/kg	TM4/PM8
Chrysene #	0.03	<0.02	<0.02	0.91	<0.02	4.30	<0.02	0.07	0.32	0.62	<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	<0.07	<0.07	1.31	<0.07	6.30	<0.07	0.13	0.55	1.18	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	0.75	<0.04	3.52	<0.04	0.06	0.31	0.69	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	0.45	<0.04	1.92	<0.04	0.05	0.22	0.48	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	0.10	<0.04	0.42	<0.04	<0.04	0.05	0.10	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	0.50	<0.04	2.15	<0.04	0.05	0.21	0.49	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	0.08	<0.04	0.27	<0.04	<0.04	<0.04	0.09	<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	9.61	<0.64	57.15	<0.64	0.71	3.24	6.76	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	0.94	<0.05	4.54	<0.05	0.09	0.40	0.85	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	0.37	<0.02	1.76	<0.02	0.04	0.15	0.33	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	95	95	95	99	98	99	93	97	95	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2	-	-	-	-	<2	-	-	-	<2	ug/kg	TM15/PM10
Benzene #	-	<3	-	-	-	-	<3	-	-	-	<3	ug/kg	TM15/PM10
Toluene #	-	<3	-	-	-	-	<3	-	-	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3	-	-	-	-	<3	-	-	-	<3	ug/kg	TM15/PM10
m/p-Xylene #	-	<5	-	-	-	-	<5	-	-	-	<5	ug/kg	TM15/PM10
o-Xylene #	-	<3	-	-	-	-	<3	-	-	-	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	99	-	-	-	-	108	-	-	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	90	-	-	-	-	103	-	-	-	<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	<30	-	<30	-	-	<30	-	-	<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

Report : Solid

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

EMT Sample No.	1-3	4-5	6-8	9-11	12-14	15,17,20	16,18-19	21,23,25	22,24,41	26-28	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-CPRC-2007	LF-TP-2007	LF-TP-2007	LF-CPRC-2007	LF-TP-2007			
Depth	0.50	1.00	2.00	3.00	4.00	0.50	0.50	1.00	1.00	2.00			
COC No / misc													
Containers	V J T	J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1 ^{sv}	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1 ^{sv}	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1 ^{sv}	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	-	<4	-	<4	<4	-	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	-	<7	-	<7	<7	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	-	<7	-	<7	<7	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	-	<7	-	<7	<7	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	-	<26	-	<26	<26	-	<26	<26	<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1 ^{sv}	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1 ^{sv}	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	<0.1 ^{sv}	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	-	<4	-	<4	<4	-	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	-	20	-	11	<7	-	<7	14	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	-	75	-	<7	<7	-	<7	70	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	-	<7	-	<7	<7	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	-	95	-	<26	<26	-	<26	84	<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	-	95	-	<52	<52	-	<52	84	<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	-	<5	<5	<5	<5	-	<5	<5	<5 ^{sv}	<5	ug/kg	TM36/PM12
Benzene #	<5	-	<5	<5	<5	<5	-	<5	<5	<5 ^{sv}	<5	ug/kg	TM36/PM12
Toluene #	<5	-	<5	<5	<5	<5	-	<5	<5	<5 ^{sv}	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	<5	<5	<5	<5	-	<5	<5	<5 ^{sv}	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	<5	<5	<5	<5	-	<5	<5	<5 ^{sv}	<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	<5	<5	<5	<5	-	<5	<5	<5 ^{sv}	<5	ug/kg	TM36/PM12
PCB 28 #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8
PCB 52 #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8
PCB 101 #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8
PCB 118 #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	<35	-	<35	-	-	<35	-	-	<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	-	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	8.2	13.4	19.1	31.2	14.4	14.3	8.3	13.9	14.0	14.7	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-	<0.3	-	<0.3	<0.3	-	<0.3	<0.3	<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

Report : Solid

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

EMT Sample No.	1-3	4-5	6-8	9-11	12-14	15,17,20	16,18-19	21,23,25	22,24,41	26-28	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-TP-2008	LF-CPRC-2007	LF-TP-2007	LF-TP-2007	LF-CPRC-2007	LF-TP-2007			
Depth	0.50	1.00	2.00	3.00	4.00	0.50	0.50	1.00	1.00	2.00			
COC No / misc													
Containers	V J T	J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021	23/09/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021			
Sulphate as SO4 (2:1 Ext) #	0.0093	0.0264	-	0.0559	-	<0.0015	0.0045	-	<0.0015	0.0728	<0.0015	g/l	TM38/PM20
Chromium III	18.1	25.5	-	33.5	-	37.5	22.3	-	29.0	35.2	<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	-	-	0.62	-	0.42	-	-	0.68	-	-	<0.02	%	TM21/PM24
Organic Matter	2.1	0.9	-	5.1	-	4.8	0.8	-	4.2	3.2	<0.2	%	TM21/PM24
Acid Reserve	NDP	NDP	-	NDP	-	NDP	NDP	-	NDP	NDP	<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	NDP	-	NDP	-	NDP	NDP	-	NDP	NDP	<0.000	gNaOH/100g	TM160/PM110
ANC at pH4	-	-	0.06	-	0.07	-	-	0.15	-	-	<0.03	mol/kg	TM77/PM0
ANC at pH7	-	-	<0.03	-	NDP	-	-	NDP	-	-	<0.03	mol/kg	TM77/PM0
Loss on Ignition #	-	-	3.7	-	1.8	-	-	3.5	-	-	<1.0	%	TM22/PM0
pH #	8.43	8.51	7.32	7.79	8.13	8.23	7.96	8.27	8.14	8.19	<0.01	pH units	TM73/PM11

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

Report : Solid

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

EMT Sample No.	29-31	32-34	38-40										
Sample ID	LF-TP-2007	LF-TP-2007	LF-CPRC-1016										
Depth	3.00	4.00	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	23/09/2021	23/09/2021	23/09/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	27/09/2021	27/09/2021	27/09/2021										
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Arsenic #	-	12.8	11.1								<0.5	mg/kg	TM30/PM15
Beryllium	-	1.1	0.9								<0.5	mg/kg	TM30/PM15
Cadmium #	-	2.1	1.6								<0.1	mg/kg	TM30/PM15
Chromium #	-	38.0	32.9								<0.5	mg/kg	TM30/PM15
Copper #	-	38	44								<1	mg/kg	TM30/PM15
Lead #	-	60	47								<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel #	-	41.0	40.6								<0.7	mg/kg	TM30/PM15
Selenium #	-	2	2								<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	2.3	1.4								<0.1	mg/kg	TM74/PM32
Zinc #	-	112	120								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.18	0.08	0.14								<0.03	mg/kg	TM4/PM8
Anthracene #	0.05	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.30	0.08	0.19								<0.03	mg/kg	TM4/PM8
Pyrene #	0.29	0.08	0.16								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.21	0.08	0.16								<0.06	mg/kg	TM4/PM8
Chrysene #	0.17	0.06	0.12								<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.36	0.11	0.20								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.20	0.06	0.10								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.13	<0.04	0.07								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.15	<0.04	0.07								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 17 Total	2.04	<0.64	1.21								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.26	0.08	0.14								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.10	0.03	0.06								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	93	93	97								<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-								<2	ug/kg	TM15/PM10
Benzene #	-	-	-								<3	ug/kg	TM15/PM10
Toluene #	-	-	-								<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-								<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-								<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-								<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-								<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	81	-	-								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

Report : Solid

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

EMT Sample No.	29-31	32-34	38-40								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2007	LF-TP-2007	LF-CPRC-1016										
Depth	3.00	4.00	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	23/09/2021	23/09/2021	23/09/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	27/09/2021	27/09/2021	27/09/2021										
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26	<26								<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26	<26								<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	<52	<52								<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
Benzene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
Toluene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	-								<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	-								<35	ug/kg	TM17/PM8
Phenol #	-	<0.01	<0.01								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	19.1	25.2	12.8								<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	<0.3								<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

Report : Solid

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

EMT Sample No.	29-31	32-34	38-40
Sample ID	LF-TP-2007	LF-TP-2007	LF-CPRC- 1016
Depth	3.00	4.00	1.00
COC No / misc			
Containers	V J T	V J T	V J T
Sample Date	23/09/2021	23/09/2021	23/09/2021
Sample Type	Soil	Soil	Soil
Batch Number	1	1	1
Date of Receipt	27/09/2021	27/09/2021	27/09/2021
Please see attached notes for all abbreviations and acronyms			
	LOD/LOR	Units	Method No.
Sulphate as SO4 (2:1 Ext) #	<0.0015	g/l	TM38/PM20
Chromium III	<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	<0.02	%	TM21/PM24
Organic Matter	<0.2	%	TM21/PM24
Acid Reserve	<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	<0.000	gNaOH/100g	TM160/PM110
ANC at pH4	<0.03	mol/kg	TM77/PM0
ANC at pH7	<0.03	mol/kg	TM77/PM0
Loss on Ignition #	<1.0	%	TM22/PM0
pH #	<0.01	pH units	TM73/PM11

Client Name:	Ground Investigations Ireland	Report :	EN12457_2
Reference:	10892-07-21		
Location:	Lugas Finglas TII	Solids:	V=60g VOC:jar, J=250g glass jar, T=plastic tub
Contact:	Conor Finnerty		
EMT Job No:	21/15093		

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

SVOC Report : Solid

EMT Sample No.	4-5	16,18-19										
Sample ID	LF-TP-2008	LF-TP-2007										
Depth	1.00	0.50										
COC No / misc												
Containers	J T	V J T										
Sample Date	23/09/2021	23/09/2021										
Sample Type	Soil	Soil										
Batch Number	1	1										
Date of Receipt	27/09/2021	27/09/2021										
										LOD/LOR	Units	Method No.
SVOC MS												
Phenols												
2-Chlorophenol #	<10	<10								<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10								<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10								<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10								<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10								<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10								<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10								<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10								<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10								<10	ug/kg	TM16/PM8
Phenol #	<10	<10								<10	ug/kg	TM16/PM8
PAHs												
2-Chloronaphthalene #	<10	<10								<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10	<10								<10	ug/kg	TM16/PM8
Phthalates												
Bis(2-ethylhexyl) phthalate	<100	<100								<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100	<100								<100	ug/kg	TM16/PM8
Other SVOCs												
1,2-Dichlorobenzene	<10	<10								<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10	<10								<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10								<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10								<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10								<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10								<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10								<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10	<10								<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10								<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10								<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10								<10	ug/kg	TM16/PM8
Azobenzene	<10	<10								<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10								<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10								<10	ug/kg	TM16/PM8
Carbazole	<10	<10								<10	ug/kg	TM16/PM8
Dibenzofuran #	<10	<10								<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10								<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10	<10								<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10								<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10								<10	ug/kg	TM16/PM8
Isophorone #	<10	<10								<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10	<10								<10	ug/kg	TM16/PM8
Nitrobenzene #	<10	<10								<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	106	110								<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	97	97								<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

VOC Report : Solid

EMT Sample No.	4-5	16,18-19										
Sample ID	LF-TP-2008	LF-TP-2007										
Depth	1.00	0.50										
COC No / misc												
Containers	J T	V J T										
Sample Date	23/09/2021	23/09/2021										
Sample Type	Soil	Soil										
Batch Number	1	1										
Date of Receipt	27/09/2021	27/09/2021										
	LOD/LOR	Units	Method No.									
VOC MS												
Dichlorodifluoromethane	<2	<2								<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2								<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3								<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2								<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1								<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2								<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2								<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6								<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7	<7								<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3								<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3								<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3								<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4								<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3								<3	ug/kg	TM15/PM10
Chloroform #	<3	<3								<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3								<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3								<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4								<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4								<4	ug/kg	TM15/PM10
Benzene #	<3	<3								<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3								<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6								<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3								<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3								<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4								<4	ug/kg	TM15/PM10
Toluene #	<3	<3								<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3								<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3								<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3								<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3								<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3								<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3								<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3								<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3								<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3								<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5								<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3								<3	ug/kg	TM15/PM10
Styrene	<3	<3								<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3								<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3								<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3								<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2								<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4								<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4								<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3								<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3								<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3								<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5								<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6								<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4								<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4								<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4								<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4								<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4								<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4								<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4								<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7	<7								<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4								<4	ug/kg	TM15/PM10
Naphthalene	<27	<27								<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7	<7								<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	99	108								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	90	103								<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty
EMT Job No: 21/15093

VOC Report : Solid (Duplicate results)

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	17.5
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	85.1
Particle Size <4mm =	>95%		
EMT Job No	21/15093	Landfill Waste Acceptance Criteria Limits	
Sample No	8		
Client Sample No	LF-TP-2008		
Depth/Other	2.00		
Sample Date	23/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.62	3	5
Loss on Ignition (%)	3.7	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	7.32	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.06	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.039	0.39	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.006	0.06	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.003	0.03	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.6	6	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	8.5	85	1000
Total Dissolved Solids	117	1170	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	26.3		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	79.2		
Particle Size <4mm =	>95%				
EMT Job No	21/15093		Landfill Waste Acceptance Criteria Limits		
Sample No	14				
Client Sample No	LF-TP-2008		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	4.00				
Sample Date	23/09/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	0.42					3	5	6
Loss on Ignition (%)	1.8		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30		500	-	-
PAH Sum of 17(mg/kg)	<0.64		100	-	-
pH (pH Units)	8.13		-	>6	-
ANC to pH 7 (mol/kg)	NDP		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.07		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
	mg/l	mg/kg	mg/kg		
	Arsenic	<0.0025	<0.025	0.5	2	25
Barium	0.057	0.57	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.014	0.14	0.5	10	30
Nickel	0.004	0.04	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	0.004	0.04	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	1.0	10	800	15000	25000
Fluoride	0.3	<3	10	150	500
Sulphate as SO4	1.0	10	1000	20000	50000
Total Dissolved Solids	122	1220	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	5	50	500	800	1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	15.1
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.9
Particle Size <4mm =	>95%		
EMT Job No	21/15093	Landfill Waste Acceptance Criteria Limits	
Sample No	25		
Client Sample No	LF-TP-2007		
Depth/Other	1.00		
Sample Date	23/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.68	3	5
Loss on Ignition (%)	3.5	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	0.71	100	-
pH (pH Units)	8.27	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.15	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.004	0.04	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.006	0.06	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	0.4	4	10
Sulphate as SO ₄	21.4	214	1000
Total Dissolved Solids	86	860	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	<2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	17.5
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	85.1
Particle Size <4mm =	>95%		
EMT Job No	21/15093	Landfill Waste Acceptance Criteria Limits	
Sample No	31		
Client Sample No	LF-TP-2007		
Depth/Other	3.00		
Sample Date	23/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.68	3	5
Loss on Ignition (%)	3.8	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	81	500	-
PAH Sum of 17(mg/kg)	2.04	100	-
pH (pH Units)	8.06	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.15	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.027	0.27	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.012	0.12	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.012	0.12	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.6	6	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	21.3	213	1000
Total Dissolved Solids	110	1100	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	<2	<20	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/15093	1	LF-TP-2008	0.50	3	29/09/2021	General Description (Bulk Analysis)	soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-TP-2008	1.00	5	29/09/2021	General Description (Bulk Analysis)	soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-TP-2008	3.00	11	29/09/2021	General Description (Bulk Analysis)	soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-TP-2007	0.50	19	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-CPRC-2007	0.50	20	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-TP-2007	2.00	28	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-TP-2007	4.00	34	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Lugas Finglas TII
Contact: Conor Finnerty

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/15093	1	LF-TP-2007	4.00	34	29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-CPRC-1016	1.00	40	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD
21/15093	1	LF-CPRC-2007	1.00	41	29/09/2021	General Description (Bulk Analysis)	Soil
					29/09/2021	Asbestos Fibres	NAD
					29/09/2021	Asbestos ACM	NAD
					29/09/2021	Asbestos Type	NAD
					29/09/2021	Asbestos Level Screen	NAD

Matrix : Solid

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Matrix : Solid

Reference: 10892-07-21

Location: Lugas Finglas TII

Contact: Conor Finnerty

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15093

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15093

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/15093

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 21/15093

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes

EMT Job No: 21/15093

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 15th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15221 Batch 1
Location : Luas Finglas-TII
Date samples received : 29th September, 2021
Status : Final Report
Issue : 1

Thirteen samples were received for analysis on 29th September, 2021 of which thirteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15221

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2010	LF-TP-2010	LF-TP-2010	LF-TP-2010	LF-TP-2010	LF-TP-2011	LF-TP-2011	LF-TP-2011	LF-TP-2011	LF-TP-2011			
Depth	0.50	1.00	2.00	3.00	4.00	0.50	1.00	2.00	3.00	0.50			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021			
Antimony	-	<1	-	3	-	2	-	-	2	2	<1	mg/kg	TM30/PM15
Arsenic #	12.6	8.5	-	15.0	9.8	10.7	-	11.0	12.5	12.1	<0.5	mg/kg	TM30/PM15
Barium #	-	68	-	117	-	112	-	-	94	73	<1	mg/kg	TM30/PM15
Beryllium	1.0	0.7	-	0.9	0.9	1.0	-	0.8	1.0	1.1	<0.5	mg/kg	TM30/PM15
Cadmium #	2.4	0.9	-	1.6	1.5	2.0	-	1.4	1.5	1.1	<0.1	mg/kg	TM30/PM15
Chromium #	40.2	31.2	-	34.0	29.9	55.5	-	24.4	45.8	23.6	<0.5	mg/kg	TM30/PM15
Copper	27	22	-	36	37	44	-	28	34	54	<1	mg/kg	TM30/PM15
Lead #	29	16	-	59	63	139	-	26	42	113	<5	mg/kg	TM30/PM15
Mercury #	<0.1	0.2	-	0.1	0.3	<0.1	-	0.3	<0.1	0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	-	1.6	-	6.3	-	3.2	-	-	3.9	2.4	<0.1	mg/kg	TM30/PM15
Nickel #	46.0	30.2	-	32.1	34.1	45.2	-	39.3	45.5	33.3	<0.7	mg/kg	TM30/PM15
Selenium #	1	<1	-	2	<1	1	-	1	1	<1	<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.0	0.4	-	2.6	2.9	1.0	-	0.9	1.4	1.2	<0.1	mg/kg	TM74/PM32
Zinc #	85	55	-	118	120	115	-	76	105	96	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	-	0.35	0.13	<0.04	-	<0.04	<0.04	0.06	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	-	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	-	0.65	0.16	<0.05	-	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	-	0.65	0.18	<0.04	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.09	0.06	-	3.25	1.09	0.26	-	0.05	0.16	0.25	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	-	0.60	0.25	0.06	-	<0.04	<0.04	0.05	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.17	0.10	-	2.54	1.18	0.42	-	0.07	0.18	0.37	<0.03	mg/kg	TM4/PM8
Pyrene #	0.16	0.09	-	2.17	1.03	0.39	-	0.06	0.17	0.36	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.18	0.10	-	1.10	0.56	0.24	-	<0.06	0.10	0.23	<0.06	mg/kg	TM4/PM8
Chrysene #	0.16	0.08	-	1.29	0.59	0.27	-	<0.02	0.12	0.28	<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.27	0.12	-	2.01	1.04	0.49	-	<0.07	0.16	0.53	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.16	0.08	-	1.18	0.59	0.26	-	<0.04	0.10	0.29	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.09	0.04	-	0.64	0.33	0.17	-	<0.04	0.05	0.18	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	-	0.17	0.08	<0.04	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.11	0.04	-	0.72	0.38	0.20	-	<0.04	0.07	0.21	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	-	0.11	0.08	<0.04	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 17 Total	1.39	0.71	-	17.43	7.67	2.76	-	<0.64	1.11	2.81	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.19	0.09	-	1.45	0.75	0.35	-	<0.05	0.12	0.38	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.08	0.03	-	0.56	0.29	0.14	-	<0.02	0.04	0.15	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	<1	-	<1	-	<1	-	-	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	121	117	-	119	120	116	-	108	124	118	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-	-	<2	-	-	-	-	-	<2	ug/kg	TM15/PM10
Benzene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	5	-	-	-	-	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-	-	9	-	-	-	-	-	<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15221

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2010	LF-TP-2010	LF-TP-2010	LF-TP-2010	LF-TP-2010	LF-TP-2011	LF-TP-2011	LF-TP-2011	LF-TP-2011	LF-TP-2011			
Depth	0.50	1.00	2.00	3.00	4.00	0.50	1.00	2.00	3.00	0.50			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	LOD/LOR	Units	Method No.
Surrogate Recovery Toluene D8	-	-	-	-	97	-	-	-	-	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	81	-	-	-	-	-	<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	<30	-	208	-	<30	-	-	<30	<30	<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	-	0.1	0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-	2.5	2.9	<0.2	-	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	-	8	<4	<4	-	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	-	33	41	<7	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	-	164	209	<7	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	-	<7	21	<7	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	-	208	274	<26	-	<26	<26	<26	<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-	<0.2	0.9	<0.2	-	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	-	6	<4	<4	-	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	-	72	48	8	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	-	225	161	53	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	-	10	<7	<7	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	-	313	210	61	-	<26	<26	<26	<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	-	521	484	61	-	<52	<52	<52	<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	-	<5	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	-	<5	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	-	7	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	-	7	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	-	12	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	-	8	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	<5	13	9	<5	<5	-	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	<35	<35	<35	<35	<35	-	<35	<35	<35	ug/kg	TM17/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15221

Report : Solid

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

EMT Sample No.	31-33	34-36	37-39								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2006	LF-CPRC-2009	LF-CPRC-2009										
Depth	1.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	27/09/2021	27/09/2021	27/09/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	29/09/2021	29/09/2021	29/09/2021								LOD/LOR	Units	Method No.
Antimony	-	-	-								<1	mg/kg	TM30/PM15
Arsenic #	10.2	10.3	-								<0.5	mg/kg	TM30/PM15
Barium #	-	-	-								<1	mg/kg	TM30/PM15
Beryllium	0.9	0.7	-								<0.5	mg/kg	TM30/PM15
Cadmium #	2.0	2.2	-								<0.1	mg/kg	TM30/PM15
Chromium #	27.3	23.0	-								<0.5	mg/kg	TM30/PM15
Copper #	30	26	-								<1	mg/kg	TM30/PM15
Lead #	42	17	-								<5	mg/kg	TM30/PM15
Mercury #	0.3	0.2	-								<0.1	mg/kg	TM30/PM15
Molybdenum #	-	-	-								<0.1	mg/kg	TM30/PM15
Nickel #	32.7	36.4	-								<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	-								<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.3	0.4	-								<0.1	mg/kg	TM74/PM32
Zinc #	80	60	-								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	-								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.04	<0.03	-								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	-								<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	-								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	-								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	-								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	-								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	-								<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	-	-								<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	71	124	-								<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-								<2	ug/kg	TM15/PM10
Benzene #	-	-	-								<3	ug/kg	TM15/PM10
Toluene #	-	-	-								<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-								<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-								<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-								<3	ug/kg	TM15/PM10

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15221

Report : Solid

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

EMT Sample No.	31-33	34-36	37-39									
Sample ID	LF-CPRC-2006	LF-CPRC-2009	LF-CPRC-2009									
Depth	1.00	0.50	1.00									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	27/09/2021	27/09/2021	27/09/2021									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	29/09/2021	29/09/2021	29/09/2021									
Surrogate Recovery Toluene D8	-	-	-							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-							<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	-							<30	mg/kg	TM5/PM8/PM16
TPH CWG												
Aliphatics												
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	-							<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	-							<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	-							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	-							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	-							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	-							<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	-							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	-							<26	mg/kg	TM5/PM8/PM16
Aromatics												
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	-							<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	-							<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	-							<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	-							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	-							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	-							<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	-							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	-							<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	-							<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	-							<5	ug/kg	TM36/PM12
Benzene #	<5	<5	-							<5	ug/kg	TM36/PM12
Toluene #	<5	<5	-							<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	-							<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	-							<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	-							<5	ug/kg	TM36/PM12
PCB 28 #	-	-	<5							<5	ug/kg	TM17/PM8
PCB 52 #	-	-	<5							<5	ug/kg	TM17/PM8
PCB 101 #	-	-	<5							<5	ug/kg	TM17/PM8
PCB 118 #	-	-	<5							<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5							<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5							<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5							<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	<35							<35	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15221

Report : Solid

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

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

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15221

Report : EN12457_2

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

EMT Sample No.	4-6	10-12	16-18	25-27	28-30						Please see attached notes for all abbreviations and acronyms					
Sample ID	LF-TP-2010	LF-TP-2010	LF-TP-2011	LF-TP-2011	LF-CPRC-2006											
Depth	1.00	3.00	0.50	3.00	0.50											
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T											
Sample Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021											
Sample Type	Soil	Soil	Soil	Soil	Soil											
Batch Number	1	1	1	1	1											
Date of Receipt	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021						Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon [#]	0.36	2.61	1.55	0.92	2.61						3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	0.034	<0.025	<0.025	<0.025						6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs [#]	<0.035	<0.035	<0.035	<0.035	<0.035						1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	208	<30	<30	<30						500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 17	0.71	17.43	2.76	1.11	2.81						100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Dry Matter Content Ratio	93.4	87.1	92.9	84.9	93.3						-	-	-	<0.1	%	NONE/PM4

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-Til
Contact: Conor Finnerty
EMT Job No: 21/15221

SVOC Report : Solid

EMT Sample No.	7-9	13-15	19-21	25-27	37-39						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2010	LF-TP-2010	LF-TP-2011	LF-TP-2011	LF-CPRC-2009								
Depth	2.00	4.00	1.00	3.00	1.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021								
SVOC MS													
Phenols													
2-Chlorophenol #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
4-Methylphenol	<10	106	<10	<10	<10						<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Phenol #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10	46	13	17	<10						<10	ug/kg	TM16/PM8
Naphthalene	<10	-	15	-	<10						<10	ug/kg	TM16/PM8
Acenaphthylene	<10	-	14	-	<10						<10	ug/kg	TM16/PM8
Acenaphthene	<10	-	<10	-	<10						<10	ug/kg	TM16/PM8
Fluorene	<10	-	<10	-	<10						<10	ug/kg	TM16/PM8
Phenanthrene #	<10	-	133	-	<10						<10	ug/kg	TM16/PM8
Anthracene	<10	-	38	-	<10						<10	ug/kg	TM16/PM8
Fluoranthene #	13	-	478	-	<10						<10	ug/kg	TM16/PM8
Pyrene #	13	-	446	-	<10						<10	ug/kg	TM16/PM8
Benzo(a)anthracene	34	-	398	-	<10						<10	ug/kg	TM16/PM8
Chrysene	14	-	329	-	<10						<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	-	635	-	<10						<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	-	297	-	<10						<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	-	131	-	<10						<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	-	40	-	<10						<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	-	154	-	<10						<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	-	457	-	<10						<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	-	178	-	<10						<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	1599	<100	<100	<100						<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100						<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	618	<100	<100	<100						<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100						<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100						<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100	<100	<100	<100	<100						<100	ug/kg	TM16/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15221

SVOC Report : Solid

EMT Sample No.	7-9	13-15	19-21	25-27	37-39						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2010	LF-TP-2010	LF-TP-2011	LF-TP-2011	LF-CPRC-2009								
Depth	2.00	4.00	1.00	3.00	1.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021						LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Carbazole	<10	33	<10	<10	<10						<10	ug/kg	TM16/PM8
Dibenzofuran #	<10	85	<10	<10	<10						<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Isophorone #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Nitrobenzene #	<10	<10	<10	<10	<10						<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	116	115	115	118	120						<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	99	115	112	107	104						<0	%	TM16/PM8

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-Til
Contact: Conor Finnerty
EMT Job No: 21/15221

VOC Report : Solid

EMT Sample No.	7-9	13-15	19-21	25-27	37-39						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2010	LF-TP-2010	LF-TP-2011	LF-TP-2011	LF-CPRC-2009								
Depth	2.00	4.00	1.00	3.00	1.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil						LOD/LOR	Units	Method No.
Batch Number	1	1	1	1	1								
Date of Receipt	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021								
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2						<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2						<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2						<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1						<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2						<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2						<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6						<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7	<7	10	14	<7						<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6						<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
Toluene #	5	5	<3	<3	<3						<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	14	55	<3						<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	9	<5	<5	<5						<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3						<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2						<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	23	<3	<3	<3						<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3						<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	48	<6	<6	<6						<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	10	<4	<4	<4						<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	49	<4	<4	<4						<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	10	<4	<4	<4						<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7	<7	<7	<7	<7						<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4						<4	ug/kg	TM15/PM10
Naphthalene	<27	54	<27	<27	<27						<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7	<7	<7	<7	<7						<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	102	97	109	101	115						<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	88	81	91	77	97						<0	%	TM15/PM10

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	7.1
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	93.4
Particle Size <4mm =	>95%		
EMT Job No	21/15221	Landfill Waste Acceptance Criteria Limits	
Sample No	6		
Client Sample No	LF-TP-2010		
Depth/Other	1.00		
Sample Date	27/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.36	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	0.71	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.004	0.04	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.009	0.09	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	0.4	4	10
Sulphate as SO ₄	1.5	15	1000
Total Dissolved Solids	51	510	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	<2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	14.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	87.1
Particle Size <4mm =	>95%		
EMT Job No	21/15221	Landfill Waste Acceptance Criteria Limits	
Sample No	12		
Client Sample No	LF-TP-2010		
Depth/Other	3.00		
Sample Date	27/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	2.61	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	0.034	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	208	500	-
PAH Sum of 17(mg/kg)	17.43	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.054	0.54	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.024	0.24	0.5
Nickel	0.003	0.03	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.004	0.04	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.5	5	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	26.0	260	1000
Total Dissolved Solids	151	1511	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	7.7
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	92.9
Particle Size <4mm =	>95%		
EMT Job No	21/15221	Landfill Waste Acceptance Criteria Limits	
Sample No	18		
Client Sample No	LF-TP-2011		
Depth/Other	0.50		
Sample Date	27/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.55	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	2.76	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.011	0.11	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.012	0.12	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.006	0.06	4
Chloride	1.5	15	800
Fluoride	0.4	4	10
Sulphate as SO ₄	1.0	10	1000
Total Dissolved Solids	72	720	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	4	40	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	17.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	84.9
Particle Size <4mm =	>95%		
EMT Job No	21/15221	Landfill Waste Acceptance Criteria Limits	
Sample No	27		
Client Sample No	LF-TP-2011		
Depth/Other	3.00		
Sample Date	27/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.92	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	1.11	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.012	0.12	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.014	0.14	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	0.5	5	10
Sulphate as SO ₄	9.6	96	1000
Total Dissolved Solids	90	900	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	2	20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	7.1
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	93.3
Particle Size <4mm =	>95%		
EMT Job No	21/15221	Landfill Waste Acceptance Criteria Limits	
Sample No	30		
Client Sample No	LF-CPRC-2006		
Depth/Other	0.50		
Sample Date	27/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	2.61	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	2.81	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.006	0.06	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.007	0.07	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.6	6	800
Fluoride	0.3	3	10
Sulphate as SO ₄	0.5	5	1000
Total Dissolved Solids	83	830	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/15221	1	LF-TP-2010	0.50	3	05/10/2021	General Description (Bulk Analysis)	soil
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-TP-2010	1.00	6	05/10/2021	General Description (Bulk Analysis)	Soil
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-TP-2010	3.00	12	05/10/2021	General Description (Bulk Analysis)	Soil
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-TP-2010	4.00	15	05/10/2021	General Description (Bulk Analysis)	Soil
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-TP-2011	0.50	18	05/10/2021	General Description (Bulk Analysis)	Soil
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-TP-2011	2.00	24	05/10/2021	General Description (Bulk Analysis)	Soil
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-TP-2011	3.00	27	05/10/2021	General Description (Bulk Analysis)	soil/stones
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/15221	1	LF-TP-2011	3.00	27	05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-CPRC-2006	0.50	30	05/10/2021	General Description (Bulk Analysis)	soil/stones
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-CPRC-2006	1.00	33	05/10/2021	General Description (Bulk Analysis)	Soil
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD
21/15221	1	LF-CPRC-2009	0.50	36	05/10/2021	General Description (Bulk Analysis)	soil/stones
					05/10/2021	Asbestos Fibres	NAD
					05/10/2021	Asbestos ACM	NAD
					05/10/2021	Asbestos Type	NAD
					05/10/2021	Asbestos Level Screen	NAD

Matrix : Solid

19 of 27

Matrix : Solid

Location: Luas Finglas-TII

Contact: Conor Finnerty

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15221

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15221

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/15221

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/15221

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes

EMT Job No: 21/15221

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Conor Finnerty
Date : 11th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15224 Batch 1
Location : Luas Finglas-TII
Date samples received : 29th September, 2021
Status : Final Report
Issue : 1

Three samples were received for analysis on 29th September, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15224

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

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

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15224

Report : Solid

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

EMT Sample No.	4-6	7-9									Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1015	LF-WS-1019											
Depth	1.00	0.50											
COC No / misc													
Containers	V J T	V J T											
Sample Date	24/09/2021	24/09/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	29/09/2021	29/09/2021									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26									<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26									<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52									<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5									<5	ug/kg	TM36/PM12
Benzene #	<5	<5									<5	ug/kg	TM36/PM12
Toluene #	<5	<5									<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM36/PM12
Phenol #	<0.01	0.03									<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	20.2	11.9									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0889	0.0088									<0.0015	g/l	TM38/PM20
Chromium III	32.0	28.5									<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Organic Matter	1.7	2.6									<0.2	%	TM21/PM24
Acid Reserve	NDP	NDP									<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	NDP									<0.000	gNaOH/100g	TM160/PM110

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/15224

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas-TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15224

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15224

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 21/15224

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 14th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15450 Batch 1
Location : Luas Finglas - TII
Date samples received : 1st October, 2021
Status : Final Report
Issue : 1

Eight samples were received for analysis on 1st October, 2021 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

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Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15450

Report : Solid

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

EMT Sample No.	1-3	10-12	16-17,24	18-20	21-23						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CP-1018	LF-CP-1019	LF-CP-2008	LF-WS-1018	LF-WS-1018								
Depth	0.50	1.00	1.00	0.50	1.00								
COC No / misc													
Containers	V J T	V J T	J T V	V J T	V J T								
Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021						LOD/LOR	Units	Method No.
Arsenic #	13.2	15.1	-	17.0	-						<0.5	mg/kg	TM30/PM15
Beryllium	1.0	1.0	-	1.1	-						<0.5	mg/kg	TM30/PM15
Cadmium #	1.6	1.5	-	2.1	-						<0.1	mg/kg	TM30/PM15
Chromium #	27.4	38.3	-	36.5	-						<0.5	mg/kg	TM30/PM15
Copper #	49	31	-	34	-						<1	mg/kg	TM30/PM15
Lead #	72	44	-	32	-						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	-	<0.1	-						<0.1	mg/kg	TM30/PM15
Nickel #	36.0	40.6	-	41.3	-						<0.7	mg/kg	TM30/PM15
Selenium #	1	2	-	1	-						<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.2	1.9	-	0.9	-						<0.1	mg/kg	TM74/PM32
Zinc #	133	101	-	94	-						<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	-	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.07	<0.03	-	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	-	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	-	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.54	<0.03	-	0.12	0.15						<0.03	mg/kg	TM4/PM8
Anthracene #	0.26	<0.04	-	<0.04	0.05						<0.04	mg/kg	TM4/PM8
Fluoranthene #	2.16	<0.03	-	0.18	0.27						<0.03	mg/kg	TM4/PM8
Pyrene #	2.04	<0.03	-	0.17	0.26						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	1.14	<0.06	-	0.12	0.17						<0.06	mg/kg	TM4/PM8
Chrysene #	1.13	<0.02	-	0.11	0.16						<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	2.86	<0.07	-	0.18	0.31						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	1.63	<0.04	-	0.10	0.17						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.83	<0.04	-	0.06	0.10						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.17	<0.04	-	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.84	<0.04	-	0.06	0.12						<0.04	mg/kg	TM4/PM8
Coronene	0.14	<0.04	-	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
PAH 17 Total	13.81	<0.64	-	1.10	1.76						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	2.06	<0.05	-	0.13	0.22						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.80	<0.02	-	0.05	0.09						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	119	113	-	111	113						<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	-	-	<30						<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15450

Report : Solid

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

EMT Sample No.	1-3	10-12	16-17,24	18-20	21-23						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CP-1018	LF-CP-1019	LF-CP-2008	LF-WS-1018	LF-WS-1018								
Depth	0.50	1.00	1.00	0.50	1.00								
COC No / misc													
Containers	V J T	V J T	J T V	V J T	V J T								
Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021						LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1 ^{SV}	<0.1	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1 ^{SV}	<0.1	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 ^{SV}	<0.1	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-	<0.2	-						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	-	<4	-						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	18	<7	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	-	<7	-						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	-	<26	-						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-	<0.2	-						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	-	<4	-						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	16	<7	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	191	<7	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	47	<7	-	<7	-						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	254	<26	-	<26	-						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	254	<52	-	<52	-						<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5 ^{SV}	<5	-	<5	<5 ^{SV}						<5	ug/kg	TM36/PM12
Benzene #	<5 ^{SV}	<5	-	<5	<5 ^{SV}						<5	ug/kg	TM36/PM12
Toluene #	<5 ^{SV}	<5	-	<5	<5 ^{SV}						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 ^{SV}	<5	-	<5	<5 ^{SV}						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 ^{SV}	<5	-	<5	<5 ^{SV}						<5	ug/kg	TM36/PM12
o-Xylene #	<5 ^{SV}	<5	-	<5	<5 ^{SV}						<5	ug/kg	TM36/PM12
PCB 28 #	-	-	-	-	<5						<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-	-	<5						<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-	-	<5						<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-	-	<5						<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-	-	<5						<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-	-	<5						<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-	-	<5						<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	-	-	<35						<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	-	<0.01	-						<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	11.0	14.8	-	19.5	16.5						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-	<0.3	-						<0.3	mg/kg	TM38/PM20

Please see attached notes for all abbreviations and acronyms

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	23.2
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	81.2
Particle Size <4mm =	>95%		
EMT Job No	21/15450	Landfill Waste Acceptance Criteria Limits	
Sample No	23		
Client Sample No	LF-WS-1018		
Depth/Other	1.00		
Sample Date	28/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.73	3	5
Loss on Ignition (%)	5.1	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	1.76	100	-
pH (pH Units)	7.70	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.08	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	0.0031	0.031	0.5
Barium	0.045	0.45	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.022	0.22	0.5
Nickel	0.004	0.04	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.006	0.06	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.8	8	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	9.7	97	1000
Total Dissolved Solids	119	1190	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	5	50	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

8 of 16

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15450

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15450

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/15450

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009; SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009; SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/15450

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/15450

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Conor Finnerty
Date : 15th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15459 Batch 1
Location : Luas Finglas - TII
Date samples received : 1st October, 2021
Status : Final Report
Issue : 1

Ten samples were received for analysis on 1st October, 2021 of which nine were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15459

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	28-30		Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1021	LF-WS-1020	LF-WS-1020	LF-CPRC-1017	LF-CPRC-1017	LF-TP-2006	LF-CPRC-1010	LF-CPRC-1010	LF-WS-2005				
Depth	0.50	0.50	1.00	0.50	1.00	4.00	0.50	1.00	1.00				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T				
Sample Date	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1	1		LOD/LOR	Units	Method No.
Date of Receipt	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021				
Antimony	-	-	-	6	-	-	-	-	-		<1	mg/kg	TM30/PM15
Arsenic #	7.2	-	13.7	11.5	12.5	9.5	-	-	16.9		<0.5	mg/kg	TM30/PM15
Barium #	-	-	-	114	-	-	-	-	-		<1	mg/kg	TM30/PM15
Beryllium	0.8	-	1.3	-	1.2	0.9	-	-	1.4		<0.5	mg/kg	TM30/PM15
Cadmium #	1.4	-	2.3	1.8	2.5	1.7	-	-	2.5		<0.1	mg/kg	TM30/PM15
Chromium #	25.6	-	30.4	27.6	42.7	31.1	-	-	37.8		<0.5	mg/kg	TM30/PM15
Copper #	22	-	47	49	24	29	-	-	48		<1	mg/kg	TM30/PM15
Lead #	20	-	63	73	29	14	-	-	82		<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1		<0.1	mg/kg	TM30/PM15
Molybdenum #	-	-	-	2.3	-	-	-	-	-		<0.1	mg/kg	TM30/PM15
Nickel #	29.2	-	44.5	40.7	50.7	40.5	-	-	48.2		<0.7	mg/kg	TM30/PM15
Selenium #	<1	-	1	1	2	1	-	-	2		<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.0	-	1.2	-	2.4	0.4	-	-	1.2		<0.1	mg/kg	TM74/PM32
Zinc #	67	-	144	148	136	82	-	-	136		<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	-	0.47		<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	-	<0.03		<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05		<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	-	<0.04		<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	-	0.09	0.21	<0.03	<0.03	0.13	-	0.09		<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	-	<0.04	0.06	<0.04	<0.04	0.05	-	<0.04		<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	-	0.17	0.40	<0.03	<0.03	0.30	-	0.17		<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	-	0.15	0.39	<0.03	<0.03	0.26	-	0.20		<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	-	0.11	0.26	<0.06	<0.06	0.23	-	0.08		<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	-	0.13	0.28	<0.02	<0.02	0.19	-	0.13		<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	-	0.23	0.54	<0.07	<0.07	0.37	-	0.28		<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	-	0.13	0.30	<0.04	<0.04	0.20	-	0.15		<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	-	0.08	0.20	<0.04	<0.04	0.14	-	<0.04		<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	-	<0.04		<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	-	<0.04	0.22	<0.04	<0.04	0.14	-	<0.04		<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	<0.04	0.05	<0.04	<0.04	<0.04	-	<0.04		<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	-	1.09	2.91	<0.64	<0.64	2.01	-	1.57		<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	-	0.17	0.39	<0.05	<0.05	0.27	-	0.20		<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	-	0.06	0.15	<0.02	<0.02	0.10	-	0.08		<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	-	-	<1	-	-	-	-	-		<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	122	-	116	115	125	121	124	-	125		<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	-	-	-	-	51	-	-		<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15459

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	28-30		Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1021	LF-WS-1020	LF-WS-1020	LF-CPRC-1017	LF-CPRC-1017	LF-TP-2006	LF-CPRC-1010	LF-CPRC-1010	LF-WS-2005				
Depth	0.50	0.50	1.00	0.50	1.00	4.00	0.50	1.00	1.00				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T				
Sample Date	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021	29/09/2021				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021		LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1	<0.1 ^{SV}	<0.1	<0.1	-	-	<0.1	<0.1	mg/kg	TM36/PM12	
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1	<0.1 ^{SV}	<0.1	<0.1	-	-	<0.1	<0.1	mg/kg	TM36/PM12	
>C8-C10 (HS_1D_AL)	<0.1	-	<0.1	<0.1 ^{SV}	<0.1	<0.1	-	-	<0.1	<0.1	mg/kg	TM36/PM12	
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	mg/kg	TM5/PM8/PM12	
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4	<4	<4	<4	-	-	<4	<4	mg/kg	TM5/PM8/PM12	
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7	<7	<7	<7	-	-	<7	<7	mg/kg	TM5/PM8/PM12	
>C21-C35 (EH_CU_1D_AL) #	<7	-	<7	38	<7	<7	-	-	<7	<7	mg/kg	TM5/PM8/PM12	
>C35-C40 (EH_1D_AL)	<7	-	<7	<7	<7	<7	-	-	<7	<7	mg/kg	TM5/PM8/PM12	
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	<26	38	<26	<26	-	-	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16	
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1	<0.1 ^{SV}	<0.1	<0.1	-	-	<0.1	<0.1	mg/kg	TM36/PM12	
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1	<0.1 ^{SV}	<0.1	<0.1	-	-	<0.1	<0.1	mg/kg	TM36/PM12	
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1	<0.1 ^{SV}	<0.1	<0.1	-	-	<0.1	<0.1	mg/kg	TM36/PM12	
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	mg/kg	TM5/PM8/PM12	
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4	<4	<4	<4	-	-	<4	<4	mg/kg	TM5/PM8/PM12	
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	<7	<7	<7	<7	-	-	<7	<7	mg/kg	TM5/PM8/PM12	
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	36	112	<7	<7	-	-	<7	<7	mg/kg	TM5/PM8/PM12	
>EC35-EC40 (EH_1D_AR)	<7	-	<7	15	<7	<7	-	-	<7	<7	mg/kg	TM5/PM8/PM12	
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-	36	127	<26	<26	-	-	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16	
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	-	<52	165	<52	<52	-	-	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16	
MTBE #	<5	-	<5	<5 ^{SV}	<5	<5	<5	-	<5	<5	ug/kg	TM36/PM12	
Benzene #	<5	-	<5	<5 ^{SV}	<5	<5	<5	-	<5	<5	ug/kg	TM36/PM12	
Toluene #	<5	-	<5	<5 ^{SV}	<5	<5	<5	-	<5	<5	ug/kg	TM36/PM12	
Ethylbenzene #	<5	-	<5	<5 ^{SV}	<5	<5	<5	-	<5	<5	ug/kg	TM36/PM12	
m/p-Xylene #	<5	-	<5	<5 ^{SV}	<5	<5	<5	-	<5	<5	ug/kg	TM36/PM12	
o-Xylene #	<5	-	<5	<5 ^{SV}	<5	<5	<5	-	<5	<5	ug/kg	TM36/PM12	
PCB 28 #	-	16	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8	
PCB 52 #	-	10	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8	
PCB 101 #	-	36	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8	
PCB 118 #	-	10	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8	
PCB 138 #	-	77	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8	
PCB 153 #	-	115	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8	
PCB 180 #	-	138	-	<5	-	-	<5	-	-	<5	ug/kg	TM17/PM8	
Total 7 PCBs #	-	402	-	<35	-	-	<35	-	-	<35	ug/kg	TM17/PM8	
Phenol #	<0.01	-	<0.01	-	<0.01	<0.01	-	-	<0.01	<0.01	mg/kg	TM26/PM21B	
Natural Moisture Content	13.4	9.8	14.9	15.1	26.8	12.0	5.4	-	27.6	<0.1	%	PM4/PM0	
Hexavalent Chromium #	<0.3	-	<0.3	<0.3	<0.3	<0.3	-	-	<0.3	<0.3	mg/kg	TM38/PM20	

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

Please see attached notes for all abbreviations and acronyms

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Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15459

SVOC Report : Solid

EMT Sample No.	4-6										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1020												
Depth	0.50												
COC No / misc													
Containers	V J T												
Sample Date	29/09/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	01/10/2021										LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	48										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	55										<10	ug/kg	TM16/PM8
Naphthalene	59										<10	ug/kg	TM16/PM8
Acenaphthylene	41										<10	ug/kg	TM16/PM8
Acenaphthene	183										<10	ug/kg	TM16/PM8
Fluorene	137										<10	ug/kg	TM16/PM8
Phenanthrene #	1416										<10	ug/kg	TM16/PM8
Anthracene	245										<10	ug/kg	TM16/PM8
Fluoranthene #	1867										<10	ug/kg	TM16/PM8
Pyrene #	1583										<10	ug/kg	TM16/PM8
Benzo(a)anthracene	852										<10	ug/kg	TM16/PM8
Chrysene	877										<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	1442										<10	ug/kg	TM16/PM8
Benzo(a)pyrene	697										<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	382										<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	96										<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	501										<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	1038										<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	404										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	253										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	122										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8

[illegible]

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	8.6
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	92.0
Particle Size <4mm =	>95%		
EMT Job No	21/15459	Landfill Waste Acceptance Criteria Limits	
Sample No	12		
Client Sample No	LF-CPRC-1017		
Depth/Other	0.50		
Sample Date	29/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	-	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	-	6	-
Sum of 7 PCBs (mg/kg)	-	1	-
Mineral Oil (mg/kg)	-	500	-
PAH Sum of 17(mg/kg)	-	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.011	0.11	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.007	0.07	0.5
Nickel	0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	0.5	5	10
Sulphate as SO ₄	1.6	16	1000
Total Dissolved Solids	92	920	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	6	60	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	6.7		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	93.7		
Particle Size <4mm =	>95%				
EMT Job No	21/15459		Landfill Waste Acceptance Criteria Limits		
Sample No	21				
Client Sample No	LF-CPRC-1010		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	0.50				
Sample Date	29/09/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	0.42		3	5	6
Loss on Ignition (%)	-		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	51		500	-	-
PAH Sum of 17(mg/kg)	2.01		100	-	-
pH (pH Units)	-		-	>6	-
ANC to pH 7 (mol/kg)	-		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
	mg/l	mg/kg			
	Arsenic	<0.0025	<0.025	0.5	2	25
Barium	0.015	0.15	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.011	0.11	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	0.5	5	800	15000	25000
Fluoride	0.4	4	10	150	500
Sulphate as SO4	27.0	270	1000	20000	50000
Total Dissolved Solids	86	860	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	<2	<20	500	800	1000

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/15459	1	LF-WS-1021	0.50	3	06/10/2021	General Description (Bulk Analysis)	soil
					06/10/2021	Asbestos Fibres	NAD
					06/10/2021	Asbestos ACM	NAD
					06/10/2021	Asbestos Type	NAD
					06/10/2021	Asbestos Level Screen	NAD
21/15459	1	LF-WS-1020	1.00	9	07/10/2021	General Description (Bulk Analysis)	Soil/Stones
					07/10/2021	Asbestos Fibres	NAD
					07/10/2021	Asbestos ACM	NAD
					07/10/2021	Asbestos Type	NAD
					07/10/2021	Asbestos Level Screen	NAD
21/15459	1	LF-CPRC-1017	0.50	11	06/10/2021	General Description (Bulk Analysis)	Soil
					06/10/2021	Asbestos Fibres	NAD
					06/10/2021	Asbestos ACM	NAD
					06/10/2021	Asbestos Type	NAD
					06/10/2021	Asbestos Level Screen	NAD
21/15459	1	LF-CPRC-1017	1.00	15	06/10/2021	General Description (Bulk Analysis)	soil/stones
					06/10/2021	Asbestos Fibres	NAD
					06/10/2021	Asbestos ACM	NAD
					06/10/2021	Asbestos Type	NAD
					06/10/2021	Asbestos Level Screen	NAD
21/15459	1	LF-TP-2006	4.00	18	06/10/2021	General Description (Bulk Analysis)	soil/stones
					06/10/2021	Asbestos Fibres	NAD
					06/10/2021	Asbestos ACM	NAD
					06/10/2021	Asbestos Type	NAD
					06/10/2021	Asbestos Level Screen	NAD
21/15459	1	LF-WS-2005	1.00	30	06/10/2021	General Description (Bulk Analysis)	soil/stones
					06/10/2021	Asbestos Fibres	NAD
					06/10/2021	Asbestos ACM	NAD
					06/10/2021	Asbestos Type	NAD
					06/10/2021	Asbestos Level Screen	NAD

Matrix : Solid

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Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15459

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15459

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/15459

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/15459

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes

EMT Job No: 21/15459

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 18th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15673 Batch 1
Location : Luas Finglas - TII
Date samples received : 6th October, 2021
Status : Final Report
Issue : 1

Ten samples were received for analysis on 6th October, 2021 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15673

Report : Solid

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

EMT Sample No.	1-3	4-6	13-15	16-18							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1009	LF-CPRC-1009	LF-CPRC-1007	LF-CPRC-1007									
Depth	0.50	1.00	0.50	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	01/10/2021	01/10/2021	01/10/2021	01/10/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	06/10/2021	06/10/2021	06/10/2021	06/10/2021							LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1	-	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1	-	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	<0.1	-	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	<0.2	-	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	<4	-	<4							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	<7	-	<7							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	<7	-	<7							<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	<7	-	<7							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26	-	<26							<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1	-	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1	-	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1	-	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2	-	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	<4	-	<4							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	<7	-	12							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	<7	-	49							<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	<7	-	<7							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26	-	61							<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	<52	-	61							<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	<35	-							<35	ug/kg	TM17/PM8
Phenol #	-	<0.01	-	<0.01							<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	9.2	11.3	7.5	9.9							<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	-	<0.3							<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - T11
Contact: Conor Finnerty
EMT Job No: 21/15673

Report: Solid

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

[illegible]

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

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	9.9
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	91.0
Particle Size <4mm =	>95%		
EMT Job No	21/15673	Landfill Waste Acceptance Criteria Limits	
Sample No	3		
Client Sample No	LF-CPRC-1009		
Depth/Other	0.50		
Sample Date	01/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.04	3	5
Loss on Ignition (%)	3.3	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	1.77	100	-
pH (pH Units)	8.44	-	>6
ANC to pH 7 (mol/kg)	0.04	-	to be evaluated
ANC to pH 4 (mol/kg)	0.14	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.006	0.06	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.014	0.14	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	0.3	<3	10
Sulphate as SO ₄	0.6	6	1000
Total Dissolved Solids	47	470	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	9.5
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	91.3
Particle Size <4mm =	>95%		
EMT Job No	21/15673	Landfill Waste Acceptance Criteria Limits	
Sample No	15		
Client Sample No	LF-CPRC-1007		
Depth/Other	0.50		
Sample Date	01/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.90	3	5
Loss on Ignition (%)	2.5	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	1.85	100	-
pH (pH Units)	8.67	-	>6
ANC to pH 7 (mol/kg)	0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.15	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.011	0.11	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.022	0.22	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	0.3	<3	10
Sulphate as SO ₄	7.7	77	1000
Total Dissolved Solids	70	700	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	2	<20	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15673

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15673

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/15673

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/15673

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/15673

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 21st October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15702 Batch 1
Location : Luas Finglas - TII
Date samples received : 6th October, 2021
Status : Final Report
Issue : 1

Ten samples were received for analysis on 6th October, 2021 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15702

Report : Solid

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

EMT Sample No.	1-3	4-6	19-21	22-24							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-2002	LF-WS-2002	LF-WS-1012	LF-WS-1012									
Depth	0.50	1.00	0.50	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	04/10/2021	04/10/2021	04/10/2021	04/10/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	06/10/2021	06/10/2021	06/10/2021	06/10/2021							LOD/LOR	Units	Method No.
PAH MS													
Naphthalene #	<0.04	-	<0.04	-							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	<0.03	-							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	-	<0.05	-							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	-	<0.04	-							<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.25	-	0.10	-							<0.03	mg/kg	TM4/PM8
Anthracene #	0.05	-	<0.04	-							<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.42	-	0.30	-							<0.03	mg/kg	TM4/PM8
Pyrene #	0.39	-	0.27	-							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.23	-	0.19	-							<0.06	mg/kg	TM4/PM8
Chrysene #	0.25	-	0.19	-							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.40	-	0.36	-							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.23	-	0.18	-							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.17	-	0.15	-							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.04	-	<0.04	-							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.16	-	0.14	-							<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	<0.04	-							<0.04	mg/kg	TM4/PM8
PAH 17 Total	2.59	-	1.88	-							<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.29	-	0.26	-							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.11	-	0.10	-							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	105	-	108	-							<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	36	-							<30	mg/kg	TM5/PM8/PM16
MTBE #	<5	-	<5	-							<5	ug/kg	TM36/PM12
Benzene #	<5	-	<5	-							<5	ug/kg	TM36/PM12
Toluene #	<5	-	<5	-							<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	<5	-							<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	<5	-							<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	<5	-							<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	<35	-							<35	ug/kg	TM17/PM8
Natural Moisture Content	8.6	-	8.3	-							<0.1	%	PM4/PM0
Sulphate as SO4 (2:1 Ext) #	-	0.0130	-	0.0032							<0.0015	g/l	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - T11
Contact: Conor Finnerty
EMT Job No: 21/15702

Report : Solid

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

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	14.6					
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	87.2					
Particle Size <4mm =	>95%							
EMT Job No	21/15702		Landfill Waste Acceptance Criteria Limits					
Sample No	3							
Client Sample No	LF-WS-2002							
Depth/Other	0.50							
Sample Date	04/10/2021							
Batch No	1							
Solid Waste Analysis			Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill			
Total Organic Carbon (%)	1.98					3	5	6
Loss on Ignition (%)	6.6					-	-	10
Sum of BTEX (mg/kg)	<0.025					6	-	-
Sum of 7 PCBs (mg/kg)	<0.035					1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30					500	-	-
PAH Sum of 17(mg/kg)	2.59					100	-	-
pH (pH Units)	8.13					-	>6	-
ANC to pH 7 (mol/kg)	NDP					-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	<0.03					-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg					
	C ₁₀	A ₁₀						
	mg/l	mg/kg						
	mg/kg							
Arsenic	<0.0025	<0.025	0.5	2	25			
Barium	0.009	0.09	20	100	300			
Cadmium	<0.0005	<0.005	0.04	1	5			
Chromium	<0.0015	<0.015	0.5	10	70			
Copper	<0.007	<0.07	2	50	100			
Mercury	<0.001	<0.01	0.01	0.2	2			
Molybdenum	0.006	0.06	0.5	10	30			
Nickel	<0.002	<0.02	0.4	10	40			
Lead	<0.005	<0.05	0.5	10	50			
Antimony	<0.002	<0.02	0.06	0.7	5			
Selenium	<0.003	<0.03	0.1	0.5	7			
Zinc	0.007	0.07	4	50	200			
Chloride	0.5	5	800	15000	25000			
Fluoride	0.5	5	10	150	500			
Sulphate as SO4	0.6	6	1000	20000	50000			
Total Dissolved Solids	88	880	4000	60000	100000			
Phenol	<0.01	<0.1	1	-	-			
Dissolved Organic Carbon	6	60	500	800	1000			

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	12.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	88.7
Particle Size <4mm =	>95%		
EMT Job No	21/15702	Landfill Waste Acceptance Criteria Limits	
Sample No	21		
Client Sample No	LF-WS-1012		
Depth/Other	0.50		
Sample Date	04/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.59	3	5
Loss on Ignition (%)	5.6	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	36	500	-
PAH Sum of 17(mg/kg)	1.88	100	-
pH (pH Units)	8.18	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.07	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.008	0.08	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.009	0.09	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.006	0.06	4
Chloride	0.4	4	800
Fluoride	0.5	5	10
Sulphate as SO ₄	0.5	<5	1000
Total Dissolved Solids	80	800	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	4	40	500

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15702

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15702

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 21/15702

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 15th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15708 Batch 1
Location : Luas Finglas - TII
Date samples received : 6th October, 2021
Status : Final Report
Issue : 1

Ten samples were received for analysis on 6th October, 2021 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15708

Report : Solid

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

EMT Sample No.	1-3	4-6	10-12	19-21	22-24	28-30					Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-1006	LF-TP-1006	LF-TP-1006	LF-TP-1007	LF-TP-1007	LF-TP-1007							
Depth	0.50	1.00	3.00	1.00	2.00	4.00							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	30/09/2021	30/09/2021	30/09/2021	30/09/2021	30/09/2021	30/09/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021					LOD/LOR	Units	Method No.
Arsenic #	-	8.6	9.5	-	17.5	10.6					<0.5	mg/kg	TM30/PM15
Beryllium	-	0.7	0.6	-	1.8	0.8					<0.5	mg/kg	TM30/PM15
Cadmium #	-	1.4	0.8	-	2.6	1.8					<0.1	mg/kg	TM30/PM15
Chromium #	-	35.1	36.1	-	27.3	22.1					<0.5	mg/kg	TM30/PM15
Copper #	-	26	18	-	40	25					<1	mg/kg	TM30/PM15
Lead #	-	16	10	-	48	20					<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	<0.1	-	<0.1	<0.1					<0.1	mg/kg	TM30/PM15
Nickel #	-	37.5	28.4	-	52.9	37.4					<0.7	mg/kg	TM30/PM15
Selenium #	-	1	2	-	2	1					<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.2	0.2	-	1.3	0.3					<0.1	mg/kg	TM74/PM32
Zinc #	-	69	53	-	117	86					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	0.07	<0.04					<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03					<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	0.14	<0.05					<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	0.10	<0.04					<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.04	<0.03	<0.03	<0.03	1.06	<0.03					<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	0.19	<0.04					<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.11	<0.03	<0.03	0.04	1.03	<0.03					<0.03	mg/kg	TM4/PM8
Pyrene #	0.10	<0.03	<0.03	0.04	0.89	<0.03					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.09	<0.06	<0.06	<0.06	0.44	<0.06					<0.06	mg/kg	TM4/PM8
Chrysene #	0.08	<0.02	<0.02	0.04	0.46	<0.02					<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.12	<0.07	<0.07	<0.07	0.71	<0.07					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.07	<0.04	<0.04	0.06	0.40	<0.04					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	0.21	<0.04					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	0.05	<0.04					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	0.24	<0.04					<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	5.99	<0.64					<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.09	<0.05	<0.05	<0.05	0.51	<0.05					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	<0.02	<0.02	<0.02	0.20	<0.02					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	125	120	124	120	119	113					<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	-	<30	-	-					<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15708

Report : Solid

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

EMT Sample No.	1-3	4-6	10-12	19-21	22-24	28-30					Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-1006	LF-TP-1006	LF-TP-1006	LF-TP-1007	LF-TP-1007	LF-TP-1007							
Depth	0.50	1.00	3.00	1.00	2.00	4.00							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	30/09/2021	30/09/2021	30/09/2021	30/09/2021	30/09/2021	30/09/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021					LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1	<0.1	-	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1	<0.1	-	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	<0.1	<0.1	-	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	<0.2	<0.2	-	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	<4	<4	-	<4	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	<7	<7	-	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	<7	<7	-	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	<7	<7	-	<7	<7					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26	<26	-	<26	<26					<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1	<0.1	-	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1	<0.1	-	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1	<0.1	-	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2	<0.2	-	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	<4	<4	-	<4	<4					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	<7	<7	-	<7	<7					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	<7	<7	-	106	<7					<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	<7	<7	-	22	<7					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26	<26	-	128	<26					<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	-	<52	<52	-	128	<52					<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	-	<5	-	-					<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	-	<5	-	-					<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	-	<5	-	-					<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	-	<5	-	-					<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	-	<5	-	-					<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	-	<5	-	-					<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	-	<5	-	-					<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	-	<35	-	-					<35	ug/kg	TM17/PM8
Phenol #	-	<0.01	<0.01	-	<0.01	<0.01					<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	8.5	9.8	9.6	11.4	16.2	18.9					<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	<0.3	-	<0.3	<0.3					<0.3	mg/kg	TM38/PM20

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

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	9.5
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	91.4
Particle Size <4mm =	>95%		
EMT Job No	21/15708	Landfill Waste Acceptance Criteria Limits	
Sample No	3		
Client Sample No	LF-TP-1006		
Depth/Other	0.50		
Sample Date	30/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.39	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.004	0.04	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.006	0.06	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	0.4	4	10
Sulphate as SO ₄	<0.5	<5	1000
Total Dissolved Solids	51	510	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	<2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	18.0
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	84.8
Particle Size <4mm =	>95%		
EMT Job No	21/15708	Landfill Waste Acceptance Criteria Limits	
Sample No	21		
Client Sample No	LF-TP-1007		
Depth/Other	1.00		
Sample Date	30/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.34	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.004	0.04	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.008	0.08	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.004	0.04	4
Chloride	0.4	4	800
Fluoride	0.5	5	10
Sulphate as SO ₄	0.5	5	1000
Total Dissolved Solids	70	700	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	4	40	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

9 of 16

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15708

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15708

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/15708

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes

EMT Job No: 21/15708

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 25th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15742 Batch 1
Location : Luas Finglas -TII
Date samples received : 6th October, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 6th October, 2021 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas -TII
Contact: Conor Finnerty
EMT Job No: 21/15742

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas -TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15742

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15742

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
Subcontracted	See attached subcontractor report for accreditation status and provider.					AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 19th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15914 Batch 1
Location : Luas Finglas - TII
Date samples received : 11th October, 2021
Status : Final Report
Issue : 1

Five samples were received for analysis on 11th October, 2021 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15914

Report : Solid

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

EMT Sample No.	4-6	7-9	10-12	13-15							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2009	LF-CPRC-2009	LF-CPRC-2009	LF-CPRC-2009									
Depth	3.00	4.00	5.00	5.80									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021									
Antimony	2	-	2	-							<1	mg/kg	TM30/PM15
Arsenic #	11.4	7.9	12.7	11.5							<0.5	mg/kg	TM30/PM15
Barium #	91	-	269	-							<1	mg/kg	TM30/PM15
Beryllium	-	0.6	-	0.9							<0.5	mg/kg	TM30/PM15
Cadmium #	1.7	1.4	2.0	1.6							<0.1	mg/kg	TM30/PM15
Chromium #	52.0	29.4	39.1	35.9							<0.5	mg/kg	TM30/PM15
Copper #	44	56	51	45							<1	mg/kg	TM30/PM15
Lead #	38	73	361	281							<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Molybdenum #	4.2	-	3.1	-							<0.1	mg/kg	TM30/PM15
Nickel #	43.6	177.7	59.5	99.7							<0.7	mg/kg	TM30/PM15
Selenium #	1	<1	<1	<1							<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	1.2	-	1.7							<0.1	mg/kg	TM74/PM32
Zinc #	126	469	466	199							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	0.10	0.16							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	0.06	0.06							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	0.07	0.09							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	0.11	0.14							<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.07	0.29	0.81	0.75							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.15	0.27	0.24							<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.13	1.00	1.07	1.08							<0.03	mg/kg	TM4/PM8
Pyrene #	0.12	0.84	0.92	0.93							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.11	0.51	0.61	0.43							<0.06	mg/kg	TM4/PM8
Chrysene #	0.07	0.51	0.55	0.54							<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.14	0.87	0.92	0.95							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.07	0.48	0.50	0.49							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.05	0.29	0.27	0.34							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	0.07	0.08							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.06	0.31	0.31	0.34							<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	0.06	<0.04							<0.04	mg/kg	TM4/PM8
PAH 6 Total #	0.45	-	3.07	-							<0.22	mg/kg	TM4/PM8
PAH 17 Total	0.82	5.25	6.70	6.62							<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.10	0.63	0.66	0.68							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.04	0.24	0.26	0.27							<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	-	<1	-							<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	90	82	97	93							<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	148	-							<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15914

Report : Solid

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

EMT Sample No.	4-6	7-9	10-12	13-15							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2009	LF-CPRC-2009	LF-CPRC-2009	LF-CPRC-2009									
Depth	3.00	4.00	5.00	5.80									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021									
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	1.1	0.2	0.2	0.4							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	1.9	<0.2	3.4							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	6	<4	8							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	41	15	49							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	20	277	133	237							<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	26	<7	25							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	352	148	323							<26	mg/kg	TM5/PM8/PM16/12/PM15
>C6-C10 (HS_1D_AL)	1.1	-	0.2	-							<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_1D_AL)	<10	-	39	-							<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_1D_AL)	17	-	87	-							<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	4.1	<0.2	5.6							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	9	<4	10							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	51	34	53							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	294	192	227							<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	23	<7	23							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	381	226	319							<26	mg/kg	TM5/PM8/PM16/12/PM15
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	733	374	642							<52	mg/kg	TM5/PM8/PM16/12/PM15
>EC6-EC10 (HS_1D_AR) #	<0.1	-	<0.1	-							<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_1D_AR)	<10	-	66	-							<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_1D_AR)	<10	-	123	-							<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Toluene #	<5	9	<5	<5							<5	ug/kg	TM36/PM12
Ethylbenzene #	19	<5	<5	<5							<5	ug/kg	TM36/PM12
m/p-Xylene #	27	15	11	10							<5	ug/kg	TM36/PM12
o-Xylene #	14	<5	9	<5							<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	<5	-							<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	<35	-							<35	ug/kg	TM17/PM8

Client Name:	Ground Investigations Ireland
Reference:	10892-07-21
Location:	Luas Finglas - TII
Contact:	Conor Finnerty
EMT Job No:	21/15914

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

Please see attached notes for all abbreviations and acronyms

Matrix : Solid

7 of 17

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

9 of 17

Matrix : Solid

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15914

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15914

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes

EMT Job No: 21/15914

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes

EMT Job No: 21/15914

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013i	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes

EMT Job No: 21/15914

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 25th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15939 Batch 1
Location : Luas Finglas
Date samples received : 11th October, 2021
Status : Final Report
Issue : 1

Twenty two samples were received for analysis on 11th October, 2021 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15939

Report : Solid

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

EMT Sample No.	7-9	10-12	16-18	25-27	40-42	43-45	49-51	52-54	55-57	61-63	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-2002	LF-WS-2002	LF-WS-2003	LF-WS-2004	LF-WS-2014	LF-WS-2014	LF-WS-2014	LF-WS-2018	LF-WS-2018	LF-WS-2019			
Depth	2.00-3.00	3.00-3.90	1.20-1.45	1.50-1.60	1.20-2.00	2.00-3.00	4.40-5.00	1.20-2.40	2.40-3.00	1.20-1.70			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	07/10/2021	07/10/2021	07/10/2021	07/10/2021	07/10/2021	07/10/2021	07/10/2021	08/10/2021	08/10/2021	08/10/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021			
Arsenic #	12.9	9.4	9.3	11.0	-	8.7	15.9	13.7	15.4	12.0	<0.5	mg/kg	TM30/PM15
Beryllium	0.8	0.8	0.7	0.8	-	0.8	1.4	1.0	1.1	0.8	<0.5	mg/kg	TM30/PM15
Cadmium #	1.4	1.4	1.5	1.9	-	1.9	3.1	1.6	3.0	3.7	<0.1	mg/kg	TM30/PM15
Chromium #	25.6	33.8	46.6	24.4	-	19.4	38.4	28.3	39.3	34.3	<0.5	mg/kg	TM30/PM15
Copper #	26	27	22	27	-	23	45	35	25	32	<1	mg/kg	TM30/PM15
Lead #	24	16	14	19	-	20	27	57	28	44	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	40.4	39.2	34.8	38.6	-	33.3	60.7	39.6	69.9	53.2	<0.7	mg/kg	TM30/PM15
Selenium #	<1	3	<1	5	-	2	3	2	3	2	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.6	0.4	0.3	0.2	-	0.5	0.9	2.1	2.1	1.5	<0.1	mg/kg	TM74/PM32
Zinc #	83	71	66	78	-	73	117	112	129	117	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	0.04	-	<0.03	<0.03	0.06	<0.03	0.61	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	0.10	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	0.10	<0.03	0.72	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	0.08	<0.03	0.62	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	-	<0.06	<0.06	0.08	<0.06	0.29	<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	0.04	-	<0.02	<0.02	0.07	<0.02	0.30	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	-	<0.07	<0.07	0.13	<0.07	0.40	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	0.06	<0.04	0.20	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	0.06	<0.04	0.13	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	0.06	<0.04	0.13	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	-	<0.64	<0.64	0.70	<0.64	3.63	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	0.09	<0.05	0.29	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.02	0.04	<0.02	0.11	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	106	105	103	106	-	104	103	106	115	40	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-	-	-	-	-	<2	-	<2	<2	ug/kg	TM15/PM10
Benzene #	-	-	-	-	-	-	-	<3	-	<3	<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	-	-	-	7	-	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	-	-	-	7	-	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	-	-	-	<3	-	<3	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	-	-	-	87	-	90	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	-	-	-	72	-	82	<0	%	TM15/PM10

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15939

Report : Solid

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

EMT Sample No.	7-9	10-12	16-18	25-27	40-42	43-45	49-51	52-54	55-57	61-63	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-2002	LF-WS-2002	LF-WS-2003	LF-WS-2004	LF-WS-2014	LF-WS-2014	LF-WS-2014	LF-WS-2018	LF-WS-2018	LF-WS-2019			
Depth	2.00-3.00	3.00-3.90	1.20-1.45	1.50-1.60	1.20-2.00	2.00-3.00	4.40-5.00	1.20-2.40	2.40-3.00	1.20-1.70			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	07/10/2021	07/10/2021	07/10/2021	07/10/2021	07/10/2021	07/10/2021	07/10/2021	08/10/2021	08/10/2021	08/10/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	5	-	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	13	-	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7	19	-	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	<7	<7	-	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	<26	37	-	<26	<26	<26	<26	<26	<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ⁺	<0.1 ⁺	<0.1 ⁺	<0.1 ⁺	-	<0.1 ⁺	<0.1 ⁺	<0.1 ⁺	<0.1 ⁺	<0.1 ⁺	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	-	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	<7	-	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	<7	<7	-	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	<7	<7	-	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	<26	<26	-	<26	<26	<26	<26	<26	<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	<52	<52	-	<52	<52	<52	<52	<52	<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5 ^{SV}	<5	<5 ^{SV}	-	<5	<5	-	<5	-	<5	ug/kg	TM36/PM12
Benzene #	<5	<5 ^{SV}	<5	<5 ^{SV}	-	<5	<5	-	<5	-	<5	ug/kg	TM36/PM12
Toluene #	<5	17 ^{SV}	43	<5 ^{SV}	-	<5	<5	-	<5	-	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5 ^{SV}	<5	<5 ^{SV}	-	<5	<5	-	<5	-	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5 ^{SV}	<5	<5 ^{SV}	-	<5	<5	-	<5	-	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5 ^{SV}	<5	<5 ^{SV}	-	<5	<5	-	<5	-	<5	ug/kg	TM36/PM12
PCB 28 #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-	-	-	-	-	<5	-	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	-	-	-	-	-	<35	-	<35	<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	13.1	12.0	11.2	9.5	-	13.1	22.2	21.1	33.6	26.3	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15939

Report : Solid

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

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15939

Report : Solid

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

EMT Sample No.	64-66												
Sample ID	LF-WS-2020												
Depth	0.20-1.20												
COC No / misc													
Containers	V J T												
Sample Date	08/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	11/10/2021												
Please see attached notes for all abbreviations and acronyms											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1										<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1										<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1										<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4										<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7										<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7										<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7										<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26										<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ⁺										<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4										<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7										<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	30										<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7										<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	30										<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52										<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	-										<5	ug/kg	TM36/PM12
Benzene #	-										<5	ug/kg	TM36/PM12
Toluene #	-										<5	ug/kg	TM36/PM12
Ethylbenzene #	-										<5	ug/kg	TM36/PM12
m/p-Xylene #	-										<5	ug/kg	TM36/PM12
o-Xylene #	-										<5	ug/kg	TM36/PM12
PCB 28 #	8										<5	ug/kg	TM17/PM8
PCB 52 #	<5										<5	ug/kg	TM17/PM8
PCB 101 #	<5										<5	ug/kg	TM17/PM8
PCB 118 #	<5										<5	ug/kg	TM17/PM8
PCB 138 #	7										<5	ug/kg	TM17/PM8
PCB 153 #	13										<5	ug/kg	TM17/PM8
PCB 180 #	12										<5	ug/kg	TM17/PM8
Total 7 PCBs #	40										<35	ug/kg	TM17/PM8
Phenol #	<0.01										<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	15.3										<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3										<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15939

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15939

SVOC Report : Solid

EMT Sample No.	52-54	61-63	64-66										
Sample ID	LF-WS-2018	LF-WS-2019	LF-WS-2020										
Depth	1.20-2.40	1.20-1.70	0.20-1.20										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	08/10/2021	08/10/2021	08/10/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	11/10/2021	11/10/2021	11/10/2021										
Please see attached notes for all abbreviations and acronyms											LOD/LOR	Units	
SVOC MS												Method No.	
Phenols													
2-Chlorophenol #	<10	<10	<10								<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10								<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10								<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10								<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10								<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10								<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10								<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10								<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10								<10	ug/kg	TM16/PM8
Phenol #	<10	<10	<10								<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10	<10	<10								<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	17	<10	27								<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100								<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100								<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	134								<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100								<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100								<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100	<100	<100								<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10								<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10	<10	<10								<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10								<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10								<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10								<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10								<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10								<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10	<10	<10								<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10								<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10								<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10								<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10								<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10								<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10								<10	ug/kg	TM16/PM8
Carbazole	<10	<10	13								<10	ug/kg	TM16/PM8
Dibenzofuran #	<10	<10	24								<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10								<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10	<10	<10								<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10								<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10								<10	ug/kg	TM16/PM8
Isophorone #	<10	<10	<10								<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10	<10	<10								<10	ug/kg	TM16/PM8
Nitrobenzene #	<10	<10	<10								<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	119	121	118								<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	114	112	121								<0	%	TM16/PM8

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/15939	1	LF-WS-2002	2.00-3.00	9	18/10/2021	General Description (Bulk Analysis)	Soil/Stones
					18/10/2021	Asbestos Fibres	NAD
					18/10/2021	Asbestos ACM	NAD
					18/10/2021	Asbestos Type	NAD
					18/10/2021	Asbestos Level Screen	NAD
21/15939	1	LF-WS-2002	3.00-3.90	12	18/10/2021	General Description (Bulk Analysis)	Soil/Stones
					18/10/2021	Asbestos Fibres	NAD
					18/10/2021	Asbestos ACM	NAD
					18/10/2021	Asbestos Type	NAD
					18/10/2021	Asbestos Level Screen	NAD
21/15939	1	LF-WS-2003	1.20-1.45	18	18/10/2021	General Description (Bulk Analysis)	Soil/Stones
					18/10/2021	Asbestos Fibres	NAD
					18/10/2021	Asbestos ACM	NAD
					18/10/2021	Asbestos Type	NAD
					18/10/2021	Asbestos Level Screen	NAD
21/15939	1	LF-WS-2004	1.50-1.60	27	18/10/2021	General Description (Bulk Analysis)	Soil/Stones
					18/10/2021	Asbestos Fibres	NAD
					18/10/2021	Asbestos ACM	NAD
					18/10/2021	Asbestos Type	NAD
					18/10/2021	Asbestos Level Screen	NAD
21/15939	1	LF-WS-2014	2.00-3.00	45	16/10/2021	General Description (Bulk Analysis)	soil
					16/10/2021	Asbestos Fibres	NAD
					16/10/2021	Asbestos ACM	NAD
					16/10/2021	Asbestos Type	NAD
					16/10/2021	Asbestos Level Screen	NAD
21/15939	1	LF-WS-2014	4.40-5.00	51	16/10/2021	General Description (Bulk Analysis)	soil
					16/10/2021	Asbestos Fibres	NAD
					16/10/2021	Asbestos ACM	NAD
					16/10/2021	Asbestos Type	NAD
					16/10/2021	Asbestos Level Screen	NAD
21/15939	1	LF-WS-2018	1.20-2.40	54	16/10/2021	General Description (Bulk Analysis)	soil
					16/10/2021	Asbestos Fibres	NAD
					16/10/2021	Asbestos ACM	NAD

[illegible]

Matrix : Solid

12 of 19

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas

Contact: Conor Finnerty

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15939

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15939

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/15939

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

EMT Job No: 21/15939

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 28th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15942 Batch 1
Location : Luas Finglas - TII
Date samples received : 11th October, 2021
Status : Final report
Issue : 1

Eight samples were received for analysis on 11th October, 2021 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15942

Report : Solid

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

EMT Sample No.	1-3	4-6	10-12	16	17-19	20-22					Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2005	LF-TP-2005	LF-TP-2005	LF-TP-2005	LF-CPRC-1012	LF-CPRC-1012							
Depth	0.50	1.00	3.00	0.20	0.50	1.00							
COC No / misc													
Containers	V J T	V J T	V J T	T	V J T	V J T							
Sample Date	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021							
Antimony	-	3	-	-	-	-					<1	mg/kg	TM30/PM15
Arsenic #	37.0	14.9	10.8	-	16.3	-					<0.5	mg/kg	TM30/PM15
Barium #	-	97	-	-	-	-					<1	mg/kg	TM30/PM15
Beryllium	0.7	-	0.8	-	1.3	-					<0.5	mg/kg	TM30/PM15
Cadmium #	1.0	5.3	1.9	-	2.7	-					<0.1	mg/kg	TM30/PM15
Chromium #	18.2	52.1	25.1	-	40.2	-					<0.5	mg/kg	TM30/PM15
Copper #	24	44	29	45	375 ^{AA}	-					<1	mg/kg	TM30/PM15
Lead #	52	66	20	-	95	-					<5	mg/kg	TM30/PM15
Magnesium	-	-	-	2991	-	-					<25	mg/kg	TM30/PM15
Manganese #	-	-	-	1114	-	-					<1	mg/kg	TM30/PM15
Mercury #	0.3	0.1	<0.1	-	0.1	-					<0.1	mg/kg	TM30/PM15
Molybdenum #	-	5.5	-	-	-	-					<0.1	mg/kg	TM30/PM15
Nickel #	26.7	53.3	39.7	-	50.5	-					<0.7	mg/kg	TM30/PM15
Phosphorus	-	-	-	1057	-	-					<10	mg/kg	TM30/PM15
Potassium	-	-	-	1638	-	-					<5	mg/kg	TM30/PM15
Selenium #	<1	1	<1	-	2	-					<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.0	-	0.4	-	2.5	-					<0.1	mg/kg	TM74/PM32
Zinc #	107	151	86	153	278	-					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	0.54	<0.04	-	<0.04	-					<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.14	<0.03	-	<0.03	-					<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.72	<0.05	-	<0.05	-					<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.82	<0.04	-	<0.04	-					<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.15	5.52	<0.03	-	0.14	-					<0.03	mg/kg	TM4/PM8
Anthracene #	0.06	2.53	<0.04	-	0.06	-					<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.30	9.57	<0.03	-	0.33	-					<0.03	mg/kg	TM4/PM8
Pyrene #	0.26	8.96	<0.03	-	0.32	-					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.21	4.64	<0.06	-	0.26	-					<0.06	mg/kg	TM4/PM8
Chrysene #	0.21	4.68	<0.02	-	0.25	-					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.41	8.98	<0.07	-	0.54	-					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.22	5.21	<0.04	-	0.29	-					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.15	2.77	<0.04	-	0.20	-					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.75	<0.04	-	<0.04	-					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.17	3.03	<0.04	-	0.22	-					<0.04	mg/kg	TM4/PM8
Coronene	<0.04	0.45	<0.04	-	<0.04	-					<0.04	mg/kg	TM4/PM8
PAH 6 Total #	-	29.56	-	-	-	-					<0.22	mg/kg	TM4/PM8
PAH 17 Total	2.14	59.31	<0.64	-	2.61	-					<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.30	6.47	<0.05	-	0.39	-					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.11	2.51	<0.02	-	0.15	-					<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	2	-	-	-	-					<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	90	99	96	-	92	-					<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	47	-	-	-	-					<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15942

Report : Solid

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

EMT Sample No.	1-3	4-6	10-12	16	17-19	20-22					Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2005	LF-TP-2005	LF-TP-2005	LF-TP-2005	LF-CPRC-1012	LF-CPRC-1012							
Depth	0.50	1.00	3.00	0.20	0.50	1.00							
COC No / misc													
Containers	V J T	V J T	V J T	T	V J T	V J T							
Sample Date	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021					LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	-	<0.1	-					<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	-	<0.1	-					<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	-	<0.1	-					<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	-	<0.2	-					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	-	<4	-					<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	-	<7	-					<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	26	47	<7	-	35	-					<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	<7	-	<7	-					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	26	47	<26	-	35	-					<26	mg/kg	TM5/PM8/PM16/PM12/PM10
>C6-C10 (HS_1D_AL)	-	<0.1	-	-	-	-					<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_1D_AL)	-	<10	-	-	-	-					<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_1D_AL)	-	34	-	-	-	-					<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	-	<0.1	-					<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	-	<0.1	-					<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	-	<0.1	-					<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	-	<0.2	-					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	8	<4	-	<4	-					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	15	76	<7	-	<7	-					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	63	246	<7	-	<7	-					<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	9	<7	-	<7	-					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	78	339	<26	-	<26	-					<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	104	386	<52	-	<52	-					<52	mg/kg	TM5/PM8/PM16/PM12/PM10
>EC6-EC10 (HS_1D_AR) #	-	<0.1	-	-	-	-					<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_1D_AR)	-	125	-	-	-	-					<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_1D_AR)	-	153	-	-	-	-					<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	-	<5	-					<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	-	<5	-					<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	-	<5	-					<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	-	<5	-					<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	-	<5	-					<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	-	<5	-					<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	-	-	-	-					<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	-	-	-	-					<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	-	-	-	-					<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	-	-	-	-					<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	-	-	-	-					<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	-	-	-	-					<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	-	-	-	-					<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	-	-	-	-					<35	ug/kg	TM17/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15942

Report : Solid

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

EMT Sample No.	1-3	4-6	10-12	16	17-19	20-22					Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2005	LF-TP-2005	LF-TP-2005	LF-TP-2005	LF-CPRC-1012	LF-CPRC-1012							
Depth	0.50	1.00	3.00	0.20	0.50	1.00							
COC No / misc													
Containers	V J T	V J T	V J T	T	V J T	V J T							
Sample Date	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021					LOD/LOR	Units	Method No.
Phenol [#]	<0.01	-	<0.01	-	<0.01	-					<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	14.0	18.3	12.4	-	13.4	-					<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	-	15.5	-	-	-	-					<0.1	%	PM4/PM0
Hexavalent Chromium [#]	<0.3	<0.3	<0.3	-	<0.3	-					<0.3	mg/kg	TM38/PM20
Sulphate as SO ₄ (2:1 Ext) [#]	0.0135	-	0.0393	-	<0.0015	0.0048					<0.0015	g/l	TM38/PM20
Chromium III	18.2	52.1	25.1	-	40.2	-					<0.5	mg/kg	NONE/NONE
Total Cyanide [#]	<0.5	-	<0.5	-	<0.5	-					<0.5	mg/kg	TM89/PM45
Total Organic Carbon [#]	-	2.29	-	-	-	-					<0.02	%	TM21/PM24
Organic Matter	1.4	-	0.6	6.2	4.1	-					<0.2	%	TM21/PM24
Acid Reserve	NDP	-	NDP	-	NDP	-					<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	-	NDP	-	NDP	-					<0.000	gNaOH/100g	TM160/PM110
pH [#]	8.51	-	8.55	7.74	8.26	8.06					<0.01	pH units	TM73/PM11
Sand (2.00-0.063 mm)*	-	-	-	14	-	-						% w/w	Subcontracted
Silt (0.063-0.002 mm)*	-	-	-	33	-	-						% w/w	Subcontracted
Clay (<0.002 mm)*	-	-	-	53	-	-						% w/w	Subcontracted
Mass of raw test portion	-	0.1075	-	-	-	-						kg	NONE/PM17
Mass of dried test portion	-	0.09	-	-	-	-						kg	NONE/PM17
Free Lime [*]	-	-	-	See attached	-	-					<1	%	Subcontracted

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15942

Report : CEN 10:1 1 Batch

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

EMT Sample No.	4-6												
Sample ID	LF-TP-2005												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	05/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	11/10/2021												
Please see attached notes for all abbreviations and acronyms													
											LOD/LOR	Units	Method No.
Dissolved Antimony #	<0.002										<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02										<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025										<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025										<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.010										<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.10										<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005										<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005										<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015										<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015										<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007										<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07										<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005										<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05										<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.014										<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.14										<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	0.003										<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	0.03										<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.003										<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	0.03										<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001										<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001										<0.0001	mg/kg	TM61/PM0
Phenol	<0.01										<0.01	mg/l	TM26/PM0
Phenol	<0.1										<0.1	mg/kg	TM26/PM0
Fluoride	0.3										<0.3	mg/l	TM173/PM0
Fluoride	3										<3	mg/kg	TM173/PM0
Sulphate as SO4 #	15.2										<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	152										<5	mg/kg	TM38/PM0
Chloride #	1.1										<0.3	mg/l	TM38/PM0
Chloride #	11										<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	5										<2	mg/l	TM60/PM0
Dissolved Organic Carbon	50										<20	mg/kg	TM60/PM0
pH	8.40										<0.01	pH units	TM73/PM0
Total Dissolved Solids #	120										<35	mg/l	TM20/PM0
Total Dissolved Solids #	1200										<350	mg/kg	TM20/PM0

Matrix : Solid

7 of 17

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15942

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15942

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes

EMT Job No: 21/15942

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ ⁺ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ ⁺ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes

EMT Job No: 21/15942

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes

EMT Job No: 21/15942

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
Subcontracted	See attached subcontractor report for accreditation status and provider.					AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 28th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15951 Batch 1
Location : Luas Finglas - TII
Date samples received : 11th October, 2021
Status : Final report
Issue : 1

Eighteen samples were received for analysis on 11th October, 2021 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15951

Report : Solid

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

EMT Sample No.	1-3	4-6	16-18	25	26-28	29-31	41-43	50			Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2001	LF-TP-2001	LF-TP-2002	LF-TP-2002	LF-TP-2003	LF-TP-2003	LF-TP-2004	LF-TP-2004					
Depth	0.50	1.00	1.00	0.20	0.50	1.00	1.00	0.20					
COC No / misc													
Containers	V J T	V J T	V J T	T	V J T	V J T	V J T	T					
Sample Date	07/10/2021	07/10/2021	07/10/2021	07/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021			LOD/LOR	Units	Method No.
Arsenic #	-	8.2	17.0	-	14.9	11.8	-	-			<0.5	mg/kg	TM30/PM15
Beryllium	-	0.7	0.7	-	1.5	0.8	-	-			<0.5	mg/kg	TM30/PM15
Cadmium #	-	1.9	1.5	-	2.6	2.5	-	-			<0.1	mg/kg	TM30/PM15
Chromium #	-	23.2	19.4	-	42.3	23.0	-	-			<0.5	mg/kg	TM30/PM15
Copper #	-	20	24	121	37	29	-	49			<1	mg/kg	TM30/PM15
Lead #	-	19	182	-	50	21	-	-			<5	mg/kg	TM30/PM15
Magnesium	-	-	-	3017	-	-	-	2483			<25	mg/kg	TM30/PM15
Manganese #	-	-	-	1581	-	-	-	842			<1	mg/kg	TM30/PM15
Mercury #	-	<0.1	<0.1	-	<0.1	<0.1	-	-			<0.1	mg/kg	TM30/PM15
Nickel #	-	30.3	32.7	-	52.4	48.3	-	-			<0.7	mg/kg	TM30/PM15
Phosphorus	-	-	-	-	-	-	-	1336			<10	mg/kg	TM30/PM15
Potassium	-	-	-	1828	-	-	-	2156			<5	mg/kg	TM30/PM15
Selenium #	-	<1	2	-	<1	<1	-	-			<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.5	0.2	-	1.9	0.4	-	-			<0.1	mg/kg	TM74/PM32
Zinc #	-	106	65	157	129	75	-	157			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	-			<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	-			<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	-	0.12	<0.03	<0.03	-			<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	-	0.07	<0.03	<0.03	-			<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	-	0.07	<0.03	<0.03	-			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	-	0.07	<0.06	<0.06	-			<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	-	0.06	<0.02	<0.02	-			<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	<0.07	<0.07	-	0.11	<0.07	<0.07	-			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	-	0.05	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	-			<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	-	<0.64	<0.64	<0.64	-			<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	-	0.08	<0.05	<0.05	-			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	-	0.03	<0.02	<0.02	-			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	95	96	-	93	89	95	-			<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	-	-	-	-	<30	-			<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15951

Report : Solid

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

EMT Sample No.	1-3	4-6	16-18	25	26-28	29-31	41-43	50			Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2001	LF-TP-2001	LF-TP-2002	LF-TP-2002	LF-TP-2003	LF-TP-2003	LF-TP-2004	LF-TP-2004					
Depth	0.50	1.00	1.00	0.20	0.50	1.00	1.00	0.20					
COC No / misc													
Containers	V J T	V J T	V J T	T	V J T	V J T	V J T	T					
Sample Date	07/10/2021	07/10/2021	07/10/2021	07/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021			LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1	<0.1	-	<0.1	<0.1	-	-			<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1	<0.1	-	<0.1	<0.1	-	-			<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	<0.1	<0.1	-	<0.1	<0.1	-	-			<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	<0.2	<0.2	-	<0.2	<0.2	-	-			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	<4	<4	-	<4	<4	-	-			<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	<7	<7	-	<7	<7	-	-			<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	<7	<7	-	<7	<7	-	-			<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	<7	<7	-	<7	<7	-	-			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26	<26	-	<26	<26	-	-			<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1	<0.1	-	<0.1	<0.1	-	-			<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1	<0.1	-	<0.1	<0.1	-	-			<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1	<0.1	-	<0.1	<0.1	-	-			<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2	<0.2	-	<0.2	<0.2	-	-			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	<4	<4	-	<4	<4	-	-			<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	<7	<7	-	<7	<7	-	-			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	<7	<7	-	<7	<7	-	-			<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	<7	<7	-	<7	<7	-	-			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26	<26	-	<26	<26	-	-			<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	-	<52	<52	-	<52	<52	-	-			<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5	-	<5	<5	<5	-			<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	-	<5	<5	<5	-			<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	-	<5	<5	<5	-			<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	-	<5	<5	<5	-			<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	-	<5	<5	<5	-			<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	-	<5	<5	<5	-			<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	-	-	-	-	<5	-			<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	-	-	-	-	<5	-			<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	-	-	-	-	<5	-			<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	-	-	-	-	<5	-			<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	-	-	-	-	<5	-			<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	-	-	-	-	<5	-			<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	-	-	-	-	<5	-			<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	-	-	-	-	<35	-			<35	ug/kg	TM17/PM8
Phenol #	-	<0.01	<0.01	-	<0.01	<0.01	-	-			<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	19.1	15.6	10.1	-	16.9	10.7	10.6	-			<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	<0.3	-	<0.3	<0.3	-	-			<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15951

Report : Solid

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

EMT Sample No.	1-3	4-6	16-18	25	26-28	29-31	41-43	50			Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-2001	LF-TP-2001	LF-TP-2002	LF-TP-2002	LF-TP-2003	LF-TP-2003	LF-TP-2004	LF-TP-2004					
Depth	0.50	1.00	1.00	0.20	0.50	1.00	1.00	0.20					
COC No / misc													
Containers	V J T	V J T	V J T	T	V J T	V J T	V J T	T					
Sample Date	07/10/2021	07/10/2021	07/10/2021	07/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021					
											LOD/LOR	Units	Method No.
Sulphate as SO ₄ (2:1 Ext) #	-	0.0100	0.0076	-	<0.0015	0.0051	-	-			<0.0015	g/l	TM38/PM20
Chromium III	-	23.2	19.4	-	42.3	23.0	-	-			<0.5	mg/kg	NONE/NONE
Total Cyanide #	-	<0.5	<0.5	-	<0.5	<0.5	-	-			<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	0.78	-	-	-	-	-	0.31	-			<0.02	%	TM21/PM24
Organic Matter	-	1.0	0.5	-	3.3	0.7	-	8.4			<0.2	%	TM21/PM24
Acid Reserve	-	NDP	NDP	-	NDP	NDP	-	-			<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	-	NDP	NDP	-	NDP	NDP	-	-			<0.000	gNaOH/100g	TM160/PM110
ANC at pH4	0.04	-	-	-	-	-	0.27	-			<0.03	mol/kg	TM77/PM0
ANC at pH7	NDP	-	-	-	-	-	0.03	-			<0.03	mol/kg	TM77/PM0
Loss on Ignition #	3.2	-	-	-	-	-	2.1	-			<1.0	%	TM22/PM0
pH #	8.27	8.35	8.71	7.29	8.22	8.64	8.59	7.73			<0.01	pH units	TM73/PM11
Sand (2.00-0.063 mm)*	-	-	-	21	-	-	-	13				% w/w	Subcontracted
Silt (0.063-0.002 mm)*	-	-	-	31	-	-	-	34				% w/w	Subcontracted
Clay (<0.002 mm)*	-	-	-	48	-	-	-	53				% w/w	Subcontracted
Free Lime *	-	-	-	See attached	-	-	-	See attached			<1	%	Subcontracted

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/15951

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

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.4
Particle Size <4mm =	>95%		
EMT Job No	21/15951	Landfill Waste Acceptance Criteria Limits	
Sample No	43		
Client Sample No	LF-TP-2004		
Depth/Other	1.00		
Sample Date	06/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.31	3	5
Loss on Ignition (%)	2.1	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.59	-	>6
ANC to pH 7 (mol/kg)	0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.27	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	<0.003	<0.03	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.007	0.07	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.004	0.04	4
Chloride	<0.3	<3	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	<0.5	<5	1000
Total Dissolved Solids	47	470	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	<2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	20.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	82.8
Particle Size <4mm =	>95%		
EMT Job No	21/15951	Landfill Waste Acceptance Criteria Limits	
Sample No	3		
Client Sample No	LF-TP-2001		
Depth/Other	0.50		
Sample Date	07/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.78	3	5
Loss on Ignition (%)	3.2	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.27	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.04	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.005	0.05	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.009	0.09	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.005	0.05	4
Chloride	<0.3	<3	800
Fluoride	0.4	4	10
Sulphate as SO ₄	<0.5	<5	1000
Total Dissolved Solids	68	680	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Note:

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

QF-PM 3.1.15 v10

Matrix : Solid

9 of 17

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15951

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15951

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/15951

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/15951

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/15951

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
Subcontracted	See attached subcontractor report for accreditation status and provider.					AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 18th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/15959 Batch 1
Location : Luas Finglas
Date samples received : 11th October, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 11th October, 2021 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15959

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

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

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15959

Report : Solid

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

EMT Sample No.	1-3												
Sample ID	LF-WS-1011												
Depth	0.50												
COC No / misc													
Containers	V J T												
Sample Date	07/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	11/10/2021												
Please see attached notes for all abbreviations and acronyms											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1										<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1										<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1										<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4										<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7										<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7										<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7										<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26										<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4										<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7										<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7										<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7										<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26										<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52										<52	mg/kg	TM5/PM8/PM16
MTBE #	<5										<5	ug/kg	TM36/PM12
Benzene #	<5										<5	ug/kg	TM36/PM12
Toluene #	<5										<5	ug/kg	TM36/PM12
Ethylbenzene #	<5										<5	ug/kg	TM36/PM12
m/p-Xylene #	<5										<5	ug/kg	TM36/PM12
o-Xylene #	<5										<5	ug/kg	TM36/PM12
Phenol #	<0.01										<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	21.5										<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3										<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	<0.0015										<0.0015	g/l	TM38/PM20
Chromium III	43.0										<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5										<0.5	mg/kg	TM89/PM45
Organic Matter	3.8										<0.2	%	TM21/PM24
Acid Reserve	NDP										<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP										<0.000	gNaOH/100g	TM160/PM110

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/15959

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Contact: Conor Finnerty

[illegible]

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NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/15959

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/15959

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 21/15959

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 22nd October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/16221 Batch 1
Location : Luas Finglas - TII
Date samples received : 14th October, 2021
Status : Final Report
Issue : 1

Five samples were received for analysis on 14th October, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Conor Finnerty
EMT Job No: 21/16221

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16221

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/16221

[illegible]

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 27th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/16271 Batch 1
Location : Luas Finglas-TII
Date samples received : 15th October, 2021
Status : Final Report
Issue : 1

Thirteen samples were received for analysis on 15th October, 2021 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/16271

Report : Solid

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

EMT Sample No.	7-9	10-12	13-15	16-18							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1017	LF-CPRC-1018	LF-CPRC-1018	LF-CPRC-1018									
Depth	1.70	2.00	3.00	4.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	28/09/2021	29/09/2021	29/09/2021	29/09/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	15/10/2021	15/10/2021	15/10/2021	15/10/2021							LOD/LOR	Units	Method No.
Arsenic #	7.2	-	15.1	13.3							<0.5	mg/kg	TM30/PM15
Beryllium	0.8	-	1.6	0.8							<0.5	mg/kg	TM30/PM15
Cadmium #	1.9	-	0.7	0.7							<0.1	mg/kg	TM30/PM15
Chromium #	31.0	-	18.9	23.6							<0.5	mg/kg	TM30/PM15
Copper #	16	-	34	22							<1	mg/kg	TM30/PM15
Lead #	17	-	22	21							<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Nickel #	43.4	-	51.3	34.8							<0.7	mg/kg	TM30/PM15
Selenium #	1	-	1	<1							<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.8	-	0.7	0.8							<0.1	mg/kg	TM74/PM32
Zinc #	72	-	107	68							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.31	0.09	<0.03							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.08	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.05	0.60	0.09	0.04							<0.03	mg/kg	TM4/PM8
Pyrene #	0.04	0.56	0.07	0.04							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.37	<0.06	<0.06							<0.06	mg/kg	TM4/PM8
Chrysene #	0.02	0.40	0.03	0.03							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	0.71	<0.07	<0.07							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.39	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	0.28	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.06	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.28	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Coronene	<0.04	0.05	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	4.09	<0.64	<0.64							<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.51	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.20	<0.02	<0.02							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	84	94	98							<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	<2	-	-	-							<2	ug/kg	TM15/PM10
Benzene #	<3	-	-	-							<3	ug/kg	TM15/PM10
Toluene #	<3	-	-	-							<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	-	-	-							<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	-	-	-							<5	ug/kg	TM15/PM10
o-Xylene #	<3	-	-	-							<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	86	-	-	-							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	73	-	-	-							<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	<30	-	-							<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/16271

Report : Solid

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

EMT Sample No.	7-9	10-12	13-15	16-18							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1017	LF-CPRC-1018	LF-CPRC-1018	LF-CPRC-1018									
Depth	1.70	2.00	3.00	4.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	28/09/2021	29/09/2021	29/09/2021	29/09/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	15/10/2021	15/10/2021	15/10/2021	15/10/2021							LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4	<4							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7	<7							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	<7	<7							<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	-	<7	<7							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	<26	<26							<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4	<4							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	<7	<7							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	<7	<7							<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	-	<7	<7							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-	<26	<26							<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	<52	-	<52	<52							<52	mg/kg	TM5/PM8/PM16
MTBE #	-	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
Benzene #	-	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
Toluene #	-	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
Ethylbenzene #	-	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
m/p-Xylene #	-	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
o-Xylene #	-	<5	<5 ^{SV}	<5 ^{SV}							<5	ug/kg	TM36/PM12
PCB 28 #	<5 ^{SV}	<5 ^{SV}	-	-							<5	ug/kg	TM17/PM8
PCB 52 #	<5 ^{SV}	<5 ^{SV}	-	-							<5	ug/kg	TM17/PM8
PCB 101 #	<5 ^{SV}	<5 ^{SV}	-	-							<5	ug/kg	TM17/PM8
PCB 118 #	<5 ^{SV}	<5 ^{SV}	-	-							<5	ug/kg	TM17/PM8
PCB 138 #	<5 ^{SV}	<5 ^{SV}	-	-							<5	ug/kg	TM17/PM8
PCB 153 #	<5 ^{SV}	<5 ^{SV}	-	-							<5	ug/kg	TM17/PM8
PCB 180 #	<5 ^{SV}	<5 ^{SV}	-	-							<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35 ^{SV}	<35 ^{SV}	-	-							<35	ug/kg	TM17/PM8
Phenol #	<0.01	-	<0.01	<0.01							<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	21.2	18.4	15.7	9.0							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3	<0.3							<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/16271

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/16271

SVOC Report : Solid

EMT Sample No.	7-9										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1017												
Depth	1.70												
COC No / misc													
Containers	V J T												
Sample Date	28/09/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	15/10/2021										LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Naphthalene	<10										<10	ug/kg	TM16/PM8
Acenaphthylene	<10										<10	ug/kg	TM16/PM8
Acenaphthene	<10										<10	ug/kg	TM16/PM8
Fluorene	<10										<10	ug/kg	TM16/PM8
Phenanthrene #	27										<10	ug/kg	TM16/PM8
Anthracene	<10										<10	ug/kg	TM16/PM8
Fluoranthene #	35										<10	ug/kg	TM16/PM8
Pyrene #	33										<10	ug/kg	TM16/PM8
Benzo(a)anthracene	46										<10	ug/kg	TM16/PM8
Chrysene	28										<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	44										<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10										<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10										<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10										<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10										<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	32										<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	12										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	22.5
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	81.6
Particle Size <4mm =	>95%		
EMT Job No	21/16271	Landfill Waste Acceptance Criteria Limits	
Sample No	12		
Client Sample No	LF-CPRC-1018		
Depth/Other	2.00		
Sample Date	29/09/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.94	3	5
Loss on Ignition (%)	2.6	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	4.09	100	-
pH (pH Units)	8.21	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.65	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.023	0.23	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.010	0.10	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.3	3	800
Fluoride	0.4	4	10
Sulphate as SO ₄	5.5	55	1000
Total Dissolved Solids	65	650	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	<2	<20	500

Note:

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

10 of 18

Matrix : Solid

Location: Luas Finglas-TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16271

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/16271

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/16271

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 21/16271

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes

EMT Job No: 21/16271

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 2nd November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/16289 Batch 1
Location : Luas Finglas
Date samples received : 15th October, 2021
Status : Final report
Issue : 1

Twelve samples were received for analysis on 15th October, 2021 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/16289

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19	20-22	23-25	29-31	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2003	LF-CPRC-2003	LF-WS-2010	LF-WS-2010	LF-CPRC-1014	LF-CPRC-1014	LF-TP-2009	LF-TP-2009	LF-TP-2009	LF-TP-2009			
Depth	0.50	1.00	0.50	1.00	0.50	1.00	0.20	0.50	1.00	3.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	T	V J T	V J T	V J T			
Sample Date	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021			
Antimony	-	-	-	-	-	2	-	-	-	-	<1	mg/kg	TM30/PM15
Arsenic #	-	-	11.2	-	10.1	11.0	-	-	11.0	13.8	<0.5	mg/kg	TM30/PM15
Barium #	-	-	-	-	-	81	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	1.0	-	0.8	-	-	-	0.8	1.0	<0.5	mg/kg	TM30/PM15
Cadmium #	-	-	2.2	-	2.0	2.0	-	-	2.0	2.1	<0.1	mg/kg	TM30/PM15
Chromium #	-	-	29.4	-	23.8	37.5	-	-	30.0	29.2	<0.5	mg/kg	TM30/PM15
Copper #	-	-	32	-	26	35	48	-	32	42	<1	mg/kg	TM30/PM15
Lead #	-	-	19	-	16	26	-	-	34	65	<5	mg/kg	TM30/PM15
Magnesium	-	-	-	-	-	-	3289	-	-	-	<25	mg/kg	TM30/PM15
Manganese #	-	-	-	-	-	-	1321	-	-	-	<1	mg/kg	TM30/PM15
Mercury #	-	-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	-	-	-	-	-	4.9	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #	-	-	45.5	-	37.8	41.3	-	-	33.8	42.6	<0.7	mg/kg	TM30/PM15
Phosphorus	-	-	-	-	-	-	847	-	-	-	<10	mg/kg	TM30/PM15
Potassium	-	-	-	-	-	-	1885	-	-	-	<5	mg/kg	TM30/PM15
Selenium #	-	-	<1	-	<1	1	-	-	<1	2	<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	-	0.6	-	0.3	-	-	-	0.7	1.7	<0.1	mg/kg	TM74/PM32
Zinc #	-	-	83	-	75	89	157	-	102	166	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.07	-	<0.03	<0.03	<0.03	<0.03	-	0.22	0.06	0.05	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	-	<0.04	<0.04	<0.04	<0.04	-	0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.24	-	<0.03	<0.03	<0.03	0.03	-	0.28	0.10	0.09	<0.03	mg/kg	TM4/PM8
Pyrene #	0.21	-	<0.03	<0.03	<0.03	0.03	-	0.24	0.10	0.08	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.16	-	<0.06	<0.06	<0.06	<0.06	-	0.17	0.11	0.07	<0.06	mg/kg	TM4/PM8
Chrysene #	0.16	-	<0.02	<0.02	<0.02	<0.02	-	0.18	0.08	0.06	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.30	-	<0.07	<0.07	<0.07	<0.07	-	0.28	0.16	0.12	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.12	-	<0.04	<0.04	<0.04	<0.04	-	0.13	0.07	0.06	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.12	-	<0.04	<0.04	<0.04	<0.04	-	0.10	0.06	0.05	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.10	-	<0.04	<0.04	<0.04	<0.04	-	0.10	0.06	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	-	-	-	-	-	<0.22	-	-	-	-	<0.22	mg/kg	TM4/PM8
PAH 17 Total	1.48	-	<0.64	<0.64	<0.64	<0.64	-	1.74	0.80	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.22	-	<0.05	<0.05	<0.05	<0.05	-	0.20	0.12	0.09	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.08	-	<0.02	<0.02	<0.02	<0.02	-	0.08	0.04	0.03	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	-	-	-	-	<1	-	-	-	-	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	100	-	103	100	102	99	-	101	103	85	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-	-	<2	-	-	-	-	-	<2	ug/kg	TM15/PM10

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/16289

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19	20-22	23-25	29-31	Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2003	LF-CPRC-2003	LF-WS-2010	LF-WS-2010	LF-CPRC-1014	LF-CPRC-1014	LF-TP-2009	LF-TP-2009	LF-TP-2009	LF-TP-2009			
Depth	0.50	1.00	0.50	1.00	0.50	1.00	0.20	0.50	1.00	3.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	T	V J T	V J T	V J T			
Sample Date	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	LOD/LOR	Units	Method No.
Benzene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-	-	7	-	-	-	-	-	<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	97	-	-	-	-	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	92	-	-	-	-	-	<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	-	<30	-	<30	-	<30	-	-	<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	-	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	-	<4	-	<4	<4	-	-	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	-	<7	-	<7	<7	-	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	-	<7	-	<7	<7	-	-	<7	12	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	-	<7	-	<7	<7	-	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	-	<26	-	<26	<26	-	-	<26	<26	<26	mg/kg	TM5/PM8/PM16
>C6-C10 (HS_1D_AL)	-	-	-	-	-	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_1D_AL)	-	-	-	-	-	<10	-	-	-	-	<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_1D_AL)	-	-	-	-	-	<10	-	-	-	-	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	-	<0.1*	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	-	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	-	<4	-	<4	<4	-	-	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	-	<7	-	<7	<7	-	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	-	<7	-	<7	<7	-	-	<7	163	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	-	<7	-	<7	<7	-	-	<7	53	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	-	<26	-	<26	<26	-	-	<26	216	<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	-	-	<52	-	<52	<52	-	-	<52	216	<52	mg/kg	TM5/PM8/PM16
>EC6-EC10 (HS_1D_AR) #	-	-	-	-	-	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_1D_AR)	-	-	-	-	-	<10	-	-	-	-	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_1D_AR)	-	-	-	-	-	<10	-	-	-	-	<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	-	<5	<5	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	-	<5	<5	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	-	<5	<5	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	<5	<5	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	<5	<5	-	<5	-	<5	<5	<5	<5	ug/kg	TM36/PM12

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/16289

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

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/16289

SVOC Report : Solid

EMT Sample No.	13-15										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1014												
Depth	0.50												
COC No / misc													
Containers	V J T												
Sample Date	13/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	15/10/2021												
											LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Naphthalene	<10										<10	ug/kg	TM16/PM8
Acenaphthylene	<10										<10	ug/kg	TM16/PM8
Acenaphthene	<10										<10	ug/kg	TM16/PM8
Fluorene	<10										<10	ug/kg	TM16/PM8
Phenanthrene #	<10										<10	ug/kg	TM16/PM8
Anthracene	<10										<10	ug/kg	TM16/PM8
Fluoranthene #	11										<10	ug/kg	TM16/PM8
Pyrene #	<10										<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10										<10	ug/kg	TM16/PM8
Chrysene	<10										<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10										<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10										<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10										<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10										<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10										<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10										<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/16289

VOC Report : Solid

EMT Sample No.	13-15												
Sample ID	LF-CPRC-1014												
Depth	0.50												
COC No / misc													
Containers	V J T												
Sample Date	13/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	15/10/2021												
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7										<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	4										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
m/p-Xylene #	7										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	97										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	92										<0	%	TM15/PM10

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	14.2		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	87.6		
Particle Size <4mm =	>95%				
EMT Job No	21/16289		Landfill Waste Acceptance Criteria Limits		
Sample No	3				
Client Sample No	LF-CPRC-2003		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	0.50				
Sample Date	13/10/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	1.03					3	5	6
Loss on Ignition (%)	4.0		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30		500	-	-
PAH Sum of 17(mg/kg)	1.48		100	-	-
pH (pH Units)	8.37		-	>6	-
ANC to pH 7 (mol/kg)	<0.03		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.08		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
	mg/l	mg/kg			
	Arsenic	<0.0025	<0.025	0.5	2	25
Barium	0.015	0.15	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	0.0024	0.024	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.007	0.07	0.5	10	30
Nickel	0.003	0.03	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.008	0.08	4	50	200
Chloride	0.5	5	800	15000	25000
Fluoride	0.5	5	10	150	500
Sulphate as SO4	1.4	14	1000	20000	50000
Total Dissolved Solids	109	1090	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	5	50	500	800	1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.2
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.9
Particle Size <4mm =	>95%		
EMT Job No	21/16289	Landfill Waste Acceptance Criteria Limits	
Sample No	12		
Client Sample No	LF-WS-2010		
Depth/Other	1.00		
Sample Date	13/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.33	3	5
Loss on Ignition (%)	1.8	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.69	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.14	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.004	0.04	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.008	0.08	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	0.3	3	10
Sulphate as SO ₄	0.5	5	1000
Total Dissolved Solids	60	600	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	<2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.7					
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.5					
Particle Size <4mm =	>95%							
EMT Job No	21/16289		Landfill Waste Acceptance Criteria Limits					
Sample No	22							
Client Sample No	LF-TP-2009							
Depth/Other	0.50							
Sample Date	13/10/2021							
Batch No	1							
Solid Waste Analysis			Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill			
Total Organic Carbon (%)	1.18					3	5	6
Loss on Ignition (%)	4.2					-	-	10
Sum of BTEX (mg/kg)	<0.025					6	-	-
Sum of 7 PCBs (mg/kg)	<0.035					1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30					500	-	-
PAH Sum of 17(mg/kg)	1.74					100	-	-
pH (pH Units)	8.30					-	>6	-
ANC to pH 7 (mol/kg)	NDP					-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.14					-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg					
	C ₁₀	A ₁₀						
	mg/l	mg/kg						
	Arsenic	<0.0025	<0.025	0.5	2	25		
Barium	0.006	0.06	20	100	300			
Cadmium	<0.0005	<0.005	0.04	1	5			
Chromium	<0.0015	<0.015	0.5	10	70			
Copper	<0.007	<0.07	2	50	100			
Mercury	<0.001	<0.01	0.01	0.2	2			
Molybdenum	0.006	0.06	0.5	10	30			
Nickel	<0.002	<0.02	0.4	10	40			
Lead	<0.005	<0.05	0.5	10	50			
Antimony	0.002	<0.02	0.06	0.7	5			
Selenium	<0.003	<0.03	0.1	0.5	7			
Zinc	0.005	0.05	4	50	200			
Chloride	<0.3	<3	800	15000	25000			
Fluoride	0.4	4	10	150	500			
Sulphate as SO4	0.7	7	1000	20000	50000			
Total Dissolved Solids	88	880	4000	60000	100000			
Phenol	<0.01	<0.1	1	-	-			
Dissolved Organic Carbon	2	<20	500	800	1000			

Matrix : Solid

13 of 24

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

15 of 24

Matrix : Solid

Location: Luas Finglas

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16289

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/16289

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes

EMT Job No: 21/16289

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes

EMT Job No: 21/16289

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

EMT Job No: 21/16289

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

EMT Job No: 21/16289

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
Subcontracted	See attached subcontractor report for accreditation status and provider.					AD	Yes
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 1st November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/16557 Batch 1
Location : Luas Finglas - TII
Date samples received : 20th October, 2021
Status : Final Report
Issue : 1

Eight samples were received for analysis on 20th October, 2021 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16557

Report : Solid

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

EMT Sample No.	1-3	7-9	10-12	13-15	16-18						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2003	LF-CPRC-1014	LF-CPRC-1014	LF-CPRC-1014	LF-CPRC-1014								
Depth	2.00	2.00	3.00	4.00	5.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	13/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	20/10/2021	20/10/2021	20/10/2021	20/10/2021	20/10/2021						LOD/LOR	Units	Method No.
Arsenic #	8.7	13.6	-	9.9	9.8						<0.5	mg/kg	TM30/PM15
Beryllium	0.7	0.9	-	0.8	0.7						<0.5	mg/kg	TM30/PM15
Cadmium #	1.5	1.2	-	1.4	1.0						<0.1	mg/kg	TM30/PM15
Chromium #	19.3	51.4	-	30.5	15.8						<0.5	mg/kg	TM30/PM15
Copper #	24	39	-	24	20						<1	mg/kg	TM30/PM15
Lead #	13	47	-	40	17						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Nickel #	30.3	42.1	-	28.0	34.3						<0.7	mg/kg	TM30/PM15
Selenium #	2	1	-	1	2						<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.3	1.1	-	1.3	0.5						<0.1	mg/kg	TM74/PM32
Zinc #	68	105	-	87	77						<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	0.06	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.09	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.15	0.06	0.05	<0.03						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.13	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	0.35	0.07	0.15	<0.03						<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.34	0.07	0.13	<0.03						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.24	<0.06	0.12	<0.06						<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.29	0.03	0.10	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	0.75	0.09	0.23	<0.07						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.40	0.05	0.11	<0.04						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	0.52	0.05	0.10	<0.04						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.09	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.57	0.05	0.11	<0.04						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	0.11	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	4.09	<0.64	1.10	<0.64						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.54	0.06	0.17	<0.05						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.21	0.03	0.06	<0.02						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	79	92	92	92	93						<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	<30	-	-						<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16557

Report : Solid

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

EMT Sample No.	1-3	7-9	10-12	13-15	16-18						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2003	LF-CPRC-1014	LF-CPRC-1014	LF-CPRC-1014	LF-CPRC-1014								
Depth	2.00	2.00	3.00	4.00	5.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	13/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	20/10/2021	20/10/2021	20/10/2021	20/10/2021	20/10/2021						LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	-	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	-	<26	<26						<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	-	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	-	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	91	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	-	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	91	-	<26	<26						<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	91	-	<52	<52						<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Toluene #	<5	6	<5	<5	<5						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	<5	-	-						<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	<5	-	-						<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	<5	-	-						<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	<5	-	-						<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	<5	-	-						<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	<5	-	-						<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	<5	-	-						<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	<35	-	-						<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	-	<0.01	<0.01						<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	15.5	25.7	16.1	22.5	13.9						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-	<0.3	<0.3						<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16557

Report: Solid

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

[illegible]

Client Name:	Ground Investigations Ireland
Reference:	10892-07-21
Location:	Luas Finglas - TII
Contact:	Stephen Kealy
EMT Job No:	21/16557

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

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16557

SVOC Report : Solid

EMT Sample No.	7-9										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1014												
Depth	2.00												
COC No / misc													
Containers	V J T												
Sample Date	14/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	20/10/2021										LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Naphthalene	<10										<10	ug/kg	TM16/PM8
Acenaphthylene	<10										<10	ug/kg	TM16/PM8
Acenaphthene	<10										<10	ug/kg	TM16/PM8
Fluorene	<10										<10	ug/kg	TM16/PM8
Phenanthrene #	54										<10	ug/kg	TM16/PM8
Anthracene	15										<10	ug/kg	TM16/PM8
Fluoranthene #	94										<10	ug/kg	TM16/PM8
Pyrene #	109										<10	ug/kg	TM16/PM8
Benzo(a)anthracene	118										<10	ug/kg	TM16/PM8
Chrysene	106										<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	187										<10	ug/kg	TM16/PM8
Benzo(a)pyrene	99										<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	47										<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	15										<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	65										<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	135										<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	52										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16557

SVOC Report : Solid

EMT Sample No.	7-9										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1014												
Depth	2.00												
COC No / misc													
Containers	V J T												
Sample Date	14/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	20/10/2021										LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10										<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
2-Nitroaniline	<10										<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
3-Nitroaniline	<10										<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10										<10	ug/kg	TM16/PM8
4-Chloroaniline	<10										<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10										<10	ug/kg	TM16/PM8
4-Nitroaniline	<10										<10	ug/kg	TM16/PM8
Azobenzene	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10										<10	ug/kg	TM16/PM8
Carbazole	<10										<10	ug/kg	TM16/PM8
Dibenzofuran #	<10										<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10										<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10										<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10										<10	ug/kg	TM16/PM8
Hexachloroethane	<10										<10	ug/kg	TM16/PM8
Isophorone #	<10										<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10										<10	ug/kg	TM16/PM8
Nitrobenzene #	<10										<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	110										<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	115										<0	%	TM16/PM8

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16557

VOC Report : Solid

EMT Sample No.	7-9												
Sample ID	LF-CPRC-1014												
Depth	2.00												
COC No / misc													
Containers	V J T												
Sample Date	14/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	20/10/2021												
											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7										<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	6										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
m/p-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	91										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	80										<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	24.3
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	80.5
Particle Size <4mm =	>95%		
EMT Job No	21/16557	Landfill Waste Acceptance Criteria Limits	
Sample No	12		
Client Sample No	LF-CPRC-1014		
Depth/Other	3.00		
Sample Date	14/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.46	3	5
Loss on Ignition (%)	4.4	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	7.85	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	1.41	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.044	0.44	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.021	0.21	0.5
Nickel	0.004	0.04	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.004	0.04	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	1.2	12	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	15.8	158	1000
Total Dissolved Solids	143	1430	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	6	60	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/16557	1	LF-CPRC-2003	2.00	3	26/10/2021	General Description (Bulk Analysis)	soil/stones
					26/10/2021	Asbestos Fibres	NAD
					26/10/2021	Asbestos ACM	NAD
					26/10/2021	Asbestos Type	NAD
					26/10/2021	Asbestos Level Screen	NAD
21/16557	1	LF-CPRC-1014	2.00	9	26/10/2021	General Description (Bulk Analysis)	Soil/Stones
					26/10/2021	Asbestos Fibres	NAD
					26/10/2021	Asbestos ACM	NAD
					26/10/2021	Asbestos Type	NAD
					26/10/2021	Asbestos Level Screen	NAD
21/16557	1	LF-CPRC-1014	4.00	15	26/10/2021	General Description (Bulk Analysis)	Soil/Stones
					26/10/2021	Asbestos Fibres	NAD
					26/10/2021	Asbestos ACM	NAD
					26/10/2021	Asbestos Type	NAD
					26/10/2021	Asbestos Level Screen	NAD
21/16557	1	LF-CPRC-1014	5.00	18	26/10/2021	General Description (Bulk Analysis)	soil/stones
					26/10/2021	Asbestos Fibres	NAD
					26/10/2021	Asbestos ACM	NAD
					26/10/2021	Asbestos Type	NAD
					26/10/2021	Asbestos Level Screen	NAD

Matrix : Solid

11 of 19

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16557

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/16557

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/16557

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 21/16557

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes

EMT Job No: 21/16557

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 28th October, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/16567 Batch 1
Location : Luas Finglas - TII
Date samples received : 20th October, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 20th October, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16567

Report : Solid

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

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16567

Report : Solid

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

EMT Sample No.	1-3	4-6									Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2010	LF-CPRC-2010											
Depth	0.50	1.00											
COC No / misc													
Containers	V J T	V J T											
Sample Date	18/10/2021	18/10/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	20/10/2021	20/10/2021									LOD/LOR	Units	Method No.
PAH MS													
Naphthalene #	0.07	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.05	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.06	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	0.05	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.86	<0.03									<0.03	mg/kg	TM4/PM8
Anthracene #	0.15	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	1.37	<0.03									<0.03	mg/kg	TM4/PM8
Pyrene #	1.28	<0.03									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.84	<0.06									<0.06	mg/kg	TM4/PM8
Chrysene #	0.88	<0.02									<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	1.34	<0.07									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.71	<0.04									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.51	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.12	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.52	<0.04									<0.04	mg/kg	TM4/PM8
Coronene	0.09	<0.04									<0.04	mg/kg	TM4/PM8
PAH 17 Total	8.90	<0.64									<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.96	<0.05									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.38	<0.02									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	94									<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26									<26	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16567

Report : Solid

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

EMT Sample No.	1-3	4-6									Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2010	LF-CPRC-2010											
Depth	0.50	1.00											
COC No / misc													
Containers	V J T	V J T											
Sample Date	18/10/2021	18/10/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	20/10/2021	20/10/2021									LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	24	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	59	<7									<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	83	<26									<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	83	<52									<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5									<5	ug/kg	TM36/PM12
Benzene #	<5	<5									<5	ug/kg	TM36/PM12
Toluene #	<5	<5									<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM36/PM12
PCB 28 #	-	<5									<5	ug/kg	TM17/PM8
PCB 52 #	-	<5									<5	ug/kg	TM17/PM8
PCB 101 #	-	<5									<5	ug/kg	TM17/PM8
PCB 118 #	-	<5									<5	ug/kg	TM17/PM8
PCB 138 #	-	<5									<5	ug/kg	TM17/PM8
PCB 153 #	-	<5									<5	ug/kg	TM17/PM8
PCB 180 #	-	<5									<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35									<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01									<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	18.4	10.0									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	0.0052									<0.0015	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)	0.0099	-									<0.0015	g/l	TM38/PM60
Chromium III	-	24.9									<0.5	mg/kg	NONE/NONE
Chromium III	27.2	-									<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Organic Matter	NDP	0.8									<0.2	%	TM21/PM24
Acid Reserve	NDP	NDP									<0.000	gNaOH/100g	TM160/PM110

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16567

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16567

SVOC Report : Solid

EMT Sample No.	4-6										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2010												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	18/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	20/10/2021										LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Naphthalene	<10										<10	ug/kg	TM16/PM8
Acenaphthylene	<10										<10	ug/kg	TM16/PM8
Acenaphthene	<10										<10	ug/kg	TM16/PM8
Fluorene	<10										<10	ug/kg	TM16/PM8
Phenanthrene #	<10										<10	ug/kg	TM16/PM8
Anthracene	<10										<10	ug/kg	TM16/PM8
Fluoranthene #	<10										<10	ug/kg	TM16/PM8
Pyrene #	<10										<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10										<10	ug/kg	TM16/PM8
Chrysene	<10										<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10										<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10										<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10										<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10										<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10										<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10										<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/16567

SVOC Report : Solid

EMT Sample No.	4-6											
Sample ID	LF-CPRC-2010											
Depth	1.00											
COC No / misc												
Containers	V J T											
Sample Date	18/10/2021											
Sample Type	Soil											
Batch Number	1											
Date of Receipt	20/10/2021											
Please see attached notes for all abbreviations and acronyms												
		LOD/LOR	Units	Method No.								
SVOC MS												
Other SVOCs												
1,2-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8								
1,2,4-Trichlorobenzene #	<10	<10	ug/kg	TM16/PM8								
1,3-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8								
1,4-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8								
2-Nitroaniline	<10	<10	ug/kg	TM16/PM8								
2,4-Dinitrotoluene	<10	<10	ug/kg	TM16/PM8								
2,6-Dinitrotoluene	<10	<10	ug/kg	TM16/PM8								
3-Nitroaniline	<10	<10	ug/kg	TM16/PM8								
4-Bromophenylphenylether #	<10	<10	ug/kg	TM16/PM8								
4-Chloroaniline	<10	<10	ug/kg	TM16/PM8								
4-Chlorophenylphenylether	<10	<10	ug/kg	TM16/PM8								
4-Nitroaniline	<10	<10	ug/kg	TM16/PM8								
Azobenzene	<10	<10	ug/kg	TM16/PM8								
Bis(2-chloroethoxy)methane	<10	<10	ug/kg	TM16/PM8								
Bis(2-chloroethyl)ether	<10	<10	ug/kg	TM16/PM8								
Carbazole	<10	<10	ug/kg	TM16/PM8								
Dibenzofuran #	<10	<10	ug/kg	TM16/PM8								
Hexachlorobenzene	<10	<10	ug/kg	TM16/PM8								
Hexachlorobutadiene #	<10	<10	ug/kg	TM16/PM8								
Hexachlorocyclopentadiene	<10	<10	ug/kg	TM16/PM8								
Hexachloroethane	<10	<10	ug/kg	TM16/PM8								
Isophorone #	<10	<10	ug/kg	TM16/PM8								
N-nitrosodi-n-propylamine #	<10	<10	ug/kg	TM16/PM8								
Nitrobenzene #	<10	<10	ug/kg	TM16/PM8								
Surrogate Recovery 2-Fluorobiphenyl	106	<0	%	TM16/PM8								
Surrogate Recovery p-Terphenyl-d14	114	<0	%	TM16/PM8								

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16567

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/16567

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/16567

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/16567

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 5th November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/16735 Batch 1
Location : Luas Finglas-TII
Date samples received : 22nd October, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 22nd October, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/16735

Report : Solid

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

EMT Sample No.	1-4	7-9	10-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2010	LF-CPRC-2010	LF-CPRC-2010										
Depth	2.00	4.00	5.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	20/10/2021	20/10/2021	20/10/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	22/10/2021	22/10/2021	22/10/2021								LOD/LOR	Units	Method No.
Arsenic #	12.4	10.5	7.6								<0.5	mg/kg	TM30/PM15
Beryllium	0.9	0.9	0.5								<0.5	mg/kg	TM30/PM15
Cadmium #	1.4	1.6	0.8								<0.1	mg/kg	TM30/PM15
Chromium #	28.7	43.2	19.0								<0.5	mg/kg	TM30/PM15
Copper #	35	76	26								<1	mg/kg	TM30/PM15
Lead #	53	84	14								<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel #	34.1	38.8	38.0								<0.7	mg/kg	TM30/PM15
Selenium #	1	1	<1								<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.9	1.7	1.3								<0.1	mg/kg	TM74/PM32
Zinc #	94	158	74								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.12	0.22	0.06								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.27	0.28	0.08								<0.03	mg/kg	TM4/PM8
Pyrene #	0.22	0.22	0.06								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.15	0.14	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene #	0.15	0.14	0.03								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.22	0.22	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.12	0.10	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.09	0.08	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.09	0.08	<0.04								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 17 Total	1.43	1.48	<0.64								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.16	0.16	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.06	0.06	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	89	93	96								<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	91	150	-								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty
EMT Job No: 21/16735

Report : Solid

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

EMT Sample No.	1-4	7-9	10-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2010	LF-CPRC-2010	LF-CPRC-2010										
Depth	2.00	4.00	5.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	20/10/2021	20/10/2021	20/10/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	22/10/2021	22/10/2021	22/10/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	0.1	0.5	0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	5.8	2.1								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	9	14	9								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	21	38	17								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	61	92	25								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	91	150	53								<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	16	26	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	47	81	<7								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	63	107	<26								<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	154	257	53								<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5								<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5								<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	9	<5								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	36	7								<5	ug/kg	TM36/PM12
o-Xylene #	<5	20	<5								<5	ug/kg	TM36/PM12
PCB 28 #	<5	<5	-								<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	-								<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	-								<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	-								<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	-								<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	-								<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	-								<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	-								<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	<0.01								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	23.7	28.1	14.2								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20

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

5 of 17

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	24.9
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	80.1
Particle Size <4mm =	>95%		
EMT Job No	21/16735	Landfill Waste Acceptance Criteria Limits	
Sample No	4		
Client Sample No	LF-CPRC-2010		
Depth/Other	2.00		
Sample Date	20/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.25	3	5
Loss on Ignition (%)	6.0	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	91	500	-
PAH Sum of 17(mg/kg)	1.43	100	-
pH (pH Units)	8.12	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.86	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀	A ₁₀	
	mg/l	mg/kg	
			mg/kg
Arsenic	<0.0025	<0.025	0.5
Barium	0.057	0.57	2
Cadmium	<0.0005	<0.005	100
Chromium	<0.0015	<0.015	300
Copper	<0.007	<0.07	0.04
Mercury	<0.001	<0.01	1
Molybdenum	0.018	0.18	5
Nickel	0.004	0.04	0.5
Lead	<0.005	<0.05	10
Antimony	0.003	0.03	70
Selenium	<0.003	<0.03	2
Zinc	<0.003	<0.03	50
Chloride	2.4	24	0.01
Fluoride	<0.3	<3	0.2
Sulphate as SO ₄	7.4	74	2
Total Dissolved Solids	146	1461	0.5
Phenol	<0.01	<0.1	10
Dissolved Organic Carbon	6	60	15000
			25000
			500
			1000
			4000
			60000
			100000
			1
			-
			-
			500
			800
			1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	38.2
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	72.4
Particle Size <4mm =	>95%		
EMT Job No	21/16735	Landfill Waste Acceptance Criteria Limits	
Sample No	9		
Client Sample No	LF-CPRC-2010		
Depth/Other	4.00		
Sample Date	20/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.72	3	5
Loss on Ignition (%)	5.3	-	10
Sum of BTEX (mg/kg)	0.065	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	150	500	-
PAH Sum of 17(mg/kg)	1.48	100	-
pH (pH Units)	7.81	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	1.56	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀	A ₁₀	
	mg/l	mg/kg	
Arsenic	0.0043	0.043	0.5
Barium	0.058	0.58	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.040	0.40	0.5
Nickel	0.009	0.09	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.006	0.06	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	1.2	12	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	52.9	529	1000
Total Dissolved Solids	229	2291	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	6	60	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas-TII

Contact: Conor Finnerty

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16735

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/16735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/16735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/16735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/16735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Conor Finnerty
Date : 11th November, 2021
Your reference :
Our reference : Test Report 21/16879 Batch 1
Location : Luas Finglas
Date samples received : 26th October, 2021
Status : Final Report
Issue : 1

Six samples were received for analysis on 26th October, 2021 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference:
Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/16879

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1007	LF-WS-1007	LF-CPRC-1020	LF-CPRC-1020	LF-CPRC-1020								
Depth	0.50	1.00	0.50	1.00	2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	21/10/2021	21/10/2021	21/10/2021	21/10/2021	21/10/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021						LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1 ^{SV}	-	<0.1	-	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1 ^{SV}	-	<0.1	-	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL) #	<0.1 ^{SV}	-	<0.1	-	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2	-	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4	-	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	15	-	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	110	-	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	-	9	-	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	134	-	<26						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ^{SV}	-	<0.1	-	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1 ^{SV}	-	<0.1	-	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1 ^{SV}	-	<0.1	-	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2	-	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4	-	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	<7	-	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	82	-	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	-	<7	-	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-	82	-	<26						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	<52	-	216	-	<52						<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5 ^{SV}	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Benzene #	<5 ^{SV}	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Toluene #	<5 ^{SV}	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 ^{SV}	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 ^{SV}	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
o-Xylene #	<5 ^{SV}	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	-	<5	-						<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	-	<5	-						<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	-	<5	-						<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	-	<5	-						<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	-	<5	-						<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	-	<5	-						<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	-	<5	-						<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	-	<35	-						<35	ug/kg	TM17/PM8
Phenol #	<0.01	-	<0.01	-	<0.01						<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	7.5	9.8	8.3	17.1	25.0						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3	-	<0.3						<0.3	mg/kg	TM38/PM20

Element Materials Technology

Report : Solid

Location: Luas Finglas
Contact: Conor Finnerty
EMT Job No: 21/16879

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

Please see attached notes for all abbreviations and acronyms

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.8		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.5		
Particle Size <4mm =	>95%				
EMT Job No	21/16879		Landfill Waste Acceptance Criteria Limits		
Sample No	6				
Client Sample No	LF-WS-1007		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	1.00				
Sample Date	21/10/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	0.61		3	5	6
Loss on Ignition (%)	2.7		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30		500	-	-
PAH Sum of 17(mg/kg)	<0.64		100	-	-
pH (pH Units)	8.63		-	>6	-
ANC to pH 7 (mol/kg)	<0.03		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	1.59		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
	mg/l	mg/kg	mg/kg		
	Arsenic	<0.0025	<0.025	0.5	2	25
Barium	0.004	0.04	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.008	0.08	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.004	0.04	4	50	200
Chloride	0.4	4	800	15000	25000
Fluoride	0.4	4	10	150	500
Sulphate as SO4	1.8	18	1000	20000	50000
Total Dissolved Solids	63	630	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	2	<20	500	800	1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	16.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	85.6
Particle Size <4mm =	>95%		
EMT Job No	21/16879	Landfill Waste Acceptance Criteria Limits	
Sample No	12		
Client Sample No	LF-CPRC-1020		
Depth/Other	1.00		
Sample Date	21/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.21	3	5
Loss on Ignition (%)	3.3	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	37	500	-
PAH Sum of 17(mg/kg)	1.55	100	-
pH (pH Units)	8.33	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.93	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.013	0.13	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.007	0.07	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	0.3	3	10
Sulphate as SO ₄	2.3	23	1000
Total Dissolved Solids	81	810	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	2	20	500

Client Name: Ground Investigations Ireland
Reference:
Location: Luas Finglas
Contact: Conor Finnerty

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

Location: Luas Finglas

Contact: Conor Finnerty

[illegible]

Client Name: Ground Investigations Ireland

Reference:

Location: Luas Finglas

Contact: Conor Finnerty

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16879

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/16879

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/16879

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/16879

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/16879

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Stephen Kealy
Date : 18th November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/17239 Batch 1
Location : Luas Finglas - TII
Date samples received : 1st November, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 1st November, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17239

Report : Solid

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

EMT Sample No.	4-6	7-9	10-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1022	LF-CPRC-1022	LF-CPRC-1022										
Depth	1.00	2.00	3.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	18/10/2021	18/10/2021	18/10/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	01/11/2021	01/11/2021	01/11/2021								LOD/LOR	Units	Method No.
Arsenic #	-	10.8	13.6								<0.5	mg/kg	TM30/PM15
Beryllium	-	0.8	0.9								<0.5	mg/kg	TM30/PM15
Cadmium #	-	1.2	1.0								<0.1	mg/kg	TM30/PM15
Chromium #	-	27.5	23.0								<0.5	mg/kg	TM30/PM15
Copper #	-	30	29								<1	mg/kg	TM30/PM15
Lead #	-	30	32								<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel #	-	37.5	38.9								<0.7	mg/kg	TM30/PM15
Selenium #	-	1	2								<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.4	0.4								<0.1	mg/kg	TM74/PM32
Zinc #	-	85	97								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	95	98								<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	<30								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17239

Report : Solid

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

EMT Sample No.	4-6	7-9	10-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1022	LF-CPRC-1022	LF-CPRC-1022										
Depth	1.00	2.00	3.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	18/10/2021	18/10/2021	18/10/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	01/11/2021	01/11/2021	01/11/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL) #	-	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26	<26								<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26	<26								<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	<52	<52								<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	<5								<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	<35								<35	ug/kg	TM17/PM8
Phenol #	-	<0.01	<0.01								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	12.0	11.8	10.5								<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	<0.3								<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
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Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17239

Report : Solid

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

[illegible]

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

EMT Sample No.	4-6	10-12									Please see attached notes for all abbreviations and acronyms					
Sample ID	LF-CPRC-1022	LF-CPRC-1022														
Depth	1.00	3.00														
COC No / misc																
Containers	V J T	V J T														
Sample Date	18/10/2021	18/10/2021														
Sample Type	Soil	Soil														
Batch Number	1	1														
Date of Receipt	01/11/2021	01/11/2021														
Solid Waste Analysis																
Total Organic Carbon [#]	0.24	0.39									3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025 ^{SV}									6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs [#]	<0.035	<0.035									1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30									500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 17	<0.64	<0.64									100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Dry Matter Content Ratio	89.4	89.9									-	-	-	<0.1	%	NONE/PM4
ANC at pH4	0.31	1.42									-	-	-	<0.03	mol/kg	TM77/PM0
ANC at pH7	<0.03	<0.03									-	-	-	<0.03	mol/kg	TM77/PM0
pH [#]	8.86	8.75									-	-	-	<0.01	pH units	TM73/PM11

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.9					
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.4					
Particle Size <4mm =	>95%							
EMT Job No	21/17239		Landfill Waste Acceptance Criteria Limits					
Sample No	6							
Client Sample No	LF-CPRC-1022							
Depth/Other	1.00							
Sample Date	18/10/2021							
Batch No	1							
Solid Waste Analysis			Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill			
Total Organic Carbon (%)	0.24					3	5	6
Loss on Ignition (%)	1.1					-	-	10
Sum of BTEX (mg/kg)	<0.025					6	-	-
Sum of 7 PCBs (mg/kg)	<0.035					1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30					500	-	-
PAH Sum of 17(mg/kg)	<0.64					100	-	-
pH (pH Units)	8.86					-	>6	-
ANC to pH 7 (mol/kg)	<0.03					-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.31					-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg					
	C ₁₀	A ₁₀						
	mg/l	mg/kg						
Arsenic	<0.0025	<0.025	0.5	2	25			
Barium	<0.003	<0.03	20	100	300			
Cadmium	<0.0005	<0.005	0.04	1	5			
Chromium	<0.0015	<0.015	0.5	10	70			
Copper	<0.007	<0.07	2	50	100			
Mercury	<0.001	<0.01	0.01	0.2	2			
Molybdenum	0.009	0.09	0.5	10	30			
Nickel	<0.002	<0.02	0.4	10	40			
Lead	<0.005	<0.05	0.5	10	50			
Antimony	<0.002	<0.02	0.06	0.7	5			
Selenium	<0.003	<0.03	0.1	0.5	7			
Zinc	0.005	0.05	4	50	200			
Chloride	0.4	4	800	15000	25000			
Fluoride	<0.3	<3	10	150	500			
Sulphate as SO4	1.2	12	1000	20000	50000			
Total Dissolved Solids	46	460	4000	60000	100000			
Phenol	<0.01	<0.1	1	-	-			
Dissolved Organic Carbon	<2	<20	500	800	1000			

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.2
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.9
Particle Size <4mm =	>95%		
EMT Job No	21/17239	Landfill Waste Acceptance Criteria Limits	
Sample No	12		
Client Sample No	LF-CPRC-1022		
Depth/Other	3.00		
Sample Date	18/10/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.39	3	5
Loss on Ignition (%)	1.8	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.75	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	1.42	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.040	0.40	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	<0.002	<0.02	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	85.9	859	1000
Total Dissolved Solids	207	2070	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

9 of 17

Matrix : Solid

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/17239

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/17239

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/17239

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/17239

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/17239

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 12th November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/17240 Batch 1
Location : Luas Finglas - TII
Date samples received : 1st November, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 1st November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17240

Report : Solid

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

EMT Sample No.	1-3	4-6									Please see attached notes for all abbreviations and acronyms			
Sample ID	LF-CPRC-1021	LF-CPRC-1021												
Depth	0.40	1.20												
COC No / misc														
Containers	V J T	V J T												
Sample Date	15/10/2021	15/10/2021												
Sample Type	Soil	Soil												
Batch Number	1	1												
Date of Receipt	01/11/2021	01/11/2021									LOD/LOR	Units	Method No.	
TPH CWG														
Aliphatics														
>C5-C6 (HS_1D_AL) #	-	<0.1									<0.1	mg/kg	TM36/PM12	
>C6-C8 (HS_1D_AL) #	-	<0.1									<0.1	mg/kg	TM36/PM12	
>C8-C10 (HS_1D_AL)	-	<0.1									<0.1	mg/kg	TM36/PM12	
>C10-C12 (EH_CU_1D_AL) #	-	<0.2									<0.2	mg/kg	TM5/PM8/PM16	
>C12-C16 (EH_CU_1D_AL) #	-	<4									<4	mg/kg	TM5/PM8/PM16	
>C16-C21 (EH_CU_1D_AL) #	-	<7									<7	mg/kg	TM5/PM8/PM16	
>C21-C35 (EH_CU_1D_AL) #	-	<7									<7	mg/kg	TM5/PM8/PM16	
>C35-C40 (EH_1D_AL)	-	<7									<7	mg/kg	TM5/PM8/PM16	
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26									<26	mg/kg	TM5/PM8/PM16/PM12/PM10	
Aromatics														
>C5-EC7 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12	
>EC7-EC8 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12	
>EC8-EC10 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12	
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2									<0.2	mg/kg	TM5/PM8/PM16	
>EC12-EC16 (EH_CU_1D_AR) #	-	<4									<4	mg/kg	TM5/PM8/PM16	
>EC16-EC21 (EH_CU_1D_AR) #	-	<7									<7	mg/kg	TM5/PM8/PM16	
>EC21-EC35 (EH_CU_1D_AR) #	-	<7									<7	mg/kg	TM5/PM8/PM16	
>EC35-EC40 (EH_1D_AR)	-	<7									<7	mg/kg	TM5/PM8/PM16	
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26									<26	mg/kg	TM5/PM8/PM16/PM12/PM10	
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	<52									<52	mg/kg	TM5/PM8/PM16/PM12/PM10	
MTBE #	<5	<5									<5	ug/kg	TM36/PM12	
Benzene #	<5	<5									<5	ug/kg	TM36/PM12	
Toluene #	7	<5									<5	ug/kg	TM36/PM12	
Ethylbenzene #	<5	<5									<5	ug/kg	TM36/PM12	
m/p-Xylene #	<5	<5									<5	ug/kg	TM36/PM12	
o-Xylene #	<5	<5									<5	ug/kg	TM36/PM12	
PCB 28 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 52 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 101 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 118 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 138 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 153 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 180 #	<5	-									<5	ug/kg	TM17/PM8	
Total 7 PCBs #	<35	-									<35	ug/kg	TM17/PM8	
Phenol #	-	<0.01									<0.01	mg/kg	TM26/PM21E	
Natural Moisture Content	13.5	32.2									<0.1	%	PM4/PM0	
Hexavalent Chromium #	-	<0.3									<0.3	mg/kg	TM38/PM20	

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17240

Report : Solid

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

[illegible]

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

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	15.1		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.9		
Particle Size <4mm =	>95%				
EMT Job No	21/17240		Landfill Waste Acceptance Criteria Limits		
Sample No	3				
Client Sample No	LF-CPRC-1021		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	0.40				
Sample Date	15/10/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	0.58					3	5	6
Loss on Ignition (%)	2.0		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30		500	-	-
PAH Sum of 17(mg/kg)	<0.64		100	-	-
pH (pH Units)	8.46		-	>6	-
ANC to pH 7 (mol/kg)	NDP		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.52		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
		mg/l	mg/kg	mg/kg	
Arsenic	0.0026	0.026	0.5	2	25
Barium	0.013	0.13	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.006	0.06	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	0.3	<3	10	150	500
Sulphate as SO4	5.7	57	1000	20000	50000
Total Dissolved Solids	78	780	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	3	30	500	800	1000

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

8 of 16

Client Name: Ground Investigations Ireland **Matrix : Solid**

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/17240

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/17240

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/17240

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/17240

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/17240

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 12th November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/17241 Batch 1
Location : Luas Finglas- TII
Date samples received : 1st November, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 1st November, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy
EMT Job No: 21/17241

Report : Solid

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

EMT Sample No.	1-3	4-6	10										
Sample ID	LF-WS-1012	LF-WS-1013	LF-WS-1013										
Depth	1.20-1.70	1.20-1.90	2.80-3.00										
COC No / misc													
Containers	V J T	V J T	T										
Sample Date	20/10/2021	20/10/2021	20/10/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	01/11/2021	01/11/2021	01/11/2021										
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Arsenic #	13.1	8.8	6.8								<0.5	mg/kg	TM30/PM15
Beryllium	1.0	0.7	0.7								<0.5	mg/kg	TM30/PM15
Cadmium #	1.1	1.6	1.5								<0.1	mg/kg	TM30/PM15
Chromium #	30.7	20.2	26.0								<0.5	mg/kg	TM30/PM15
Copper #	19	29	21								<1	mg/kg	TM30/PM15
Lead #	16	16	15								<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel #	25.3	33.0	32.8								<0.7	mg/kg	TM30/PM15
Selenium #	<1	2	4								<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.3	0.4	0.2								<0.1	mg/kg	TM74/PM32
Zinc #	76	60	68								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	87	93	96								<0	%	TM4/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy
EMT Job No: 21/17241

Report : Solid

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

EMT Sample No.	1-3	4-6	10								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1012	LF-WS-1013	LF-WS-1013										
Depth	1.20-1.70	1.20-1.90	2.80-3.00										
COC No / misc													
Containers	V J T	V J T	T										
Sample Date	20/10/2021	20/10/2021	20/10/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	01/11/2021	01/11/2021	01/11/2021										
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	<26								<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	<26								<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	<52								<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5 ^{SV}								<5	ug/kg	TM36/PM12
Phenol #	<0.01	<0.01	<0.01								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	27.6	9.3	8.6								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0214	0.0130	0.0200								<0.0015	g/l	TM38/PM20
Chromium III	30.7	20.2	26.0								<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5								<0.5	mg/kg	TM89/PM45
Organic Matter	0.8	0.6	0.7								<0.2	%	TM21/PM24
Acid Reserve	NDP	NDP	NDP								<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	NDP	NDP								<0.000	gNaOH/100g	TM160/PM110

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy
EMT Job No: 21/17241

Report : Solid

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

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

6 of 12

Matrix : Solid

Reference: 10892-07-21

Location: Luas Finglas- TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/17241

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/17241

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 21/17241

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 15th November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/17339 Batch 1
Location : Luas Finglas-TII
Date samples received : 2nd November, 2021
Status : Final Report
Issue : 1

Six samples were received for analysis on 2nd November, 2021 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:



Bruce Leslie
Project Manager

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Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17339

Report : Solid

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

EMT Sample No.	1-3	4-6	10-12	13-15	16-18						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1007	LF-WS-1007	LF-WS-2010	LF-WS-2010	LF-WS-1010								
Depth	1.50	2.50	1.50	2.50	2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	21/10/2021	21/10/2021	21/10/2021	21/10/2021	26/10/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021								
Arsenic #	14.1	9.6	8.4	6.9	8.0						<0.5	mg/kg	TM30/PM15
Beryllium	1.3	0.8	0.7	0.8	1.0						<0.5	mg/kg	TM30/PM15
Cadmium #	2.6	1.3	1.9	1.5	1.4						<0.1	mg/kg	TM30/PM15
Chromium #	51.7	23.5	22.5	24.7	26.2						<0.5	mg/kg	TM30/PM15
Copper #	46	25	25	24	24						<1	mg/kg	TM30/PM15
Lead #	35	23	15	14	17						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Nickel #	71.1	40.0	38.1	33.7	42.0						<0.7	mg/kg	TM30/PM15
Selenium #	2	2	2	4	1						<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.8	0.3	0.4	0.4	0.4						<0.1	mg/kg	TM74/PM32
Zinc #	110	90	71	65	82						<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	0.05	<0.03						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06						<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	0.05	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	95	94	98	97						<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	<2	-	-	-	-						<2	ug/kg	TM15/PM10
Benzene #	<3	-	-	-	-						<3	ug/kg	TM15/PM10
Toluene #	<3	-	-	-	-						<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	-	-	-	-						<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	-	-	-	-						<5	ug/kg	TM15/PM10
o-Xylene #	<3	-	-	-	-						<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	92	-	-	-	-						<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	70	-	-	-	-						<0	%	TM15/PM10

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17339

Report : Solid

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

EMT Sample No.	1-3	4-6	10-12	13-15	16-18						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1007	LF-WS-1007	LF-WS-2010	LF-WS-2010	LF-WS-1010								
Depth	1.50	2.50	1.50	2.50	2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	21/10/2021	21/10/2021	21/10/2021	21/10/2021	26/10/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021						LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	2.9	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	9	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	11	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	<26	<26	<26						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	<26	<26	<26						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	<52	<52	<52	<52	<52						<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	-	<5	<5	78 ^{SV}	12						<5	ug/kg	TM36/PM12
Benzene #	-	<5	<5	<5 ^{SV}	<5						<5	ug/kg	TM36/PM12
Toluene #	-	<5	<5	<5 ^{SV}	21						<5	ug/kg	TM36/PM12
Ethylbenzene #	-	<5	<5	<5 ^{SV}	<5						<5	ug/kg	TM36/PM12
m/p-Xylene #	-	<5	<5	<5 ^{SV}	<5						<5	ug/kg	TM36/PM12
o-Xylene #	-	<5	<5	<5 ^{SV}	<5						<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	-	-	-						<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	-	-	-						<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	-	-	-						<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	-	-	-						<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	-	-	-						<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	-	-	-						<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	-	-	-						<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	-	-	-						<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	13.3	10.9	8.9	7.7	11.2						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17339

Report: Solid

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

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17339

SVOC Report : Solid

EMT Sample No.	1-3										Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1007												
Depth	1.50												
COC No / misc													
Containers	V J T												
Sample Date	21/10/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	02/11/2021												
											LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Naphthalene	<10										<10	ug/kg	TM16/PM8
Acenaphthylene	<10										<10	ug/kg	TM16/PM8
Acenaphthene	<10										<10	ug/kg	TM16/PM8
Fluorene	<10										<10	ug/kg	TM16/PM8
Phenanthrene #	<10										<10	ug/kg	TM16/PM8
Anthracene	<10										<10	ug/kg	TM16/PM8
Fluoranthene #	<10										<10	ug/kg	TM16/PM8
Pyrene #	<10										<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10										<10	ug/kg	TM16/PM8
Chrysene	<10										<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10										<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10										<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10										<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10										<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10										<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10										<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17339

SVOC Report : Solid

EMT Sample No.	1-3											
Sample ID	LF-WS-1007											
Depth	1.50											
COC No / misc												
Containers	V J T											
Sample Date	21/10/2021											
Sample Type	Soil											
Batch Number	1											
Date of Receipt	02/11/2021											
Please see attached notes for all abbreviations and acronyms												
		LOD/LOR	Units	Method No.								
SVOC MS												
Other SVOCs												
1,2-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8								
1,2,4-Trichlorobenzene #	<10	<10	ug/kg	TM16/PM8								
1,3-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8								
1,4-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8								
2-Nitroaniline	<10	<10	ug/kg	TM16/PM8								
2,4-Dinitrotoluene	<10	<10	ug/kg	TM16/PM8								
2,6-Dinitrotoluene	<10	<10	ug/kg	TM16/PM8								
3-Nitroaniline	<10	<10	ug/kg	TM16/PM8								
4-Bromophenylphenylether #	<10	<10	ug/kg	TM16/PM8								
4-Chloroaniline	<10	<10	ug/kg	TM16/PM8								
4-Chlorophenylphenylether	<10	<10	ug/kg	TM16/PM8								
4-Nitroaniline	<10	<10	ug/kg	TM16/PM8								
Azobenzene	<10	<10	ug/kg	TM16/PM8								
Bis(2-chloroethoxy)methane	<10	<10	ug/kg	TM16/PM8								
Bis(2-chloroethyl)ether	<10	<10	ug/kg	TM16/PM8								
Carbazole	<10	<10	ug/kg	TM16/PM8								
Dibenzofuran #	<10	<10	ug/kg	TM16/PM8								
Hexachlorobenzene	<10	<10	ug/kg	TM16/PM8								
Hexachlorobutadiene #	<10	<10	ug/kg	TM16/PM8								
Hexachlorocyclopentadiene	<10	<10	ug/kg	TM16/PM8								
Hexachloroethane	<10	<10	ug/kg	TM16/PM8								
Isophorone #	<10	<10	ug/kg	TM16/PM8								
N-nitrosodi-n-propylamine #	<10	<10	ug/kg	TM16/PM8								
Nitrobenzene #	<10	<10	ug/kg	TM16/PM8								
Surrogate Recovery 2-Fluorobiphenyl	114	<0	%	TM16/PM8								
Surrogate Recovery p-Terphenyl-d14	103	<0	%	TM16/PM8								

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy

Note:

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

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

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/17339	1	LF-WS-1007	1.50	3	08/11/2021	General Description (Bulk Analysis)	Soil/Stones
					08/11/2021	Asbestos Fibres	NAD
					08/11/2021	Asbestos ACM	NAD
					08/11/2021	Asbestos Type	NAD
					08/11/2021	Asbestos Level Screen	NAD
21/17339	1	LF-WS-1007	2.50	6	08/11/2021	General Description (Bulk Analysis)	soil/stone
					08/11/2021	Asbestos Fibres	NAD
					08/11/2021	Asbestos ACM	NAD
					08/11/2021	Asbestos Type	NAD
					08/11/2021	Asbestos Level Screen	NAD
21/17339	1	LF-WS-2010	1.50	12	08/11/2021	General Description (Bulk Analysis)	Soil/Stones
					08/11/2021	Asbestos Fibres	NAD
					08/11/2021	Asbestos ACM	NAD
					08/11/2021	Asbestos Type	NAD
					08/11/2021	Asbestos Level Screen	NAD
21/17339	1	LF-WS-2010	2.50	15	08/11/2021	General Description (Bulk Analysis)	Soil/Stones
					08/11/2021	Asbestos Fibres	NAD
					08/11/2021	Asbestos ACM	NAD
					08/11/2021	Asbestos Type	NAD
					08/11/2021	Asbestos Level Screen	NAD
21/17339	1	LF-WS-1010	2.00	18	08/11/2021	General Description (Bulk Analysis)	soil/stone
					08/11/2021	Asbestos Fibres	NAD
					08/11/2021	Asbestos ACM	NAD
					08/11/2021	Asbestos Type	NAD
					08/11/2021	Asbestos Level Screen	NAD

Matrix : Solid

9 of 16

Matrix : Solid

Location: Luas Finglas-TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/17339

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/17339

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 21/17339

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH ₄ + 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

EMT Job No: 21/17339

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 16th November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/17472 Batch 1
Location : Luas Finglas-TII
Date samples received : 4th November, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 4th November, 2021 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17472

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2011	LF-CPRC-2011	LF-CPRC-1006	LF-CPRC-1006									
Depth	0.50	1.00	0.50	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	01/11/2021	01/11/2021	01/11/2021	01/11/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	04/11/2021	04/11/2021	04/11/2021	04/11/2021									
Antimony	-	1	-	-							<1	mg/kg	TM30/PM15
Arsenic #	15.9	9.3	10.1	12.3							<0.5	mg/kg	TM30/PM15
Barium #	-	88	-	-							<1	mg/kg	TM30/PM15
Beryllium	0.6	<0.5	1.1	0.9							<0.5	mg/kg	TM30/PM15
Cadmium #	0.8	1.1	2.4	1.4							<0.1	mg/kg	TM30/PM15
Chromium #	55.0	23.1	26.1	24.9							<0.5	mg/kg	TM30/PM15
Copper #	38	11	25	28							<1	mg/kg	TM30/PM15
Lead #	151	16	29	43							<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Molybdenum #	-	2.5	-	-							<0.1	mg/kg	TM30/PM15
Nickel #	16.8	13.0	34.4	24.0							<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1							<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.8	0.6	0.9	1.2							<0.1	mg/kg	TM74/PM32
Zinc #	152	60	102	97							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	0.05							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.09	<0.03	0.05	0.43							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	0.10							<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.33	<0.03	0.09	0.68							<0.03	mg/kg	TM4/PM8
Pyrene #	0.34	<0.03	0.07	0.58							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.23	<0.06	<0.06	0.38							<0.06	mg/kg	TM4/PM8
Chrysene #	0.22	<0.02	0.05	0.42							<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.36	<0.07	<0.07	0.66							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.20	<0.04	<0.04	0.36							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.17	<0.04	<0.04	0.29							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	0.06							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.24	<0.04	<0.04	0.24							<0.04	mg/kg	TM4/PM8
Coronene	0.09	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
PAH 6 Total #	-	<0.22	-	-							<0.22	mg/kg	TM4/PM8
PAH 17 Total	2.27	<0.64	<0.64	4.25							<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.26	<0.05	<0.05	0.48							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.10	<0.02	<0.02	0.18							<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	<1	-	-							<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	88	82	95	95							<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	<30	<30	-							<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17472

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12							Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-2011	LF-CPRC-2011	LF-CPRC-1006	LF-CPRC-1006									
Depth	0.50	1.00	0.50	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	01/11/2021	01/11/2021	01/11/2021	01/11/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	04/11/2021	04/11/2021	04/11/2021	04/11/2021							LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	91	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	9	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	100	<26	<26	<26							<26	mg/kg	TM5/PM8/PM16/PM12/PM10
>C6-C10 (HS_1D_AL)	-	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_1D_AL)	-	<10	-	-							<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_1D_AL)	-	<10	-	-							<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	17							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	82	<7	<7	95							<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	17	<7	<7	18							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	99	<26	<26	130							<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	199	<52	<52	130							<52	mg/kg	TM5/PM8/PM16/PM12/PM10
>EC6-EC10 (HS_1D_AR) #	-	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_1D_AR)	-	<10	-	-							<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_1D_AR)	-	<10	-	-							<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	<5	-							<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	<5	-							<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	<5	-							<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	<5	-							<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	<5	-							<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	<5	-							<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	<5	-							<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	<35	-							<35	ug/kg	TM17/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/17472

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	7-9														
Sample ID	LF-CPRC-2011	LF-CPRC-1006														
Depth	1.00	0.50														
COC No / misc																
Containers	V J T	V J T														
Sample Date	01/11/2021	01/11/2021														
Sample Type	Soil	Soil														
Batch Number	1	1														
Date of Receipt	04/11/2021	04/11/2021														
											Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	0.49	0.66									3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025									6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035									1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30									500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	-									-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64									100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	-									0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.22	-									20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	0.013	-									0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	-									0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	-									2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	-									0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.15	-									0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	0.09	-									0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	-									0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	-									0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	-									0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	0.09	-									4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	740	-									4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	-									500	800	1000	<20	mg/kg	TM60/PM0
Dry Matter Content Ratio	91.8	81.2									-	-	-	<0.1	%	NONE/PM4
ANC at pH4	-	1.02									-	-	-	<0.03	mol/kg	TM77/PM0
ANC at pH7	-	NDP									-	-	-	<0.03	mol/kg	TM77/PM0
pH #	8.09	8.21									-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	-									1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	-									-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	30	-									1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	9	-									800	15000	25000	<3	mg/kg	TM38/PM0

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	23.2		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	81.2		
Particle Size <4mm =	>95%				
EMT Job No	21/17472		Landfill Waste Acceptance Criteria Limits		
Sample No	9				
Client Sample No	LF-CPRC-1006		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	0.50				
Sample Date	01/11/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	0.66					3	5	6
Loss on Ignition (%)	2.8		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30		500	-	-
PAH Sum of 17(mg/kg)	<0.64		100	-	-
pH (pH Units)	8.21		-	>6	-
ANC to pH 7 (mol/kg)	NDP		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	1.02		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
	mg/l	mg/kg			
Arsenic	<0.0025	<0.025	0.5	2	25
Barium	0.040	0.40	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.013	0.13	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	0.005	0.05	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.003	<0.03	4	50	200
Chloride	0.7	7	800	15000	25000
Fluoride	<0.3	<3	10	150	500
Sulphate as SO4	6.2	62	1000	20000	50000
Total Dissolved Solids	100	1000	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	5	50	500	800	1000

Matrix : Solid

8 of 18

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/17472	1	LF-CPRC-2011	0.50	3	05/11/2021	General Description (Bulk Analysis)	Soil/Stones
					05/11/2021	Asbestos Fibres	NAD
					05/11/2021	Asbestos ACM	NAD
					05/11/2021	Asbestos Type	NAD
					05/11/2021	Asbestos Level Screen	NAD
21/17472	1	LF-CPRC-2011	1.00	5	05/11/2021	General Description (Bulk Analysis)	Soil/Stones
					05/11/2021	Asbestos Fibres	NAD
					05/11/2021	Asbestos ACM	NAD
					05/11/2021	Asbestos Type	NAD
					05/11/2021	Asbestos Level Screen	NAD
21/17472	1	LF-CPRC-1006	0.50	9	05/11/2021	General Description (Bulk Analysis)	Soil/Stones
					05/11/2021	Asbestos Fibres	NAD
					05/11/2021	Asbestos ACM	NAD
					05/11/2021	Asbestos Type	NAD
					05/11/2021	Asbestos Level Screen	NAD
21/17472	1	LF-CPRC-1006	1.00	12	05/11/2021	General Description (Bulk Analysis)	Soil/Stones
					05/11/2021	Asbestos Fibres	NAD
					05/11/2021	Asbestos ACM	NAD
					05/11/2021	Asbestos Type	NAD
					05/11/2021	Asbestos Level Screen	NAD

Matrix : Solid

10 of 18

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas-TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/17472

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/17472

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes

EMT Job No: 21/17472

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/17472

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No

EMT Job No: 21/17472

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 17th November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/17688 Batch 1
Location : Luas Finglas - TII
Date samples received : 9th November, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 9th November, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17688

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8	9-12	13-16								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1022	LF-WS-1005	LF-WS-1005										
Depth	1.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	05/11/2021	05/11/2021	05/11/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	09/11/2021	09/11/2021	09/11/2021								LOD/LOR	Units	Method No.
Arsenic #	15.7	15.9	-								<0.5	mg/kg	TM30/PM15
Beryllium	0.9	1.2	-								<0.5	mg/kg	TM30/PM15
Cadmium #	1.5	3.7	-								<0.1	mg/kg	TM30/PM15
Chromium #	30.0	35.7	-								<0.5	mg/kg	TM30/PM15
Copper #	28	30	-								<1	mg/kg	TM30/PM15
Lead #	33	36	-								<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	-								<0.1	mg/kg	TM30/PM15
Nickel #	43.0	48.7	-								<0.7	mg/kg	TM30/PM15
Selenium #	1	1	-								<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.4	1.7	-								<0.1	mg/kg	TM74/PM32
Zinc #	110	124	-								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	0.06	<0.03								<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.06	<0.03								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.05	<0.02								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	93	76	89								<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	<30								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17688

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8	9-12	13-16								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1022	LF-WS-1005	LF-WS-1005										
Depth	1.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	05/11/2021	05/11/2021	05/11/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	09/11/2021	09/11/2021	09/11/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-								<0.2	mg/kg	TM5/PM8/PM12
>C12-C16 (EH_CU_1D_AL) #	<4	<4	-								<4	mg/kg	TM5/PM8/PM12
>C16-C21 (EH_CU_1D_AL) #	<7	<7	-								<7	mg/kg	TM5/PM8/PM12
>C21-C35 (EH_CU_1D_AL) #	<7	18	-								<7	mg/kg	TM5/PM8/PM12
>C35-C40 (EH_1D_AL)	<7	<7	-								<7	mg/kg	TM5/PM8/PM12
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26	-								<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-								<0.2	mg/kg	TM5/PM8/PM12
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	-								<4	mg/kg	TM5/PM8/PM12
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	-								<7	mg/kg	TM5/PM8/PM12
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	-								<7	mg/kg	TM5/PM8/PM12
>EC35-EC40 (EH_1D_AR)	<7	<7	-								<7	mg/kg	TM5/PM8/PM12
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	-								<26	mg/kg	TM5/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	-								<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5								<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5								<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5								<5	ug/kg	TM36/PM12
PCB 28 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 52 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 101 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 118 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5								<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	<35								<35	ug/kg	TM17/PM8
Phenol #	<0.01	<0.01	-								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	12.5	20.1	14.8								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-								<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/17688

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8	9-12	13-16								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1022	LF-WS-1005	LF-WS-1005										
Depth	1.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	05/11/2021	05/11/2021	05/11/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	09/11/2021	09/11/2021	09/11/2021										
										LOD/LOR	Units	Method No.	
Sulphate as SO4 (2:1 Ext) #	0.0245	0.0073	0.0055								<0.0015	g/l	TM38/PM20
Chromium III	30.0	35.7	-								<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	-								<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	-	-	0.47								<0.02	%	TM21/PM24
Organic Matter	0.4	3.3	-								<0.2	%	TM21/PM24
Acid Reserve	NDP	NDP	-								<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	NDP	-								<0.000	gNaOH/100g	TM160/PM110
ANC at pH4	-	-	1.05								<0.03	mol/kg	TM77/PM0
ANC at pH7	-	-	<0.03								<0.03	mol/kg	TM77/PM0
Loss on Ignition #	-	-	3.8								<1.0	%	TM22/PM0
pH #	8.58	8.25	8.34								<0.01	pH units	TM73/PM11

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

5 of 16

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	18.7		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	84.3		
Particle Size <4mm =	>95%				
EMT Job No	21/17688		Landfill Waste Acceptance Criteria Limits		
Sample No	15				
Client Sample No	LF-WS-1005		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	1.00				
Sample Date	05/11/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	0.47					3	5	6
Loss on Ignition (%)	3.8		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30		500	-	-
PAH Sum of 17(mg/kg)	<0.64		100	-	-
pH (pH Units)	8.34		-	>6	-
ANC to pH 7 (mol/kg)	<0.03		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	1.05		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
	mg/l	mg/kg			
	Arsenic	<0.0025	<0.025	0.5	2	25
Barium	<0.003	<0.03	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.006	0.06	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.003	<0.03	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	0.5	5	10	150	500
Sulphate as SO4	<0.5	<5	1000	20000	50000
Total Dissolved Solids	61	610	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	<2	<20	500	800	1000

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/17688

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/17688

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/17688

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/17688

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/17688

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 23rd November, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/18039 Batch 1
Location : Luas Finglas - TII
Date samples received : 15th November, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 15th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/18039

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms			
Sample ID	LF-CPRC-1003	LF-CPRC-1003												
Depth	0.50	1.00												
COC No / misc														
Containers	V J T	V J T												
Sample Date	09/11/2021	09/11/2021												
Sample Type	Soil	Soil												
Batch Number	1	1												
Date of Receipt	15/11/2021	15/11/2021									LOD/LOR	Units	Method No.	
TPH CWG														
Aliphatics														
>C5-C6 (HS_1D_AL) #	<0.1	-									<0.1	mg/kg	TM36/PM12	
>C6-C8 (HS_1D_AL) #	<0.1	-									<0.1	mg/kg	TM36/PM12	
>C8-C10 (HS_1D_AL)	<0.1	-									<0.1	mg/kg	TM36/PM12	
>C10-C12 (EH_CU_1D_AL) #	<0.2	-									<0.2	mg/kg	TM5/PM8/PM12	
>C12-C16 (EH_CU_1D_AL) #	<4	-									<4	mg/kg	TM5/PM8/PM12	
>C16-C21 (EH_CU_1D_AL) #	<7	-									<7	mg/kg	TM5/PM8/PM12	
>C21-C35 (EH_CU_1D_AL) #	<7	-									<7	mg/kg	TM5/PM8/PM12	
>C35-C40 (EH_1D_AL)	<7	-									<7	mg/kg	TM5/PM8/PM12	
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-									<26	mg/kg	TM5/TM36/PM8/PM12/PM16	
Aromatics														
>C5-EC7 (HS_1D_AR) #	<0.1	-									<0.1	mg/kg	TM36/PM12	
>EC7-EC8 (HS_1D_AR) #	<0.1	-									<0.1	mg/kg	TM36/PM12	
>EC8-EC10 (HS_1D_AR) #	<0.1	-									<0.1	mg/kg	TM36/PM12	
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-									<0.2	mg/kg	TM5/PM8/PM12	
>EC12-EC16 (EH_CU_1D_AR) #	<4	-									<4	mg/kg	TM5/PM8/PM12	
>EC16-EC21 (EH_CU_1D_AR) #	<7	-									<7	mg/kg	TM5/PM8/PM12	
>EC21-EC35 (EH_CU_1D_AR) #	<7	-									<7	mg/kg	TM5/PM8/PM12	
>EC35-EC40 (EH_1D_AR)	<7	-									<7	mg/kg	TM5/PM8/PM12	
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-									<26	mg/kg	TM5/TM36/PM8/PM12/PM16	
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	-									<52	mg/kg	TM5/TM36/PM8/PM12/PM16	
MTBE #	<5	-									<5	ug/kg	TM36/PM12	
Benzene #	<5	-									<5	ug/kg	TM36/PM12	
Toluene #	<5	-									<5	ug/kg	TM36/PM12	
Ethylbenzene #	<5	-									<5	ug/kg	TM36/PM12	
m/p-Xylene #	<5	-									<5	ug/kg	TM36/PM12	
o-Xylene #	<5	-									<5	ug/kg	TM36/PM12	
PCB 28 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 52 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 101 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 118 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 138 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 153 #	<5	-									<5	ug/kg	TM17/PM8	
PCB 180 #	<5	-									<5	ug/kg	TM17/PM8	
Total 7 PCBs #	<35	-									<35	ug/kg	TM17/PM8	
Phenol #	<0.01	-									<0.01	mg/kg	TM26/PM21B	
Natural Moisture Content	16.7	-									<0.1	%	PM4/PM0	
Hexavalent Chromium #	<0.3	-									<0.3	mg/kg	TM38/PM20	

Element Materials Technology

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EMT Job No: 21/18039

Report : Solid

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EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1003	LF-CPRC-1003											
Depth	0.50	1.00											
COC No / misc													
Containers	V J T	V J T											
Sample Date	09/11/2021	09/11/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	15/11/2021	15/11/2021									LOD/LOR	Units	Method No.
Sulphate as SO ₄ (2:1 Ext) #	0.0181	0.0167									<0.0015	g/l	TM38/PM20
Chromium III	27.9	-									<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	-									<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	1.39	-									<0.02	%	TM21/PM24
Organic Matter	2.4	-									<0.2	%	TM21/PM24
Acid Reserve	NDP	-									<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	-									<0.000	gNaOH/100g	TM160/PM110
ANC at pH4	0.71	-									<0.03	mol/kg	TM77/PM0
ANC at pH7	NDP	-									<0.03	mol/kg	TM77/PM0
Loss on Ignition #	4.0	-									<1.0	%	TM22/PM0
pH #	8.35	8.28									<0.01	pH units	TM73/PM11

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	15.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.4
Particle Size <4mm =	>95%		
EMT Job No	21/18039	Landfill Waste Acceptance Criteria Limits	
Sample No	3		
Client Sample No	LF-CPRC-1003		
Depth/Other	0.50		
Sample Date	09/11/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.39	3	5
Loss on Ignition (%)	4.0	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.35	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.71	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.019	0.19	2
Cadmium	<0.0005	<0.005	100
Chromium	<0.0015	<0.015	0.04
Copper	<0.007	<0.07	1
Mercury	<0.001	<0.01	0.5
Molybdenum	0.009	0.09	10
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	10
Antimony	<0.002	<0.02	0.5
Selenium	<0.003	<0.03	0.06
Zinc	0.011	0.11	0.7
Chloride	<0.3	<3	5
Fluoride	0.4	4	0.1
Sulphate as SO ₄	0.6	6	0.5
Total Dissolved Solids	74	740	4
Phenol	<0.01	<0.1	50
Dissolved Organic Carbon	4	40	800

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18039

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18039

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/18039

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/18039

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/18039

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 7th December, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/18229 Batch 1
Location : Luas Finglas-TII
Date samples received : 17th November, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 17th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/18229

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/18229

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms		
Sample ID	CP1034	CP1034											
Depth	2.00	3.00											
COC No / misc													
Containers	V J T	V J T											
Sample Date	12/11/2021	12/11/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	17/11/2021	17/11/2021									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-									<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	-									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	10	-									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	11	-									<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	-									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	-									<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	-									<5	ug/kg	TM36/PM12
Benzene #	<5	-									<5	ug/kg	TM36/PM12
Toluene #	<5	-									<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-									<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-									<5	ug/kg	TM36/PM12
o-Xylene #	<5	-									<5	ug/kg	TM36/PM12
Phenol #	<0.01	-									<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	14.0	-									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.1415	0.0425									<0.0015	g/l	TM38/PM20
Chromium III	19.6	-									<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	-									<0.5	mg/kg	TM89/PM45
Organic Matter	1.0	-									<0.2	%	TM21/PM24
Acid Reserve	NDP	-									<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP	-									<0.000	gNaOH/100g	TM160/PM110

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/18229

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Matrix : Solid

Reference: 10892-07-21

Location: Luas Finglas-TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18229

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18229

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 21/18229

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 6th December, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/18583 Batch 1
Location : Luas Finglas- TII
Date samples received : 23rd November, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 23rd November, 2021 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy
EMT Job No: 21/18583

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy
EMT Job No: 21/18583

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8												
Sample ID	LT-CPRC-1032												
Depth	3.00												
COC No / misc													
Containers	V J T												
Sample Date	18/11/2021												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	23/11/2021												
Please see attached notes for all abbreviations and acronyms											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1										<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1										<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1										<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4										<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7										<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7										<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7										<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26										<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1										<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4										<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7										<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7										<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7										<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26										<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52										<52	mg/kg	TM5/PM8/PM16
MTBE #	<5										<5	ug/kg	TM36/PM12
Benzene #	<5										<5	ug/kg	TM36/PM12
Toluene #	<5										<5	ug/kg	TM36/PM12
Ethylbenzene #	<5										<5	ug/kg	TM36/PM12
m/p-Xylene #	<5										<5	ug/kg	TM36/PM12
o-Xylene #	<5										<5	ug/kg	TM36/PM12
Phenol #	<0.01										<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	16.0										<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3										<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0765										<0.0015	g/l	TM38/PM20
Chromium III	32.3										<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5										<0.5	mg/kg	TM89/PM45
Organic Matter	1.1										<0.2	%	TM21/PM24
Acid Reserve	NDP										<0.000	gNaOH/100g	TM160/PM110
Alkali Reserve	NDP										<0.000	gNaOH/100g	TM160/PM110

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy
EMT Job No: 21/18583

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas- TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18583

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18583

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 21/18583

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 8th December, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/18720 Batch 1
Location : Luas Finglas-TII
Date samples received : 25th November, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 25th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/18720

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1031	LF-CPRC-1031											
Depth	2.00	2.60											
COC No / misc													
Containers	V J T	V J T											
Sample Date	19/11/2021	19/11/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	25/11/2021	25/11/2021									LOD/LOR	Units	Method No.
Arsenic #	-	10.5									<0.5	mg/kg	TM30/PM15
Beryllium	-	0.9									<0.5	mg/kg	TM30/PM15
Cadmium #	-	2.5									<0.1	mg/kg	TM30/PM15
Chromium #	-	25.4									<0.5	mg/kg	TM30/PM15
Copper #	-	38									<1	mg/kg	TM30/PM15
Lead #	-	17									<5	mg/kg	TM30/PM15
Mercury #	-	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	-	37.6									<0.7	mg/kg	TM30/PM15
Selenium #	-	<1									<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.4									<0.1	mg/kg	TM74/PM32
Zinc #	-	85									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.24	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.30	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.18	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	0.21	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	2.49	0.03									<0.03	mg/kg	TM4/PM8
Anthracene #	0.80	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	4.11	0.05									<0.03	mg/kg	TM4/PM8
Pyrene #	3.57	0.05									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	2.03	<0.06									<0.06	mg/kg	TM4/PM8
Chrysene #	2.19	0.03									<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	3.66	<0.07									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	2.02	<0.04									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	1.42	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.20	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.29	<0.04									<0.04	mg/kg	TM4/PM8
Coronene	0.25	<0.04									<0.04	mg/kg	TM4/PM8
PAH 17 Total	24.96	<0.64									<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	2.64	<0.05									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.02	<0.02									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	101	98									<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	131	-									<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/18720

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1031	LF-CPRC-1031											
Depth	2.00	2.60											
COC No / misc													
Containers	V J T	V J T											
Sample Date	19/11/2021	19/11/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	25/11/2021	25/11/2021									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	<7									<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26									<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2 ^{SV}									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	<4 ^{SV}									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26									<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	<52									<52	mg/kg	TM5/PM8/PM16
MTBE #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
Benzene #	23 ^{SV}	<5									<5	ug/kg	TM36/PM12
Toluene #	21 ^{SV}	<5									<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
m/p-Xylene #	16 ^{SV}	<5									<5	ug/kg	TM36/PM12
o-Xylene #	7 ^{SV}	<5									<5	ug/kg	TM36/PM12
PCB 28 #	<5	-									<5	ug/kg	TM17/PM8
PCB 52 #	<5	-									<5	ug/kg	TM17/PM8
PCB 101 #	<5	-									<5	ug/kg	TM17/PM8
PCB 118 #	<5	-									<5	ug/kg	TM17/PM8
PCB 138 #	<5	-									<5	ug/kg	TM17/PM8
PCB 153 #	<5	-									<5	ug/kg	TM17/PM8
PCB 180 #	<5	-									<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-									<35	ug/kg	TM17/PM8
Phenol #	-	<0.01									<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	14.8	15.0									<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3									<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy
EMT Job No: 21/18720

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8
Sample ID	LF-CPRC-1031	LF-CPRC-1031
Depth	2.00	2.60
COC No / misc		
Containers	V J T	V J T
Sample Date	19/11/2021	19/11/2021
Sample Type	Soil	Soil
Batch Number	1	1
Date of Receipt	25/11/2021	25/11/2021
Sulphate as SO ₄ (2:1 Ext) #	0.1982	0.0486
Chromium III	-	25.4
Total Cyanide *	-	<0.5
Total Organic Carbon #	4.06	-
Organic Matter	-	0.8
Acid Reserve	-	NDP
Alkali Reserve	-	NDP
pH #	7.87	8.41

Client Name:	Ground Investigations Ireland
Reference:	10892-07-21
Location:	Luas Finglas-TII
Contact:	Stephen Kealy
EMT Job No:	21/18720

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

QF-PM 3.1.14 v5

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas-TII
Contact: Stephen Kealy

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[illegible]

Matrix : Solid

[illegible]

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Reference: 10892-07-21

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NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18720

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18720

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/18720

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/18720

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 13th December, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/18938 Batch 1
Location : Luas Finglas - TII
Date samples received : 29th November, 2021
Status : Final Report
Issue : 1

Three samples were received for analysis on 29th November, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/18938

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-7	8-11								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1006	LF-WS-1006	LF-WS-2011										
Depth	0.50	1.20	0.50-1.00										
COC No / misc													
Containers	V J T	J T	V J T										
Sample Date	25/11/2021	25/11/2021	25/11/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	29/11/2021	29/11/2021	29/11/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1 ⁺	-	<0.1 ⁺								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1 ⁺	-	<0.1 ⁺								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 ⁺	-	<0.1 ⁺								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	<26								<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ⁺	-	<0.1 ⁺								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1 ⁺	-	<0.1 ⁺								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1 ⁺	-	<0.1 ⁺								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	19	-	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	155	-	<7								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	12	-	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	186	-	<26								<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	186	-	<52								<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #													
MTBE #	<5	-	<5								<5	ug/kg	TM36/PM12
Benzene #													
Benzene #	<5	-	<5								<5	ug/kg	TM36/PM12
Toluene #													
Toluene #	<5	-	<5								<5	ug/kg	TM36/PM12
Ethylbenzene #													
Ethylbenzene #	<5	-	<5								<5	ug/kg	TM36/PM12
m/p-Xylene #													
m/p-Xylene #	<5	-	<5								<5	ug/kg	TM36/PM12
o-Xylene #													
o-Xylene #	<5	-	<5								<5	ug/kg	TM36/PM12
PCB 28 #													
PCB 28 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 52 #													
PCB 52 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 101 #													
PCB 101 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 118 #													
PCB 118 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 138 #													
PCB 138 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 153 #													
PCB 153 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 180 #													
PCB 180 #	<5	-	<5								<5	ug/kg	TM17/PM8
Total 7 PCBs #													
Total 7 PCBs #	<35	-	<35								<35	ug/kg	TM17/PM8
Phenol #													
Phenol #	<0.01	-	<0.01								<0.01	mg/kg	TM26/PM21E
Natural Moisture Content													
Natural Moisture Content	12.9	-	9.2								<0.1	%	PM4/PM0
Hexavalent Chromium #													
Hexavalent Chromium #	<0.3	-	<0.3								<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/18938

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	15.2
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.8
Particle Size <4mm =	>95%		
EMT Job No	21/18938	Landfill Waste Acceptance Criteria Limits	
Sample No	4		
Client Sample No	LF-WS-1006		
Depth/Other	0.50		
Sample Date	25/11/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.08	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	9.09	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	0.0104	0.104	0.5
Barium	0.058	0.58	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.005	0.05	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.012	0.12	4
Chloride	0.7	7	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	5.1	51	1000
Total Dissolved Solids	74	740	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	4	40	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	12.1					
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.2					
Particle Size <4mm =	>95%							
EMT Job No	21/18938		Landfill Waste Acceptance Criteria Limits					
Sample No	11							
Client Sample No	LF-WS-2011							
Depth/Other	0.50-1.00							
Sample Date	25/11/2021							
Batch No	1							
Solid Waste Analysis			Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill			
Total Organic Carbon (%)	0.46					3	5	6
Loss on Ignition (%)	-					-	-	10
Sum of BTEX (mg/kg)	<0.025					6	-	-
Sum of 7 PCBs (mg/kg)	<0.035					1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30					500	-	-
PAH Sum of 17(mg/kg)	<0.64					100	-	-
pH (pH Units)	-					-	>6	-
ANC to pH 7 (mol/kg)	-					-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-					-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg					
	C ₁₀	A ₁₀						
	mg/l	mg/kg						
Arsenic	<0.0025	<0.025	0.5	2	25			
Barium	0.006	0.06	20	100	300			
Cadmium	<0.0005	<0.005	0.04	1	5			
Chromium	<0.0015	<0.015	0.5	10	70			
Copper	<0.007	<0.07	2	50	100			
Mercury	<0.001	<0.01	0.01	0.2	2			
Molybdenum	0.020	0.20	0.5	10	30			
Nickel	<0.002	<0.02	0.4	10	40			
Lead	<0.005	<0.05	0.5	10	50			
Antimony	<0.002	<0.02	0.06	0.7	5			
Selenium	<0.003	<0.03	0.1	0.5	7			
Zinc	0.004	0.04	4	50	200			
Chloride	<0.3	<3	800	15000	25000			
Fluoride	<0.3	<3	10	150	500			
Sulphate as SO4	1.7	17	1000	20000	50000			
Total Dissolved Solids	42	420	4000	60000	100000			
Phenol	<0.01	<0.1	1	-	-			
Dissolved Organic Carbon	2	<20	500	800	1000			

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

9 of 16

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18938

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18938

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/18938

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009; SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009; SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes

EMT Job No: 21/18938

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 21st December, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/19029 Batch 1
Location : Luas Finglas
Date samples received : 1st December, 2021
Status : Final Report
Issue : 1

Six samples were received for analysis on 1st December, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Stephen Kealy
EMT Job No: 21/19029

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	13-16	21-24								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1008	WS-1009	CPRC1027										
Depth	0.50	1.00	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	30/11/2021	26/11/2021	26/11/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	01/12/2021	01/12/2021	01/12/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	1.2								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	23.9								<0.2	mg/kg	TM5/PM8/PM12
>C12-C16 (EH_CU_1D_AL) #	<4	-	140								<4	mg/kg	TM5/PM8/PM12
>C16-C21 (EH_CU_1D_AL) #	<7	-	307								<7	mg/kg	TM5/PM8/PM12
>C21-C35 (EH_CU_1D_AL) #	<7	-	110								<7	mg/kg	TM5/PM8/PM12
>C35-C40 (EH_1D_AL)	<7	-	<7								<7	mg/kg	TM5/PM8/PM12
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	582								<26	mg/kg	TM5/TM36/PM8/PM12/PM15
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	5.0								<0.2	mg/kg	TM5/PM8/PM12
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	109								<4	mg/kg	TM5/PM8/PM12
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	307								<7	mg/kg	TM5/PM8/PM12
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	88								<7	mg/kg	TM5/PM8/PM12
>EC35-EC40 (EH_1D_AR)	<7	-	<7								<7	mg/kg	TM5/PM8/PM12
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-	509								<26	mg/kg	TM5/TM36/PM8/PM12/PM15
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	-	1091								<52	mg/kg	TM5/TM36/PM8/PM12/PM15
MTBE #	<5	-	<5								<5	ug/kg	TM36/PM12
Benzene #	<5	-	<5								<5	ug/kg	TM36/PM12
Toluene #	7	-	11								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	7								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	23								<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	<5								<5	ug/kg	TM36/PM12
PCB 28 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 52 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 101 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 118 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5								<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5								<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	<35								<35	ug/kg	TM17/PM8
Phenol #	<0.01	-	<0.01								<0.01	mg/kg	TM26/PM218
Natural Moisture Content	9.9	-	18.8								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3								<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Stephen Kealy
EMT Job No: 21/19029

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Please see attached notes for all abbreviations and acronyms

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	17.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	84.9
Particle Size <4mm =	>95%		
EMT Job No	21/19029	Landfill Waste Acceptance Criteria Limits	
Sample No	24		
Client Sample No	CPRC1027		
Depth/Other	1.00		
Sample Date	26/11/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.40	3	5
Loss on Ignition (%)	2.6	-	10
Sum of BTEX (mg/kg)	0.041	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	581	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.22	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	1.25	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.055	0.55	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.033	0.33	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.003	0.03	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.005	0.05	4
Chloride	1.3	13	800
Fluoride	0.3	3	10
Sulphate as SO ₄	17.8	178	1000
Total Dissolved Solids	93	930	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/19029

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/19029

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/19029

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/19029

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/19029

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Stephen Kealy
Date : 23rd December, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/19067 Batch 1
Location : Luas Finglas - TII
Date samples received : 1st December, 2021
Status : Final Report
Issue : 1

Six samples were received for analysis on 1st December, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/19067

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	9-12	17-20	21-24								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CRPC-1023	LF-CRPC-1023	LF-WS-1023										
Depth	0.50	2.00	0.10-1.10										
COC No / misc													
Containers	V J T	V J T	V T										
Sample Date	24/11/2021	25/11/2021	25/11/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	01/12/2021	01/12/2021	01/12/2021								LOD/LOR	Units	Method No.
Antimony	2	-	-								<1	mg/kg	TM30/PM15
Arsenic #	11.6	-	14.8								<0.5	mg/kg	TM30/PM15
Barium #	52	-	-								<1	mg/kg	TM30/PM15
Beryllium	0.9	-	0.9								<0.5	mg/kg	TM30/PM15
Cadmium #	1.2	-	2.7								<0.1	mg/kg	TM30/PM15
Chromium #	34.2	-	41.2								<0.5	mg/kg	TM30/PM15
Copper #	26	-	21								<1	mg/kg	TM30/PM15
Lead #	18	-	22								<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	<0.1								<0.1	mg/kg	TM30/PM15
Molybdenum #	2.5	-	-								<0.1	mg/kg	TM30/PM15
Nickel #	40.1	-	35.8								<0.7	mg/kg	TM30/PM15
Selenium #	1	-	1								<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	-	1.2								<0.1	mg/kg	TM74/PM32
Zinc #	96	-	113								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	-	0.06								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	0.09								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	-	0.09								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	-	0.07								<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	-	0.79								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	-	0.23								<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	-	2.28								<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	-	2.10								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	-	1.47								<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	-	1.53								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	-	2.87								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	-	1.49								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	-	1.19								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	-	0.25								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	-	1.01								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	0.21								<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	-	-								<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	-	15.73								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	-	2.07								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	-	0.80								<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	-	-								<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	81	-	96								<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	38								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/19067

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	9-12	17-20	21-24								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CRPC-1023	LF-CRPC-1023	LF-WS-1023										
Depth	0.50	2.00	0.10-1.10										
COC No / misc													
Containers	V J T	V J T	V T										
Sample Date	24/11/2021	25/11/2021	25/11/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	01/12/2021	01/12/2021	01/12/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	38								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	38								<26	mg/kg	TM5/PM8/PM16
>C6-C10 (HS_1D_AL)	<0.1	-	-								<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_1D_AL)	<10	-	-								<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_1D_AL)	<10	-	-								<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1 ^{SV}								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	41								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	196								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	-	26								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-	263								<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	-	301								<52	mg/kg	TM5/PM8/PM16
>EC6-EC10 (HS_1D_AR) #	<0.1	-	-								<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_1D_AR)	<10	-	-								<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_1D_AR)	<10	-	-								<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	-	<5 ^{SV}								<5	ug/kg	TM36/PM12
Benzene #	<5	-	<5 ^{SV}								<5	ug/kg	TM36/PM12
Toluene #	<5	-	17 ^{SV}								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	<5 ^{SV}								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	<5 ^{SV}								<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	<5 ^{SV}								<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	<5								<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	<5								<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	<35								<35	ug/kg	TM17/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/19067

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/19067

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	9-12	21-24									Please see attached notes for all abbreviations and acronyms					
Sample ID	LF-CRPC-1023	LF-WS-1023														
Depth	0.50	0.10-1.10														
COC No / misc																
Containers	V J T	V T														
Sample Date	24/11/2021	25/11/2021														
Sample Type	Soil	Soil														
Batch Number	1	1														
Date of Receipt	01/12/2021	01/12/2021									Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	0.38	1.92									3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025 ^{SV}									6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035									1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	38									500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	-									-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	15.73									100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	-									0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	-									20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	-									0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	-									0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	-									2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	-									0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.05	-									0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	-									0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	-									0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	-									0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	-									0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	0.04	-									4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	470	-									4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	-									500	800	1000	<20	mg/kg	TM60/PM0
Dry Matter Content Ratio	83.2	84.2									-	-	-	<0.1	%	NONE/PM4
ANC at pH4	-	1.21									-	-	-	<0.03	mol/kg	TM77/PM0
ANC at pH7	-	<0.03									-	-	-	<0.03	mol/kg	TM77/PM0
pH #	-	8.54									-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	-									1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	-									-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	61	-									1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	<3	-									800	15000	25000	<3	mg/kg	TM38/PM0

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	18.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	84.2
Particle Size <4mm =	>95%		
EMT Job No	21/19067	Landfill Waste Acceptance Criteria Limits	
Sample No	24		
Client Sample No	LF-WS-1023		
Depth/Other	0.10-1.10		
Sample Date	25/11/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.92	3	5
Loss on Ignition (%)	3.7	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	38	500	-
PAH Sum of 17(mg/kg)	15.73	100	-
pH (pH Units)	8.54	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	1.21	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	0.0031	0.031	0.5
Barium	0.008	0.08	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.005	0.05	0.5
Nickel	0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	2.0	20	1000
Total Dissolved Solids	81	810	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Matrix : Solid

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Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/19067	1	LF-CRPC-1023	0.50	11	07/12/2021	General Description (Bulk Analysis)	SOIL
					07/12/2021	Asbestos Fibres	NAD
					07/12/2021	Asbestos ACM	NAD
					07/12/2021	Asbestos Type	NAD
					07/12/2021	Asbestos Level Screen	NAD
21/19067	1	LF-WS-1023	0.10-1.10	23	07/12/2021	General Description (Bulk Analysis)	SOIL
					07/12/2021	Asbestos Fibres	NAD
					07/12/2021	Asbestos ACM	NAD
					07/12/2021	Asbestos Type	NAD
					07/12/2021	Asbestos Level Screen	NAD

Matrix : Solid

[illegible]

Matrix : Solid

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/19067

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/19067

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes

EMT Job No: 21/19067

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/19067

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No

EMT Job No: 21/19067

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 21st December, 2021
Your reference : 10892-07-21
Our reference : Test Report 21/19391 Batch 1
Location : Luas Finglass -TII
Date samples received : 3rd December, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 3rd December, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglass -TII
Contact: Stephen Kealy
EMT Job No: 21/19391

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8	9-12	13-16								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1024	LF-CPRC-1024	LF-CPRC-1024										
Depth	1.00	2.00	3.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	01/12/2021	01/12/2021	01/12/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	03/12/2021	03/12/2021	03/12/2021								LOD/LOR	Units	Method No.
Arsenic #	-	7.7	-								<0.5	mg/kg	TM30/PM15
Beryllium	-	0.6	-								<0.5	mg/kg	TM30/PM15
Cadmium #	-	1.4	-								<0.1	mg/kg	TM30/PM15
Chromium #	-	31.0	-								<0.5	mg/kg	TM30/PM15
Copper #	-	19	-								<1	mg/kg	TM30/PM15
Lead #	-	12	-								<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	-								<0.1	mg/kg	TM30/PM15
Nickel #	-	26.4	-								<0.7	mg/kg	TM30/PM15
Selenium #	-	2	-								<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.3	-								<0.1	mg/kg	TM74/PM32
Zinc #	-	66	-								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	-								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	-								<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	-								<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	<0.07	-								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	-								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	-								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	-								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	90	95	-								<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	-								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglass -TII
Contact: Stephen Kealy
EMT Job No: 21/19391

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8	9-12	13-16								Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1024	LF-CPRC-1024	LF-CPRC-1024										
Depth	1.00	2.00	3.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	01/12/2021	01/12/2021	01/12/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	03/12/2021	03/12/2021	03/12/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1	-								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1	-								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	1.8	-								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	2.9	-								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	-	<4	-								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	-	<7	-								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	-	<7	-								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	-	<7	-								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26	-								<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2	-								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	-	<4	-								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	-	<7	-								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	-	<7	-								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	-	<7	-								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26	-								<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	<52	-								<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	-								<5	ug/kg	TM36/PM12
Benzene #	<5	<5	-								<5	ug/kg	TM36/PM12
Toluene #	<5	<5	-								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	-								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	-								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	-								<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	-								<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	-								<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	-								<35	ug/kg	TM17/PM8
Phenol #	-	<0.01	-								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	13.3	14.0	-								<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	-								<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglass -TII
Contact: Stephen Kealy
EMT Job No: 21/19391

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

5 of 16

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	15.7
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.4
Particle Size <4mm =	>95%		
EMT Job No	21/19391	Landfill Waste Acceptance Criteria Limits	
Sample No	8		
Client Sample No	LF-CPRC-1024		
Depth/Other	1.00		
Sample Date	01/12/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.22	3	5
Loss on Ignition (%)	1.6	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	10.76	-	>6
ANC to pH 7 (mol/kg)	0.06	-	to be evaluated
ANC to pH 4 (mol/kg)	0.82	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	0.0039	0.039	0.5
Barium	<0.003	<0.03	20
Cadmium	<0.0005	<0.005	0.04
Chromium	0.0053	0.053	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.008	0.08	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	1.0	10	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	10.1	101	1000
Total Dissolved Solids	78	780	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglass -TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglass -TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/19391

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/19391

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/19391

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/19391

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/19391

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 21st December, 2021
Your reference : 1089-07-21
Our reference : Test Report 21/19545 Batch 1
Location : Luas Finglas TII
Date samples received : 8th December, 2021
Status : Final Report
Issue : 1

Ten samples were received for analysis on 8th December, 2021 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 1089-07-21
Location: Luas Finglas TII
Contact: Stephen Kealy
EMT Job No: 21/19545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	13-16	17-20	21-24	29-32	33-36						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1003	LF-TP-1004	LF-TP-1004	LF-TP-1005	LF-WS-1001								
Depth	1.00	0.50	1.00	1.00	0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	08/12/2021	08/12/2021	08/12/2021	08/12/2021	08/12/2021						LOD/LOR	Units	Method No.
Arsenic #	8.0	-	14.4	16.6	19.5						<0.5	mg/kg	TM30/PM15
Beryllium	0.7	-	0.8	1.0	0.8						<0.5	mg/kg	TM30/PM15
Cadmium #	2.0	-	1.9	3.2	1.3						<0.1	mg/kg	TM30/PM15
Chromium #	29.9	-	23.1	39.3	29.6						<0.5	mg/kg	TM30/PM15
Copper #	24	-	26	23	28						<1	mg/kg	TM30/PM15
Lead #	15	-	39	31	45						<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	<0.1	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Nickel #	35.6	-	29.9	48.2	33.3						<0.7	mg/kg	TM30/PM15
Selenium #	<1	-	<1	1	<1						<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.4	-	1.1	0.5	1.0						<0.1	mg/kg	TM74/PM32
Zinc #	74	-	143	87	114						<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	-	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	-	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	-	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	-	0.08	<0.03	0.14						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	-	0.06	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	-	0.32	<0.03	0.27						<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	-	0.29	<0.03	0.23						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	-	0.15	<0.06	0.18						<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	-	0.25	<0.02	0.16						<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	<0.07	-	0.77	<0.07	0.32						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	-	0.30	<0.04	0.16						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	-	0.59	<0.04	0.13						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	-	0.06	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	-	0.49	<0.04	0.12						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	0.14	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	-	3.50	<0.64	1.71						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	-	0.55	<0.05	0.23						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	-	0.22	<0.02	0.09						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	-	98	99	101						<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	<30	-	<30						<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 1089-07-21
Location: Luas Finglas TII
Contact: Stephen Kealy
EMT Job No: 21/19545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	13-16	17-20	21-24	29-32	33-36						Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-WS-1003	LF-TP-1004	LF-TP-1004	LF-TP-1005	LF-WS-1001								
Depth	1.00	0.50	1.00	1.00	0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	08/12/2021	08/12/2021	08/12/2021	08/12/2021	08/12/2021						LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	-	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	<26	<26	<26						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	-	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-	<26	<26	<26						<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	<52	-	<52	<52	<52						<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	-	<5	<5	<5						<5	ug/kg	TM36/PM12
Benzene #	<5	-	<5	<5	<5						<5	ug/kg	TM36/PM12
Toluene #	<5	-	<5	<5	<5						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	<5	<5	<5						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	<5	<5	<5						<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	<5	<5	<5						<5	ug/kg	TM36/PM12
PCB 28 #	-	-	<5	-	<5						<5	ug/kg	TM17/PM8
PCB 52 #	-	-	<5	-	<5						<5	ug/kg	TM17/PM8
PCB 101 #	-	-	<5	-	<5						<5	ug/kg	TM17/PM8
PCB 118 #	-	-	<5	-	<5						<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5	-	<5						<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5	-	<5						<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5	-	<5						<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	<35	-	<35						<35	ug/kg	TM17/PM8
Phenol #	<0.01	-	<0.01	<0.01	<0.01						<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	10.8	-	26.5	14.4	17.4						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 1089-07-21
Location: Luas Finglas TII
Contact: Stephen Kealy
EMT Job No: 21/19545

Report: Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

5 of 17

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	16.4
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	85.9
Particle Size <4mm =	>95%		
EMT Job No	21/19545	Landfill Waste Acceptance Criteria Limits	
Sample No	23		
Client Sample No	LF-TP-1004		
Depth/Other	1.00		
Sample Date	06/12/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.89	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	3.50	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.025	0.25	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.016	0.16	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	0.5	5	10
Sulphate as SO ₄	1.0	10	1000
Total Dissolved Solids	66	660	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	23.3
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	81.1
Particle Size <4mm =	>95%		
EMT Job No	21/19545	Landfill Waste Acceptance Criteria Limits	
Sample No	35		
Client Sample No	LF-WS-1001		
Depth/Other	0.50		
Sample Date	06/12/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.41	3	5
Loss on Ignition (%)	4.9	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	1.71	100	-
pH (pH Units)	8.20	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.41	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.026	0.26	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.005	0.05	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.8	8	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	4.9	49	1000
Total Dissolved Solids	85	850	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	4	40	500

Client Name: Ground Investigations Ireland
Reference: 1089-07-21
Location: Luas Finglas TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/19545	1	LF-WS-1003	1.00	16	16/12/2021	General Description (Bulk Analysis)	soil/stones
					16/12/2021	Asbestos Fibres	NAD
					16/12/2021	Asbestos ACM	NAD
					16/12/2021	Asbestos Type	NAD
					16/12/2021	Asbestos Level Screen	NAD
21/19545	1	LF-TP-1004	1.00	24	16/12/2021	General Description (Bulk Analysis)	Soil/Stones
					16/12/2021	Asbestos Fibres	NAD
					16/12/2021	Asbestos ACM	NAD
					16/12/2021	Asbestos Type	NAD
					16/12/2021	Asbestos Level Screen	NAD
21/19545	1	LF-TP-1005	1.00	32	16/12/2021	General Description (Bulk Analysis)	soil/stones
					16/12/2021	Asbestos Fibres	NAD
					16/12/2021	Asbestos ACM	NAD
					16/12/2021	Asbestos Type	NAD
					16/12/2021	Asbestos Level Screen	NAD
21/19545	1	LF-WS-1001	0.50	36	16/12/2021	General Description (Bulk Analysis)	Soil/Stones
					16/12/2021	Asbestos Fibres	NAD
					16/12/2021	Asbestos ACM	NAD
					16/12/2021	Asbestos Type	NAD
					16/12/2021	Asbestos Level Screen	NAD

Matrix : Solid

9 of 17

Contact: Stephen Kealy

[illegible]

10 of 17

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/19545

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/19545

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/19545

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/19545

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/19545

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Conor Finnerty
Date : 4th January, 2022
Your reference : 10892-07-21
Our reference : Test Report 21/19859 Batch 1
Location : Luas Finglas- TII
Date samples received : 13th December, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 13th December, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Conor Finnerty
EMT Job No: 21/19859

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Conor Finnerty
EMT Job No: 21/19859

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	9-12									Please see attached notes for all abbreviations and acronyms			
Sample ID	TP1008	WS2008												
Depth	0.50	0.50												
COC No / misc														
Containers	V J T	V J T												
Sample Date	07/12/2021	08/12/2021												
Sample Type	Soil	Soil												
Batch Number	1	1												
Date of Receipt	13/12/2021	13/12/2021									LOD/LOR	Units	Method No.	
TPH CWG														
Aliphatics														
>C5-C6 (HS_1D_AL) #	<0.1	<0.1 ^{SV}									<0.1	mg/kg	TM36/PM12	
>C6-C8 (HS_1D_AL) #	<0.1	<0.1 ^{SV}									<0.1	mg/kg	TM36/PM12	
>C8-C10 (HS_1D_AL)	<0.1	<0.1 ^{SV}									<0.1	mg/kg	TM36/PM12	
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16	
>C12-C16 (EH_CU_1D_AL) #	<4	<4									<4	mg/kg	TM5/PM8/PM16	
>C16-C21 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16	
>C21-C35 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16	
>C35-C40 (EH_1D_AL)	<7	<7									<7	mg/kg	TM5/PM8/PM16	
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	<26									<26	mg/kg	TM5/PM8/PM16	
Aromatics														
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1 ^{SV}									<0.1	mg/kg	TM36/PM12	
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1 ^{SV}									<0.1	mg/kg	TM36/PM12	
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1 ^{SV}									<0.1	mg/kg	TM36/PM12	
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16	
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4									<4	mg/kg	TM5/PM8/PM16	
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16	
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16	
>EC35-EC40 (EH_1D_AR)	<7	<7									<7	mg/kg	TM5/PM8/PM16	
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26									<26	mg/kg	TM5/PM8/PM16	
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52									<52	mg/kg	TM5/PM8/PM16	
MTBE #	<5	<5 ^{SV}									<5	ug/kg	TM36/PM12	
Benzene #	<5	<5 ^{SV}									<5	ug/kg	TM36/PM12	
Toluene #	<5	<5 ^{SV}									<5	ug/kg	TM36/PM12	
Ethylbenzene #	<5	<5 ^{SV}									<5	ug/kg	TM36/PM12	
m/p-Xylene #	<5	<5 ^{SV}									<5	ug/kg	TM36/PM12	
o-Xylene #	<5	<5 ^{SV}									<5	ug/kg	TM36/PM12	
Phenol #	<0.01	<0.01									<0.01	mg/kg	TM26/PM21B	
Natural Moisture Content	23.4	18.7									<0.1	%	PM4/PM0	
Hexavalent Chromium#	<0.3	<0.3									<0.3	mg/kg	TM38/PM20	
Sulphate as SO4 (2:1 Ext) #	0.0042	0.0439									<0.0015	g/l	TM38/PM20	
Chromium III	40.2	29.1									<0.5	mg/kg	NONE/NONE	
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45	
Organic Matter	2.1	1.9									<0.2	%	TM21/PM24	
Acid Reserve	NDP	NDP									<0.000	gNaOH/100g	TM160/PM110	
Alkali Reserve	NDP	NDP									<0.000	gNaOH/100g	TM160/PM110	

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Conor Finnerty
EMT Job No: 21/19859

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas- TII
Contact: Conor Finnerty

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

6 of 12

Matrix : Solid

Reference: 10892-07-21

Location: Luas Finglas- TII

Contact: Conor Finnerty

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/19859

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/19859

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 21/19859

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland



Attention : Stephen Kealy
Date : 10th January, 2022
Your reference : 10892-07-21
Our reference : Test Report 21/20195 Batch 1
Location : Luas Finglas - TII
Date samples received : 16th December, 2021
Status : Final Report
Issue : 1

Fourteen samples were received for analysis on 16th December, 2021 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

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Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/20195

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8	9-12	21-24	29-32	37-40	45-48	53-56			Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-3001	LF-TP-3001	LF-TP-3001	LF-TP-3002	LF-WS-3001	LF-WS-3002	LF-CPRC-3002	LF-CPRC-2012					
Depth	0.50	1.00	2.00	2.00	1.00	1.00	1.00	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1			LOD/LOR	Units	Method No.
Date of Receipt	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021					
Arsenic #	12.6	-	11.5	14.4	-	16.8	13.4	13.0			<0.5	mg/kg	TM30/PM15
Beryllium	1.1	-	0.8	0.9	-	0.8	1.2	1.0			<0.5	mg/kg	TM30/PM15
Cadmium #	0.7	-	2.0	2.9	-	1.7	5.1	1.8			<0.1	mg/kg	TM30/PM15
Chromium #	69.2	-	33.5	23.2	-	31.4	47.4	28.6			<0.5	mg/kg	TM30/PM15
Copper #	38	-	36	42	-	80	37	40			<1	mg/kg	TM30/PM15
Lead #	80	-	24	20	-	98	23	83			<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	0.2			<0.1	mg/kg	TM30/PM15
Nickel #	44.3	-	41.2	50.3	-	33.1	88.3	40.4			<0.7	mg/kg	TM30/PM15
Selenium #	2	-	2	2	-	<1	3	2			<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	-	0.5	0.5	-	0.8	0.8	1.4			<0.1	mg/kg	TM74/PM32
Zinc #	169	-	101	115	-	180	126	188			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.15	-	<0.04	<0.04	-	0.07	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.38	-	<0.03	<0.03	-	0.18	<0.03	0.05			<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.63	-	<0.05	<0.05	-	<0.05	<0.05	0.06			<0.05	mg/kg	TM4/PM8
Fluorene #	0.39	-	<0.04	<0.04	-	0.07	<0.04	0.10			<0.04	mg/kg	TM4/PM8
Phenanthrene #	4.22	-	<0.03	<0.03	-	0.51	<0.03	0.62			<0.03	mg/kg	TM4/PM8
Anthracene #	1.04	-	<0.04	<0.04	-	0.28	<0.04	0.13			<0.04	mg/kg	TM4/PM8
Fluoranthene #	6.51	-	0.05	<0.03	-	3.80	<0.03	0.90			<0.03	mg/kg	TM4/PM8
Pyrene #	6.20	-	0.03	<0.03	-	4.35	<0.03	0.75			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	3.01	-	<0.06	<0.06	-	3.54	<0.06	0.46			<0.06	mg/kg	TM4/PM8
Chrysene #	3.04	-	0.02	<0.02	-	3.41	<0.02	0.47			<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	4.78	-	<0.07	<0.07	-	7.53	<0.07	0.86			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	2.52	-	<0.04	<0.04	-	3.93	<0.04	0.41			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	1.91	-	<0.04	<0.04	-	3.27	<0.04	0.39			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.41	-	<0.04	<0.04	-	0.61	<0.04	0.07			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.62	-	<0.04	<0.04	-	2.54	<0.04	0.29			<0.04	mg/kg	TM4/PM8
Coronene	0.42	-	<0.04	<0.04	-	0.47	<0.04	0.06			<0.04	mg/kg	TM4/PM8
PAH 17 Total	37.23	-	<0.64	<0.64	-	34.56	<0.64	5.62			<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	3.44	-	<0.05	<0.05	-	5.42	<0.05	0.62			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.34	-	<0.02	<0.02	-	2.11	<0.02	0.24			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	93	-	89	93	-	84	94	96			<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	<30	-	-	-	<30	-	-			<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/20195

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8	9-12	21-24	29-32	37-40	45-48	53-56			Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-TP-3001	LF-TP-3001	LF-TP-3001	LF-TP-3002	LF-WS-3001	LF-WS-3002	LF-CPRC-3002	LF-CPRC-2012					
Depth	0.50	1.00	2.00	2.00	1.00	1.00	1.00	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021	14/12/2021					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021	16/12/2021			LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1 ^{SV}			<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1 ^{SV}			<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL) #	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1 ^{SV}			<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4	<4	-	<4	<4	7			<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	12	-	<7	<7	-	<7	<7	80			<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	81	-	<7	<7	-	<7	<7	609			<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	15	-	<7	<7	-	<7	<7	15			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	108	-	<26	<26	-	<26	<26	711			<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1 ^{SV}			<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1 ^{SV}			<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1 ^{SV}			<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4	<4	-	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	26	-	<7	<7	-	<7	<7	51			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	227	-	91	<7	-	90	<7	302			<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	46	-	21	<7	-	9	<7	13			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	299	-	112	<26	-	99	<26	366			<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-40) (EH+HS_CU_1D_Total)	407	-	112	<52	-	99	<52	1077			<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5	<5	-	<5	<5	<5 ^{SV}			<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	-	<5	<5	10 ^{SV}			<5	ug/kg	TM36/PM12
Toluene #	<5	9	<5	<5	-	12	<5	<5 ^{SV}			<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	-	<5	<5	<5 ^{SV}			<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	-	<5	<5	<5 ^{SV}			<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	-	<5	<5	<5 ^{SV}			<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	-	-	-	<5	-	-			<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	-	-	-	<5	-	-			<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	-	-	-	<5	-	-			<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	-	-	-	<5	-	-			<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	-	-	-	<5	-	-			<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	-	-	-	<5	-	-			<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	-	-	-	<5	-	-			<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	-	-	-	<35	-	-			<35	ug/kg	TM17/PM8
Phenol #	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01			<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	8.6	26.9	13.9	15.5	-	13.0	20.7	21.1			<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3	<0.3	-	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20

Element Materials Technology

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Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	26.4
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	79.1
Particle Size <4mm =	>95%		
EMT Job No	21/20195	Landfill Waste Acceptance Criteria Limits	
Sample No	7		
Client Sample No	LF-TP-3001		
Depth/Other	1.00		
Sample Date	14/12/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.39	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	9.19	100	-
pH (pH Units)	-	-	>6
ANC to pH 7 (mol/kg)	-	-	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.006	0.06	20
Cadmium	<0.0005	<0.005	0.04
Chromium	0.0024	0.024	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.014	0.14	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	0.4	4	10
Sulphate as SO ₄	3.7	37	1000
Total Dissolved Solids	79	790	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	15.9
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.3
Particle Size <4mm =	>95%		
EMT Job No	21/20195	Landfill Waste Acceptance Criteria Limits	
Sample No	39		
Client Sample No	LF-WS-3002		
Depth/Other	1.00		
Sample Date	14/12/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	1.73	3	5
Loss on Ignition (%)	3.9	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	34.56	100	-
pH (pH Units)	8.40	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.62	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	0.0065	0.065	0.5
Barium	0.007	0.07	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	0.011	0.11	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.006	0.06	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	0.008	0.08	4
Chloride	1.1	11	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	1.9	19	1000
Total Dissolved Solids	89	890	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	4	40	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/20195	1	LF-TP-3001	0.50	3	23/12/2021	General Description (Bulk Analysis)	soil/stones
					23/12/2021	Asbestos Fibres	Fibre Bundles
					23/12/2021	Asbestos ACM	NAD
					23/12/2021	Asbestos Type	Chrysotile
					23/12/2021	Asbestos Level Screen	less than 0.1%
21/20195	1	LF-TP-3001	2.00	11	23/12/2021	General Description (Bulk Analysis)	soil/stones
					23/12/2021	Asbestos Fibres	NAD
					23/12/2021	Asbestos ACM	NAD
					23/12/2021	Asbestos Type	NAD
					23/12/2021	Asbestos Level Screen	NAD
21/20195	1	LF-TP-3002	2.00	23	23/12/2021	General Description (Bulk Analysis)	soil/stones
					23/12/2021	Asbestos Fibres	NAD
					23/12/2021	Asbestos ACM	NAD
					23/12/2021	Asbestos Type	NAD
					23/12/2021	Asbestos Level Screen	NAD
21/20195	1	LF-WS-3002	1.00	40	23/12/2021	General Description (Bulk Analysis)	Soil/Stones
					23/12/2021	Asbestos Fibres	NAD
					23/12/2021	Asbestos ACM	NAD
					23/12/2021	Asbestos Type	NAD
					23/12/2021	Asbestos Level Screen	NAD
21/20195	1	LF-CPRC-3002	1.00	47	23/12/2021	General Description (Bulk Analysis)	Soil/Stones
					23/12/2021	Asbestos Fibres	NAD
					23/12/2021	Asbestos ACM	NAD
					23/12/2021	Asbestos Type	NAD
					23/12/2021	Asbestos Level Screen	NAD
21/20195	1	LF-CPRC-2012	1.00	55	23/12/2021	General Description (Bulk Analysis)	Soil/Stones
					23/12/2021	Asbestos Fibres	NAD
					23/12/2021	Asbestos ACM	NAD
					23/12/2021	Asbestos Type	NAD
					23/12/2021	Asbestos Level Screen	NAD

Matrix : Solid

9 of 17

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/20195

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/20195

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/20195

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/20195

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/20195

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Stephen Kealy
Date : 10th January, 2022
Your reference : 10892-07-21
Our reference : Test Report 21/20197 Batch 1
Location : Luas Finglas -TII
Date samples received : 16th December, 2021
Status : Final Report
Issue : 1

Four samples were received for analysis on 16th December, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas -TII
Contact: Stephen Kealy
EMT Job No: 21/20197

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8	9-12	13-16								Please see attached notes for all abbreviations and acronyms		
Sample ID	WS2006	WS2007	WS2007										
Depth	1.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	09/12/2021	09/12/2021	09/12/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	16/12/2021	16/12/2021	16/12/2021								LOD/LOR	Units	Method No.
Arsenic #	16.5	-	9.2								<0.5	mg/kg	TM30/PM15
Beryllium	1.5	-	0.8								<0.5	mg/kg	TM30/PM15
Cadmium #	4.2	-	2.0								<0.1	mg/kg	TM30/PM15
Chromium #	48.3	-	22.6								<0.5	mg/kg	TM30/PM15
Copper #	44	-	27								<1	mg/kg	TM30/PM15
Lead #	51	-	16								<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	<0.1								<0.1	mg/kg	TM30/PM15
Nickel #	60.1	-	36.7								<0.7	mg/kg	TM30/PM15
Selenium #	2	-	1								<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.1	-	0.4								<0.1	mg/kg	TM74/PM32
Zinc #	152	-	76								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.05	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.05	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Pyrene #	0.04	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene #	0.05	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	90	93	90								<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	<30	-								<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas -TII
Contact: Stephen Kealy
EMT Job No: 21/20197

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8	9-12	13-16								Please see attached notes for all abbreviations and acronyms		
Sample ID	WS2006	WS2007	WS2007										
Depth	1.00	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	09/12/2021	09/12/2021	09/12/2021										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	16/12/2021	16/12/2021	16/12/2021								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_1D_AL)	<26	-	<26								<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	-	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	-	<26								<26	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	-	<52								<52	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5								<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5								<5	ug/kg	TM36/PM12
Toluene #	6	8	<5								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5								<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	-								<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	-								<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	-								<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	-								<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	-								<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	-								<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	-								<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	-								<35	ug/kg	TM17/PM8
Phenol #	<0.01	-	<0.01								<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	22.2	10.0	10.0								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3								<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas -TII
Contact: Stephen Kealy
EMT Job No: 21/20197

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

5 of 16

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	8.6
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	92.1
Particle Size <4mm =	>95%		
EMT Job No	21/20197	Landfill Waste Acceptance Criteria Limits	
Sample No	11		
Client Sample No	WS2007		
Depth/Other	0.50		
Sample Date	09/12/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.37	3	5
Loss on Ignition (%)	1.5	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.56	-	>6
ANC to pH 7 (mol/kg)	0.04	-	to be evaluated
ANC to pH 4 (mol/kg)	2.19	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.031	0.31	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.007	0.07	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.5	5	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	15.6	156	1000
Total Dissolved Solids	54	540	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas -TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Client Name: Ground Investigations Ireland

Reference: 10892-07-21

Location: Luas Finglas -TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/20197

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/20197

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/20197

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/20197

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/20197

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Stephen Kealy
Date : 10th January, 2022
Your reference : 10892-07-21
Our reference : Test Report 21/20198 Batch 1
Location : Luas Finglas - TII
Date samples received : 16th December, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 16th December, 2021 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/20198

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-8										Please see attached notes for all abbreviations and acronyms				
Sample ID	LF-CPRC-1001														
Depth	1.00														
COC No / misc															
Containers	V J T														
Sample Date	13/12/2021														
Sample Type	Soil														
Batch Number	1														
Date of Receipt	16/12/2021											LOD/LOR	Units	Method No.	
PAH MS															
Naphthalene #	0.09											<0.04	mg/kg	TM4/PM8	
Acenaphthylene	<0.03											<0.03	mg/kg	TM4/PM8	
Acenaphthene #	0.06											<0.05	mg/kg	TM4/PM8	
Fluorene #	0.06											<0.04	mg/kg	TM4/PM8	
Phenanthrene #	0.29											<0.03	mg/kg	TM4/PM8	
Anthracene #	0.09											<0.04	mg/kg	TM4/PM8	
Fluoranthene #	0.27											<0.03	mg/kg	TM4/PM8	
Pyrene #	0.20											<0.03	mg/kg	TM4/PM8	
Benzo(a)anthracene #	0.11											<0.06	mg/kg	TM4/PM8	
Chrysene #	0.09											<0.02	mg/kg	TM4/PM8	
Benzo(bk)fluoranthene #	0.11											<0.07	mg/kg	TM4/PM8	
Benzo(a)pyrene #	0.06											<0.04	mg/kg	TM4/PM8	
Indeno(123cd)pyrene #	0.06											<0.04	mg/kg	TM4/PM8	
Dibenzo(ah)anthracene #	<0.04											<0.04	mg/kg	TM4/PM8	
Benzo(ghi)perylene #	<0.04											<0.04	mg/kg	TM4/PM8	
Coronene	<0.04											<0.04	mg/kg	TM4/PM8	
PAH 17 Total	1.49											<0.64	mg/kg	TM4/PM8	
Benzo(b)fluoranthene	0.08											<0.05	mg/kg	TM4/PM8	
Benzo(k)fluoranthene	0.03											<0.02	mg/kg	TM4/PM8	
PAH Surrogate % Recovery	92											<0	%	TM4/PM8	
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30											<30	mg/kg	TM5/PM8/PM16	
MTBE #	<5											<5	ug/kg	TM36/PM12	
Benzene #	<5											<5	ug/kg	TM36/PM12	
Toluene #	<5											<5	ug/kg	TM36/PM12	
Ethylbenzene #	<5											<5	ug/kg	TM36/PM12	
m/p-Xylene #	<5											<5	ug/kg	TM36/PM12	
o-Xylene #	<5											<5	ug/kg	TM36/PM12	
PCB 28 #	<5											<5	ug/kg	TM17/PM8	
PCB 52 #	<5											<5	ug/kg	TM17/PM8	
PCB 101 #	<5											<5	ug/kg	TM17/PM8	
PCB 118 #	<5											<5	ug/kg	TM17/PM8	
PCB 138 #	<5											<5	ug/kg	TM17/PM8	
PCB 153 #	<5											<5	ug/kg	TM17/PM8	
PCB 180 #	<5											<5	ug/kg	TM17/PM8	
Total 7 PCBs #	<35											<35	ug/kg	TM17/PM8	
Natural Moisture Content	13.1											<0.1	%	PM4/PM0	
Sulphate as SO4 (2:1 Ext) #	0.0115											<0.0015	g/l	TM38/PM20	

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/20198

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Please see attached notes for all abbreviations and acronyms

[illegible]

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	16.2		
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.1		
Particle Size <4mm =	>95%				
EMT Job No	21/20198		Landfill Waste Acceptance Criteria Limits		
Sample No	7				
Client Sample No	LF-CPRC-1001		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Depth/Other	1.00				
Sample Date	13/12/2021				
Batch No	1				
Solid Waste Analysis					
Total Organic Carbon (%)	0.36					3	5	6
Loss on Ignition (%)	-		-	-	10
Sum of BTEX (mg/kg)	<0.025		6	-	-
Sum of 7 PCBs (mg/kg)	<0.035		1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30		500	-	-
PAH Sum of 17(mg/kg)	1.49		100	-	-
pH (pH Units)	-		-	>6	-
ANC to pH 7 (mol/kg)	-		-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-		-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀			
	mg/l	mg/kg			
	Arsenic	<0.0025	<0.025	0.5	2	25
Barium	0.014	0.14	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.022	0.22	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.004	0.04	4	50	200
Chloride	1.1	11	800	15000	25000
Fluoride	<0.3	<3	10	150	500
Sulphate as SO4	2.5	25	1000	20000	50000
Total Dissolved Solids	65	650	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	2	<20	500	800	1000

Matrix : Solid

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/20198

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/20198

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/20198

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland




Attention : Stephen Kealy
Date : 13th January, 2022
Your reference : 10892-07-21
Our reference : Test Report 21/20625 Batch 1
Location : Luas Finglas - TII
Date samples received : 23rd December, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 23rd December, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/20625

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8											
Sample ID	LF-CPRC-1028	LF-CPRC-1028											
Depth	0.50	1.00											
COC No / misc													
Containers	V J T	V J T											
Sample Date	20/12/2021	20/12/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	23/12/2021	23/12/2021											
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Arsenic #	-	12.5									<0.5	mg/kg	TM30/PM15
Beryllium	-	1.1									<0.5	mg/kg	TM30/PM15
Cadmium #	-	2.1									<0.1	mg/kg	TM30/PM15
Chromium #	-	36.2									<0.5	mg/kg	TM30/PM15
Copper #	-	33									<1	mg/kg	TM30/PM15
Lead #	-	26									<5	mg/kg	TM30/PM15
Mercury #	-	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	-	44.9									<0.7	mg/kg	TM30/PM15
Selenium #	-	1									<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.7									<0.1	mg/kg	TM74/PM32
Zinc #	-	96									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.08	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.30	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.11	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	0.12	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	1.08	<0.03									<0.03	mg/kg	TM4/PM8
Anthracene #	0.53	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	3.71	0.09									<0.03	mg/kg	TM4/PM8
Pyrene #	3.70	0.08									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	2.64	0.08									<0.06	mg/kg	TM4/PM8
Chrysene #	2.64	0.06									<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	5.23	0.09									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	2.80	0.06									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	2.24	0.05									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.31	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	2.15	<0.04									<0.04	mg/kg	TM4/PM8
Coronene	0.41	<0.04									<0.04	mg/kg	TM4/PM8
PAH 17 Total	28.05	<0.64									<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	3.77	0.06									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.46	0.03									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	92	89									<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-									<30	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/20625

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms		
Sample ID	LF-CPRC-1028	LF-CPRC-1028											
Depth	0.50	1.00											
COC No / misc													
Containers	V J T	V J T											
Sample Date	20/12/2021	20/12/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	23/12/2021	23/12/2021									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	-	<0.2 ^{SV}									<0.2	mg/kg	TM5/PM8/PM12
>C12-C16 (EH_CU_1D_AL) #	-	<4 ^{SV}									<4	mg/kg	TM5/PM8/PM12
>C16-C21 (EH_CU_1D_AL) #	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM12
>C21-C35 (EH_CU_1D_AL) #	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM12
>C35-C40 (EH_1D_AL)	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM12
Total aliphatics C5-40 (EH+HS_1D_AL)	-	<26 ^{SV}									<26	mg/kg	TM5/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	-	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	-	<0.2 ^{SV}									<0.2	mg/kg	TM5/PM8/PM12
>EC12-EC16 (EH_CU_1D_AR) #	-	<4 ^{SV}									<4	mg/kg	TM5/PM8/PM12
>EC16-EC21 (EH_CU_1D_AR) #	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM12
>EC21-EC35 (EH_CU_1D_AR) #	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM12
>EC35-EC40 (EH_1D_AR)	-	<7 ^{SV}									<7	mg/kg	TM5/PM8/PM12
Total aromatics C5-40 (EH+HS_1D_AR)	-	<26 ^{SV}									<26	mg/kg	TM5/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	<52 ^{SV}									<52	mg/kg	TM5/PM8/PM12/PM16
MTBE #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
Benzene #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
Toluene #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
o-Xylene #	<5 ^{SV}	<5									<5	ug/kg	TM36/PM12
PCB 28 #	<5	-									<5	ug/kg	TM17/PM8
PCB 52 #	<5	-									<5	ug/kg	TM17/PM8
PCB 101 #	<5	-									<5	ug/kg	TM17/PM8
PCB 118 #	<5	-									<5	ug/kg	TM17/PM8
PCB 138 #	<5	-									<5	ug/kg	TM17/PM8
PCB 153 #	<5	-									<5	ug/kg	TM17/PM8
PCB 180 #	<5	-									<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-									<35	ug/kg	TM17/PM8
Phenol #	-	<0.01									<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	20.2	15.8									<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3									<0.3	mg/kg	TM38/PM20

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy
EMT Job No: 21/20625

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Please see attached notes for all abbreviations and acronyms

<div>EMT Sample No.</div>		1-4															
<div>Sample ID</div>		LF-CPRC-1028															
<div>Depth</div>		0.50															
<div>COC No / misc</div>																	
<div>Containers</div>		V J T															
<div>Sample Date</div>		20/12/2021															
<div>Sample Type</div>		Soil															
<div>Batch Number</div>		1															
<div>Date of Receipt</div>		23/12/2021										Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
<div>Solid Waste Analysis</div>																	
Total Organic Carbon [#]		2.30										3	5	6	<0.02	%	TM21/PM2
Sum of BTEX		<0.025 ^{#V}										6	-	-	<0.025	mg/kg	TM36/PM1
Sum of 7 PCBs [#]		<0.035										1	-	-	<0.035	mg/kg	TM17/PM
Mineral Oil		<30										500	-	-	<30	mg/kg	TMS/PM8/PM1
PAH Sum of 17		28.05										100	-	-	<0.64	mg/kg	TM4/PM8
<div>CEN 10:1 Leachate</div>																	
Dry Matter Content Ratio		87.8										-	-	-	<0.1	%	NONE/PM
ANC at pH4		1.90										-	-	-	<0.03	mol/kg	TM77/PM
ANC at pH7		0.04										-	-	-	<0.03	mol/kg	TM77/PM
pH [#]		8.30										-	-	-	<0.01	pH units	TM73/PM1

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	13.9
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	87.8
Particle Size <4mm =	>95%		
EMT Job No	21/20625	Landfill Waste Acceptance Criteria Limits	
Sample No	4		
Client Sample No	LF-CPRC-1028		
Depth/Other	0.50		
Sample Date	20/12/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	2.30	3	5
Loss on Ignition (%)	4.9	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	28.05	100	-
pH (pH Units)	8.30	-	>6
ANC to pH 7 (mol/kg)	0.04	-	to be evaluated
ANC to pH 4 (mol/kg)	1.90	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.010	0.10	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	0.018	0.18	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.9	9	800
Fluoride	0.6	6	10
Sulphate as SO ₄	2.2	22	1000
Total Dissolved Solids	76	760	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Ground Investigations Ireland
Reference: 10892-07-21
Location: Luas Finglas - TII
Contact: Stephen Kealy

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation. Asbestos quantification to 0.001% dry fibre of dry mass of sample is accredited to ISO17025.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Matrix : Solid

[illegible]

Matrix : Solid

Reference: 10892-07-21

Location: Luas Finglas - TII

Contact: Stephen Kealy

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/20625

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/20625

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 21/20625

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

EMT Job No: 21/20625

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM160	Titrimetric determination of acid reserve to pH 4.0 or alkali reserve to pH 10.0 based on method C14.2 Canadian Government (2013).	PM110	Preparation of a 10% (w/w) aqueous solution of soil in distilled water			AR	No
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 21/20625

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Appendix D – Waste Classification Reports

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



BUUIJ-8YV6B-OOL88

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in **pale yellow**.

Job name

Luas Rail Non-Landfill

Description/Comments

Analysis of soils deemed representative of soils and Made Ground (non-municipal waste landfill)

Project

21075

Site

Luas Finglas

Classified by

Name: **Ruadh McIntosh**
Date: **03 Mar 2022 16:03 GMT**
Telephone: **0) 131 344 4605**
Company: **Gavin & Doherty Geosolutions**
Edinburgh

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

30 Oct 2019

Next 3 year Refresher due by Oct 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	LF-TP-2005-05/10/2021-0.50m		Non Hazardous		-	-	4
2	LF-TP-2005-05/10/2021-1.00m		Non Hazardous		Pass	-	7
3	LF-TP-2005-05/10/2021-3.00m		Non Hazardous		-	-	11
4	LF-CPRC-1012-05/10/2021-0.50m		Non Hazardous		-	-	14
5	LF-TP-2001-07/10/2021-1.00m		Non Hazardous		-	-	17
6	LF-TP-2002-07/10/2021-1.00m		Non Hazardous		-	-	20
7	LF-TP-2003-06/10/2021-0.50m		Non Hazardous		-	-	23
8	LF-TP-2003-06/10/2021-1.00m		Non Hazardous		-	-	26
9	LF-WS-1011-07/10/2021-0.50m		Non Hazardous		-	-	29
10	LF-CPRC-1017-28/09/2021-1.70m		Non Hazardous		-	-	32
11	LF-CPRC-1018-29/09/2021-3.00m		Non Hazardous		-	-	38
12	LF-WS-2010-13/10/2021-0.50m		Non Hazardous		-	-	41
13	LF-TP-2009-13/10/2021-1.00m		Non Hazardous		-	-	44
14	LF-TP-2009-13/10/2021-3.00m		Non Hazardous		-	-	47
15	LF-CPRC-2003-13/10/2021-2.00m		Non Hazardous		-	-	50
16	LF-CPRC-1014-14/10/2021-5.00m		Non Hazardous		-	-	53
17	LF-CPRC-2010-20/10/2021-5.00m		Non Hazardous		-	-	56
18	LF-WS-1007-21/10/2021-0.50m		Non Hazardous		-	-	59
19	LF-CPRC-1022-18/10/2021-2.00m		Non Hazardous		-	-	62
20	LF-CPRC-1022-18/10/2021-3.00m		Non Hazardous		Pass	Pass	65
21	LF-WS-1012-20/10/2021-1.20-1.70m		Non Hazardous		-	-	69
22	LF-WS-1013-20/10/2021-1.20-1.90m		Non Hazardous		-	-	72
23	LF-WS-1013-20/10/2021-2.80-3.00m		Non Hazardous		-	-	75
24	LF-WS-1007-21/10/2021-1.50m		Non Hazardous		-	-	78
25	LF-WS-1007-21/10/2021-2.50m		Non Hazardous		-	-	84
26	LF-WS-2010-21/10/2021-1.50m		Non Hazardous		-	-	87

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
27	LF-WS-2010-21/10/2021-2.50m		Non Hazardous		-	-	90
28	LF-WS-1010-26/10/2021-2.00m		Non Hazardous		-	-	93
29	LF-CPRC-1004-28/10/2021-0.50m		Non Hazardous		-	-	96
30	LF-CPRC-1004-28/10/2021-2.00m		Non Hazardous		-	-	99
31	LF-CPRC-1005-28/10/2021-1.00m		Non Hazardous		-	-	102
32	LF-CPRC-2011-01/11/2021-0.50m		Non Hazardous		-	-	105
33	LF-CPRC-2011-01/11/2021-1.00m		Non Hazardous		Pass	Pass	108
34	LF-CPRC-1006-01/11/2021-0.50m		Non Hazardous		Pass	Pass	112
35	LF-CPRC-1006-01/11/2021-1.00m		Non Hazardous		-	-	116
36	LF-WS-1005-05/11/2021-0.50m		Non Hazardous		-	-	119
37	LF-CPRC-1003-09/11/2021-0.50m		Non Hazardous		Pass	Pass	122
38	LW-WS-1022-05/11/2021-1.40m		Non Hazardous		-	-	126
39	LW-WS-1004-05/11/2021-0.50m		Non Hazardous		-	-	129
40	CP1034-12/11/2021-2.00m		Non Hazardous		-	-	132
41	LT-CPRC-1032-18/11/2021-3.00m		Non Hazardous		-	-	135
42	LF-CPRC-1031-19/11/2021-2.60m		Non Hazardous		-	-	138
43	LF-WS-1006-25/11/2021-0.50m		Non Hazardous		Pass	-	141
44	LF-WS-2011-25/11/2021-0.50-1.00m		Non Hazardous		Pass	-	145
45	LF-WS-1008-30/11/2021-0.50m		Non Hazardous		-	-	149
46	CPRC1027-26/11/2021-1.00m		Non Hazardous		Fail	Pass	152
47	LF-CRPC-1023-24/11/2021-0.50m		Non Hazardous		Pass	-	156
48	LF-WS-1023-25/11/2021-0.10-1.10m		Non Hazardous		Pass	Pass	160
49	LF-CPRC-1024-01/12/2021-2.00m		Non Hazardous		-	-	164
50	TP01-02/12/2021-0.50-1.00m		Non Hazardous		Fail	Fail	167
51	TP01-02/12/2021-1.50m		Non Hazardous		Pass	Pass	171
52	TP02-02/12/2021-0.45-0.75m		Non Hazardous		Fail	Pass	175
53	TP02-02/12/2021-1.20m		Non Hazardous		Pass	Pass	179
54	TP03-02/12/2021-0.45-1.00m		Non Hazardous		Pass	Pass	183
55	LF-WS-1003-06/12/2021-1.00m		Non Hazardous		-	-	187
56	LF-TP-1004-06/12/2021-1.00m		Non Hazardous		Pass	-	190
57	LF-TP-1005-06/12/2021-1.00m		Non Hazardous		-	-	194
58	LF-WS-1001-06/12/2021-0.50m		Non Hazardous		Pass	Pass	197
59	TP1008-07/12/2021-0.50m		Non Hazardous		-	-	201
60	WS2008-08/12/2021-0.50m		Non Hazardous		-	-	204
61	LF-TP-3001-14/12/2021-0.50m		Non Hazardous		-	-	207
62	LF-TP-3001-14/12/2021-2.00m		Non Hazardous		-	-	210
63	LF-TP-3002-14/12/2021-2.00m		Non Hazardous		-	-	213
64	LF-WS-3002-14/12/2021-1.00m		Non Hazardous		Pass	Pass	216
65	LF-CPRC-3002-14/12/2021-1.00m		Non Hazardous		-	-	220
66	LF-CPRC-2012-14/12/2021-1.00m		Non Hazardous		-	-	223
67	WS2006-09/12/2021-1.00m		Non Hazardous		-	-	226
68	WS2007-09/12/2021-1.00m		Non Hazardous		-	-	229
69	LF-CPRC-1028-20/12/2021-1.00m		Non Hazardous		-	-	232

Related documents

#	Name	Description
1	EMT-21-15942-Batch-1-202203021440.HWOL	.hwol file used to create the Job
2	EMT-21-15951-Batch-1-202203021448.HWOL	.hwol file used to create the Job
3	EMT-21-15959-Batch-1-202110181506.HWOL	.hwol file used to create the Job
4	EMT-21-16221-Batch-1-202110221434.HWOL	.hwol file used to create the Job
5	EMT-21-16271-Batch-1-202110271400.HWOL	.hwol file used to create the Job
6	EMT-21-16289-Batch-1-202111021624.HWOL	.hwol file used to create the Job
7	EMT-21-16557-Batch-1-202111011132.HWOL	.hwol file used to create the Job
8	EMT-21-16567-Batch-1-202110281659.HWOL	.hwol file used to create the Job
9	EMT-21-16735-Batch-1-202111051153.HWOL	.hwol file used to create the Job
10	EMT-21-16879-Batch-1-2021111111234.HWOL	.hwol file used to create the Job
11	EMT-21-17239-Batch-1-202111180836.HWOL	.hwol file used to create the Job
12	EMT-21-17240-Batch-1-202111121320.HWOL	.hwol file used to create the Job
13	EMT-21-17241-Batch-1-202111121146.HWOL	.hwol file used to create the Job
14	EMT-21-17339-Batch-1-202111151358.HWOL	.hwol file used to create the Job
15	EMT-21-17405-Batch-1-202111180922.HWOL	.hwol file used to create the Job
16	EMT-21-17472-Batch-1-202111161336.HWOL	.hwol file used to create the Job
17	EMT-21-17688-Batch-1-202111171335.HWOL	.hwol file used to create the Job
18	EMT-21-18039-Batch-1-202111231445.HWOL	.hwol file used to create the Job
19	EMT-21-18040-Batch-1-202111251238.HWOL	.hwol file used to create the Job

#	Name	Description
20	EMT-21-18229-Batch-1-202112071052.HWOL	.hwol file used to create the Job
21	EMT-21-18583-Batch-1-202112061035.HWOL	.hwol file used to create the Job
22	EMT-21-18720-Batch-1-202112081343.HWOL	.hwol file used to create the Job
23	EMT-21-18938-Batch-1-202112131222.HWOL	.hwol file used to create the Job
24	EMT-21-19029-Batch-1-202112210834.HWOL	.hwol file used to create the Job
25	EMT-21-19067-Batch-1-202112231537.HWOL	.hwol file used to create the Job
26	EMT-21-19391-Batch-1-202112210833.HWOL	.hwol file used to create the Job
27	EMT-21-19395-Batch-1-202112301432.HWOL	.hwol file used to create the Job
28	EMT-21-19545-Batch-1-202112210946.HWOL	.hwol file used to create the Job
29	EMT-21-19859-Batch-1-202201041412.HWOL	.hwol file used to create the Job
30	EMT-21-20195-Batch-1-202201101040.HWOL	.hwol file used to create the Job
31	EMT-21-20197-Batch-1-202201101039.HWOL	.hwol file used to create the Job
32	EMT-21-20198-Batch-1-202201101359.HWOL	.hwol file used to create the Job
33	EMT-21-20625-Batch-1-202201131304.HWOL	.hwol file used to create the Job
34	Luas.batch	.batch file used to create the Job
35	Example waste stream template for contaminated soils	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Ruadh McIntosh

Created date: 03 Mar 2022 16:03 GMT

Appendices	Page
Appendix A: Classifier defined and non EU CLP determinands	235
Appendix B: Rationale for selection of metal species	239
Appendix C: Version	240

Classification of sample: LF-TP-2005-05/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2005-05/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				37	mg/kg	1.32	42.853	mg/kg	0.00429 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.7	mg/kg	2.775	1.704	mg/kg	0.00017 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1	mg/kg	3.22	2.824	mg/kg	0.000282 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1	mg/kg	1.142	1.002	mg/kg	0.0001 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18.2	mg/kg	1.462	23.334	mg/kg	0.00233 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	23.703	mg/kg	0.00237 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	52	mg/kg		45.614	mg/kg	0.00456 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				0.3	mg/kg	1.353	0.356	mg/kg	0.0000356 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				26.7	mg/kg	2.637	61.754	mg/kg	0.00618 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				107	mg/kg	2.469	231.767	mg/kg	0.0232 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				104	mg/kg		91.228	mg/kg	0.00912 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.51 pH		8.51 pH	8.51 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.15 mg/kg		0.132 mg/kg	0.0000132 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.06 mg/kg		0.0526 mg/kg	0.00000526 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				0.3 mg/kg		0.263 mg/kg	0.0000263 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.26 mg/kg		0.228 mg/kg	0.0000228 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.21 mg/kg		0.184 mg/kg	0.0000184 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.21 mg/kg		0.184 mg/kg	0.0000184 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.3 mg/kg		0.263 mg/kg	0.0000263 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.11 mg/kg		0.0965 mg/kg	0.00000965 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.22 mg/kg		0.193 mg/kg	0.0000193 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.15 mg/kg		0.132 mg/kg	0.0000132 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.17 mg/kg		0.149 mg/kg	0.0000149 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0532 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00912%)

Classification of sample: LF-TP-2005-05/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2005-05/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18.3% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				3 mg/kg	1.197	3.036 mg/kg	0.000304 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				14.9 mg/kg	1.32	16.63 mg/kg	0.00166 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				5.3 mg/kg	1.142	5.118 mg/kg	0.000512 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				52.1 mg/kg	1.462	64.368 mg/kg	0.00644 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				44 mg/kg	1.126	41.876 mg/kg	0.00419 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	66 mg/kg		55.79 mg/kg	0.00558 %	✓	
	082-001-00-6									
8	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.114 mg/kg	0.0000114 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
9	molybdenum { molybdenum(VI) oxide }				5.5 mg/kg	1.5	6.975 mg/kg	0.000697 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
10	nickel { nickel sulfate }				53.3 mg/kg	2.637	118.796 mg/kg	0.0119 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.159 mg/kg	0.000216 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				151 mg/kg	2.469	315.185 mg/kg	0.0315 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		386 mg/kg		326.289 mg/kg	0.0326 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	naphthalene				0.54 mg/kg		0.456 mg/kg	0.0000456 %		✓	
	601-052-00-2	202-049-5	91-20-3								
20	acenaphthylene				0.14 mg/kg		0.118 mg/kg	0.0000118 %		✓	
		205-917-1	208-96-8								
21	acenaphthene				0.72 mg/kg		0.609 mg/kg	0.0000609 %		✓	
		201-469-6	83-32-9								
22	fluorene				0.82 mg/kg		0.693 mg/kg	0.0000693 %		✓	
		201-695-5	86-73-7								
23	phenanthrene				5.52 mg/kg		4.666 mg/kg	0.000467 %		✓	
		201-581-5	85-01-8								
24	anthracene				2.53 mg/kg		2.139 mg/kg	0.000214 %		✓	
		204-371-1	120-12-7								
25	fluoranthene				9.57 mg/kg		8.09 mg/kg	0.000809 %		✓	
		205-912-4	206-44-0								
26	pyrene				8.96 mg/kg		7.574 mg/kg	0.000757 %		✓	
		204-927-3	129-00-0								
27	benzo[a]anthracene				4.64 mg/kg		3.922 mg/kg	0.000392 %		✓	
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				4.68 mg/kg		3.956 mg/kg	0.000396 %		✓	
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				6.47 mg/kg		5.469 mg/kg	0.000547 %		✓	
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				2.51 mg/kg		2.122 mg/kg	0.000212 %		✓	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				5.21 mg/kg		4.404 mg/kg	0.00044 %		✓	
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				2.77 mg/kg		2.342 mg/kg	0.000234 %		✓	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				0.75 mg/kg		0.634 mg/kg	0.0000634 %		✓	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				3.03 mg/kg		2.561 mg/kg	0.000256 %		✓	
		205-883-8	191-24-2								
35	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
36	coronene				0.45 mg/kg		0.38 mg/kg	0.000038 %		✓	
		205-881-7	191-07-1								
37	barium { barium sulphide }				97 mg/kg	1.233	101.14 mg/kg	0.0101 %		✓	
	016-002-00-X	244-214-4	21109-95-5								
38	benzo[j]fluoranthene				2 mg/kg		1.691 mg/kg	0.000169 %		✓	
	601-035-00-X	205-910-3	205-82-3								
Total:									0.111 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0326%)

WAC results for sample: LF-TP-2005-05/10/2021-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample cannot be evaluated against the Non Haz (Non hazardous waste landfill) criteria because of missing determinand values.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	2.29	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	47	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	59.31	100	-
7	pH	pH		-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.1	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.14	0.5	10
16	nickel	mg/kg	0.03	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.03	4	50
21	chloride	mg/kg	11	800	15,000
22	fluoride	mg/kg	3	10	150
23	sulphate	mg/kg	152	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	50	500	800
26	TDS (total dissolved solids)	mg/kg	1200	4,000	60,000

Key

	User supplied data
	Missing WAC determinand value

Classification of sample: LF-TP-2005-05/10/2021-3.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2005-05/10/2021-3.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12.4% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 12.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				10.8 mg/kg	1.32	12.686 mg/kg	0.00127 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.8 mg/kg	2.775	1.975 mg/kg	0.000198 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.146 mg/kg	0.000115 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.9 mg/kg	1.142	1.931 mg/kg	0.000193 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25.1 mg/kg	1.462	32.638 mg/kg	0.00326 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				29 mg/kg	1.126	29.049 mg/kg	0.0029 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20 mg/kg		17.794 mg/kg	0.00178 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				39.7 mg/kg	2.637	93.128 mg/kg	0.00931 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				86 mg/kg	2.469	188.932 mg/kg	0.0189 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.55 pH		8.55 pH	8.55 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0436 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1012-05/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1012-05/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13.4% (dry weight correction)	

Hazard properties

None identified

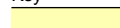



Determinands

Moisture content: 13.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				16.3	mg/kg	1.32	18.978	mg/kg	0.0019 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.3	mg/kg	2.775	3.182	mg/kg	0.000318 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				2.5	mg/kg	3.22	7.098	mg/kg	0.00071 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.7	mg/kg	1.142	2.72	mg/kg	0.000272 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				40.2	mg/kg	1.462	51.812	mg/kg	0.00518 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				375	mg/kg	1.126	372.318	mg/kg	0.0372 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	95	mg/kg		83.774	mg/kg	0.00838 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				0.1	mg/kg	1.353	0.119	mg/kg	0.0000119 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				50.5	mg/kg	2.637	117.419	mg/kg	0.0117 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.504	mg/kg	0.00045 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				278	mg/kg	2.469	605.348	mg/kg	0.0605 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.26 pH		8.26 pH	8.26 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.14 mg/kg		0.123 mg/kg	0.0000123 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.06 mg/kg		0.0529 mg/kg	0.00000529 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				0.33 mg/kg		0.291 mg/kg	0.0000291 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.32 mg/kg		0.282 mg/kg	0.0000282 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.26 mg/kg		0.229 mg/kg	0.0000229 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.25 mg/kg		0.22 mg/kg	0.000022 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.39 mg/kg		0.344 mg/kg	0.0000344 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.15 mg/kg		0.132 mg/kg	0.0000132 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.29 mg/kg		0.256 mg/kg	0.0000256 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.2 mg/kg		0.176 mg/kg	0.0000176 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.22 mg/kg		0.194 mg/kg	0.0000194 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.132 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-2001-07/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2001-07/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15.6% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 15.6% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8.2 mg/kg	1.32	9.366 mg/kg	0.000937 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.681 mg/kg	0.000168 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.5 mg/kg	3.22	1.393 mg/kg	0.000139 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.9 mg/kg	1.142	1.878 mg/kg	0.000188 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.2 mg/kg	1.462	29.332 mg/kg	0.00293 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				20 mg/kg	1.126	19.479 mg/kg	0.00195 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	19 mg/kg		16.436 mg/kg	0.00164 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				30.3 mg/kg	2.637	69.11 mg/kg	0.00691 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				106 mg/kg	2.469	226.423 mg/kg	0.0226 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.35 pH		8.35 pH	8.35 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0432 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-2002-07/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2002-07/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.1% (dry weight correction)	

Hazard properties

None identified

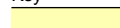



Determinands

Moisture content: 10.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				17	mg/kg	1.32	20.386	mg/kg	0.00204 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.7	mg/kg	2.775	1.765	mg/kg	0.000176 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.2	mg/kg	3.22	0.585	mg/kg	0.0000585 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.5	mg/kg	1.142	1.556	mg/kg	0.000156 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19.4	mg/kg	1.462	25.753	mg/kg	0.00258 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	24.543	mg/kg	0.00245 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	182	mg/kg		165.304	mg/kg	0.0165 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				32.7	mg/kg	2.637	78.31	mg/kg	0.00783 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.639	mg/kg	0.000464 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				65	mg/kg	2.469	145.78	mg/kg	0.0146 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.71 pH		8.71 pH	8.71 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0523 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-2003-06/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2003-06/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16.9% (dry weight correction)	

Hazard properties

None identified

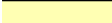



Determinands

Moisture content: 16.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				14.9 mg/kg	1.32	16.829 mg/kg	0.00168 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1.5 mg/kg	2.775	3.561 mg/kg	0.000356 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				1.9 mg/kg	3.22	5.233 mg/kg	0.000523 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2.6 mg/kg	1.142	2.541 mg/kg	0.000254 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				42.3 mg/kg	1.462	52.886 mg/kg	0.00529 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				37 mg/kg	1.126	35.635 mg/kg	0.00356 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	50 mg/kg		42.772 mg/kg	0.00428 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				52.4 mg/kg	2.637	118.188 mg/kg	0.0118 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				129 mg/kg	2.469	272.489 mg/kg	0.0272 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.22 pH		8.22 pH	8.22 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.12 mg/kg		0.103 mg/kg	0.0000103 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.07 mg/kg		0.0599 mg/kg	0.00000599 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.07 mg/kg		0.0599 mg/kg	0.00000599 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.07 mg/kg		0.0599 mg/kg	0.00000599 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.06 mg/kg		0.0513 mg/kg	0.00000513 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.08 mg/kg		0.0684 mg/kg	0.00000684 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.03 mg/kg		0.0257 mg/kg	0.00000257 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.05 mg/kg		0.0428 mg/kg	0.00000428 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0607 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-2003-06/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2003-06/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.7% (dry weight correction)	

Hazard properties

None identified

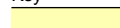



Determinands

Moisture content: 10.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				11.8	mg/kg	1.32	14.074	mg/kg	0.00141 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	2.006	mg/kg	0.000201 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.4	mg/kg	3.22	1.163	mg/kg	0.000116 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.5	mg/kg	1.142	2.58	mg/kg	0.000258 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23	mg/kg	1.462	30.367	mg/kg	0.00304 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				29	mg/kg	1.126	29.495	mg/kg	0.00295 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	21	mg/kg		18.97	mg/kg	0.0019 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				48.3	mg/kg	2.637	115.042	mg/kg	0.0115 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				75	mg/kg	2.469	167.297	mg/kg	0.0167 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.64 pH		8.64 pH	8.64 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0438 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-1011-07/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1011-07/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21.5% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 21.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				14.3 mg/kg	1.32	15.54 mg/kg	0.00155 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				1.4 mg/kg	2.775	3.198 mg/kg	0.00032 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide }				2.7 mg/kg	3.22	7.155 mg/kg	0.000716 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				2 mg/kg	1.142	1.88 mg/kg	0.000188 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				43 mg/kg	1.462	51.726 mg/kg	0.00517 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				113 mg/kg	1.126	104.712 mg/kg	0.0105 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	61 mg/kg		50.206 mg/kg	0.00502 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				0.3 mg/kg	1.353	0.334 mg/kg	0.0000334 %	✓		
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				42.2 mg/kg	2.637	91.579 mg/kg	0.00916 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				1 mg/kg	2.554	2.102 mg/kg	0.00021 %	✓		
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				219 mg/kg	2.469	445.083 mg/kg	0.0445 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %			<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.29 pH		8.29 pH	8.29 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.1 mg/kg		0.0823 mg/kg	0.00000823 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.17 mg/kg		0.14 mg/kg	0.000014 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.15 mg/kg		0.123 mg/kg	0.0000123 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.11 mg/kg		0.0905 mg/kg	0.00000905 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.11 mg/kg		0.0905 mg/kg	0.00000905 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.14 mg/kg		0.115 mg/kg	0.0000115 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.05 mg/kg		0.0412 mg/kg	0.00000412 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.11 mg/kg		0.0905 mg/kg	0.00000905 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0828 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1017-28/09/2021-1.70m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1017-28/09/2021-1.70m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21.2% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 21.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.2	mg/kg	1.32	7.844	mg/kg	0.000784 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.832	mg/kg	0.000183 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.8	mg/kg	3.22	2.125	mg/kg	0.000213 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.9	mg/kg	1.142	1.791	mg/kg	0.000179 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31	mg/kg	1.462	37.383	mg/kg	0.00374 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				16	mg/kg	1.126	14.863	mg/kg	0.00149 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17	mg/kg		14.026	mg/kg	0.0014 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				43.4	mg/kg	2.637	94.416	mg/kg	0.00944 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.107	mg/kg	0.000211 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				72	mg/kg	2.469	146.691	mg/kg	0.0147 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.003	mg/kg		<0.003	mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.011 mg/kg		<0.011 mg/kg	<0.0000011 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.84 pH		7.84 pH	7.84 pH			
			PH								
21	naphthalene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.027 mg/kg		0.0223 mg/kg	0.00000223 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.05 mg/kg		0.0413 mg/kg	0.00000413 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.04 mg/kg		0.033 mg/kg	0.0000033 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.046 mg/kg		0.038 mg/kg	0.0000038 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.028 mg/kg		0.0231 mg/kg	0.00000231 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.032 mg/kg		0.0264 mg/kg	0.00000264 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.012 mg/kg		0.0099 mg/kg	0.00000099 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-027-00-9	201-167-4	79-01-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
43	hexachlorobenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
44	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
45	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
46	dichlorodifluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-893-9	75-71-8							
47	chloromethane; methyl chloride				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
48	bromomethane; methylbromide				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
49	chloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	dichloromethane; methylene chloride				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-004-00-3	200-838-9	75-09-2							
53	2,2-dichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		209-832-0	594-20-7							
54	bromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-826-3	74-97-5							
55	chloroform; trichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
56	1,1,1-trichloroethane; methyl chloroform				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
57	1,1-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
58	1,2-dichloropropane; propylene dichloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
59	dibromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
60	bromodichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-856-7	75-27-4							
61	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
62	trans-1,3-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		431-460-4	10061-02-6							
63	1,1,2-trichloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
64	1,3-dichloropropane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		205-531-3	142-28-9							
65	dibromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		204-704-0	124-48-1							
66	1,2-dibromoethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
67	chlorobenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
68	1,1,1,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		211-135-1	630-20-6							
69	bromoform; tribromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
70	1,1,2,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-015-00-3	201-197-8	79-34-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
71	bromobenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
72	1,2,3-trichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
73	mesitylene; 1,3,5-trimethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
74	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
75	1,2,4-trimethylbenzene				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
76	sec-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		205-227-0	135-98-8							
77	4-isopropyltoluene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		202-796-7	99-87-6							
78	1,3-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
79	1,4-dichlorobenzene; p-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
80	n-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		203-209-7	104-51-8							
81	1,2-dichlorobenzene; o-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
82	1,2-dibromo-3-chloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
83	1,2,4-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
84	hexachlorobutadiene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		201-765-5	87-68-3							
85	1,2,3-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
		201-757-1	87-61-6							
86	styrene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-026-00-0	202-851-5	100-42-5							
87	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							
88	2-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-857-5	88-75-5							
89	2,4-dichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
90	3,4-xlenol; [1] 2,5-xlenol; [2] 2,4-xlenol; [3] 2,3-xlenol; [4] 2,6-xlenol; [5] xlenol; [6] 2,4(or 2,5)-xlenol [7]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]							
91	2,4,5-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-017-00-X	202-467-8	95-95-4							
92	2,4,6-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-018-00-5	201-795-9	88-06-2							
93	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-014-00-3	200-431-6	59-50-7							
94	4-nitrophenol; p-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	609-015-00-2	202-811-7	100-02-7							
95	pentachlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-002-00-8	201-778-6	87-86-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
96	2-chloronaphthalene	202-079-9	91-58-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
97	2-methyl naphthalene	202-078-3	91-57-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
98	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
99	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
100	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
101	di-n-octyl phthalate	204-214-7	117-84-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
102	diethyl phthalate	201-550-6	84-66-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
103	dimethyl phthalate	205-011-6	131-11-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
104	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
105	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
106	4-bromophenylphenylether	202-952-4	101-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
107	4-chloroaniline	612-137-00-9	203-401-0	106-47-8	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
108	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
109	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
110	bis(2-chloroethoxy)methane	203-920-2	111-91-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
111	bis(2-chloroethyl) ether	603-029-00-2	203-870-1	111-44-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
112	carbazole	201-696-0	86-74-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
113	dibenzofuran	205-071-3	132-64-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
114	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
115	hexachloroethane	200-666-4	67-72-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
116	3,5,5-trimethylcyclohex-2-enone; isophorone	606-012-00-8	201-126-0	78-59-1	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
117	nitrosodipropylamine	612-098-00-8	210-698-0	621-64-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
118	nitrobenzene	609-003-00-7	202-716-0	98-95-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
119	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
120	cumene; [1] propylbenzene [2]	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
121	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]	602-040-00-X	202-424-3 [1] 203-580-5 [2]	95-49-8 [1] 108-41-8 [2]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		203-397-0 [3] 246-698-2 [4]	106-43-4 [3] 25168-05-2 [4]							
122	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4] 604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
123	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
Total:								0.0378 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1018-29/09/2021-3.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1018-29/09/2021-3.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15.7% (dry weight correction)	

Hazard properties

None identified

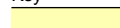



Determinands

Moisture content: 15.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				15.1	mg/kg	1.32	17.232	mg/kg	0.00172 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.6	mg/kg	2.775	3.838	mg/kg	0.000384 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.7	mg/kg	3.22	1.948	mg/kg	0.000195 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.7	mg/kg	1.142	0.691	mg/kg	0.0000691 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18.9	mg/kg	1.462	23.875	mg/kg	0.00239 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				34	mg/kg	1.126	33.086	mg/kg	0.00331 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	22	mg/kg		19.015	mg/kg	0.0019 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				51.3	mg/kg	2.637	116.907	mg/kg	0.0117 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.207	mg/kg	0.000221 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				107	mg/kg	2.469	228.362	mg/kg	0.0228 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.53 pH		8.53 pH	8.53 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.09 mg/kg		0.0778 mg/kg	0.00000778 %	✓		
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.09 mg/kg		0.0778 mg/kg	0.00000778 %	✓		
		205-912-4	206-44-0								
28	pyrene				0.07 mg/kg		0.0605 mg/kg	0.00000605 %	✓		
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.03 mg/kg		0.0259 mg/kg	0.00000259 %	✓		
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0502 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-2010-13/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-2010-13/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 12% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				11.2	mg/kg	1.32	13.203	mg/kg	0.00132 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1	mg/kg	2.775	2.478	mg/kg	0.000248 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.6	mg/kg	3.22	1.725	mg/kg	0.000172 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.2	mg/kg	1.142	2.244	mg/kg	0.000224 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29.4	mg/kg	1.462	38.366	mg/kg	0.00384 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				32	mg/kg	1.126	32.168	mg/kg	0.00322 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	19	mg/kg		16.964	mg/kg	0.0017 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				45.5	mg/kg	2.637	107.115	mg/kg	0.0107 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				83	mg/kg	2.469	182.993	mg/kg	0.0183 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.49 pH		8.49 pH	8.49 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0454 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-2009-13/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2009-13/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14.8% (dry weight correction)	

Hazard properties

None identified

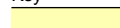



Determinands

Moisture content: 14.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				11	mg/kg	1.32	12.651	mg/kg	0.00127 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.934	mg/kg	0.000193 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.7	mg/kg	3.22	1.963	mg/kg	0.000196 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2	mg/kg	1.142	1.99	mg/kg	0.000199 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30	mg/kg	1.462	38.194	mg/kg	0.00382 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				32	mg/kg	1.126	31.384	mg/kg	0.00314 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	34	mg/kg		29.617	mg/kg	0.00296 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				33.8	mg/kg	2.637	77.631	mg/kg	0.00776 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				102	mg/kg	2.469	219.397	mg/kg	0.0219 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.37 pH		8.37 pH	8.37 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.06 mg/kg		0.0523 mg/kg	0.00000523 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.1 mg/kg		0.0871 mg/kg	0.00000871 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.1 mg/kg		0.0871 mg/kg	0.00000871 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.11 mg/kg		0.0958 mg/kg	0.00000958 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.08 mg/kg		0.0697 mg/kg	0.00000697 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.12 mg/kg		0.105 mg/kg	0.0000105 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.04 mg/kg		0.0348 mg/kg	0.00000348 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.07 mg/kg		0.061 mg/kg	0.0000061 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.06 mg/kg		0.0523 mg/kg	0.00000523 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.06 mg/kg		0.0523 mg/kg	0.00000523 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0472 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-2009-13/10/2021-3.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-2009-13/10/2021-3.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18.3% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				13.8 mg/kg	1.32	15.402 mg/kg	0.00154 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1 mg/kg	2.775	2.346 mg/kg	0.000235 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				1.7 mg/kg	3.22	4.627 mg/kg	0.000463 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2.1 mg/kg	1.142	2.028 mg/kg	0.000203 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29.2 mg/kg	1.462	36.076 mg/kg	0.00361 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				42 mg/kg	1.126	39.972 mg/kg	0.004 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	65 mg/kg		54.945 mg/kg	0.00549 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				42.6 mg/kg	2.637	94.947 mg/kg	0.00949 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				2 mg/kg	2.554	4.318 mg/kg	0.000432 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				166 mg/kg	2.469	346.495 mg/kg	0.0346 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		216 mg/kg		182.587 mg/kg	0.0183 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.97 pH		7.97 pH	7.97 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.05 mg/kg		0.0423 mg/kg	0.00000423 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.09 mg/kg		0.0761 mg/kg	0.00000761 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.08 mg/kg		0.0676 mg/kg	0.00000676 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.07 mg/kg		0.0592 mg/kg	0.00000592 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.06 mg/kg		0.0507 mg/kg	0.00000507 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.09 mg/kg		0.0761 mg/kg	0.00000761 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.03 mg/kg		0.0254 mg/kg	0.00000254 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.06 mg/kg		0.0507 mg/kg	0.00000507 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.05 mg/kg		0.0423 mg/kg	0.00000423 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0786 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0183%)

Classification of sample: LF-CPRC-2003-13/10/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2003-13/10/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15.5% (dry weight correction)	

Hazard properties

None identified

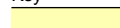



Determinands

Moisture content: 15.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				8.7	mg/kg	1.32	9.945	mg/kg	0.000995 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.7	mg/kg	2.775	1.682	mg/kg	0.000168 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.3	mg/kg	3.22	0.836	mg/kg	0.0000836 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.5	mg/kg	1.142	1.484	mg/kg	0.000148 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19.3	mg/kg	1.462	24.423	mg/kg	0.00244 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	23.395	mg/kg	0.00234 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	13	mg/kg		11.255	mg/kg	0.00113 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				30.3	mg/kg	2.637	69.17	mg/kg	0.00692 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.422	mg/kg	0.000442 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				68	mg/kg	2.469	145.378	mg/kg	0.0145 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.58 pH		8.58 pH	8.58 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0346 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1014-14/10/2021-5.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1014-14/10/2021-5.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13.9% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 13.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				9.8 mg/kg	1.32	11.36 mg/kg	0.00114 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.706 mg/kg	0.000171 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide }				0.5 mg/kg	3.22	1.413 mg/kg	0.000141 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				1 mg/kg	1.142	1.003 mg/kg	0.0001 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15.8 mg/kg	1.462	20.274 mg/kg	0.00203 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				20 mg/kg	1.126	19.77 mg/kg	0.00198 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		14.925 mg/kg	0.00149 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				34.3 mg/kg	2.637	79.401 mg/kg	0.00794 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				2 mg/kg	2.554	4.484 mg/kg	0.000448 %	✓		
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				77 mg/kg	2.469	166.932 mg/kg	0.0167 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %			<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.25 pH		8.25 pH	8.25 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0376 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-2010-20/10/2021-5.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2010-20/10/2021-5.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14.2% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.6	mg/kg	1.32	8.787	mg/kg	0.000879 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.5	mg/kg	2.775	1.215	mg/kg	0.000122 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.3	mg/kg	3.22	3.665	mg/kg	0.000367 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.8	mg/kg	1.142	0.8	mg/kg	0.00008 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19	mg/kg	1.462	24.317	mg/kg	0.00243 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	25.633	mg/kg	0.00256 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	14	mg/kg		12.259	mg/kg	0.00123 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				38	mg/kg	2.637	87.736	mg/kg	0.00877 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				74	mg/kg	2.469	160.007	mg/kg	0.016 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				53	mg/kg		46.41	mg/kg	0.00464 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				0.007 mg/kg		0.0061 mg/kg	0.000000613 %		✓	
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.37 pH		8.37 pH	8.37 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.06 mg/kg		0.0525 mg/kg	0.00000525 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.08 mg/kg		0.0701 mg/kg	0.00000701 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.06 mg/kg		0.0525 mg/kg	0.00000525 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.03 mg/kg		0.0263 mg/kg	0.00000263 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0376 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.00464%)
xylene: (conc.: 6.13e-07%)

Classification of sample: LF-WS-1007-21/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1007-21/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
7.5% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 7.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8.1 mg/kg	1.32	9.948 mg/kg	0.000995 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.8 mg/kg	2.775	2.065 mg/kg	0.000207 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.3 mg/kg	3.22	0.899 mg/kg	0.0000899 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.3 mg/kg	1.142	1.381 mg/kg	0.000138 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31.9 mg/kg	1.462	43.371 mg/kg	0.00434 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	24.089 mg/kg	0.00241 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		15.814 mg/kg	0.00158 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				35.3 mg/kg	2.637	86.581 mg/kg	0.00866 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.376 mg/kg	0.000238 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				70 mg/kg	2.469	160.791 mg/kg	0.0161 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.65 pH		8.65 pH	8.65 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.04 mg/kg		0.0372 mg/kg	0.00000372 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.06 mg/kg		0.0558 mg/kg	0.00000558 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.05 mg/kg		0.0465 mg/kg	0.00000465 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.06 mg/kg		0.0558 mg/kg	0.00000558 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0402 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1022-18/10/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1022-18/10/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
11.8% (dry weight correction)	

Hazard properties

None identified

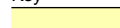



Determinands

Moisture content: 11.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				10.8	mg/kg	1.32	12.754	mg/kg	0.00128 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.986	mg/kg	0.000199 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.4	mg/kg	3.22	1.152	mg/kg	0.000115 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.2	mg/kg	1.142	1.226	mg/kg	0.000123 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27.5	mg/kg	1.462	35.951	mg/kg	0.0036 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				30	mg/kg	1.126	30.212	mg/kg	0.00302 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	30	mg/kg		26.834	mg/kg	0.00268 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				37.5	mg/kg	2.637	88.44	mg/kg	0.00884 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.284	mg/kg	0.000228 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				85	mg/kg	2.469	187.737	mg/kg	0.0188 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.71 pH		8.71 pH	8.71 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0443 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1022-18/10/2021-3.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1022-18/10/2021-3.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.5% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 10.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				13.6 mg/kg	1.32	16.25 mg/kg	0.00163 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.9 mg/kg	2.775	2.26 mg/kg	0.000226 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.166 mg/kg	0.000117 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				1 mg/kg	1.142	1.034 mg/kg	0.000103 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23 mg/kg	1.462	30.422 mg/kg	0.00304 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				29 mg/kg	1.126	29.548 mg/kg	0.00295 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	32 mg/kg		28.959 mg/kg	0.0029 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				38.9 mg/kg	2.637	92.821 mg/kg	0.00928 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				2 mg/kg	2.554	4.622 mg/kg	0.000462 %	✓		
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				97 mg/kg	2.469	216.762 mg/kg	0.0217 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %			<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.75 pH		8.75 pH	8.75 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0478 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-CPRC-1022-18/10/2021-3.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	% 0.39	3	5
2	LOI (loss on ignition)	% 1.8	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg <30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg <0.64	100	-
7	pH	pH 8.75	-	>6
8	ANC (acid neutralisation capacity)	mol/kg <0.03	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg <0.025	0.5	2
10	barium	mg/kg 0.4	20	100
11	cadmium	mg/kg <0.005	0.04	1
12	chromium	mg/kg <0.015	0.5	10
13	copper	mg/kg <0.07	2	50
14	mercury	mg/kg <0.01	0.01	0.2
15	molybdenum	mg/kg <0.02	0.5	10
16	nickel	mg/kg <0.02	0.4	10
17	lead	mg/kg <0.05	0.5	10
18	antimony	mg/kg <0.02	0.06	0.7
19	selenium	mg/kg <0.03	0.1	0.5
20	zinc	mg/kg <0.03	4	50
21	chloride	mg/kg 4	800	15,000
22	fluoride	mg/kg <3	10	150
23	sulphate	mg/kg 859	1,000	20,000
24	phenol index	mg/kg <0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg 30	500	800
26	TDS (total dissolved solids)	mg/kg 2070	4,000	60,000

Key

User supplied data

Classification of sample: LF-WS-1012-20/10/2021-1.20-1.70m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1012-20/10/2021-1.20-1.70m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
27.6% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 27.6% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				13.1 mg/kg	1.32	13.555 mg/kg	0.00136 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1 mg/kg	2.775	2.175 mg/kg	0.000218 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.3 mg/kg	3.22	0.757 mg/kg	0.0000757 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.1 mg/kg	1.142	0.985 mg/kg	0.0000985 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30.7 mg/kg	1.462	35.164 mg/kg	0.00352 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				19 mg/kg	1.126	16.765 mg/kg	0.00168 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16 mg/kg		12.539 mg/kg	0.00125 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				25.3 mg/kg	2.637	52.279 mg/kg	0.00523 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				76 mg/kg	2.469	147.074 mg/kg	0.0147 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.27 pH		8.27 pH	8.27 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0338 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-1013-20/10/2021-1.20-1.90m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1013-20/10/2021-1.20-1.90m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.3% (dry weight correction)	

Hazard properties

None identified

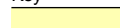



Determinands

Moisture content: 9.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				8.8	mg/kg	1.32	10.63	mg/kg	0.00106 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.7	mg/kg	2.775	1.777	mg/kg	0.000178 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.4	mg/kg	3.22	1.178	mg/kg	0.000118 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.6	mg/kg	1.142	1.672	mg/kg	0.000167 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				20.2	mg/kg	1.462	27.011	mg/kg	0.0027 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				29	mg/kg	1.126	29.873	mg/kg	0.00299 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16	mg/kg		14.639	mg/kg	0.00146 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				33	mg/kg	2.637	79.607	mg/kg	0.00796 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.673	mg/kg	0.000467 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				60	mg/kg	2.469	135.551	mg/kg	0.0136 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.63 pH		8.63 pH	8.63 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0361 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-1013-20/10/2021-2.80-3.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1013-20/10/2021-2.80-3.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.6% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 8.6% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				6.8 mg/kg	1.32	8.267 mg/kg	0.000827 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.789 mg/kg	0.000179 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.2 mg/kg	3.22	0.593 mg/kg	0.0000593 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.5 mg/kg	1.142	1.578 mg/kg	0.000158 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				26 mg/kg	1.462	34.991 mg/kg	0.0035 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	21.771 mg/kg	0.00218 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	15 mg/kg		13.812 mg/kg	0.00138 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				32.8 mg/kg	2.637	79.635 mg/kg	0.00796 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				4 mg/kg	2.554	9.406 mg/kg	0.000941 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				68 mg/kg	2.469	154.615 mg/kg	0.0155 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.82 pH		8.82 pH	8.82 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0381 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-1007-21/10/2021-1.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1007-21/10/2021-1.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13.3% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				14.1	mg/kg	1.32	16.431	mg/kg	0.00164 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.3	mg/kg	2.775	3.184	mg/kg	0.000318 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.8	mg/kg	3.22	2.274	mg/kg	0.000227 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.6	mg/kg	1.142	2.621	mg/kg	0.000262 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				51.7	mg/kg	1.462	66.692	mg/kg	0.00667 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				46	mg/kg	1.126	45.711	mg/kg	0.00457 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	35	mg/kg		30.891	mg/kg	0.00309 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				71.1	mg/kg	2.637	165.462	mg/kg	0.0165 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.508	mg/kg	0.000451 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				110	mg/kg	2.469	239.738	mg/kg	0.024 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.003	mg/kg		<0.003	mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.011 mg/kg		<0.011 mg/kg	<0.0000011 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH		PH		8.21 pH		8.21 pH	8.21 pH			
21	naphthalene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-027-00-9	201-167-4	79-01-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
43	hexachlorobenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
44	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
45	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
46	dichlorodifluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-893-9	75-71-8							
47	chloromethane; methyl chloride				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
48	bromomethane; methylbromide				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
49	chloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	dichloromethane; methylene chloride				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-004-00-3	200-838-9	75-09-2							
53	2,2-dichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		209-832-0	594-20-7							
54	bromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-826-3	74-97-5							
55	chloroform; trichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
56	1,1,1-trichloroethane; methyl chloroform				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
57	1,1-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
58	1,2-dichloropropane; propylene dichloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
59	dibromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
60	bromodichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-856-7	75-27-4							
61	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
62	trans-1,3-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		431-460-4	10061-02-6							
63	1,1,2-trichloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
64	1,3-dichloropropane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		205-531-3	142-28-9							
65	dibromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		204-704-0	124-48-1							
66	1,2-dibromoethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
67	chlorobenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
68	1,1,1,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		211-135-1	630-20-6							
69	bromoform; tribromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
70	1,1,2,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-015-00-3	201-197-8	79-34-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
71	bromobenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
72	1,2,3-trichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
73	mesitylene; 1,3,5-trimethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
74	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
75	1,2,4-trimethylbenzene				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
76	sec-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		205-227-0	135-98-8							
77	4-isopropyltoluene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		202-796-7	99-87-6							
78	1,3-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
79	1,4-dichlorobenzene; p-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
80	n-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		203-209-7	104-51-8							
81	1,2-dichlorobenzene; o-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
82	1,2-dibromo-3-chloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
83	1,2,4-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
84	hexachlorobutadiene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		201-765-5	87-68-3							
85	1,2,3-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
		201-757-1	87-61-6							
86	styrene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-026-00-0	202-851-5	100-42-5							
87	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							
88	2-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-857-5	88-75-5							
89	2,4-dichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
90	3,4-xlenol; [1] 2,5-xlenol; [2] 2,4-xlenol; [3] 2,3-xlenol; [4] 2,6-xlenol; [5] xlenol; [6] 2,4(or 2,5)-xlenol [7]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]							
91	2,4,5-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-017-00-X	202-467-8	95-95-4							
92	2,4,6-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-018-00-5	201-795-9	88-06-2							
93	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-014-00-3	200-431-6	59-50-7							
94	4-nitrophenol; p-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	609-015-00-2	202-811-7	100-02-7							
95	pentachlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-002-00-8	201-778-6	87-86-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
96	2-chloronaphthalene	202-079-9	91-58-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
97	2-methyl naphthalene	202-078-3	91-57-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
98	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
99	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
100	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
101	di-n-octyl phthalate	204-214-7	117-84-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
102	diethyl phthalate	201-550-6	84-66-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
103	dimethyl phthalate	205-011-6	131-11-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
104	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
105	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
106	4-bromophenylphenylether	202-952-4	101-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
107	4-chloroaniline	612-137-00-9	203-401-0	106-47-8	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
108	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
109	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
110	bis(2-chloroethoxy)methane	203-920-2	111-91-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
111	bis(2-chloroethyl) ether	603-029-00-2	203-870-1	111-44-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
112	carbazole	201-696-0	86-74-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
113	dibenzofuran	205-071-3	132-64-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
114	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
115	hexachloroethane	200-666-4	67-72-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
116	3,5,5-trimethylcyclohex-2-enone; isophorone	606-012-00-8	201-126-0	78-59-1	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
117	nitrosodipropylamine	612-098-00-8	210-698-0	621-64-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
118	nitrobenzene	609-003-00-7	202-716-0	98-95-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
119	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
120	cumene; [1] propylbenzene [2]	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
121	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]	602-040-00-X	202-424-3 [1] 203-580-5 [2]	95-49-8 [1] 108-41-8 [2]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		203-397-0 [3] 246-698-2 [4]	106-43-4 [3] 25168-05-2 [4]							
122	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4] 604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
123	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
Total:								0.0633 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-1007-21/10/2021-2.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1007-21/10/2021-2.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.9% (dry weight correction)	

Hazard properties

None identified

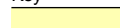



Determinands

Moisture content: 10.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				9.6	mg/kg	1.32	11.429	mg/kg	0.00114 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	2.002	mg/kg	0.0002 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.3	mg/kg	3.22	0.871	mg/kg	0.0000871 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.3	mg/kg	1.142	1.339	mg/kg	0.000134 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.5	mg/kg	1.462	30.971	mg/kg	0.0031 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				25	mg/kg	1.126	25.381	mg/kg	0.00254 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	23	mg/kg		20.739	mg/kg	0.00207 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				40	mg/kg	2.637	95.101	mg/kg	0.00951 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.606	mg/kg	0.000461 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				90	mg/kg	2.469	200.394	mg/kg	0.02 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.61 pH		8.61 pH	8.61 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0447 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-2010-21/10/2021-1.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-2010-21/10/2021-1.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.9% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 8.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8.4 mg/kg	1.32	10.184 mg/kg	0.00102 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.784 mg/kg	0.000178 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.183 mg/kg	0.000118 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.9 mg/kg	1.142	1.993 mg/kg	0.000199 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22.5 mg/kg	1.462	30.197 mg/kg	0.00302 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				25 mg/kg	1.126	25.847 mg/kg	0.00258 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	15 mg/kg		13.774 mg/kg	0.00138 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				38.1 mg/kg	2.637	92.248 mg/kg	0.00922 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				2 mg/kg	2.554	4.69 mg/kg	0.000469 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				71 mg/kg	2.469	160.992 mg/kg	0.0161 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.68 pH		8.68 pH	8.68 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0397 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-2010-21/10/2021-2.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-2010-21/10/2021-2.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
7.7% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 7.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.9	mg/kg	1.32	8.459	mg/kg	0.000846 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	2.062	mg/kg	0.000206 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.4	mg/kg	3.22	1.196	mg/kg	0.00012 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.5	mg/kg	1.142	1.591	mg/kg	0.000159 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24.7	mg/kg	1.462	33.519	mg/kg	0.00335 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	25.089	mg/kg	0.00251 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	14	mg/kg		12.999	mg/kg	0.0013 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				33.7	mg/kg	2.637	82.504	mg/kg	0.00825 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				4	mg/kg	2.554	9.485	mg/kg	0.000949 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				65	mg/kg	2.469	149.029	mg/kg	0.0149 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				0.078	mg/kg		0.0724	mg/kg	0.00000724 %	✓	
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.2 pH		8.2 pH	8.2 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.05 mg/kg		0.0464 mg/kg	0.00000464 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.05 mg/kg		0.0464 mg/kg	0.00000464 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.038 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (conc.: 7.24e-06%)

Classification of sample: LF-WS-1010-26/10/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1010-26/10/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
11.2% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8 mg/kg	1.32	9.499 mg/kg	0.00095 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1 mg/kg	2.775	2.496 mg/kg	0.00025 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.158 mg/kg	0.000116 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.4 mg/kg	1.142	1.438 mg/kg	0.000144 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				26.2 mg/kg	1.462	34.436 mg/kg	0.00344 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				24 mg/kg	1.126	24.3 mg/kg	0.00243 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		15.288 mg/kg	0.00153 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				42 mg/kg	2.637	99.587 mg/kg	0.00996 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.297 mg/kg	0.00023 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				82 mg/kg	2.469	182.088 mg/kg	0.0182 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				0.012 mg/kg		0.0108 mg/kg	0.00000108 %	✓	
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		0.021 mg/kg		0.0189 mg/kg	0.00000189 %	✓	
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
20	pH		PH		8.6 pH		8.6 pH	8.6 pH		
21	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
22	acenaphthylene 205-917-1	208-96-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
24	fluorene 201-695-5	86-73-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
25	phenanthrene 201-581-5	85-01-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	anthracene 204-371-1	120-12-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
27	fluoranthene 205-912-4	206-44-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	pyrene 204-927-3	129-00-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
30	chrysene 601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	benzo[ghi]perylene 205-883-8	191-24-2			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
37	phenol 604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
38	coronene 205-881-7	191-07-1			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
Total:								0.0427 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (conc.: 1.08e-06%)
toluene: (conc.: 1.89e-06%)

Classification of sample: LF-CPRC-1004-28/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1004-28/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25.2% (dry weight correction)	

Hazard properties

None identified

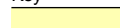



Determinands

Moisture content: 25.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				25.6	mg/kg	1.32	26.997	mg/kg	0.0027 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.3	mg/kg	2.775	2.882	mg/kg	0.000288 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.1	mg/kg	3.22	2.829	mg/kg	0.000283 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.2	mg/kg	1.142	2.007	mg/kg	0.000201 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				38.8	mg/kg	1.462	45.294	mg/kg	0.00453 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				44	mg/kg	1.126	39.568	mg/kg	0.00396 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	81	mg/kg		64.696	mg/kg	0.00647 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				43.1	mg/kg	2.637	90.768	mg/kg	0.00908 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.04	mg/kg	0.000204 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				204	mg/kg	2.469	402.345	mg/kg	0.0402 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.07 pH		8.07 pH	8.07 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.09 mg/kg		0.0719 mg/kg	0.00000719 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.09 mg/kg		0.0719 mg/kg	0.00000719 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.08 mg/kg		0.0639 mg/kg	0.00000639 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.08 mg/kg		0.0639 mg/kg	0.00000639 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.08 mg/kg		0.0639 mg/kg	0.00000639 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.03 mg/kg		0.024 mg/kg	0.0000024 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.06 mg/kg		0.0479 mg/kg	0.00000479 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.06 mg/kg		0.0479 mg/kg	0.00000479 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.06 mg/kg		0.0479 mg/kg	0.00000479 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0734 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1004-28/10/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1004-28/10/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
19.1% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 19.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8 mg/kg	1.32	8.869 mg/kg	0.000887 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1 mg/kg	2.775	2.33 mg/kg	0.000233 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.081 mg/kg	0.000108 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.4 mg/kg	1.142	1.343 mg/kg	0.000134 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				41 mg/kg	1.462	50.314 mg/kg	0.00503 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	20.797 mg/kg	0.00208 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20 mg/kg		16.793 mg/kg	0.00168 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				39.4 mg/kg	2.637	87.225 mg/kg	0.00872 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				91 mg/kg	2.469	188.67 mg/kg	0.0189 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.35 pH		8.35 pH	8.35 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0434 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1005-28/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1005-28/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
30.9% (dry weight correction)	

Hazard properties

None identified

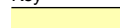



Determinands

Moisture content: 30.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				20.5	mg/kg	1.32	20.677	mg/kg	0.00207 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.2	mg/kg	2.775	2.544	mg/kg	0.000254 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				2.3	mg/kg	3.22	5.658	mg/kg	0.000566 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.5	mg/kg	1.142	2.182	mg/kg	0.000218 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				42.3	mg/kg	1.462	47.23	mg/kg	0.00472 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	22.363	mg/kg	0.00224 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	29	mg/kg		22.154	mg/kg	0.00222 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				40.8	mg/kg	2.637	82.182	mg/kg	0.00822 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	1.951	mg/kg	0.000195 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				126	mg/kg	2.469	237.686	mg/kg	0.0238 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.59 pH		7.59 pH	7.59 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0499 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-2011-01/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2011-01/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13.6% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13.6% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				15.9 mg/kg	1.32	18.48 mg/kg	0.00185 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.6 mg/kg	2.775	1.466 mg/kg	0.000147 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide }				0.8 mg/kg	3.22	2.268 mg/kg	0.000227 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				0.8 mg/kg	1.142	0.804 mg/kg	0.0000804 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				55 mg/kg	1.462	70.762 mg/kg	0.00708 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				38 mg/kg	1.126	37.662 mg/kg	0.00377 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	151 mg/kg		132.923 mg/kg	0.0133 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				16.8 mg/kg	2.637	38.993 mg/kg	0.0039 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				152 mg/kg	2.469	330.399 mg/kg	0.033 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group		TPH		199 mg/kg		175.176 mg/kg	0.0175 %	✓		
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.57 pH		8.57 pH	8.57 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.09 mg/kg		0.0792 mg/kg	0.00000792 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.33 mg/kg		0.29 mg/kg	0.000029 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.34 mg/kg		0.299 mg/kg	0.0000299 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.23 mg/kg		0.202 mg/kg	0.0000202 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.22 mg/kg		0.194 mg/kg	0.0000194 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.26 mg/kg		0.229 mg/kg	0.0000229 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.1 mg/kg		0.088 mg/kg	0.0000088 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.2 mg/kg		0.176 mg/kg	0.0000176 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.17 mg/kg		0.15 mg/kg	0.000015 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.24 mg/kg		0.211 mg/kg	0.0000211 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				0.09 mg/kg		0.0792 mg/kg	0.00000792 %		✓	
		205-881-7	191-07-1								
Total:									0.0816 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0175%)

Classification of sample: LF-CPRC-2011-01/11/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details
















Sample name:	LoW Code:
LF-CPRC-2011-01/11/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25.3% (dry weight correction)	

Hazard properties



None identified

Determinands

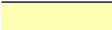



Moisture content: 25.3% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		antimony { antimony trioxide }			1	mg/kg	1.197	0.955	mg/kg	0.0000955 %	✓	
		051-005-00-X	215-175-0	1309-64-4								
2		arsenic { arsenic trioxide }			9.3	mg/kg	1.32	9.8	mg/kg	0.00098 %	✓	
		033-003-00-0	215-481-4	1327-53-3								
3		beryllium { beryllium oxide }			<0.5	mg/kg	2.775	<1.388	mg/kg	<0.000139 %		<LOD
		004-003-00-8	215-133-1	1304-56-9								
4		boron { diboron trioxide }			0.6	mg/kg	3.22	1.542	mg/kg	0.000154 %	✓	
		005-008-00-8	215-125-8	1303-86-2								
5		cadmium { cadmium oxide }			1.1	mg/kg	1.142	1.003	mg/kg	0.0001 %	✓	
		048-002-00-0	215-146-2	1306-19-0								
6		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }			23.1	mg/kg	1.462	26.945	mg/kg	0.00269 %	✓	
			215-160-9	1308-38-9								
7		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }			<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
		024-017-00-8										
8		copper { dicopper oxide; copper (I) oxide }			11	mg/kg	1.126	9.884	mg/kg	0.000988 %	✓	
		029-002-00-X	215-270-7	1317-39-1								
9		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }		1	16	mg/kg		12.769	mg/kg	0.00128 %	✓	
		082-001-00-6										
10		mercury { mercury dichloride }			<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7								
11		molybdenum { molybdenum(VI) oxide }			2.5	mg/kg	1.5	2.993	mg/kg	0.000299 %	✓	
		042-001-00-9	215-204-7	1313-27-5								
12		nickel { nickel sulfate }			13	mg/kg	2.637	27.356	mg/kg	0.00274 %	✓	
		028-009-00-5	232-104-9	7786-81-4								
13		selenium { nickel selenate }			<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
		028-031-00-5	239-125-2	15060-62-5								
14		zinc { zinc sulphate }			60	mg/kg	2.469	118.242	mg/kg	0.0118 %	✓	
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
15		TPH (C6 to C40) petroleum group			<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
				TPH								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
17	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
18	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
19	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
20	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
21	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
22	pH				8.09 pH		8.09 pH	8.09 pH		
			PH							
23	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
24	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
25	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
26	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
27	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
28	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
29	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
30	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
31	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
32	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
33	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
34	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
35	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
36	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5							
37	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
38	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2							
39	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
40	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
41	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	 barium {  barium sulphide }				88 mg/kg	1.233	86.63 mg/kg	0.00866 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
43	benzo[<i>j</i>]fluoranthene				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	601-035-00-X	205-910-3	205-82-3							
Total:								0.0358 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-CPRC-2011-01/11/2021-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.49	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH	8.09	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.22	20	100
11	cadmium	mg/kg	0.013	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.15	0.5	10
16	nickel	mg/kg	0.09	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.09	4	50
21	chloride	mg/kg	9	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	30	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	30	500	800
26	TDS (total dissolved solids)	mg/kg	740	4,000	60,000

Key

User supplied data

Classification of sample: LF-CPRC-1006-01/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1006-01/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
17.8% (dry weight correction)	

Hazard properties

None identified

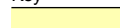



Determinands

Moisture content: 17.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				10.1	mg/kg	1.32	11.32	mg/kg	0.00113 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.1	mg/kg	2.775	2.592	mg/kg	0.000259 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.9	mg/kg	3.22	2.46	mg/kg	0.000246 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.4	mg/kg	1.142	2.327	mg/kg	0.000233 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				26.1	mg/kg	1.462	32.383	mg/kg	0.00324 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				25	mg/kg	1.126	23.894	mg/kg	0.00239 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	29	mg/kg		24.618	mg/kg	0.00246 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				34.4	mg/kg	2.637	76.997	mg/kg	0.0077 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				102	mg/kg	2.469	213.81	mg/kg	0.0214 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.21 pH		8.21 pH	8.21 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.05 mg/kg		0.0424 mg/kg	0.00000424 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.09 mg/kg		0.0764 mg/kg	0.00000764 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.07 mg/kg		0.0594 mg/kg	0.00000594 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.05 mg/kg		0.0424 mg/kg	0.00000424 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0448 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-CPRC-1006-01/11/2021-0.50m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.66	3	5
2	LOI (loss on ignition)	%	2.8	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH	8.21	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.4	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.13	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	0.05	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	<0.03	4	50
21	chloride	mg/kg	7	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	62	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	50	500	800
26	TDS (total dissolved solids)	mg/kg	1000	4,000	60,000

Key

User supplied data

Classification of sample: LF-CPRC-1006-01/11/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **LF-CPRC-1006-01/11/2021-1.00m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **20%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 20% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12.3	mg/kg	1.32	13.533	mg/kg	0.00135 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.9	mg/kg	2.775	2.082	mg/kg	0.000208 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.2	mg/kg	3.22	3.22	mg/kg	0.000322 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.4	mg/kg	1.142	1.333	mg/kg	0.000133 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24.9	mg/kg	1.462	30.327	mg/kg	0.00303 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				28	mg/kg	1.126	26.271	mg/kg	0.00263 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	43	mg/kg		35.833	mg/kg	0.00358 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				24	mg/kg	2.637	52.734	mg/kg	0.00527 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				97	mg/kg	2.469	199.601	mg/kg	0.02 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group		TPH		130	mg/kg		108.333	mg/kg	0.0108 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.18 pH		8.18 pH	8.18 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				0.05 mg/kg		0.0417 mg/kg	0.00000417 %		✓	
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.43 mg/kg		0.358 mg/kg	0.0000358 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.1 mg/kg		0.0833 mg/kg	0.00000833 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				0.68 mg/kg		0.567 mg/kg	0.0000567 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.58 mg/kg		0.483 mg/kg	0.0000483 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.38 mg/kg		0.317 mg/kg	0.0000317 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.42 mg/kg		0.35 mg/kg	0.000035 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.48 mg/kg		0.4 mg/kg	0.00004 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.18 mg/kg		0.15 mg/kg	0.000015 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.36 mg/kg		0.3 mg/kg	0.00003 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.29 mg/kg		0.242 mg/kg	0.0000242 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				0.06 mg/kg		0.05 mg/kg	0.000005 %		✓	
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.24 mg/kg		0.2 mg/kg	0.00002 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0481 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0108%)

Classification of sample: LF-WS-1005-05/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1005-05/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
20.1% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 20.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				15.9 mg/kg	1.32	17.48 mg/kg	0.00175 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				1.2 mg/kg	2.775	2.773 mg/kg	0.000277 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide }				1.7 mg/kg	3.22	4.558 mg/kg	0.000456 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				3.7 mg/kg	1.142	3.519 mg/kg	0.000352 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				35.7 mg/kg	1.462	43.445 mg/kg	0.00434 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				30 mg/kg	1.126	28.124 mg/kg	0.00281 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	36 mg/kg		29.975 mg/kg	0.003 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				48.7 mg/kg	2.637	106.916 mg/kg	0.0107 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				1 mg/kg	2.554	2.126 mg/kg	0.000213 %	✓		
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				124 mg/kg	2.469	254.948 mg/kg	0.0255 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %			<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.25 pH		8.25 pH	8.25 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.06 mg/kg		0.05 mg/kg	0.000005 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.06 mg/kg		0.05 mg/kg	0.000005 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.05 mg/kg		0.0416 mg/kg	0.00000416 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0548 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1003-09/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1003-09/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16.7% (dry weight correction)	

Hazard properties

None identified

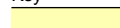



Determinands

Moisture content: 16.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				13.3	mg/kg	1.32	15.047	mg/kg	0.0015 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.903	mg/kg	0.00019 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.6	mg/kg	3.22	1.655	mg/kg	0.000166 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.9	mg/kg	1.142	1.86	mg/kg	0.000186 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27.9	mg/kg	1.462	34.942	mg/kg	0.00349 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				31	mg/kg	1.126	29.908	mg/kg	0.00299 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	35	mg/kg		29.991	mg/kg	0.003 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				36.6	mg/kg	2.637	82.693	mg/kg	0.00827 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				104	mg/kg	2.469	220.057	mg/kg	0.022 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.35 pH		8.35 pH	8.35 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓		
		205-912-4	206-44-0								
28	pyrene				0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓		
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓		
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.09 mg/kg		0.0771 mg/kg	0.00000771 %	✓		
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.03 mg/kg		0.0257 mg/kg	0.00000257 %	✓		
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓		
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓		
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓		
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0475 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-CPRC-1003-09/11/2021-0.50m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.39	3	5
2	LOI (loss on ignition)	%	4	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH	8.35	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.19	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.09	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.11	4	50
21	chloride	mg/kg	<3	800	15,000
22	fluoride	mg/kg	4	10	150
23	sulphate	mg/kg	6	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	40	500	800
26	TDS (total dissolved solids)	mg/kg	740	4,000	60,000

Key

User supplied data

Classification of sample: LW-WS-1022-05/11/2021-1.40m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details














Sample name: **LW-WS-1022-05/11/2021-1.40m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **11.6%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

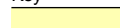



Determinands

Moisture content: 11.6% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				6 mg/kg	1.32	7.099 mg/kg	0.00071 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.741 mg/kg	0.000174 %	✓		
		004-003-00-8	215-133-1	1304-56-9								
3		boron { diboron trioxide }				0.3 mg/kg	3.22	0.866 mg/kg	0.0000866 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
4		cadmium { cadmium oxide }				0.6 mg/kg	1.142	0.614 mg/kg	0.0000614 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14.2 mg/kg	1.462	18.597 mg/kg	0.00186 %	✓		
			215-160-9	1308-38-9								
6		chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD	
		024-017-00-8										
7		copper { dicopper oxide; copper (I) oxide }				12 mg/kg	1.126	12.106 mg/kg	0.00121 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	18 mg/kg		16.129 mg/kg	0.00161 %	✓		
		082-001-00-6										
9		mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
10		nickel { nickel sulfate }				21.9 mg/kg	2.637	51.741 mg/kg	0.00517 %	✓		
		028-009-00-5	232-104-9	7786-81-4								
11		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
12		zinc { zinc sulphate }				36 mg/kg	2.469	79.655 mg/kg	0.00797 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13		TPH (C6 to C40) petroleum group				<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD	
				TPH								
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
15		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.44 pH		8.44 pH	8.44 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0246 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LW-WS-1004-05/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LW-WS-1004-05/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.9% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 10.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				9.7 mg/kg	1.32	11.548 mg/kg	0.00115 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.6 mg/kg	2.775	1.502 mg/kg	0.00015 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.5 mg/kg	3.22	1.452 mg/kg	0.000145 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.7 mg/kg	1.142	1.751 mg/kg	0.000175 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13.3 mg/kg	1.462	17.528 mg/kg	0.00175 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	21.32 mg/kg	0.00213 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	12 mg/kg		10.821 mg/kg	0.00108 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				29.3 mg/kg	2.637	69.662 mg/kg	0.00697 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				57 mg/kg	2.469	126.916 mg/kg	0.0127 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		0.011 mg/kg		0.0099 mg/kg	0.000000992 %	✓	
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.01 mg/kg		0.009 mg/kg	0.000000902 %	✓	
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
20	pH		PH		8.65 pH		8.65 pH	8.65 pH		
21	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
22	acenaphthylene 205-917-1	208-96-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
24	fluorene 201-695-5	86-73-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
25	phenanthrene 201-581-5	85-01-8			0.03 mg/kg		0.0271 mg/kg	0.00000271 %	✓	
26	anthracene 204-371-1	120-12-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
27	fluoranthene 205-912-4	206-44-0			0.1 mg/kg		0.0902 mg/kg	0.00000902 %	✓	
28	pyrene 204-927-3	129-00-0			0.09 mg/kg		0.0812 mg/kg	0.00000812 %	✓	
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
30	chrysene 601-048-00-0	205-923-4	218-01-9		0.06 mg/kg		0.0541 mg/kg	0.00000541 %	✓	
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.07 mg/kg		0.0631 mg/kg	0.00000631 %	✓	
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.03 mg/kg		0.0271 mg/kg	0.00000271 %	✓	
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.07 mg/kg		0.0631 mg/kg	0.00000631 %	✓	
34	indeno[123-cd]pyrene 205-893-2	193-39-5			0.06 mg/kg		0.0541 mg/kg	0.00000541 %	✓	
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	benzo[ghi]perylene 205-883-8	191-24-2			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
37	phenol 604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
38	coronene 205-881-7	191-07-1			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
Total:								0.032 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 9.92e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

xylene: (conc.: 9.02e-07%)

Classification of sample: CP1034-12/11/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
CP1034-12/11/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14% (dry weight correction)	

Hazard properties

None identified

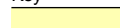



Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				9.8	mg/kg	1.32	11.35	mg/kg	0.00114 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.6	mg/kg	2.775	1.461	mg/kg	0.000146 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.6	mg/kg	3.22	1.695	mg/kg	0.000169 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.1	mg/kg	1.142	2.104	mg/kg	0.00021 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19.6	mg/kg	1.462	25.129	mg/kg	0.00251 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				27	mg/kg	1.126	26.666	mg/kg	0.00267 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20	mg/kg		17.544	mg/kg	0.00175 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				26.6	mg/kg	2.637	61.523	mg/kg	0.00615 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				72	mg/kg	2.469	155.956	mg/kg	0.0156 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.29 pH		8.29 pH	8.29 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.51 mg/kg		0.447 mg/kg	0.0000447 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.13 mg/kg		0.114 mg/kg	0.0000114 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				0.66 mg/kg		0.579 mg/kg	0.0000579 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.5 mg/kg		0.439 mg/kg	0.0000439 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.27 mg/kg		0.237 mg/kg	0.0000237 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.29 mg/kg		0.254 mg/kg	0.0000254 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.29 mg/kg		0.254 mg/kg	0.0000254 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.11 mg/kg		0.0965 mg/kg	0.00000965 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.21 mg/kg		0.184 mg/kg	0.0000184 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.16 mg/kg		0.14 mg/kg	0.000014 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.13 mg/kg		0.114 mg/kg	0.0000114 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0363 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LT-CPRC-1032-18/11/2021-3.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LT-CPRC-1032-18/11/2021-3.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 16% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				11 mg/kg	1.32	12.52 mg/kg	0.00125 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.9 mg/kg	2.775	2.153 mg/kg	0.000215 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide }				0.6 mg/kg	3.22	1.665 mg/kg	0.000167 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				2.2 mg/kg	1.142	2.166 mg/kg	0.000217 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				32.3 mg/kg	1.462	40.697 mg/kg	0.00407 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				36 mg/kg	1.126	34.941 mg/kg	0.00349 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20 mg/kg		17.241 mg/kg	0.00172 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				39.8 mg/kg	2.637	90.466 mg/kg	0.00905 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				1 mg/kg	2.554	2.202 mg/kg	0.00022 %	✓		
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				76 mg/kg	2.469	161.781 mg/kg	0.0162 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %			<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.46 pH		8.46 pH	8.46 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.03 mg/kg		0.0259 mg/kg	0.00000259 %		✓	
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.042 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1031-19/11/2021-2.60m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1031-19/11/2021-2.60m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15% (dry weight correction)	

Hazard properties

None identified

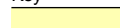



Determinands

Moisture content: 15% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				10.5	mg/kg	1.32	12.055	mg/kg	0.00121 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.9	mg/kg	2.775	2.172	mg/kg	0.000217 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.4	mg/kg	3.22	1.12	mg/kg	0.000112 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.5	mg/kg	1.142	2.483	mg/kg	0.000248 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25.4	mg/kg	1.462	32.281	mg/kg	0.00323 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				38	mg/kg	1.126	37.203	mg/kg	0.00372 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17	mg/kg		14.783	mg/kg	0.00148 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				37.6	mg/kg	2.637	86.208	mg/kg	0.00862 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				85	mg/kg	2.469	182.513	mg/kg	0.0183 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.41 pH		8.41 pH	8.41 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.03 mg/kg		0.0261 mg/kg	0.00000261 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.05 mg/kg		0.0435 mg/kg	0.00000435 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.05 mg/kg		0.0435 mg/kg	0.00000435 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.03 mg/kg		0.0261 mg/kg	0.00000261 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0428 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-1006-25/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1006-25/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12.9% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 12.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				19.4 mg/kg	1.32	22.688 mg/kg	0.00227 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.6 mg/kg	2.775	1.475 mg/kg	0.000147 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				1 mg/kg	3.22	2.852 mg/kg	0.000285 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.1 mg/kg	1.142	1.113 mg/kg	0.000111 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16.9 mg/kg	1.462	21.878 mg/kg	0.00219 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				25 mg/kg	1.126	24.931 mg/kg	0.00249 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	65 mg/kg		57.573 mg/kg	0.00576 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				19.8 mg/kg	2.637	46.241 mg/kg	0.00462 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.262 mg/kg	0.000226 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				170 mg/kg	2.469	371.816 mg/kg	0.0372 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		186 mg/kg		164.748 mg/kg	0.0165 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH		PH		8.38 pH		8.38 pH	8.38 pH			
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				0.33 mg/kg		0.292 mg/kg	0.0000292 %		✓	
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.19 mg/kg		0.168 mg/kg	0.0000168 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.23 mg/kg		0.204 mg/kg	0.0000204 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				0.9 mg/kg		0.797 mg/kg	0.0000797 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.85 mg/kg		0.753 mg/kg	0.0000753 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.68 mg/kg		0.602 mg/kg	0.0000602 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.86 mg/kg		0.762 mg/kg	0.0000762 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				1.32 mg/kg		1.169 mg/kg	0.000117 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.51 mg/kg		0.452 mg/kg	0.0000452 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.99 mg/kg		0.877 mg/kg	0.0000877 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.91 mg/kg		0.806 mg/kg	0.0000806 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				0.17 mg/kg		0.151 mg/kg	0.0000151 %		✓	
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.94 mg/kg		0.833 mg/kg	0.0000833 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				0.21 mg/kg		0.186 mg/kg	0.0000186 %		✓	
		205-881-7	191-07-1								
Total:									0.0728 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0165%)

WAC results for sample: LF-WS-1006-25/11/2021-0.50m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample cannot be evaluated against the Non Haz (Non hazardous waste landfill) criteria because of missing determinand values.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.08	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	9.09	100	-
7	pH	pH		-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.104	0.5	2
10	barium	mg/kg	0.58	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.05	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.12	4	50
21	chloride	mg/kg	7	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	51	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	40	500	800
26	TDS (total dissolved solids)	mg/kg	740	4,000	60,000

Key

	User supplied data
	Missing WAC determinand value

Classification of sample: LF-WS-2011-25/11/2021-0.50-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-2011-25/11/2021-0.50-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.2% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 9.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				10.9 mg/kg	1.32	13.179 mg/kg	0.00132 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.9 mg/kg	2.775	2.287 mg/kg	0.000229 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.3 mg/kg	3.22	0.885 mg/kg	0.0000885 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2 mg/kg	1.142	2.092 mg/kg	0.000209 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22.3 mg/kg	1.462	29.847 mg/kg	0.00298 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				27 mg/kg	1.126	27.838 mg/kg	0.00278 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		15.568 mg/kg	0.00156 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				42.1 mg/kg	2.637	101.652 mg/kg	0.0102 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				3 mg/kg	2.554	7.016 mg/kg	0.000702 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				86 mg/kg	2.469	194.468 mg/kg	0.0194 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.73 pH		8.73 pH	8.73 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0449 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-WS-2011-25/11/2021-0.50-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample cannot be evaluated against the Non Haz (Non hazardous waste landfill) criteria because of missing determinand values.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.46	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH		-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.06	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.2	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.04	4	50
21	chloride	mg/kg	<3	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	17	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	<20	500	800
26	TDS (total dissolved solids)	mg/kg	420	4,000	60,000

Key

	User supplied data
	Missing WAC determinand value

Classification of sample: LF-WS-1008-30/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1008-30/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.9% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8.3 mg/kg	1.32	9.972 mg/kg	0.000997 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.768 mg/kg	0.000177 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.7 mg/kg	3.22	2.051 mg/kg	0.000205 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.6 mg/kg	1.142	1.663 mg/kg	0.000166 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22 mg/kg	1.462	29.258 mg/kg	0.00293 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				20 mg/kg	1.126	20.489 mg/kg	0.00205 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		15.469 mg/kg	0.00155 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				27.8 mg/kg	2.637	66.697 mg/kg	0.00667 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				62 mg/kg	2.469	139.305 mg/kg	0.0139 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		0.007 mg/kg		0.0063 mg/kg	0.000000637 %	✓	
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
20	pH		PH		8.54 pH		8.54 pH	8.54 pH		
21	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
22	acenaphthylene 205-917-1	208-96-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
24	fluorene 201-695-5	86-73-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
25	phenanthrene 201-581-5	85-01-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	anthracene 204-371-1	120-12-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
27	fluoranthene 205-912-4	206-44-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	pyrene 204-927-3	129-00-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
30	chrysene 601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	benzo[ghi]perylene 205-883-8	191-24-2			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
37	phenol 604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
38	coronene 205-881-7	191-07-1			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
Total:								0.0344 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 6.37e-07%)

Classification of sample: CPRC1027-26/11/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **CPRC1027-26/11/2021-1.00m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **18.8%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 18.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12.2	mg/kg	1.32	13.559	mg/kg	0.00136 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1	mg/kg	2.775	2.336	mg/kg	0.000234 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.7	mg/kg	3.22	1.897	mg/kg	0.00019 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.9	mg/kg	1.142	1.827	mg/kg	0.000183 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				35.6	mg/kg	1.462	43.797	mg/kg	0.00438 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	24.641	mg/kg	0.00246 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	22	mg/kg		18.519	mg/kg	0.00185 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				56.1	mg/kg	2.637	124.51	mg/kg	0.0125 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.299	mg/kg	0.00043 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				138	mg/kg	2.469	286.837	mg/kg	0.0287 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group		TPH		1091	mg/kg		918.35	mg/kg	0.0918 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				0.011 mg/kg		0.0092 mg/kg	0.00000926 %	✓	
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				0.007 mg/kg		0.0058 mg/kg	0.00000589 %	✓	
	601-023-00-4	202-849-4	100-41-4							
18	xylene				0.023 mg/kg		0.0194 mg/kg	0.00000194 %	✓	
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
20	pH		PH		8.22 pH		8.22 pH	8.22 pH		
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
24	fluorene				0.06 mg/kg		0.0505 mg/kg	0.00000505 %	✓	
		201-695-5	86-73-7							
25	phenanthrene				0.06 mg/kg		0.0505 mg/kg	0.00000505 %	✓	
		201-581-5	85-01-8							
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
28	pyrene				0.05 mg/kg		0.0421 mg/kg	0.00000421 %	✓	
		204-927-3	129-00-0							
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5							
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2							
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
Total:								0.144 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

toluene: (conc.: 9.26e-07%)

ethylbenzene: (conc.: 5.89e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.0918%)

xylene: (conc.: 1.94e-06%)

WAC results for sample: CPRC1027-26/11/2021-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.4	3	5
2	LOI (loss on ignition)	%	2.6	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	0.041	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	581	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH	8.22	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.03	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.55	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.33	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	0.03	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.05	4	50
21	chloride	mg/kg	13	800	15,000
22	fluoride	mg/kg	3	10	150
23	sulphate	mg/kg	178	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	30	500	800
26	TDS (total dissolved solids)	mg/kg	930	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail

Classification of sample: LF-CRPC-1023-24/11/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details
















Sample name:	LoW Code:
LF-CRPC-1023-24/11/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13.4% (dry weight correction)	

Hazard properties

None identified

Determinands

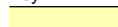



Moisture content: 13.4% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		antimony { antimony trioxide }				2 mg/kg	1.197	2.111 mg/kg	0.000211 %	✓		
		051-005-00-X	215-175-0	1309-64-4								
2		arsenic { arsenic trioxide }				11.6 mg/kg	1.32	13.506 mg/kg	0.00135 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
3		beryllium { beryllium oxide }				0.9 mg/kg	2.775	2.203 mg/kg	0.00022 %	✓		
		004-003-00-8	215-133-1	1304-56-9								
4		boron { diboron trioxide }				0.5 mg/kg	3.22	1.42 mg/kg	0.000142 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
5		cadmium { cadmium oxide }				1.2 mg/kg	1.142	1.209 mg/kg	0.000121 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
6		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				34.2 mg/kg	1.462	44.079 mg/kg	0.00441 %	✓		
			215-160-9	1308-38-9								
7		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD	
		024-017-00-8										
8		copper { dicopper oxide; copper (I) oxide }				26 mg/kg	1.126	25.814 mg/kg	0.00258 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
9		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	18 mg/kg		15.873 mg/kg	0.00159 %	✓		
		082-001-00-6										
10		mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
11		molybdenum { molybdenum(VI) oxide }				2.5 mg/kg	1.5	3.307 mg/kg	0.000331 %	✓		
		042-001-00-9	215-204-7	1313-27-5								
12		nickel { nickel sulfate }				40.1 mg/kg	2.637	93.237 mg/kg	0.00932 %	✓		
		028-009-00-5	232-104-9	7786-81-4								
13		selenium { nickel selenate }				1 mg/kg	2.554	2.252 mg/kg	0.000225 %	✓		
		028-031-00-5	239-125-2	15060-62-5								
14		zinc { zinc sulphate }				96 mg/kg	2.469	209.041 mg/kg	0.0209 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
15		TPH (C6 to C40) petroleum group				<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD	
				TPH								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
17	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
18	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
19	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
20	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
21	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
22	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
23	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
24	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
25	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
26	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
27	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
28	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
29	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
30	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
31	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
32	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
33	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
34	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
35	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5							
36	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
37	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2							
38	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
39	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
40	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
41	barium { barium sulphide }				52 mg/kg	1.233	56.562 mg/kg	0.00566 %	✓	
	016-002-00-X	244-214-4	21109-95-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	benzo[j]fluoranthene				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	601-035-00-X	205-910-3	205-82-3							
Total:								0.0526 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-CRPC-1023-24/11/2021-0.50m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample cannot be evaluated against the Non Haz (Non hazardous waste landfill) criteria because of missing determinand values.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.38	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH		-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	<0.03	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.05	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.04	4	50
21	chloride	mg/kg	<3	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	61	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	<20	500	800
26	TDS (total dissolved solids)	mg/kg	470	4,000	60,000

Key

	User supplied data
	Missing WAC determinand value

Classification of sample: LF-WS-1023-25/11/2021-0.10-1.10m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1023-25/11/2021-0.10-1.10m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12.5% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 12.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				14.8	mg/kg	1.32	17.37	mg/kg	0.00174 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.9	mg/kg	2.775	2.22	mg/kg	0.000222 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.2	mg/kg	3.22	3.435	mg/kg	0.000343 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.7	mg/kg	1.142	2.742	mg/kg	0.000274 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				41.2	mg/kg	1.462	53.525	mg/kg	0.00535 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	21.017	mg/kg	0.0021 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	22	mg/kg		19.556	mg/kg	0.00196 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				35.8	mg/kg	2.637	83.905	mg/kg	0.00839 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.27	mg/kg	0.000227 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				113	mg/kg	2.469	248.027	mg/kg	0.0248 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				301	mg/kg		267.556	mg/kg	0.0268 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				0.017 mg/kg		0.0151 mg/kg	0.00000151 %	✓	
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
20	pH		PH		8.54 pH		8.54 pH	8.54 pH		
21	naphthalene				0.06 mg/kg		0.0533 mg/kg	0.00000533 %	✓	
	601-052-00-2	202-049-5	91-20-3							
22	acenaphthylene				0.09 mg/kg		0.08 mg/kg	0.000008 %	✓	
		205-917-1	208-96-8							
23	acenaphthene				0.09 mg/kg		0.08 mg/kg	0.000008 %	✓	
		201-469-6	83-32-9							
24	fluorene				0.07 mg/kg		0.0622 mg/kg	0.00000622 %	✓	
		201-695-5	86-73-7							
25	phenanthrene				0.79 mg/kg		0.702 mg/kg	0.0000702 %	✓	
		201-581-5	85-01-8							
26	anthracene				0.23 mg/kg		0.204 mg/kg	0.0000204 %	✓	
		204-371-1	120-12-7							
27	fluoranthene				2.28 mg/kg		2.027 mg/kg	0.000203 %	✓	
		205-912-4	206-44-0							
28	pyrene				2.1 mg/kg		1.867 mg/kg	0.000187 %	✓	
		204-927-3	129-00-0							
29	benzo[a]anthracene				1.47 mg/kg		1.307 mg/kg	0.000131 %	✓	
	601-033-00-9	200-280-6	56-55-3							
30	chrysene				1.53 mg/kg		1.36 mg/kg	0.000136 %	✓	
	601-048-00-0	205-923-4	218-01-9							
31	benzo[b]fluoranthene				2.07 mg/kg		1.84 mg/kg	0.000184 %	✓	
	601-034-00-4	205-911-9	205-99-2							
32	benzo[k]fluoranthene				0.8 mg/kg		0.711 mg/kg	0.0000711 %	✓	
	601-036-00-5	205-916-6	207-08-9							
33	benzo[a]pyrene; benzo[def]chrysene				1.49 mg/kg		1.324 mg/kg	0.000132 %	✓	
	601-032-00-3	200-028-5	50-32-8							
34	indeno[123-cd]pyrene				1.19 mg/kg		1.058 mg/kg	0.000106 %	✓	
		205-893-2	193-39-5							
35	dibenz[a,h]anthracene				0.25 mg/kg		0.222 mg/kg	0.0000222 %	✓	
	601-041-00-2	200-181-8	53-70-3							
36	benzo[ghi]perylene				1.01 mg/kg		0.898 mg/kg	0.0000898 %	✓	
		205-883-8	191-24-2							
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
39	coronene				0.21 mg/kg		0.187 mg/kg	0.0000187 %	✓	
		205-881-7	191-07-1							
Total:								0.0737 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 1.51e-06%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0268%)

WAC results for sample: LF-WS-1023-25/11/2021-0.10-1.10m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.92	3	5
2	LOI (loss on ignition)	%	3.7	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	38	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	15.73	100	-
7	pH	pH	8.54	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.03	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.031	0.5	2
10	barium	mg/kg	0.08	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.05	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	<0.03	4	50
21	chloride	mg/kg	4	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	20	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	30	500	800
26	TDS (total dissolved solids)	mg/kg	810	4,000	60,000

Key

User supplied data

Classification of sample: LF-CPRC-1024-01/12/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1024-01/12/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14% (dry weight correction)	

Hazard properties

None identified

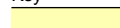



Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.7	mg/kg	1.32	8.918	mg/kg	0.000892 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.6	mg/kg	2.775	1.461	mg/kg	0.000146 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.3	mg/kg	3.22	0.847	mg/kg	0.0000847 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.4	mg/kg	1.142	1.403	mg/kg	0.00014 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31	mg/kg	1.462	39.744	mg/kg	0.00397 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				19	mg/kg	1.126	18.765	mg/kg	0.00188 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	12	mg/kg		10.526	mg/kg	0.00105 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				26.4	mg/kg	2.637	61.06	mg/kg	0.00611 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.48	mg/kg	0.000448 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				66	mg/kg	2.469	142.959	mg/kg	0.0143 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.74 pH		8.74 pH	8.74 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0345 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP01-02/12/2021-0.50-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP01-02/12/2021-0.50-1.00m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
16.5% (dry weight correction)	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				2 mg/kg	1.197	2.055 mg/kg	0.000206 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				7.4 mg/kg	1.32	8.387 mg/kg	0.000839 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.49 mg/kg	0.000049 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				59.6 mg/kg	1.462	74.771 mg/kg	0.00748 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				62 mg/kg	1.126	59.919 mg/kg	0.00599 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	72 mg/kg		61.803 mg/kg	0.00618 %	✓	
	082-001-00-6									
8	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	molybdenum { molybdenum(VI) oxide }				4.4 mg/kg	1.5	5.666 mg/kg	0.000567 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
10	nickel { nickel sulfate }				52 mg/kg	2.637	117.689 mg/kg	0.0118 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.192 mg/kg	0.000219 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				71 mg/kg	2.469	150.489 mg/kg	0.015 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		217 mg/kg		186.266 mg/kg	0.0186 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		0.017 mg/kg		0.0146 mg/kg	0.00000146 %	✓	
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH		PH		8.42 pH		8.42 pH	8.42 pH		
20	naphthalene 601-052-00-2	202-049-5	91-20-3		0.12 mg/kg		0.103 mg/kg	0.0000103 %	✓	
21	acenaphthylene 205-917-1	208-96-8			0.55 mg/kg		0.472 mg/kg	0.0000472 %	✓	
22	acenaphthene 201-469-6	83-32-9			0.06 mg/kg		0.0515 mg/kg	0.00000515 %	✓	
23	fluorene 201-695-5	86-73-7			0.09 mg/kg		0.0773 mg/kg	0.00000773 %	✓	
24	phenanthrene 201-581-5	85-01-8			0.77 mg/kg		0.661 mg/kg	0.0000661 %	✓	
25	anthracene 204-371-1	120-12-7			0.54 mg/kg		0.464 mg/kg	0.0000464 %	✓	
26	fluoranthene 205-912-4	206-44-0			1.84 mg/kg		1.579 mg/kg	0.000158 %	✓	
27	pyrene 204-927-3	129-00-0			2.27 mg/kg		1.948 mg/kg	0.000195 %	✓	
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		1.56 mg/kg		1.339 mg/kg	0.000134 %	✓	
29	chrysene 601-048-00-0	205-923-4	218-01-9		1.58 mg/kg		1.356 mg/kg	0.000136 %	✓	
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		1.88 mg/kg		1.614 mg/kg	0.000161 %	✓	
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.73 mg/kg		0.627 mg/kg	0.0000627 %	✓	
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		1.56 mg/kg		1.339 mg/kg	0.000134 %	✓	
33	indeno[123-cd]pyrene 205-893-2	193-39-5			1.06 mg/kg		0.91 mg/kg	0.000091 %	✓	
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		0.28 mg/kg		0.24 mg/kg	0.000024 %	✓	
35	benzo[ghi]perylene 205-883-8	191-24-2			1.04 mg/kg		0.893 mg/kg	0.0000893 %	✓	
36	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	coronene 205-881-7	191-07-1			0.24 mg/kg		0.206 mg/kg	0.0000206 %	✓	
38	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		159 mg/kg	1.233	168.348 mg/kg	0.0168 %	✓	
39	benzo[j]fluoranthene 601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0854 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 1.46e-06%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0186%)

WAC results for sample: TP01-02/12/2021-0.50-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample FAILS the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	% 5.91	3	5
2	LOI (loss on ignition)	%	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg 64	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg 16.17	100	-
7	pH	pH 8.42	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg <0.025	0.5	2
10	barium	mg/kg 0.16	20	100
11	cadmium	mg/kg <0.005	0.04	1
12	chromium	mg/kg <0.015	0.5	10
13	copper	mg/kg <0.07	2	50
14	mercury	mg/kg <0.0001	0.01	0.2
15	molybdenum	mg/kg 0.05	0.5	10
16	nickel	mg/kg <0.02	0.4	10
17	lead	mg/kg <0.05	0.5	10
18	antimony	mg/kg <0.02	0.06	0.7
19	selenium	mg/kg <0.03	0.1	0.5
20	zinc	mg/kg <0.03	4	50
21	chloride	mg/kg 4	800	15,000
22	fluoride	mg/kg <3	10	150
23	sulphate	mg/kg 59	1,000	20,000
24	phenol index	mg/kg <0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg 30	500	800
26	TDS (total dissolved solids)	mg/kg 560	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail
	Non Hazardous WAC criteria fail

Classification of sample: TP01-02/12/2021-1.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP01-02/12/2021-1.50m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
17.7%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified





Determinands

Moisture content: 17.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				2 mg/kg	1.197	2.034 mg/kg	0.000203 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				6.5 mg/kg	1.32	7.292 mg/kg	0.000729 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				0.6 mg/kg	1.142	0.582 mg/kg	0.0000582 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				82.5 mg/kg	1.462	102.445 mg/kg	0.0102 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	16.262 mg/kg	0.00163 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16 mg/kg		13.594 mg/kg	0.00136 %	✓	
	082-001-00-6									
8	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	molybdenum { molybdenum(VI) oxide }				6.6 mg/kg	1.5	8.412 mg/kg	0.000841 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
10	nickel { nickel sulfate }				32.6 mg/kg	2.637	73.03 mg/kg	0.0073 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.17 mg/kg	0.000217 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				75 mg/kg	2.469	157.347 mg/kg	0.0157 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH		PH		8.27 pH		8.27 pH	8.27 pH		
20	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene 205-917-1	208-96-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene 201-695-5	86-73-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene 201-581-5	85-01-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene 204-371-1	120-12-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene 205-912-4	206-44-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene 204-927-3	129-00-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene 601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene 205-883-8	191-24-2			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	coronene 205-881-7	191-07-1			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
38	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		46 mg/kg	1.233	48.208 mg/kg	0.00482 %	✓	
39	benzo[j]fluoranthene 601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0486 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: TP01-02/12/2021-1.50m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.57	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH	8.27	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	<0.03	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.05	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	0.04	0.1	0.5
20	zinc	mg/kg	<0.03	4	50
21	chloride	mg/kg	5	800	15,000
22	fluoride	mg/kg	4	10	150
23	sulphate	mg/kg	37	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	30	500	800
26	TDS (total dissolved solids)	mg/kg	520	4,000	60,000

Key

User supplied data

Classification of sample: TP02-02/12/2021-0.45-0.75m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP02-02/12/2021-0.45-0.75m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
11.4% (dry weight correction)	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				1 mg/kg	1.197	1.075 mg/kg	0.000107 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				5.2 mg/kg	1.32	6.163 mg/kg	0.000616 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.41 mg/kg	0.000041 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				49 mg/kg	1.462	64.287 mg/kg	0.00643 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				15 mg/kg	1.126	15.16 mg/kg	0.00152 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	34 mg/kg		30.521 mg/kg	0.00305 %	✓	
	082-001-00-6									
8	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	molybdenum { molybdenum(VI) oxide }				3.5 mg/kg	1.5	4.713 mg/kg	0.000471 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
10	nickel { nickel sulfate }				16.7 mg/kg	2.637	39.527 mg/kg	0.00395 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				50 mg/kg	2.469	110.83 mg/kg	0.0111 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		239 mg/kg		214.542 mg/kg	0.0215 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	pH				8.44 pH		8.44 pH	8.44 pH		
			PH							
20	naphthalene				0.22 mg/kg		0.197 mg/kg	0.0000197 %	✓	
	601-052-00-2	202-049-5	91-20-3							
21	acenaphthylene				0.14 mg/kg		0.126 mg/kg	0.0000126 %	✓	
		205-917-1	208-96-8							
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
23	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
24	phenanthrene				0.4 mg/kg		0.359 mg/kg	0.0000359 %	✓	
		201-581-5	85-01-8							
25	anthracene				0.16 mg/kg		0.144 mg/kg	0.0000144 %	✓	
		204-371-1	120-12-7							
26	fluoranthene				0.59 mg/kg		0.53 mg/kg	0.000053 %	✓	
		205-912-4	206-44-0							
27	pyrene				0.74 mg/kg		0.664 mg/kg	0.0000664 %	✓	
		204-927-3	129-00-0							
28	benzo[a]anthracene				0.49 mg/kg		0.44 mg/kg	0.000044 %	✓	
	601-033-00-9	200-280-6	56-55-3							
29	chrysene				0.59 mg/kg		0.53 mg/kg	0.000053 %	✓	
	601-048-00-0	205-923-4	218-01-9							
30	benzo[b]fluoranthene				1.01 mg/kg		0.907 mg/kg	0.0000907 %	✓	
	601-034-00-4	205-911-9	205-99-2							
31	benzo[k]fluoranthene				0.39 mg/kg		0.35 mg/kg	0.000035 %	✓	
	601-036-00-5	205-916-6	207-08-9							
32	benzo[a]pyrene; benzo[def]chrysene				0.8 mg/kg		0.718 mg/kg	0.0000718 %	✓	
	601-032-00-3	200-028-5	50-32-8							
33	indeno[123-cd]pyrene				0.7 mg/kg		0.628 mg/kg	0.0000628 %	✓	
		205-893-2	193-39-5							
34	dibenz[a,h]anthracene				0.12 mg/kg		0.108 mg/kg	0.0000108 %	✓	
	601-041-00-2	200-181-8	53-70-3							
35	benzo[ghi]perylene				0.6 mg/kg		0.539 mg/kg	0.0000539 %	✓	
		205-883-8	191-24-2							
36	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
37	coronene				0.13 mg/kg		0.117 mg/kg	0.0000117 %	✓	
		205-881-7	191-07-1							
38	barium { barium sulphide }				84 mg/kg	1.233	93.01 mg/kg	0.0093 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
39	benzo[j]fluoranthene				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	601-035-00-X	205-910-3	205-82-3							
Total:								0.0591 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0215%)

WAC results for sample: TP02-02/12/2021-0.45-0.75m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	3.12	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	85	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	7.08	100	-
7	pH	pH	8.44	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.048	0.5	2
10	barium	mg/kg	0.07	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.05	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	0.02	0.06	0.7
19	selenium	mg/kg	0.05	0.1	0.5
20	zinc	mg/kg	0.03	4	50
21	chloride	mg/kg	3	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	106	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	40	500	800
26	TDS (total dissolved solids)	mg/kg	600	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail

Classification of sample: TP02-02/12/2021-1.20m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP02-02/12/2021-1.20m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
24.9%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified





Determinands

Moisture content: 24.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				2 mg/kg	1.197	1.917 mg/kg	0.000192 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				5.5 mg/kg	1.32	5.814 mg/kg	0.000581 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.64 mg/kg	0.000064 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				79.2 mg/kg	1.462	92.678 mg/kg	0.00927 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	14.423 mg/kg	0.00144 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		13.611 mg/kg	0.00136 %	✓	
	082-001-00-6									
8	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	molybdenum { molybdenum(VI) oxide }				5.6 mg/kg	1.5	6.726 mg/kg	0.000673 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
10	nickel { nickel sulfate }				22.4 mg/kg	2.637	47.287 mg/kg	0.00473 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.045 mg/kg	0.000204 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				59 mg/kg	2.469	116.644 mg/kg	0.0117 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	pH				7.88 pH		7.88 pH	7.88 pH		
			PH							
20	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
21	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
23	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
24	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
25	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
26	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
27	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
28	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
29	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
30	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
31	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
32	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
33	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5							
34	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
35	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2							
36	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
37	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
38	barium { barium sulphide }				38 mg/kg	1.233	37.528 mg/kg	0.00375 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
39	benzo[j]fluoranthene				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	601-035-00-X	205-910-3	205-82-3							
Total:								0.0394 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: TP02-02/12/2021-1.20m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.92	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH	7.88	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	<0.03	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.04	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	0.03	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.05	4	50
21	chloride	mg/kg	4	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	6	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	90	500	800
26	TDS (total dissolved solids)	mg/kg	510	4,000	60,000

Key

User supplied data

Classification of sample: TP03-02/12/2021-0.45-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP03-02/12/2021-0.45-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
19.1% (dry weight correction)	

Hazard properties

None identified

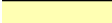



Determinands

Moisture content: 19.1% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		antimony { antimony trioxide }				2 mg/kg	1.197	2.01 mg/kg	0.000201 %	✓		
		051-005-00-X	215-175-0	1309-64-4								
2		arsenic { arsenic trioxide }				12.7 mg/kg	1.32	14.079 mg/kg	0.00141 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
3		cadmium { cadmium oxide }				1.2 mg/kg	1.142	1.151 mg/kg	0.000115 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				67.1 mg/kg	1.462	82.343 mg/kg	0.00823 %	✓		
			215-160-9	1308-38-9								
5		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD	
		024-017-00-8										
6		copper { dicopper oxide; copper (I) oxide }				37 mg/kg	1.126	34.977 mg/kg	0.0035 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
7		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20 mg/kg		16.793 mg/kg	0.00168 %	✓		
		082-001-00-6										
8		mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
9		molybdenum { molybdenum(VI) oxide }				5.6 mg/kg	1.5	7.054 mg/kg	0.000705 %	✓		
		042-001-00-9	215-204-7	1313-27-5								
10		nickel { nickel sulfate }				72.5 mg/kg	2.637	160.503 mg/kg	0.0161 %	✓		
		028-009-00-5	232-104-9	7786-81-4								
11		selenium { nickel selenate }				1 mg/kg	2.554	2.144 mg/kg	0.000214 %	✓		
		028-031-00-5	239-125-2	15060-62-5								
12		zinc { zinc sulphate }				109 mg/kg	2.469	225.989 mg/kg	0.0226 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13		TPH (C6 to C40) petroleum group				<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD	
				TPH								
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
15		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	pH				8.26 pH		8.26 pH	8.26 pH			
			PH								
20	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
25	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
26	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
27	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
28	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
36	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
37	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
38	barium { barium sulphide }				32 mg/kg	1.233	33.142 mg/kg	0.00331 %		✓	
	016-002-00-X	244-214-4	21109-95-5								
39	benzo[j]fluoranthene				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	601-035-00-X	205-910-3	205-82-3								
Total:									0.0635 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: TP03-02/12/2021-0.45-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.34	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<0.64	100	-
7	pH	pH	8.26	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	<0.03	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.02	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.04	4	50
21	chloride	mg/kg	<3	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	56	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	30	500	800
26	TDS (total dissolved solids)	mg/kg	<350	4,000	60,000

Key

User supplied data

Classification of sample: LF-WS-1003-06/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1003-06/12/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.8% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 10.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8 mg/kg	1.32	9.533 mg/kg	0.000953 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.753 mg/kg	0.000175 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.162 mg/kg	0.000116 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2 mg/kg	1.142	2.062 mg/kg	0.000206 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29.9 mg/kg	1.462	39.441 mg/kg	0.00394 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				24 mg/kg	1.126	24.387 mg/kg	0.00244 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	15 mg/kg		13.538 mg/kg	0.00135 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				35.6 mg/kg	2.637	84.717 mg/kg	0.00847 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				74 mg/kg	2.469	164.917 mg/kg	0.0165 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.54 pH		8.54 pH	8.54 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0399 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-1004-06/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **LF-TP-1004-06/12/2021-1.00m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **26.5%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

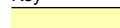



Determinands

Moisture content: 26.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				14.4	mg/kg	1.32	15.03	mg/kg	0.0015 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.755	mg/kg	0.000176 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.1	mg/kg	3.22	2.8	mg/kg	0.00028 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.9	mg/kg	1.142	1.716	mg/kg	0.000172 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.1	mg/kg	1.462	26.689	mg/kg	0.00267 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	23.141	mg/kg	0.00231 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	39	mg/kg		30.83	mg/kg	0.00308 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				29.9	mg/kg	2.637	62.322	mg/kg	0.00623 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				143	mg/kg	2.469	279.138	mg/kg	0.0279 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.23 pH		8.23 pH	8.23 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.08 mg/kg		0.0632 mg/kg	0.00000632 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.06 mg/kg		0.0474 mg/kg	0.00000474 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				0.32 mg/kg		0.253 mg/kg	0.0000253 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.29 mg/kg		0.229 mg/kg	0.0000229 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.15 mg/kg		0.119 mg/kg	0.0000119 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.25 mg/kg		0.198 mg/kg	0.0000198 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.55 mg/kg		0.435 mg/kg	0.0000435 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.22 mg/kg		0.174 mg/kg	0.0000174 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.3 mg/kg		0.237 mg/kg	0.0000237 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.59 mg/kg		0.466 mg/kg	0.0000466 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				0.06 mg/kg		0.0474 mg/kg	0.00000474 %		✓	
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.49 mg/kg		0.387 mg/kg	0.0000387 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				0.14 mg/kg		0.111 mg/kg	0.0000111 %		✓	
		205-881-7	191-07-1								
Total:									0.0503 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-TP-1004-06/12/2021-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample cannot be evaluated against the Non Haz (Non hazardous waste landfill) criteria because of missing determinand values.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.89	3	5
2	LOI (loss on ignition)	%		-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	3.5	100	-
7	pH	pH		-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.25	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.16	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	<0.03	4	50
21	chloride	mg/kg	<3	800	15,000
22	fluoride	mg/kg	5	10	150
23	sulphate	mg/kg	10	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	<20	500	800
26	TDS (total dissolved solids)	mg/kg	660	4,000	60,000

Key

	User supplied data
	Missing WAC determinand value

Classification of sample: LF-TP-1005-06/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **LF-TP-1005-06/12/2021-1.00m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **14.4%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

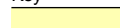



Determinands

Moisture content: 14.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				16.6	mg/kg	1.32	19.159	mg/kg	0.00192 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1	mg/kg	2.775	2.426	mg/kg	0.000243 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.5	mg/kg	3.22	1.407	mg/kg	0.000141 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				3.2	mg/kg	1.142	3.195	mg/kg	0.00032 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				39.3	mg/kg	1.462	50.209	mg/kg	0.00502 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				23	mg/kg	1.126	22.636	mg/kg	0.00226 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	31	mg/kg		27.098	mg/kg	0.00271 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				48.2	mg/kg	2.637	111.091	mg/kg	0.0111 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.232	mg/kg	0.000223 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				87	mg/kg	2.469	187.787	mg/kg	0.0188 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.51 pH		8.51 pH	8.51 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0482 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-1001-06/12/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-1001-06/12/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
17.4% (dry weight correction)	

Hazard properties

None identified

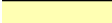



Determinands

Moisture content: 17.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				19.5 mg/kg	1.32	21.93 mg/kg	0.00219 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.8 mg/kg	2.775	1.891 mg/kg	0.000189 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide }				1 mg/kg	3.22	2.743 mg/kg	0.000274 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				1.3 mg/kg	1.142	1.265 mg/kg	0.000126 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29.6 mg/kg	1.462	36.85 mg/kg	0.00369 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				28 mg/kg	1.126	26.853 mg/kg	0.00269 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	45 mg/kg		38.33 mg/kg	0.00383 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				33.3 mg/kg	2.637	74.788 mg/kg	0.00748 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				114 mg/kg	2.469	239.778 mg/kg	0.024 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %			<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.2 pH		8.2 pH	8.2 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.14 mg/kg		0.119 mg/kg	0.0000119 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.27 mg/kg		0.23 mg/kg	0.000023 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.23 mg/kg		0.196 mg/kg	0.0000196 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.18 mg/kg		0.153 mg/kg	0.0000153 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.16 mg/kg		0.136 mg/kg	0.0000136 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.23 mg/kg		0.196 mg/kg	0.0000196 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.09 mg/kg		0.0767 mg/kg	0.00000767 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.16 mg/kg		0.136 mg/kg	0.0000136 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.13 mg/kg		0.111 mg/kg	0.0000111 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.12 mg/kg		0.102 mg/kg	0.0000102 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0503 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: LF-WS-1001-06/12/2021-0.50m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.41	3	5
2	LOI (loss on ignition)	%	4.9	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.71	100	-
7	pH	pH	8.2	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.03	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.025	0.5	2
10	barium	mg/kg	0.26	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	<0.07	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.05	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	<0.03	4	50
21	chloride	mg/kg	8	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	49	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	40	500	800
26	TDS (total dissolved solids)	mg/kg	850	4,000	60,000

Key

User supplied data

Classification of sample: TP1008-07/12/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP1008-07/12/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23.4% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 23.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				15 mg/kg	1.32	16.049 mg/kg	0.0016 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1.3 mg/kg	2.775	2.924 mg/kg	0.000292 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				1.8 mg/kg	3.22	4.697 mg/kg	0.00047 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2.4 mg/kg	1.142	2.222 mg/kg	0.000222 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				40.2 mg/kg	1.462	47.613 mg/kg	0.00476 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				35 mg/kg	1.126	31.934 mg/kg	0.00319 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	43 mg/kg		34.846 mg/kg	0.00348 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				55 mg/kg	2.637	117.518 mg/kg	0.0118 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.07 mg/kg	0.000207 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				126 mg/kg	2.469	252.132 mg/kg	0.0252 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.53 pH		8.53 pH	8.53 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0566 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS2008-08/12/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS2008-08/12/2021-0.50m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **18.7%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

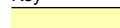



Determinands

Moisture content: 18.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12.2	mg/kg	1.32	13.57	mg/kg	0.00136 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1	mg/kg	2.775	2.338	mg/kg	0.000234 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1	mg/kg	3.22	2.713	mg/kg	0.000271 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.4	mg/kg	1.142	2.31	mg/kg	0.000231 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29.1	mg/kg	1.462	35.831	mg/kg	0.00358 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				38	mg/kg	1.126	36.044	mg/kg	0.0036 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	33	mg/kg		27.801	mg/kg	0.00278 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				0.1	mg/kg	1.353	0.114	mg/kg	0.0000114 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				43.6	mg/kg	2.637	96.849	mg/kg	0.00968 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.303	mg/kg	0.00043 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				102	mg/kg	2.469	212.189	mg/kg	0.0212 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH		PH		7.98 pH		7.98 pH	7.98 pH			
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.06 mg/kg		0.0505 mg/kg	0.00000505 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.09 mg/kg		0.0758 mg/kg	0.00000758 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0488 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-TP-3001-14/12/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-3001-14/12/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.6% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.6% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				12.6 mg/kg	1.32	15.319 mg/kg	0.00153 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1.1 mg/kg	2.775	2.811 mg/kg	0.000281 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.5 mg/kg	3.22	1.482 mg/kg	0.000148 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.736 mg/kg	0.0000736 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				69.2 mg/kg	1.462	93.13 mg/kg	0.00931 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				38 mg/kg	1.126	39.396 mg/kg	0.00394 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	80 mg/kg		73.665 mg/kg	0.00737 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				44.3 mg/kg	2.637	107.555 mg/kg	0.0108 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				2 mg/kg	2.554	4.703 mg/kg	0.00047 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				169 mg/kg	2.469	384.264 mg/kg	0.0384 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		407 mg/kg		374.77 mg/kg	0.0375 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.52 pH		8.52 pH	8.52 pH			
			PH								
21	naphthalene				0.15 mg/kg		0.138 mg/kg	0.0000138 %			✓
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				0.38 mg/kg		0.35 mg/kg	0.000035 %			✓
		205-917-1	208-96-8								
23	acenaphthene				0.63 mg/kg		0.58 mg/kg	0.000058 %			✓
		201-469-6	83-32-9								
24	fluorene				0.39 mg/kg		0.359 mg/kg	0.0000359 %			✓
		201-695-5	86-73-7								
25	phenanthrene				4.22 mg/kg		3.886 mg/kg	0.000389 %			✓
		201-581-5	85-01-8								
26	anthracene				1.04 mg/kg		0.958 mg/kg	0.0000958 %			✓
		204-371-1	120-12-7								
27	fluoranthene				6.51 mg/kg		5.994 mg/kg	0.000599 %			✓
		205-912-4	206-44-0								
28	pyrene				6.2 mg/kg		5.709 mg/kg	0.000571 %			✓
		204-927-3	129-00-0								
29	benzo[a]anthracene				3.01 mg/kg		2.772 mg/kg	0.000277 %			✓
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				3.04 mg/kg		2.799 mg/kg	0.00028 %			✓
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				3.44 mg/kg		3.168 mg/kg	0.000317 %			✓
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				1.34 mg/kg		1.234 mg/kg	0.000123 %			✓
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				2.52 mg/kg		2.32 mg/kg	0.000232 %			✓
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				1.91 mg/kg		1.759 mg/kg	0.000176 %			✓
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				0.41 mg/kg		0.378 mg/kg	0.0000378 %			✓
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				1.62 mg/kg		1.492 mg/kg	0.000149 %			✓
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				0.42 mg/kg		0.387 mg/kg	0.0000387 %			✓
		205-881-7	191-07-1								
Total:									0.113 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0375%)

Classification of sample: LF-TP-3001-14/12/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-3001-14/12/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13.9% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				11.5	mg/kg	1.32	13.331	mg/kg	0.00133 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.949	mg/kg	0.000195 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.5	mg/kg	3.22	1.413	mg/kg	0.000141 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2	mg/kg	1.142	2.006	mg/kg	0.000201 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				33.5	mg/kg	1.462	42.987	mg/kg	0.0043 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				36	mg/kg	1.126	35.586	mg/kg	0.00356 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	24	mg/kg		21.071	mg/kg	0.00211 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				41.2	mg/kg	2.637	95.374	mg/kg	0.00954 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.484	mg/kg	0.000448 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				101	mg/kg	2.469	218.963	mg/kg	0.0219 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				112	mg/kg		98.332	mg/kg	0.00983 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.33 pH		8.33 pH	8.33 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.05 mg/kg		0.0439 mg/kg	0.00000439 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.03 mg/kg		0.0263 mg/kg	0.00000263 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.02 mg/kg		0.0176 mg/kg	0.00000176 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0538 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00983%)

Classification of sample: LF-TP-3002-14/12/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-TP-3002-14/12/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15.5% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 15.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				14.4 mg/kg	1.32	16.461 mg/kg	0.00165 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.9 mg/kg	2.775	2.163 mg/kg	0.000216 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.5 mg/kg	3.22	1.394 mg/kg	0.000139 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2.9 mg/kg	1.142	2.868 mg/kg	0.000287 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.2 mg/kg	1.462	29.358 mg/kg	0.00294 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				42 mg/kg	1.126	40.941 mg/kg	0.00409 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20 mg/kg		17.316 mg/kg	0.00173 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				50.3 mg/kg	2.637	114.827 mg/kg	0.0115 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				2 mg/kg	2.554	4.422 mg/kg	0.000442 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				115 mg/kg	2.469	245.861 mg/kg	0.0246 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.54 pH		8.54 pH	8.54 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.053 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-WS-3002-14/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-WS-3002-14/12/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				16.8	mg/kg	1.32	19.63	mg/kg	0.00196 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.965	mg/kg	0.000196 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.8	mg/kg	3.22	2.28	mg/kg	0.000228 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.7	mg/kg	1.142	1.719	mg/kg	0.000172 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31.4	mg/kg	1.462	40.613	mg/kg	0.00406 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				80	mg/kg	1.126	79.709	mg/kg	0.00797 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	98	mg/kg		86.726	mg/kg	0.00867 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				33.1	mg/kg	2.637	77.234	mg/kg	0.00772 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				180	mg/kg	2.469	393.339	mg/kg	0.0393 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				99	mg/kg		87.611	mg/kg	0.00876 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				0.012 mg/kg		0.0106 mg/kg	0.00000106 %	✓	
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
20	pH				8.4 pH		8.4 pH	8.4 pH		
			PH							
21	naphthalene				0.07 mg/kg		0.0619 mg/kg	0.00000619 %	✓	
	601-052-00-2	202-049-5	91-20-3							
22	acenaphthylene				0.18 mg/kg		0.159 mg/kg	0.0000159 %	✓	
		205-917-1	208-96-8							
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
24	fluorene				0.07 mg/kg		0.0619 mg/kg	0.00000619 %	✓	
		201-695-5	86-73-7							
25	phenanthrene				0.51 mg/kg		0.451 mg/kg	0.0000451 %	✓	
		201-581-5	85-01-8							
26	anthracene				0.28 mg/kg		0.248 mg/kg	0.0000248 %	✓	
		204-371-1	120-12-7							
27	fluoranthene				3.8 mg/kg		3.363 mg/kg	0.000336 %	✓	
		205-912-4	206-44-0							
28	pyrene				4.35 mg/kg		3.85 mg/kg	0.000385 %	✓	
		204-927-3	129-00-0							
29	benzo[a]anthracene				3.54 mg/kg		3.133 mg/kg	0.000313 %	✓	
	601-033-00-9	200-280-6	56-55-3							
30	chrysene				3.41 mg/kg		3.018 mg/kg	0.000302 %	✓	
	601-048-00-0	205-923-4	218-01-9							
31	benzo[b]fluoranthene				5.42 mg/kg		4.796 mg/kg	0.00048 %	✓	
	601-034-00-4	205-911-9	205-99-2							
32	benzo[k]fluoranthene				2.11 mg/kg		1.867 mg/kg	0.000187 %	✓	
	601-036-00-5	205-916-6	207-08-9							
33	benzo[a]pyrene; benzo[def]chrysene				3.93 mg/kg		3.478 mg/kg	0.000348 %	✓	
	601-032-00-3	200-028-5	50-32-8							
34	indeno[123-cd]pyrene				3.27 mg/kg		2.894 mg/kg	0.000289 %	✓	
		205-893-2	193-39-5							
35	dibenz[a,h]anthracene				0.61 mg/kg		0.54 mg/kg	0.000054 %	✓	
	601-041-00-2	200-181-8	53-70-3							
36	benzo[ghi]perylene				2.54 mg/kg		2.248 mg/kg	0.000225 %	✓	
		205-883-8	191-24-2							
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
39	coronene				0.47 mg/kg		0.416 mg/kg	0.0000416 %	✓	
		205-881-7	191-07-1							
Total:								0.0826 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 1.06e-06%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00876%)

WAC results for sample: LF-WS-3002-14/12/2021-1.00m

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.73	3	5
2	LOI (loss on ignition)	%	3.9	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.025	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.035	1	-
5	Mineral oil (C10 to C40)	mg/kg	<30	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	34.56	100	-
7	pH	pH	8.4	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.03	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.065	0.5	2
10	barium	mg/kg	0.07	20	100
11	cadmium	mg/kg	<0.005	0.04	1
12	chromium	mg/kg	<0.015	0.5	10
13	copper	mg/kg	0.11	2	50
14	mercury	mg/kg	<0.01	0.01	0.2
15	molybdenum	mg/kg	0.06	0.5	10
16	nickel	mg/kg	<0.02	0.4	10
17	lead	mg/kg	<0.05	0.5	10
18	antimony	mg/kg	<0.02	0.06	0.7
19	selenium	mg/kg	<0.03	0.1	0.5
20	zinc	mg/kg	0.08	4	50
21	chloride	mg/kg	11	800	15,000
22	fluoride	mg/kg	<3	10	150
23	sulphate	mg/kg	19	1,000	20,000
24	phenol index	mg/kg	<0.1	1	-
25	DOC (dissolved organic carbon)	mg/kg	40	500	800
26	TDS (total dissolved solids)	mg/kg	890	4,000	60,000

Key

User supplied data

Classification of sample: LF-CPRC-3002-14/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-3002-14/12/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
20.7% (dry weight correction)	

Hazard properties

None identified

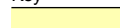



Determinands

Moisture content: 20.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				13.4	mg/kg	1.32	14.658	mg/kg	0.00147 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.2	mg/kg	2.775	2.759	mg/kg	0.000276 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.8	mg/kg	3.22	2.134	mg/kg	0.000213 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				5.1	mg/kg	1.142	4.827	mg/kg	0.000483 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				47.4	mg/kg	1.462	57.397	mg/kg	0.00574 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				37	mg/kg	1.126	34.514	mg/kg	0.00345 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	23	mg/kg		19.056	mg/kg	0.00191 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				88.3	mg/kg	2.637	192.891	mg/kg	0.0193 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				3	mg/kg	2.554	6.348	mg/kg	0.000635 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				126	mg/kg	2.469	257.772	mg/kg	0.0258 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.29 pH		8.29 pH	8.29 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0647 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-2012-14/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2012-14/12/2021-1.00m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
21.1%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				13 mg/kg	1.32	14.174 mg/kg	0.00142 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1 mg/kg	2.775	2.292 mg/kg	0.000229 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				1.4 mg/kg	3.22	3.722 mg/kg	0.000372 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.8 mg/kg	1.142	1.698 mg/kg	0.00017 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				28.6 mg/kg	1.462	34.517 mg/kg	0.00345 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				40 mg/kg	1.126	37.189 mg/kg	0.00372 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	83 mg/kg		68.538 mg/kg	0.00685 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				0.2 mg/kg	1.353	0.224 mg/kg	0.0000224 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				40.4 mg/kg	2.637	87.962 mg/kg	0.0088 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				2 mg/kg	2.554	4.218 mg/kg	0.000422 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				188 mg/kg	2.469	383.342 mg/kg	0.0383 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		1077 mg/kg		889.348 mg/kg	0.0889 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				0.01 mg/kg		0.0082 mg/kg	0.00000826 %	✓	
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.93 pH		7.93 pH	7.93 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				0.05 mg/kg		0.0413 mg/kg	0.00000413 %		✓	
		205-917-1	208-96-8								
23	acenaphthene				0.06 mg/kg		0.0495 mg/kg	0.00000495 %		✓	
		201-469-6	83-32-9								
24	fluorene				0.1 mg/kg		0.0826 mg/kg	0.00000826 %		✓	
		201-695-5	86-73-7								
25	phenanthrene				0.62 mg/kg		0.512 mg/kg	0.0000512 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.13 mg/kg		0.107 mg/kg	0.0000107 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				0.9 mg/kg		0.743 mg/kg	0.0000743 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.75 mg/kg		0.619 mg/kg	0.0000619 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.46 mg/kg		0.38 mg/kg	0.000038 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.47 mg/kg		0.388 mg/kg	0.0000388 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.62 mg/kg		0.512 mg/kg	0.0000512 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.24 mg/kg		0.198 mg/kg	0.0000198 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.41 mg/kg		0.339 mg/kg	0.0000339 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.39 mg/kg		0.322 mg/kg	0.0000322 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				0.07 mg/kg		0.0578 mg/kg	0.00000578 %		✓	
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.29 mg/kg		0.239 mg/kg	0.0000239 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				0.06 mg/kg		0.0495 mg/kg	0.00000495 %		✓	
		205-881-7	191-07-1								
Total:									0.153 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

benzene: (conc.: 8.26e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0889%)

Classification of sample: WS2006-09/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS2006-09/12/2021-1.00m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **22.2%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 22.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				16.5	mg/kg	1.32	17.828	mg/kg	0.00178 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.5	mg/kg	2.775	3.407	mg/kg	0.000341 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.1	mg/kg	3.22	2.898	mg/kg	0.00029 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				4.2	mg/kg	1.142	3.926	mg/kg	0.000393 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				48.3	mg/kg	1.462	57.769	mg/kg	0.00578 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				44	mg/kg	1.126	40.539	mg/kg	0.00405 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	51	mg/kg		41.735	mg/kg	0.00417 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				60.1	mg/kg	2.637	129.677	mg/kg	0.013 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.18	mg/kg	0.000418 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				152	mg/kg	2.469	307.147	mg/kg	0.0307 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				0.006 mg/kg		0.0049 mg/kg	0.000000491 %	✓	
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
20	pH		PH		8.29 pH		8.29 pH	8.29 pH		
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
25	phenanthrene				0.05 mg/kg		0.0409 mg/kg	0.00000409 %	✓	
		201-581-5	85-01-8							
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
27	fluoranthene				0.05 mg/kg		0.0409 mg/kg	0.00000409 %	✓	
		205-912-4	206-44-0							
28	pyrene				0.04 mg/kg		0.0327 mg/kg	0.00000327 %	✓	
		204-927-3	129-00-0							
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
30	chrysene				0.05 mg/kg		0.0409 mg/kg	0.00000409 %	✓	
	601-048-00-0	205-923-4	218-01-9							
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5							
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2							
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
Total:								0.0664 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because amples exhibited no evidence of hydrocarbon contamination/ free phase product therefore a test for liquid flammability was deemed not appropriate. See page 21 WM3 guidance.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 4.91e-07%)

Classification of sample: WS2007-09/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS2007-09/12/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10% (dry weight correction)	

Hazard properties

None identified





Determinands

Moisture content: 10% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				9.2 mg/kg	1.32	11.043 mg/kg	0.0011 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.8 mg/kg	2.775	2.018 mg/kg	0.000202 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.171 mg/kg	0.000117 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2 mg/kg	1.142	2.077 mg/kg	0.000208 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22.6 mg/kg	1.462	30.028 mg/kg	0.003 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				27 mg/kg	1.126	27.635 mg/kg	0.00276 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16 mg/kg		14.545 mg/kg	0.00145 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				36.7 mg/kg	2.637	87.969 mg/kg	0.0088 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.322 mg/kg	0.000232 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				76 mg/kg	2.469	170.606 mg/kg	0.0171 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.65 pH		8.65 pH	8.65 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0404 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: LF-CPRC-1028-20/12/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1028-20/12/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15.8% (dry weight correction)	

Hazard properties

None identified

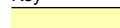



Determinands

Moisture content: 15.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12.5	mg/kg	1.32	14.252	mg/kg	0.00143 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.1	mg/kg	2.775	2.636	mg/kg	0.000264 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.7	mg/kg	3.22	1.946	mg/kg	0.000195 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.1	mg/kg	1.142	2.072	mg/kg	0.000207 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				36.2	mg/kg	1.462	45.689	mg/kg	0.00457 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				33	mg/kg	1.126	32.085	mg/kg	0.00321 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	26	mg/kg		22.453	mg/kg	0.00225 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				44.9	mg/kg	2.637	102.234	mg/kg	0.0102 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.205	mg/kg	0.000221 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				96	mg/kg	2.469	204.709	mg/kg	0.0205 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.56 pH		8.56 pH	8.56 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.09 mg/kg		0.0777 mg/kg	0.00000777 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.08 mg/kg		0.0691 mg/kg	0.00000691 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.08 mg/kg		0.0691 mg/kg	0.00000691 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.06 mg/kg		0.0518 mg/kg	0.00000518 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.06 mg/kg		0.0518 mg/kg	0.00000518 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.03 mg/kg		0.0259 mg/kg	0.00000259 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.06 mg/kg		0.0518 mg/kg	0.00000518 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.05 mg/kg		0.0432 mg/kg	0.00000432 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0485 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non EU CLP determinands

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

EU CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

EU CLP index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

EU CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

■ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2; H371

■ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

EU CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **barium sulphide** (EC Number: 244-214-4, CAS Number: 21109-95-5)

EU CLP index number: 016-002-00-X
Description/Comments:
Additional Hazard Statement(s): EUH031 >= 0.8 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

■ **1,1-dichloroethane and 1,2-dichloroethane (combined)** (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane
Data source: N/a
Data source date: 14 Oct 2016
Hazard Statements: Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 1B; H350 , Aquatic Chronic 3; H412

▪ **dichlorodifluoromethane** (EC Number: 200-893-9, CAS Number: 75-71-8)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Aquatic Chronic 3; H412 , Ozone 1; H420 , Press. Gas; H280

▪ **trichlorofluoromethane** (EC Number: 200-892-3, CAS Number: 75-69-4)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H312 , Ozone 1; H420

▪ **2,2-dichloropropane** (EC Number: 209-832-0, CAS Number: 594-20-7)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H332 , Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Acute Tox. 4; H312 , Eye Irrit. 2; H319

▪ **bromochloromethane** (EC Number: 200-826-3, CAS Number: 74-97-5)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H312 , Skin Corr. 1B; H314 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Ozone 1; H420

▪ **bromodichloromethane** (EC Number: 200-856-7, CAS Number: 75-27-4)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 1A; H360

▪ **trans-1,3-dichloropropene** (EC Number: 431-460-4, CAS Number: 10061-02-6)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Flam. Liq. 3; H226 , Acute Tox. 3; H301 , Asp. Tox. 1; H304 , Acute Tox. 3; H311 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , Aquatic Chronic 1; H410

▪ **1,3-dichloropropane** (EC Number: 205-531-3, CAS Number: 142-28-9)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H332 , Flam. Liq. 2; H225 , Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335

▪ **dibromochloromethane** (EC Number: 204-704-0, CAS Number: 124-48-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT SE 3; H336 , Muta. 2; H341 , Aquatic Chronic 2; H411

▪ **1,1,1,2-tetrachloroethane** (EC Number: 211-135-1, CAS Number: 630-20-6)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , Carc. 2; H351 , Acute Tox. 4; H312 , Aquatic Chronic 3; H412 , Skin Irrit. 2; H315

▪ **tert-butylbenzene** (EC Number: 202-632-4, CAS Number: 98-06-6)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Acute Tox. 4; H332 , STOT SE 3; H335 , Asp. Tox. 1; H304 , Aquatic Chronic 2; H411

■ **sec-butylbenzene** (EC Number: 205-227-0, CAS Number: 135-98-8)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Chronic 2; H411

■ **4-isopropyltoluene** (EC Number: 202-796-7, CAS Number: 99-87-6)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Chronic 2; H411

■ **n-butylbenzene** (EC Number: 203-209-7, CAS Number: 104-51-8)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **hexachlorobutadiene** (EC Number: 201-765-5, CAS Number: 87-68-3)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301 , Acute Tox. 2; H310 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 2; H330 , Carc. 2; H351 , Repr. 2; H361 , STOT SE 2; H371 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **1,2,3-trichlorobenzene** (EC Number: 201-757-1, CAS Number: 87-61-6)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , STOT SE 3; H336 , Aquatic Acute 1; H400 , Aquatic Chronic 3; H410

■ **2-nitrophenol** (EC Number: 201-857-5, CAS Number: 88-75-5)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT RE 2; H373 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **2-chloronaphthalene** (EC Number: 202-079-9, CAS Number: 91-58-7)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ **2-methyl naphthalene** (EC Number: 202-078-3, CAS Number: 91-57-6)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , STOT SE 3; H336 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **di-n-octyl phthalate** (EC Number: 204-214-7, CAS Number: 117-84-0)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Repr. 2; H361 , Skin Sens. 1; H317 , Resp. Sens. 1; H334 , Eye Irrit. 2; H319 , Aquatic Chronic 4; H413

■ **diethyl phthalate** (EC Number: 201-550-6, CAS Number: 84-66-2)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , STOT SE 3; H335 , STOT RE 2; H373 , Repr. 2; H361 , Acute Tox. 4; H302 , STOT SE 3; H336 , Skin Sens. 1; H317 , Aquatic Chronic 1; H410

▪ **dimethyl phthalate** (EC Number: 205-011-6, CAS Number: 131-11-3)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , STOT SE 3; H335 , STOT SE 3; H336 , Repr. 2; H361 , Aquatic Chronic 3; H412

▪ **4-bromophenylphenylether** (EC Number: 202-952-4, CAS Number: 101-55-3)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **4-chlorophenylphenylether** (EC Number: 230-281-7, CAS Number: 7005-72-3)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **bis(2-chloroethoxy)methane** (EC Number: 203-920-2, CAS Number: 111-91-1)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301 , Acute Tox. 4; H312 , Acute Tox. 1; H330 , Acute Tox. 2; H330 , STOT SE 1; H370 , STOT RE 2; H373

▪ **carbazole** (EC Number: 201-696-0, CAS Number: 86-74-8)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Muta. 2; H341 , Carc. 2; H351 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301

▪ **dibenzofuran** (EC Number: 205-071-3, CAS Number: 132-64-9)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Acute Tox. 4; H332 , Aquatic Chronic 2; H411

▪ **hexachloroethane** (EC Number: 200-666-4, CAS Number: 67-72-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , STOT RE 2; H373

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VI not detected above LOD

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel sulfate}

Chromium VI not detected above LOD

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc sulphate}

Chromium VI not detected above LOD

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

barium {barium sulphide}

CrVI not detected above LOD

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021

HazWasteOnline Classification Engine Version: 2022.25.4995.9469 (25 Jan 2022)

HazWasteOnline Database: 2022.25.4995.9469 (25 Jan 2022)

This classification utilises the following guidance and legislation:

WM3 v1.1.NI - Waste Classification - 1st Edition v1.1.NI - Jan 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

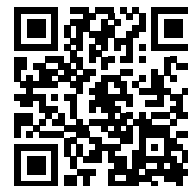
2020 No. 1540 of 16th December 2020

17th ATP - Regulation (EU) 2021/849 of 11 March 2021

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



WDDTP-QB3ZL-Z7CT7

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in **pale yellow**.

Job name

Luas Rail - Landfill

Description/Comments

Samples deemed representative of likely municipal landfill waste.

Project

Luas Rail Project

Site

21075

Classified by

Name: **Ruadh McIntosh**
Date: **03 Mar 2022 16:56 GMT**
Telephone: **0) 131 344 4605**
Company: **Gavin & Doherty Geosolutions**
Edinburgh

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

30 Oct 2019

Next 3 year Refresher due by Oct 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	LF-CPRC-1014-13/10/2021-0.50m		Non Hazardous		2
2	LF-CPRC-1014-13/10/2021-1.00m		Non Hazardous		8
3	LF-CPRC-1014-14/10/2021-2.00m		Non Hazardous		11
4	LF-CPRC-1014-14/10/2021-4.00m		Non Hazardous		17
5	LF-CPRC-2010-18/10/2021-0.50m		Non Hazardous		20
6	LF-CPRC-2010-18/10/2021-1.00m		Non Hazardous		23
7	LF-CPRC-2010-20/10/2021-2.00m		Non Hazardous		29
8	LF-CPRC-2010-20/10/2021-4.00m		Non Hazardous		32
9	LF-CPRC-1017-28/09/2021-1.70m		Non Hazardous		35
10	LF-CPRC-1018-29/09/2021-3.00m		Non Hazardous		41
11	LF-CPRC-1018-29/09/2021-4.00m		Non Hazardous		44
12	LF-CPRC-1020-21/10/2021-0.50m		Non Hazardous		47
13	LF-CPRC-1020-21/10/2021-2.00m		Non Hazardous		50
14	LF-CPRC-1021-15/10/2021-1.20m		Non Hazardous		53

Related documents

#	Name	Description
1	Luas Rail Project	waste stream template used to create this Job

Report

Created by: Ruadh McIntosh

Created date: 03 Mar 2022 16:56 GMT

Appendices	Page
Appendix A: Classifier defined and non EU CLP determinands	56
Appendix B: Rationale for selection of metal species	60
Appendix C: Version	61

Classification of sample: LF-CPRC-1014-13/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1014-13/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.2% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				10.1	mg/kg	1.32	12.212	mg/kg	0.00122 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	2.033	mg/kg	0.000203 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.3	mg/kg	3.22	0.885	mg/kg	0.0000885 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2	mg/kg	1.142	2.092	mg/kg	0.000209 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.8	mg/kg	1.462	31.854	mg/kg	0.00319 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	26.807	mg/kg	0.00268 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16	mg/kg		14.652	mg/kg	0.00147 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				37.8	mg/kg	2.637	91.27	mg/kg	0.00913 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				<52	mg/kg	2.469	<128.403	mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				75	mg/kg		68.681	mg/kg	0.00687 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.003	mg/kg		<0.003	mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				0.007 mg/kg		0.0064 mg/kg	0.000000641 %	✓		
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.59 pH		8.59 pH	8.59 pH			
			PH								
21	naphthalene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.011 mg/kg		0.0101 mg/kg	0.00000101 %	✓		
		205-912-4	206-44-0								
28	pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-027-00-9	201-167-4	79-01-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
43	hexachlorobenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
44	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
45	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
46	dichlorodifluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-893-9	75-71-8							
47	chloromethane; methyl chloride				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
48	bromomethane; methylbromide				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
49	chloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	dichloromethane; methylene chloride				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-004-00-3	200-838-9	75-09-2							
53	2,2-dichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		209-832-0	594-20-7							
54	bromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-826-3	74-97-5							
55	chloroform; trichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
56	1,1,1-trichloroethane; methyl chloroform				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
57	1,1-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
58	1,2-dichloropropane; propylene dichloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
59	dibromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
60	bromodichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-856-7	75-27-4							
61	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
62	trans-1,3-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		431-460-4	10061-02-6							
63	1,1,2-trichloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
64	1,3-dichloropropane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		205-531-3	142-28-9							
65	dibromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		204-704-0	124-48-1							
66	1,2-dibromoethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
67	chlorobenzene				0.004 mg/kg		0.0036 mg/kg	0.000000366 %	✓	
	602-033-00-1	203-628-5	108-90-7							
68	1,1,1,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		211-135-1	630-20-6							
69	bromoform; tribromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
70	1,1,2,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-015-00-3	201-197-8	79-34-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
71	bromobenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
72	1,2,3-trichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
73	mesitylene; 1,3,5-trimethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
74	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
75	1,2,4-trimethylbenzene				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
76	sec-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		205-227-0	135-98-8							
77	4-isopropyltoluene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		202-796-7	99-87-6							
78	1,3-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
79	1,4-dichlorobenzene; p-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
80	n-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		203-209-7	104-51-8							
81	1,2-dichlorobenzene; o-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
82	1,2-dibromo-3-chloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
83	1,2,4-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
84	hexachlorobutadiene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		201-765-5	87-68-3							
85	1,2,3-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
		201-757-1	87-61-6							
86	styrene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-026-00-0	202-851-5	100-42-5							
87	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							
88	2-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-857-5	88-75-5							
89	2,4-dichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
90	3,4-xlenol; [1] 2,5-xlenol; [2] 2,4-xlenol; [3] 2,3-xlenol; [4] 2,6-xlenol; [5] xlenol; [6] 2,4(or 2,5)-xlenol [7]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]							
91	2,4,5-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-017-00-X	202-467-8	95-95-4							
92	2,4,6-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-018-00-5	201-795-9	88-06-2							
93	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-014-00-3	200-431-6	59-50-7							
94	4-nitrophenol; p-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	609-015-00-2	202-811-7	100-02-7							
95	pentachlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-002-00-8	201-778-6	87-86-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
96	2-chloronaphthalene	202-079-9	91-58-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
97	2-methyl naphthalene	202-078-3	91-57-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
98	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
99	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
100	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
101	di-n-octyl phthalate	204-214-7	117-84-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
102	diethyl phthalate	201-550-6	84-66-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
103	dimethyl phthalate	205-011-6	131-11-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
104	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
105	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
106	4-bromophenylphenylether	202-952-4	101-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
107	4-chloroaniline	612-137-00-9	203-401-0	106-47-8	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
108	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
109	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
110	bis(2-chloroethoxy)methane	203-920-2	111-91-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
111	bis(2-chloroethyl) ether	603-029-00-2	203-870-1	111-44-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
112	carbazole	201-696-0	86-74-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
113	dibenzofuran	205-071-3	132-64-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
114	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
115	hexachloroethane	200-666-4	67-72-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
116	3,5,5-trimethylcyclohex-2-enone; isophorone	606-012-00-8	201-126-0	78-59-1	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
117	nitrosodipropylamine	612-098-00-8	210-698-0	621-64-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
118	nitrobenzene	609-003-00-7	202-716-0	98-95-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
119	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
120	cumene; [1] propylbenzene [2]	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
121	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]	602-040-00-X	202-424-3 [1] 203-580-5 [2]	95-49-8 [1] 108-41-8 [2]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		203-397-0 [3] 246-698-2 [4]	106-43-4 [3] 25168-05-2 [4]							
122	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4] 604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
123	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
Total:								0.0385 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
🧪	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.00687%)
xylene: (conc.: 6.41e-07%)
chlorobenzene: (conc.: 3.66e-07%)

Classification of sample: LF-CPRC-1014-13/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1014-13/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12.2% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 12.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	antimony { antimony trioxide }				2	mg/kg	1.197	2.134	mg/kg	0.000213 %	✓	
	051-005-00-X	215-175-0	1309-64-4									
2	arsenic { arsenic trioxide }				11	mg/kg	1.32	12.944	mg/kg	0.00129 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	cadmium { cadmium oxide }				2	mg/kg	1.142	2.036	mg/kg	0.000204 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				37.5	mg/kg	1.462	48.849	mg/kg	0.00488 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				35	mg/kg	1.126	35.121	mg/kg	0.00351 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	26	mg/kg		23.173	mg/kg	0.00232 %	✓	
	082-001-00-6											
8	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	molybdenum { molybdenum(VI) oxide }				4.9	mg/kg	1.5	6.552	mg/kg	0.000655 %	✓	
	042-001-00-9	215-204-7	1313-27-5									
10	nickel { nickel sulfate }				41.3	mg/kg	2.637	97.054	mg/kg	0.00971 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.276	mg/kg	0.000228 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				<52	mg/kg	2.469	<128.403	mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group		TPH		89	mg/kg		79.323	mg/kg	0.00793 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.03 mg/kg		0.0267 mg/kg	0.00000267 %	✓	
		205-912-4	206-44-0							
26	pyrene				0.03 mg/kg		0.0267 mg/kg	0.00000267 %	✓	
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2							
35	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
36	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
37	barium { barium sulphide }				81 mg/kg	1.233	89.049 mg/kg	0.0089 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
38	benzo[j]fluoranthene				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	601-035-00-X	205-910-3	205-82-3							
Total:								0.0529 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00793%)

Classification of sample: LF-CPRC-1014-14/10/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1014-14/10/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25.7% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 25.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				13.6 mg/kg	1.32	14.285 mg/kg	0.00143 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.9 mg/kg	2.775	1.987 mg/kg	0.000199 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				1.1 mg/kg	3.22	2.818 mg/kg	0.000282 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.2 mg/kg	1.142	1.091 mg/kg	0.000109 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				51.4 mg/kg	1.462	59.764 mg/kg	0.00598 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				39 mg/kg	1.126	34.932 mg/kg	0.00349 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	47 mg/kg		37.391 mg/kg	0.00374 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				42.1 mg/kg	2.637	88.309 mg/kg	0.00883 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.032 mg/kg	0.000203 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				91 mg/kg	2.469	178.764 mg/kg	0.0179 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		105 mg/kg		83.532 mg/kg	0.00835 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		0.006 mg/kg		0.0047 mg/kg	0.000000477 %	✓	
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
20	pH		PH		7.71 pH		7.71 pH	7.71 pH		
21	naphthalene 601-052-00-2	202-049-5	91-20-3		0.06 mg/kg		0.0477 mg/kg	0.00000477 %	✓	
22	acenaphthylene 205-917-1	208-96-8			0.09 mg/kg		0.0716 mg/kg	0.00000716 %	✓	
23	acenaphthene 201-469-6	83-32-9			<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
24	fluorene 201-695-5	86-73-7			<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
25	phenanthrene 201-581-5	85-01-8			0.15 mg/kg		0.119 mg/kg	0.0000119 %	✓	
26	anthracene 204-371-1	120-12-7			0.13 mg/kg		0.103 mg/kg	0.0000103 %	✓	
27	fluoranthene 205-912-4	206-44-0			0.35 mg/kg		0.278 mg/kg	0.0000278 %	✓	
28	pyrene 204-927-3	129-00-0			0.34 mg/kg		0.27 mg/kg	0.000027 %	✓	
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.24 mg/kg		0.191 mg/kg	0.0000191 %	✓	
30	chrysene 601-048-00-0	205-923-4	218-01-9		0.29 mg/kg		0.231 mg/kg	0.0000231 %	✓	
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.54 mg/kg		0.43 mg/kg	0.000043 %	✓	
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.21 mg/kg		0.167 mg/kg	0.0000167 %	✓	
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.4 mg/kg		0.318 mg/kg	0.0000318 %	✓	
34	indeno[123-cd]pyrene 205-893-2	193-39-5			0.52 mg/kg		0.414 mg/kg	0.0000414 %	✓	
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		0.09 mg/kg		0.0716 mg/kg	0.00000716 %	✓	
36	benzo[ghi]perylene 205-883-8	191-24-2			0.57 mg/kg		0.453 mg/kg	0.0000453 %	✓	
37	phenol 604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
38	1,1-dichloroethane and 1,2-dichloroethane (combined) 203-458-1, 200-863-5	107-06-2, 75-34-3			<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
39	tetrachloroethylene 602-028-00-4	204-825-9	127-18-4		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
40	carbon tetrachloride; tetrachloromethane 602-008-00-5	200-262-8	56-23-5		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
41	trichloroethylene; trichloroethene 602-027-00-9	201-167-4	79-01-6		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
43	hexachlorobenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
44	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
45	coronene				0.11 mg/kg		0.0875 mg/kg	0.00000875 %	✓	
		205-881-7	191-07-1							
46	dichlorodifluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-893-9	75-71-8							
47	chloromethane; methyl chloride				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
48	bromomethane; methylbromide				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
49	chloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	dichloromethane; methylene chloride				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-004-00-3	200-838-9	75-09-2							
53	2,2-dichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		209-832-0	594-20-7							
54	bromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-826-3	74-97-5							
55	chloroform; trichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
56	1,1,1-trichloroethane; methyl chloroform				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
57	1,1-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
58	1,2-dichloropropane; propylene dichloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
59	dibromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
60	bromodichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-856-7	75-27-4							
61	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
62	trans-1,3-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		431-460-4	10061-02-6							
63	1,1,2-trichloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
64	1,3-dichloropropane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		205-531-3	142-28-9							
65	dibromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		204-704-0	124-48-1							
66	1,2-dibromoethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
67	chlorobenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
68	1,1,1,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		211-135-1	630-20-6							
69	bromoform; tribromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
70	1,1,2,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-015-00-3	201-197-8	79-34-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
71	bromobenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
72	1,2,3-trichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
73	mesitylene; 1,3,5-trimethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
74	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
75	1,2,4-trimethylbenzene				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
76	sec-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		205-227-0	135-98-8							
77	4-isopropyltoluene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		202-796-7	99-87-6							
78	1,3-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
79	1,4-dichlorobenzene; p-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
80	n-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		203-209-7	104-51-8							
81	1,2-dichlorobenzene; o-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
82	1,2-dibromo-3-chloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
83	1,2,4-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
84	hexachlorobutadiene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		201-765-5	87-68-3							
85	1,2,3-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
		201-757-1	87-61-6							
86	styrene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-026-00-0	202-851-5	100-42-5							
87	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							
88	2-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-857-5	88-75-5							
89	2,4-dichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
90	3,4-xyleneol; [1] 2,5-xyleneol; [2] 2,4-xyleneol; [3] 2,3-xyleneol; [4] 2,6-xyleneol; [5] xyleneol; [6] 2,4(or 2,5)-xyleneol [7]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]							
91	2,4,5-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-017-00-X	202-467-8	95-95-4							
92	2,4,6-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-018-00-5	201-795-9	88-06-2							
93	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-014-00-3	200-431-6	59-50-7							
94	4-nitrophenol; p-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	609-015-00-2	202-811-7	100-02-7							
95	pentachlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-002-00-8	201-778-6	87-86-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
96	2-chloronaphthalene	202-079-9	91-58-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
97	2-methyl naphthalene	202-078-3	91-57-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
98	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
99	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
100	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
101	di-n-octyl phthalate	204-214-7	117-84-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
102	diethyl phthalate	201-550-6	84-66-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
103	dimethyl phthalate	205-011-6	131-11-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
104	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
105	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
106	4-bromophenylphenylether	202-952-4	101-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
107	4-chloroaniline	612-137-00-9	203-401-0	106-47-8	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
108	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
109	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
110	bis(2-chloroethoxy)methane	203-920-2	111-91-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
111	bis(2-chloroethyl) ether	603-029-00-2	203-870-1	111-44-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
112	carbazole	201-696-0	86-74-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
113	dibenzofuran	205-071-3	132-64-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
114	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
115	hexachloroethane	200-666-4	67-72-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
116	3,5-trimethylcyclohex-2-enone; isophorone	606-012-00-8	201-126-0	78-59-1	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
117	nitrosodipropylamine	612-098-00-8	210-698-0	621-64-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
118	nitrobenzene	609-003-00-7	202-716-0	98-95-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
119	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
120	cumene; [1] propylbenzene [2]	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
121	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]	602-040-00-X	202-424-3 [1] 203-580-5 [2]	95-49-8 [1] 108-41-8 [2]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		203-397-0 [3] 246-698-2 [4]	106-43-4 [3] 25168-05-2 [4]							
122	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4] 604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
123	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
Total:								0.0511 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 4.77e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00835%)

Classification of sample: LF-CPRC-1014-14/10/2021-4.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details














Sample name:	LoW Code:
LF-CPRC-1014-14/10/2021-4.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
22.5% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 22.5% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				9.9	mg/kg	1.32	10.67	mg/kg	0.00107 %	✓
		033-003-00-0	215-481-4	1327-53-3								
2		beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.812	mg/kg	0.000181 %	✓
		004-003-00-8	215-133-1	1304-56-9								
3		boron { diboron trioxide }				1.3	mg/kg	3.22	3.417	mg/kg	0.000342 %	✓
		005-008-00-8	215-125-8	1303-86-2								
4		cadmium { cadmium oxide }				1.4	mg/kg	1.142	1.306	mg/kg	0.000131 %	✓
		048-002-00-0	215-146-2	1306-19-0								
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30.5	mg/kg	1.462	36.39	mg/kg	0.00364 %	✓
			215-160-9	1308-38-9								
6		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %	<LOD
		024-017-00-8										
7		copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	22.058	mg/kg	0.00221 %	✓
		029-002-00-X	215-270-7	1317-39-1								
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	40	mg/kg		32.653	mg/kg	0.00327 %	✓
		082-001-00-6										
9		mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %	<LOD
		080-010-00-X	231-299-8	7487-94-7								
10		nickel { nickel sulfate }				28	mg/kg	2.637	60.267	mg/kg	0.00603 %	✓
		028-009-00-5	232-104-9	7786-81-4								
11		selenium { nickel selenate }				1	mg/kg	2.554	2.085	mg/kg	0.000208 %	✓
		028-031-00-5	239-125-2	15060-62-5								
12		zinc { zinc sulphate }				<52	mg/kg	2.469	<128.403	mg/kg	<0.0128 %	<LOD
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13		TPH (C6 to C40) petroleum group				87	mg/kg		71.02	mg/kg	0.0071 %	✓
				TPH								
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %	<LOD
		603-181-00-X	216-653-1	1634-04-4								
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %	<LOD
		601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.75 pH		7.75 pH	7.75 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.05 mg/kg		0.0408 mg/kg	0.00000408 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.15 mg/kg		0.122 mg/kg	0.0000122 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.13 mg/kg		0.106 mg/kg	0.0000106 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.12 mg/kg		0.098 mg/kg	0.0000098 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.1 mg/kg		0.0816 mg/kg	0.00000816 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.17 mg/kg		0.139 mg/kg	0.0000139 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.06 mg/kg		0.049 mg/kg	0.0000049 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.11 mg/kg		0.0898 mg/kg	0.00000898 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.1 mg/kg		0.0816 mg/kg	0.00000816 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.11 mg/kg		0.0898 mg/kg	0.00000898 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0373 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0071%)

Classification of sample: LF-CPRC-2010-18/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2010-18/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18.4% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				38	mg/kg	1.32	42.375	mg/kg	0.00424 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				3.6	mg/kg	2.775	8.439	mg/kg	0.000844 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.8	mg/kg	3.22	4.895	mg/kg	0.00049 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.3	mg/kg	1.142	1.254	mg/kg	0.000125 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27.2	mg/kg	1.462	33.576	mg/kg	0.00336 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				215	mg/kg	1.126	204.448	mg/kg	0.0204 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	401	mg/kg		338.682	mg/kg	0.0339 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				1.8	mg/kg	1.353	2.058	mg/kg	0.000206 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				75.1	mg/kg	2.637	167.242	mg/kg	0.0167 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.314	mg/kg	0.000431 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				83	mg/kg	2.469	173.101	mg/kg	0.0173 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				275	mg/kg		232.264	mg/kg	0.0232 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.14 pH		8.14 pH	8.14 pH			
			PH								
21	naphthalene				0.07 mg/kg		0.0591 mg/kg	0.00000591 %		✓	
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				0.05 mg/kg		0.0422 mg/kg	0.00000422 %		✓	
		205-917-1	208-96-8								
23	acenaphthene				0.06 mg/kg		0.0507 mg/kg	0.00000507 %		✓	
		201-469-6	83-32-9								
24	fluorene				0.05 mg/kg		0.0422 mg/kg	0.00000422 %		✓	
		201-695-5	86-73-7								
25	phenanthrene				0.86 mg/kg		0.726 mg/kg	0.0000726 %		✓	
		201-581-5	85-01-8								
26	anthracene				0.15 mg/kg		0.127 mg/kg	0.0000127 %		✓	
		204-371-1	120-12-7								
27	fluoranthene				1.37 mg/kg		1.157 mg/kg	0.000116 %		✓	
		205-912-4	206-44-0								
28	pyrene				1.28 mg/kg		1.081 mg/kg	0.000108 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.84 mg/kg		0.709 mg/kg	0.0000709 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.88 mg/kg		0.743 mg/kg	0.0000743 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.96 mg/kg		0.811 mg/kg	0.0000811 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.38 mg/kg		0.321 mg/kg	0.0000321 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.71 mg/kg		0.6 mg/kg	0.00006 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.51 mg/kg		0.431 mg/kg	0.0000431 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				0.12 mg/kg		0.101 mg/kg	0.0000101 %		✓	
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.52 mg/kg		0.439 mg/kg	0.0000439 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				0.09 mg/kg		0.076 mg/kg	0.0000076 %		✓	
		205-881-7	191-07-1								
Total:									0.122 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0232%)

Classification of sample: LF-CPRC-2010-18/10/2021-1.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2010-18/10/2021-1.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 10% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				11.4 mg/kg	1.32	13.683 mg/kg	0.00137 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.8 mg/kg	2.775	2.018 mg/kg	0.000202 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.5 mg/kg	3.22	1.464 mg/kg	0.000146 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				2.5 mg/kg	1.142	2.596 mg/kg	0.00026 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24.9 mg/kg	1.462	33.084 mg/kg	0.00331 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				32 mg/kg	1.126	32.753 mg/kg	0.00328 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16 mg/kg		14.545 mg/kg	0.00145 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				43.7 mg/kg	2.637	104.748 mg/kg	0.0105 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				<52 mg/kg	2.469	<128.403 mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		80 mg/kg		72.727 mg/kg	0.00727 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH		PH		8.62 pH		8.62 pH	8.62 pH			
21	naphthalene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-027-00-9	201-167-4	79-01-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
43	hexachlorobenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
44	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
45	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
46	dichlorodifluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-893-9	75-71-8							
47	chloromethane; methyl chloride				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
48	bromomethane; methylbromide				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
49	chloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	dichloromethane; methylene chloride				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-004-00-3	200-838-9	75-09-2							
53	2,2-dichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		209-832-0	594-20-7							
54	bromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-826-3	74-97-5							
55	chloroform; trichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
56	1,1,1-trichloroethane; methyl chloroform				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
57	1,1-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
58	1,2-dichloropropane; propylene dichloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
59	dibromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
60	bromodichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-856-7	75-27-4							
61	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
62	trans-1,3-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		431-460-4	10061-02-6							
63	1,1,2-trichloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
64	1,3-dichloropropane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		205-531-3	142-28-9							
65	dibromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		204-704-0	124-48-1							
66	1,2-dibromoethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
67	chlorobenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
68	1,1,1,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		211-135-1	630-20-6							
69	bromoform; tribromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
70	1,1,2,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-015-00-3	201-197-8	79-34-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
71	bromobenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
72	1,2,3-trichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
73	mesitylene; 1,3,5-trimethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
74	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
75	1,2,4-trimethylbenzene				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
76	sec-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		205-227-0	135-98-8							
77	4-isopropyltoluene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		202-796-7	99-87-6							
78	1,3-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
79	1,4-dichlorobenzene; p-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
80	n-butylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		203-209-7	104-51-8							
81	1,2-dichlorobenzene; o-dichlorobenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
82	1,2-dibromo-3-chloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
83	1,2,4-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
84	hexachlorobutadiene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		201-765-5	87-68-3							
85	1,2,3-trichlorobenzene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
		201-757-1	87-61-6							
86	styrene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-026-00-0	202-851-5	100-42-5							
87	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							
88	2-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-857-5	88-75-5							
89	2,4-dichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
90	3,4-xyleneol; [1] 2,5-xyleneol; [2] 2,4-xyleneol; [3] 2,3-xyleneol; [4] 2,6-xyleneol; [5] xyleneol; [6] 2,4(or 2,5)-xyleneol [7]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]							
91	2,4,5-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-017-00-X	202-467-8	95-95-4							
92	2,4,6-trichlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-018-00-5	201-795-9	88-06-2							
93	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-014-00-3	200-431-6	59-50-7							
94	4-nitrophenol; p-nitrophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	609-015-00-2	202-811-7	100-02-7							
95	pentachlorophenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-002-00-8	201-778-6	87-86-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
96	2-chloronaphthalene	202-079-9	91-58-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
97	2-methyl naphthalene	202-078-3	91-57-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
98	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
99	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
100	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
101	di-n-octyl phthalate	204-214-7	117-84-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
102	diethyl phthalate	201-550-6	84-66-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
103	dimethyl phthalate	205-011-6	131-11-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
104	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
105	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
106	4-bromophenylphenylether	202-952-4	101-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
107	4-chloroaniline	612-137-00-9	203-401-0	106-47-8	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
108	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
109	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
110	bis(2-chloroethoxy)methane	203-920-2	111-91-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
111	bis(2-chloroethyl) ether	603-029-00-2	203-870-1	111-44-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
112	carbazole	201-696-0	86-74-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
113	dibenzofuran	205-071-3	132-64-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
114	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
115	hexachloroethane	200-666-4	67-72-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
116	3,5-trimethylcyclohex-2-enone; isophorone	606-012-00-8	201-126-0	78-59-1	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
117	nitrosodipropylamine	612-098-00-8	210-698-0	621-64-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
118	nitrobenzene	609-003-00-7	202-716-0	98-95-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
119	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
120	cumene; [1] propylbenzene [2]	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
121	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]	602-040-00-X	202-424-3 [1] 203-580-5 [2]	95-49-8 [1] 108-41-8 [2]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		203-397-0 [3] 246-698-2 [4]	106-43-4 [3] 25168-05-2 [4]							
122	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4] 604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
123	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
Total:								0.0412 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00727%)

Classification of sample: LF-CPRC-2010-20/10/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2010-20/10/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23.7% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 23.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12.4	mg/kg	1.32	13.235	mg/kg	0.00132 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.9	mg/kg	2.775	2.019	mg/kg	0.000202 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.9	mg/kg	3.22	2.343	mg/kg	0.000234 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.4	mg/kg	1.142	1.293	mg/kg	0.000129 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				28.7	mg/kg	1.462	33.91	mg/kg	0.00339 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				35	mg/kg	1.126	31.856	mg/kg	0.00319 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	53	mg/kg		42.846	mg/kg	0.00428 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				34.1	mg/kg	2.637	72.685	mg/kg	0.00727 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	2.065	mg/kg	0.000206 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				154	mg/kg	2.469	307.414	mg/kg	0.0307 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group		TPH		94	mg/kg		75.99	mg/kg	0.0076 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.12 pH		8.12 pH	8.12 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.12 mg/kg		0.097 mg/kg	0.0000097 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.27 mg/kg		0.218 mg/kg	0.0000218 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.22 mg/kg		0.178 mg/kg	0.0000178 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.15 mg/kg		0.121 mg/kg	0.0000121 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.15 mg/kg		0.121 mg/kg	0.0000121 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.16 mg/kg		0.129 mg/kg	0.0000129 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.06 mg/kg		0.0485 mg/kg	0.00000485 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.12 mg/kg		0.097 mg/kg	0.0000097 %		✓	
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.09 mg/kg		0.0728 mg/kg	0.00000728 %		✓	
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				0.09 mg/kg		0.0728 mg/kg	0.00000728 %		✓	
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0589 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0076%)

Classification of sample: LF-CPRC-2010-20/10/2021-4.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-2010-20/10/2021-4.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
28.1% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 28.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				10.5	mg/kg	1.32	10.822	mg/kg	0.00108 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.9	mg/kg	2.775	1.95	mg/kg	0.000195 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				1.7	mg/kg	3.22	4.273	mg/kg	0.000427 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.6	mg/kg	1.142	1.427	mg/kg	0.000143 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				43.2	mg/kg	1.462	49.289	mg/kg	0.00493 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				76	mg/kg	1.126	66.797	mg/kg	0.00668 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	84	mg/kg		65.574	mg/kg	0.00656 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				38.8	mg/kg	2.637	79.862	mg/kg	0.00799 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				1	mg/kg	2.554	1.994	mg/kg	0.000199 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				257	mg/kg	2.469	495.401	mg/kg	0.0495 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				158	mg/kg		123.341	mg/kg	0.0123 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				0.009 mg/kg		0.007 mg/kg	0.000000703 %	✓	
	601-023-00-4	202-849-4	100-41-4							
18	xylene				0.056 mg/kg		0.0437 mg/kg	0.00000437 %	✓	
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.8 mg/kg	1.884	1.177 mg/kg	0.000118 %	✓	
	006-007-00-5									
20	pH				7.81 pH		7.81 pH	7.81 pH		
			PH							
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
25	phenanthrene				0.22 mg/kg		0.172 mg/kg	0.0000172 %	✓	
		201-581-5	85-01-8							
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
27	fluoranthene				0.28 mg/kg		0.219 mg/kg	0.0000219 %	✓	
		205-912-4	206-44-0							
28	pyrene				0.22 mg/kg		0.172 mg/kg	0.0000172 %	✓	
		204-927-3	129-00-0							
29	benzo[a]anthracene				0.14 mg/kg		0.109 mg/kg	0.0000109 %	✓	
	601-033-00-9	200-280-6	56-55-3							
30	chrysene				0.14 mg/kg		0.109 mg/kg	0.0000109 %	✓	
	601-048-00-0	205-923-4	218-01-9							
31	benzo[b]fluoranthene				0.16 mg/kg		0.125 mg/kg	0.0000125 %	✓	
	601-034-00-4	205-911-9	205-99-2							
32	benzo[k]fluoranthene				0.06 mg/kg		0.0468 mg/kg	0.00000468 %	✓	
	601-036-00-5	205-916-6	207-08-9							
33	benzo[a]pyrene; benzo[def]chrysene				0.1 mg/kg		0.0781 mg/kg	0.00000781 %	✓	
	601-032-00-3	200-028-5	50-32-8							
34	indeno[123-cd]pyrene				0.08 mg/kg		0.0625 mg/kg	0.00000625 %	✓	
		205-893-2	193-39-5							
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
36	benzo[ghi]perylene				0.08 mg/kg		0.0625 mg/kg	0.00000625 %	✓	
		205-883-8	191-24-2							
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
39	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
Total:								0.0904 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

ethylbenzene: (conc.: 7.03e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.0123%)

xylene: (conc.: 4.37e-06%)

Classification of sample: LF-CPRC-1017-28/09/2021-1.70m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1017-28/09/2021-1.70m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21.2% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 21.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				7.2 mg/kg	1.32	7.844 mg/kg	0.000784 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.8 mg/kg	2.775	1.832 mg/kg	0.000183 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.8 mg/kg	3.22	2.125 mg/kg	0.000213 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				1.9 mg/kg	1.142	1.791 mg/kg	0.000179 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31 mg/kg	1.462	37.383 mg/kg	0.00374 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	14.863 mg/kg	0.00149 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		14.026 mg/kg	0.0014 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				43.4 mg/kg	2.637	94.416 mg/kg	0.00944 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.107 mg/kg	0.000211 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				<52 mg/kg	2.469	<128.403 mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		72 mg/kg		59.406 mg/kg	0.00594 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.011 mg/kg		<0.011 mg/kg	<0.0000011 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH		PH		7.84 pH		7.84 pH	7.84 pH			
21	naphthalene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.027 mg/kg		0.0223 mg/kg	0.00000223 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.05 mg/kg		0.0413 mg/kg	0.00000413 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.04 mg/kg		0.033 mg/kg	0.0000033 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.046 mg/kg		0.038 mg/kg	0.0000038 %		✓	
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.028 mg/kg		0.0231 mg/kg	0.00000231 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.032 mg/kg		0.0264 mg/kg	0.00000264 %		✓	
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				0.012 mg/kg		0.0099 mg/kg	0.00000099 %		✓	
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-027-00-9	201-167-4	79-01-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
43	hexachlorobenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
44	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
45	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-881-7	191-07-1							
46	dichlorodifluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-893-9	75-71-8							
47	chloromethane; methyl chloride				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
48	bromomethane; methylbromide				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
49	chloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	dichloromethane; methylene chloride				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	602-004-00-3	200-838-9	75-09-2							
53	2,2-dichloropropane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		209-832-0	594-20-7							
54	bromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-826-3	74-97-5							
55	chloroform; trichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
56	1,1,1-trichloroethane; methyl chloroform				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
57	1,1-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
58	1,2-dichloropropane; propylene dichloride				<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
59	dibromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
60	bromodichloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		200-856-7	75-27-4							
61	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
62	trans-1,3-dichloropropene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		431-460-4	10061-02-6							
63	1,1,2-trichloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
64	1,3-dichloropropane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		205-531-3	142-28-9							
65	dibromochloromethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		204-704-0	124-48-1							
66	1,2-dibromoethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
67	chlorobenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
68	1,1,1,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
		211-135-1	630-20-6							
69	bromoform; tribromomethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
70	1,1,2,2-tetrachloroethane				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	602-015-00-3	201-197-8	79-34-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
71	bromobenzene 602-060-00-9	203-623-8	108-86-1		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
72	1,2,3-trichloropropane 602-062-00-X	202-486-1	96-18-4		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
73	mesitylene; 1,3,5-trimethylbenzene 601-025-00-5	203-604-4	108-67-8		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
74	tert-butylbenzene 202-632-4	98-06-6			<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
75	1,2,4-trimethylbenzene 601-043-00-3	202-436-9	95-63-6		<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
76	sec-butylbenzene 205-227-0	135-98-8			<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
77	4-isopropyltoluene 202-796-7	99-87-6			<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
78	1,3-dichlorobenzene 602-067-00-7	208-792-1	541-73-1		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
79	1,4-dichlorobenzene; p-dichlorobenzene 602-035-00-2	203-400-5	106-46-7		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
80	n-butylbenzene 203-209-7	104-51-8			<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
81	1,2-dichlorobenzene; o-dichlorobenzene 602-034-00-7	202-425-9	95-50-1		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
82	1,2-dibromo-3-chloropropane 602-021-00-6	202-479-3	96-12-8		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
83	1,2,4-trichlorobenzene 602-087-00-6	204-428-0	120-82-1		<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
84	hexachlorobutadiene 201-765-5	87-68-3			<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
85	1,2,3-trichlorobenzene 201-757-1	87-61-6			<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
86	styrene 601-026-00-0	202-851-5	100-42-5		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
87	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4] 604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
88	2-nitrophenol 201-857-5	88-75-5			<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
89	2,4-dichlorophenol 604-011-00-7	204-429-6	120-83-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
90	3,4-xyleneol; [1] 2,5-xyleneol; [2] 2,4-xyleneol; [3] 2,3-xyleneol; [4] 2,6-xyleneol; [5] xyleneol; [6] 2,4(or 2,5)-xyleneol [7] 604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
91	2,4,5-trichlorophenol 604-017-00-X	202-467-8	95-95-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
92	2,4,6-trichlorophenol 604-018-00-5	201-795-9	88-06-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
93	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol 604-014-00-3	200-431-6	59-50-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
94	4-nitrophenol; p-nitrophenol 609-015-00-2	202-811-7	100-02-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
95	pentachlorophenol 604-002-00-8	201-778-6	87-86-5		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
96	2-chloronaphthalene	202-079-9	91-58-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
97	2-methyl naphthalene	202-078-3	91-57-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
98	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
99	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
100	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
101	di-n-octyl phthalate	204-214-7	117-84-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
102	diethyl phthalate	201-550-6	84-66-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
103	dimethyl phthalate	205-011-6	131-11-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
104	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
105	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
106	4-bromophenylphenylether	202-952-4	101-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
107	4-chloroaniline	612-137-00-9	203-401-0	106-47-8	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
108	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
109	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
110	bis(2-chloroethoxy)methane	203-920-2	111-91-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
111	bis(2-chloroethyl) ether	603-029-00-2	203-870-1	111-44-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
112	carbazole	201-696-0	86-74-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
113	dibenzofuran	205-071-3	132-64-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
114	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
115	hexachloroethane	200-666-4	67-72-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
116	3,5-trimethylcyclohex-2-enone; isophorone	606-012-00-8	201-126-0	78-59-1	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
117	nitrosodipropylamine	612-098-00-8	210-698-0	621-64-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
118	nitrobenzene	609-003-00-7	202-716-0	98-95-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
119	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD
120	cumene; [1] propylbenzene [2]	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
121	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]	602-040-00-X	202-424-3 [1] 203-580-5 [2]	95-49-8 [1] 108-41-8 [2]	<0.006 mg/kg		<0.006 mg/kg	<0.0000006 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		203-397-0 [3] 246-698-2 [4]	106-43-4 [3] 25168-05-2 [4]							
122	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4] 604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
123	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
Total:								0.0367 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00594%)

Classification of sample: LF-CPRC-1018-29/09/2021-3.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1018-29/09/2021-3.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15.7% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 15.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				15.1 mg/kg	1.32	17.232 mg/kg	0.00172 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				1.6 mg/kg	2.775	3.838 mg/kg	0.000384 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.7 mg/kg	3.22	1.948 mg/kg	0.000195 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.691 mg/kg	0.0000691 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18.9 mg/kg	1.462	23.875 mg/kg	0.00239 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				34 mg/kg	1.126	33.086 mg/kg	0.00331 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	22 mg/kg		19.015 mg/kg	0.0019 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				51.3 mg/kg	2.637	116.907 mg/kg	0.0117 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.207 mg/kg	0.000221 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				<52 mg/kg	2.469	<128.403 mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		107 mg/kg		92.481 mg/kg	0.00925 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.53 pH		8.53 pH	8.53 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.09 mg/kg		0.0778 mg/kg	0.00000778 %		✓	
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.09 mg/kg		0.0778 mg/kg	0.00000778 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.07 mg/kg		0.0605 mg/kg	0.00000605 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.03 mg/kg		0.0259 mg/kg	0.00000259 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0442 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00925%)

Classification of sample: LF-CPRC-1018-29/09/2021-4.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **LF-CPRC-1018-29/09/2021-4.00m** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **9%** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				13.3	mg/kg	1.32	16.11	mg/kg	0.00161 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	2.037	mg/kg	0.000204 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.8	mg/kg	3.22	2.363	mg/kg	0.000236 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.7	mg/kg	1.142	0.734	mg/kg	0.0000734 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.6	mg/kg	1.462	31.645	mg/kg	0.00316 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	22.724	mg/kg	0.00227 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	21	mg/kg		19.266	mg/kg	0.00193 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				34.8	mg/kg	2.637	84.18	mg/kg	0.00842 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				<52	mg/kg	2.469	<128.403	mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				68	mg/kg		62.385	mg/kg	0.00624 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.57 pH		8.57 pH	8.57 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.04 mg/kg		0.0367 mg/kg	0.00000367 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.04 mg/kg		0.0367 mg/kg	0.00000367 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.03 mg/kg		0.0275 mg/kg	0.00000275 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0375 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00624%)

Classification of sample: LF-CPRC-1020-21/10/2021-0.50m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1020-21/10/2021-0.50m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.3% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				9.5 mg/kg	1.32	11.582 mg/kg	0.00116 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.5 mg/kg	2.775	1.281 mg/kg	0.000128 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide }				0.3 mg/kg	3.22	0.892 mg/kg	0.0000892 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.527 mg/kg	0.0000527 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				40.5 mg/kg	1.462	54.657 mg/kg	0.00547 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				40 mg/kg	1.126	41.584 mg/kg	0.00416 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	48 mg/kg		44.321 mg/kg	0.00443 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel sulfate }				19.7 mg/kg	2.637	47.962 mg/kg	0.0048 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc sulphate }				216 mg/kg	2.469	492.491 mg/kg	0.0492 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
13	TPH (C6 to C40) petroleum group		TPH		63 mg/kg		58.172 mg/kg	0.00582 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.77 pH		8.77 pH	8.77 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.04 mg/kg		0.0369 mg/kg	0.00000369 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.03 mg/kg		0.0277 mg/kg	0.00000277 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.03 mg/kg		0.0277 mg/kg	0.00000277 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.0758 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00582%)

Classification of sample: LF-CPRC-1020-21/10/2021-2.00m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1020-21/10/2021-2.00m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 25% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				12.9	mg/kg	1.32	13.626	mg/kg	0.00136 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.2	mg/kg	2.775	2.664	mg/kg	0.000266 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.7	mg/kg	3.22	1.803	mg/kg	0.00018 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				2.1	mg/kg	1.142	1.919	mg/kg	0.000192 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				34	mg/kg	1.462	39.754	mg/kg	0.00398 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				39	mg/kg	1.126	35.128	mg/kg	0.00351 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	31	mg/kg		24.8	mg/kg	0.00248 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				52.7	mg/kg	2.637	111.163	mg/kg	0.0111 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				2	mg/kg	2.554	4.086	mg/kg	0.000409 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				<52	mg/kg	2.469	<128.403	mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				130	mg/kg		104	mg/kg	0.0104 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.06 pH		8.06 pH	8.06 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.06 mg/kg		0.048 mg/kg	0.0000048 %		✓	
		205-912-4	206-44-0								
28	pyrene				0.06 mg/kg		0.048 mg/kg	0.0000048 %		✓	
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.05 mg/kg		0.04 mg/kg	0.000004 %		✓	
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.047 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
●	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0104%)

Classification of sample: LF-CPRC-1021-15/10/2021-1.20m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
LF-CPRC-1021-15/10/2021-1.20m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
32.2% (dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 32.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				10.2	mg/kg	1.32	10.187	mg/kg	0.00102 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.8	mg/kg	2.775	1.679	mg/kg	0.000168 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide }				0.3	mg/kg	3.22	0.731	mg/kg	0.0000731 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				1.4	mg/kg	1.142	1.21	mg/kg	0.000121 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				21.4	mg/kg	1.462	23.659	mg/kg	0.00237 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				20	mg/kg	1.126	17.033	mg/kg	0.0017 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	23	mg/kg		17.398	mg/kg	0.00174 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				29.2	mg/kg	2.637	58.238	mg/kg	0.00582 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				<52	mg/kg	2.469	<128.403	mg/kg	<0.0128 %		<LOD
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group		TPH		75	mg/kg		56.732	mg/kg	0.00567 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				8.58 pH		8.58 pH	8.58 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	coronene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-881-7	191-07-1								
Total:									0.032 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase hydrocarbon observed / noted within the field logs

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00567%)

Appendix A: Classifier defined and non EU CLP determinands

■ chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ lead compounds with the exception of those specified elsewhere in this Annex (worst case)

EU CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

■ TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

EU CLP index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

▪ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

EU CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

▪ **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2; H371

▪ **barium sulphide** (EC Number: 244-214-4, CAS Number: 21109-95-5)

EU CLP index number: 016-002-00-X
Description/Comments:
Additional Hazard Statement(s): EUH031 >= 0.8 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

▪ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

EU CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

▪ **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

▪ **1,1-dichloroethane and 1,2-dichloroethane (combined)** (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane
Data source: N/a
Data source date: 14 Oct 2016
Hazard Statements: Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 1B; H350 , Aquatic Chronic 3; H412

• **dichlorodifluoromethane** (EC Number: 200-893-9, CAS Number: 75-71-8)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Aquatic Chronic 3; H412 , Ozone 1; H420 , Press. Gas; H280

• **trichlorofluoromethane** (EC Number: 200-892-3, CAS Number: 75-69-4)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H312 , Ozone 1; H420

• **2,2-dichloropropane** (EC Number: 209-832-0, CAS Number: 594-20-7)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H332 , Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Acute Tox. 4; H312 , Eye Irrit. 2; H319

• **bromochloromethane** (EC Number: 200-826-3, CAS Number: 74-97-5)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H312 , Skin Corr. 1B; H314 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Ozone 1; H420

• **bromodichloromethane** (EC Number: 200-856-7, CAS Number: 75-27-4)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 1A; H360

• **trans-1,3-dichloropropene** (EC Number: 431-460-4, CAS Number: 10061-02-6)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Flam. Liq. 3; H226 , Acute Tox. 3; H301 , Asp. Tox. 1; H304 , Acute Tox. 3; H311 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , Aquatic Chronic 1; H410

• **1,3-dichloropropane** (EC Number: 205-531-3, CAS Number: 142-28-9)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H332 , Flam. Liq. 2; H225 , Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335

• **dibromochloromethane** (EC Number: 204-704-0, CAS Number: 124-48-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT SE 3; H336 , Muta. 2; H341 , Aquatic Chronic 2; H411

• **1,1,1,2-tetrachloroethane** (EC Number: 211-135-1, CAS Number: 630-20-6)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , Carc. 2; H351 , Acute Tox. 4; H312 , Aquatic Chronic 3; H412 , Skin Irrit. 2; H315

• **tert-butylbenzene** (EC Number: 202-632-4, CAS Number: 98-06-6)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Acute Tox. 4; H332 , STOT SE 3; H335 , Asp. Tox. 1; H304 , Aquatic Chronic 2; H411

▪ **sec-butylbenzene** (EC Number: 205-227-0, CAS Number: 135-98-8)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Chronic 2; H411

▪ **4-isopropyltoluene** (EC Number: 202-796-7, CAS Number: 99-87-6)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Chronic 2; H411

▪ **n-butylbenzene** (EC Number: 203-209-7, CAS Number: 104-51-8)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **hexachlorobutadiene** (EC Number: 201-765-5, CAS Number: 87-68-3)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301 , Acute Tox. 2; H310 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 2; H330 , Carc. 2; H351 , Repr. 2; H361 , STOT SE 2; H371 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **1,2,3-trichlorobenzene** (EC Number: 201-757-1, CAS Number: 87-61-6)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , STOT SE 3; H336 , Aquatic Acute 1; H400 , Aquatic Chronic 3; H410

▪ **2-nitrophenol** (EC Number: 201-857-5, CAS Number: 88-75-5)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT RE 2; H373 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **2-chloronaphthalene** (EC Number: 202-079-9, CAS Number: 91-58-7)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

▪ **2-methyl naphthalene** (EC Number: 202-078-3, CAS Number: 91-57-6)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , STOT SE 3; H336 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **di-n-octyl phthalate** (EC Number: 204-214-7, CAS Number: 117-84-0)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Repr. 2; H361 , Skin Sens. 1; H317 , Resp. Sens. 1; H334 , Eye Irrit. 2; H319 , Aquatic Chronic 4; H413

▪ **diethyl phthalate** (EC Number: 201-550-6, CAS Number: 84-66-2)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , STOT SE 3; H335 , STOT RE 2; H373 , Repr. 2; H361 , Acute Tox. 4; H302 , STOT SE 3; H336 , Skin Sens. 1; H317 , Aquatic Chronic 1; H410

▪ **dimethyl phthalate** (EC Number: 205-011-6, CAS Number: 131-11-3)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, Acute Tox. 3; H331, STOT SE 3; H335, STOT SE 3; H336, Repr. 2; H361, Aquatic Chronic 3; H412

▪ **4-bromophenylphenylether** (EC Number: 202-952-4, CAS Number: 101-55-3)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302, Skin Irrit. 2; H315, Skin Sens. 1; H317, Eye Dam. 1; H318, Eye Irrit. 2; H319, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

▪ **4-chlorophenylphenylether** (EC Number: 230-281-7, CAS Number: 7005-72-3)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302, Skin Irrit. 2; H315, Skin Sens. 1; H317, Eye Dam. 1; H318, Eye Irrit. 2; H319, STOT SE 3; H335, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

▪ **bis(2-chloroethoxy)methane** (EC Number: 203-920-2, CAS Number: 111-91-1)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301, Acute Tox. 4; H312, Acute Tox. 1; H330, Acute Tox. 2; H330, STOT SE 1; H370, STOT RE 2; H373

▪ **carbazole** (EC Number: 201-696-0, CAS Number: 86-74-8)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302, Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Muta. 2; H341, Carc. 2; H351, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Acute Tox. 3; H331, Acute Tox. 3; H311, Acute Tox. 3; H301

▪ **dibenzofuran** (EC Number: 205-071-3, CAS Number: 132-64-9)

Description/Comments: VOC; Data from C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 4; H312, Acute Tox. 4; H332, Aquatic Chronic 2; H411

▪ **hexachloroethane** (EC Number: 200-666-4, CAS Number: 67-72-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, STOT RE 2; H373

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required);

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required);

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required);

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required);

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required);

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required);

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

CrVI <LOD, next worst case selected

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required);

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required);

nickel {nickel sulfate}

CrVI <LOD, next worst case selected

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required);

zinc {zinc sulphate}

CrVI <LOD, next worst case selected

barium {barium sulphide}

CrVI not detected above LOD

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required);

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required);

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required);

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021

HazWasteOnline Classification Engine Version: 2022.25.4995.9469 (25 Jan 2022)

HazWasteOnline Database: 2022.25.4995.9469 (25 Jan 2022)

This classification utilises the following guidance and legislation:

WM3 v1.1.NI - Waste Classification - 1st Edition v1.1.NI - Jan 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

17th ATP - Regulation (EU) 2021/849 of 11 March 2021

Appendix F – Irish Landfill Waste Criteria

Irish Landfill Acceptance Criteria

As defined by EU Council Decision 2003/33/EC of establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (Landfill Directive). Engineering and monitoring controls for the various landfill types are set out in the Landfill Directive.

Parameter	Landfill facility type		
	Inert	Inert Increased Limits	Non-Hazardous
	mg/kg dry substance	mg/kg dry substance	mg/kg dry substance
Arsenic (As)	0.5	1.5	2
Barium (Ba)	20.0	20.0	100
Cadmium (Cd)	0.04	0.04	1
Total Chromium (Cr)	0.5	0.5	10
Copper (Cu)	2.0	2.0	50
Mercury (Hg)	0.01	0.01	0.2
Molybdenum (Mo)	0.5	1.5	10
Nickel (Ni)	0.4	0.4	10
Lead (Pb)	0.5	0.5	10
Antimony (Sb)	0.06	0.18	0.7
Selenium (Se)	0.1	0.3	0.5
Zinc (Zn)	4.0	4.0	50
Chloride	800	2,400	15,000
Flouride	10	10	150
Sulphate	1,000	3,000	20,000
Phenol Index	1.0	1.0	Not defined (use HWOL)
DOC	500	500	800
TDS	4,000	12,000	60,000
TOC	30,000 (3%)	60,000 (6%)	NA
BTEX*	6.0	6.0	Not defined (use HWOL)
PCB (7 congeners)*	1.0	1.0	Not defined (use HWOL)
Mineral Oil (C10 – C40)*	500	500	Not defined (use HWOL)
EPH	NA	NA	Not defined (use HWOL)
Total PAH sum 17*	6 (100)	100	Not defined (use HWOL)

All of the above criteria are leachate results apart from those marked with a * these limits are the total pollutant content values for the waste.

All other limits are LS = 10 l/kg, testing must conform to sampling and test methods as defined by Council Decision of 19th December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

Some limits and applicable waste types may vary at specific waste facilities and should be confirmed in advance.

A determination as to if a waste is non-hazardous or hazardous may need to be carried out where there is a suspicion of contamination. Additional contaminants of concern (e.g. asbestos, VOCs etc) should be assessed if they are suspected in the waste.

HWOL - Hazwaste Online Application developed by One Touch Data Limited based on Regulation (EC) No. 1272/2008: the classification, labelling and packaging of substances and mixtures (CLP) and the latest UK Environment Agency guidance, WM3. Accepted by the EPA as tool for classifying waste.

Waste Category	Classification Criteria	Outlets
Category A Unlined Recovery Sites	<p>Uncontaminated soil and stone free from anthropogenic contamination (e.g physical contaminants brick, concrete etc <2%. Free from PAHs, Hydrocarbons etc).</p> <p><u>To be defined in the EPA Soil Trigger Level/Article 27 Guidance.</u> Individual licenced sites can agree specific limits with the EPA (ref EPA Update Note, Feb 2019).</p>	Soil Recovery Facilities, Waste Facility Permitted Sites, COR Sites or potential by-product if not a waste

Landfills

Category B1 Inert Landfills	<p>Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL application*.</p>	<p>Kyletalesha, Co. Laois W0026-03</p> <p>IMS Hollywood, Co. Dublin W0129-02</p> <p>Walshestown Restoration, Co. Kildare W0254-01</p>
Category B2 Inert Landfills increased limits	<p>Reported concentrations greater than Category B criteria but less than IMS Hollywood Landfill acceptance criteria, as set out in their Waste Licence W0129-02. Results also found to be non-hazardous using the HWOL application*.</p>	<p>IMS Hollywood, Co. Dublin W0129-02</p>
Category C Non-haz landfills	<p>Reported concentrations greater than Category B1 criteria but within non-haz landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL application*.</p>	<p>Ballynagran, Co. Wicklow W165-02</p> <p>Drehid, Co. Kildare W0201-01</p> <p>East Galway, Co. Galway W0178-02</p> <p>Knockharley, Co. Meath W0146-02</p> <p>Corranure, Co. Cavan W0077-04</p> <p>Export</p>

Hazardous Material

Category D Hazardous Treatment	<p>Results found to be hazardous using HWOL application*.</p>	<p>Enva Portlaois W0184-02,</p> <p>Rilta Greenogue W0192-03,</p> <p>Export</p>
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Notes:

* Hazwaste Online Application developed by One Touch Data Limited based on Regulation (EC) No. 1272/2008: the classification, labelling and packaging of substances and mixtures (CLP) and the latest UK Environment Agency guidance, WM3.

While material may be classified based on the EU Council Decision 2003/33/EC or the HWOL application, waste acceptance criteria may vary at each waste facility and should be confirmed in advance.

Presence of trace asbestos may result in category changes and many Irish facilities do not accept trace asbestos.

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