



**GEOENVIRONMENTAL
GROUND INVESTIGATION ASSESSMENT
AT PB LEINERS (PB GELATINS), CARDIFF,
CF37 5SQ.**



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GEOENVIRONMENTAL ASSESSMENT AT PB LEINERS, CARDIFF

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ACRONYMS / TERMS USED IN THIS REPORT

BH	Borehole
C4SLs	Category 4 Screening Levels
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Assessment Criteria
CLP	The Classification, Labelling and Packaging of Substances and Mixtures Regulations
CLR 11	Model Procedures for the Management of Land Contamination
COPC	Contaminants of Potential Concern
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
ECL	Environmental Compliance Limited
GAC	Generic Assessment Criteria
GQRA	Generic Quantitative Risk Assessment
HDP	Hand-Dug Pit
LOD	Limit of Detection
LOW	Limit of Waste
mbgl	Meters Below Ground Level
NaOH	Sodium hydroxide (Caustic soda)
NRW	Natural Resources Wales
PAHs	Polycyclic Aromatic Hydrocarbons
POPs	Persistent Organic Pollutants
S4ULs	Suitable 4 Use Levels
SGV	Soil Guideline Value
SSV	Site Screening Value
VOC	Volatile Organic Compounds

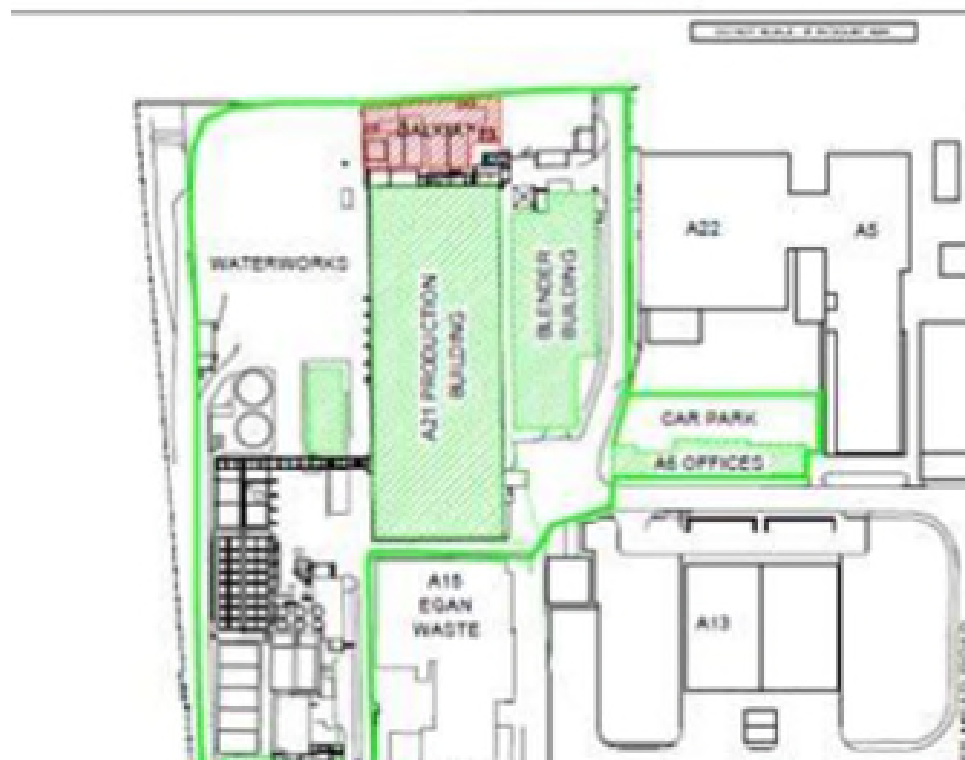
sVOC	Semi-Volatile Organic Compound
WAC	Waste Acceptance Criteria
WM3	EA Technical Guidance on the Classification and Assessment of Waste

1. BACKGROUND

1.1. Overview

- 1.1.1. Environmental Compliance Limited (“ECL”) has been appointed by Veolia to undertake a geo-environmental assessment at PB Gelatins (PB Leiners), Pontypridd, CF37 5SQ following an environmental incident on the 11th June 2020 involving the spillage of approximately 20 tonnes of liquid sodium hydroxide (“NaOH”). All works were undertaken in accordance with ECL proposal letter ECL.Q20.220 dated 19th June 2020.
- 1.1.2. The site is located at Unit A6, Severn Road, Pontypridd, CF37 5SQ. The approximate spill location being the area highlighted in red on the site location plan below (Figure 1). The spill is estimated to have covered an area of at least 25m².

Figure 1: Approximate Spill Location



- 1.1.3. It is ECL’s understanding that the incident on the 11th June 2020 involved the spillage of approximately 20 tonnes of (liquid) sodium hydroxide (NaOH or Caustic Soda) onto land at the Pontypridd site.
- 1.1.4. Immediate measures taken by Veolia included the isolation of the NaOH supply pipeline at its source in the PB Leiners factory, as well as locking the pipeline off at the delivery point to Veolia’s site. Veolia has also requested that PB Leiners removes the NaOH supply line at their earliest opportunity. All staff involved in onsite operation have been instructed that no further use is to be made of the PB Leiners NaOH supply.

- 1.1.5. The initial clean-up process took place on the afternoon of Thursday the 11th June. The surface liquid was removed by vacuum tanker, by specialist contractor, Egan Waste Services Limited. The area was then washed down and the resulting washings were again removed by vacuum tanker. All waste was disposed of through the PB Liners on-site trade effluent treatment plant. However, it is understood that an unknown volume of the spilled NaOH is likely to have entered near surface ground materials within the spill area.

1.2. Scope of Works

- 1.2.1. The works undertaken as part of this report are presented below;
- A Geoenvironmental assessment, based on the findings of an intrusive investigation. Outlining the concentrations of contamination encountered, associated with the recent spill, and assessing the potential to cause harm to human health and controlled waters using the relevant threshold values.
 - The anticipated extent of the area affected by the spill and depth to which soils have been contaminated will be assessed. This information will be used to inform the remediation strategy. Remedial action will be undertaken by a suitably licenced remediation contractor following prior approval from Natural Resources Wales (“NRW”).
 - Waste classification in line with Environment Agency (“EA”) WM3 guidance, will be undertaken in order to inform the appropriate waste code and appropriate disposal options.
- 1.2.2. This assessment has been undertaken, where possible, in accordance with current guidance such as CLR 11 ‘*Model Procedures for the Management of Land Contamination*’ (Environment Agency, 2004), LCRM – ‘*Land contamination: risk management*’ (Environment Agency, 2019), BS10175-A2:2017 (Investigation of Potentially Contaminated Sites, Code of Practice) and BS5930-A3:2015 (Code of Practice for Site Investigation).

1.3. Existing Site Conditions

- 1.3.1. As per the specified requirements of BS10175, “*Investigation of potentially contaminated sites, code of practice*”, a phase 1 desk study must be undertaken prior to a phase 2 intrusive investigation. This has been conducted by Integral Geotechnique (Wales) Limited, report reference 12588/PB/20/SCR (contained within Appendix I of this report), and ECL’s conceptual understanding of the site is based on the information contained therein.
- 1.3.2. From report reference 12588/PB/20/SCR, it is understood the site is underlain by relatively homogenous ‘Made Ground’ comprising hardcore like materials and anthropogenic materials including brick, ash, clinker, metal, concrete and pottery. The presence of cobbles and boulders was noted in the made ground. It is understood the Made Ground extends to a greatest depth of 1.6mbgl.
- 1.3.3. It should be noted that a slight hydrocarbon odour was noted in the near surface materials in one trial pit. Soil sampling and laboratory analysis identified a number of contaminants including metals, semi-metals, PAHs and hydrocarbon compounds. These were however considered unlikely to migrate and affect controlled waters. The desk study has indicated

previous site use included metal alloy works and heavy and light industrial uses including Gelatin manufacture.

- 1.3.4. Groundwater was first encountered at a depth of 3.2mbgl in BH1, however in both BH1 and BH2 groundwater fell to 10.6m following completion of the drilling. Groundwater flow direction is anticipated to be north/easterly toward the River Taff some 370m north (at its closest point) from the spill location. The site is underlain by shallow Secondary A aquifer and deeper secondary A bedrock aquifer (permeable layers capable of supporting water supplies at a local rather than strategic scale).
- 1.3.5. The Made Ground was immediately underlain by a thin mantle of superficial clay which was in turn underlain by superficial deposits comprising sands, gravels and cobbles. These variable but predominantly cohesive alluvial soils were recorded to a proven depth of between 19.7 to 27mbgl.

2. INVESTIGATION AND SAMPLING STRATEGY

2.1. General

- 2.1.1. A Dynamic Sampling (window sampling) rig was utilised to obtain the necessary soil samples and install a shallow groundwater monitoring well downgradient of the spill impacted area. Soil leachate tests (for the purpose of a Level 2 groundwater assessment) were scheduled on samples obtained from the central spill area.
- 2.1.2. Soil screening tests for the purposes of assessing the risk to human health and the necessary WM3 assessment were scheduled on samples obtained from the spill impacted area and both up, and down-gradient of this.
- 2.1.3. Shallow soil samples were also obtained by hand auger along the north-western site boundary, as per NRW requirements, and from spill impacted areas between structures on site, which the drilling rig could not access.
- 2.1.4. All works were undertaken on the 14th July 2020 in accordance with BS5930:2015, BS10175:A2 (2017) and where appropriate Appendix D of the Technical Guidance document WM3 (Guidance on the classification and assessment of waste, 2015). All works were supervised by suitably experienced personnel from ECL.
- 2.1.5. All boreholes not utilised for groundwater monitoring were backfilled with bentonite clay fill in order to prevent the creation of preferential pathways for any contaminants to migrate to deeper strata and groundwater.
- 2.1.6. A site baseline was established by the progression of 1No. upgradient borehole, in the surrounding site area which was not impacted by the spill. The remaining intrusive locations are all located within areas of the site directly impacted by the spill and/or downgradient of this. All exploratory hole locations are presented in Appendix I and the reasoning behind each investigation location is given in Table 1.

Table 1: Exploratory Hole Rationale

Location	Notes	Location Rationale
BH01	Upgradient borehole	Upgradient borehole, not known to be impacted by the recent spill, for establishment of site baseline conditions, against which relevant contaminant concentrations will be compared.
BH02	Central spill area	Borehole progressed for the collection of environmental samples and the determination of depth to which ground materials were contaminated by the spill.
BH03	Downgradient borehole	Downgradient borehole progressed for the collection of environmental samples and assessment of groundwater quality at a location downgradient of the spill location.

Table 1: Exploratory Hole Rationale (Cont.)

Location	Notes	Location Rationale
HDP1	Spill area	Hand-augered trial pit for the collection of environmental samples in an area of the site inaccessible to the sampling rig. The trial pit is located between the green boiler house structures in main spill impacted area.
HDP2	NW site boundary	Hand augered trial pit on the north-west site boundary with 'Western Power' for the purpose of assessing whether materials beyond the site boundary may have been impacted by the spill.
HDP3	Spill area	Hand-augered location between the green boiler house structured for the purpose of collecting environmental samples. It should be noted that ground materials within this area were between 5-10cm thick. The trial pit was terminated on concrete encountered at between 0.05 to 0.1mbgl, assumed concrete footing/pad foundation for the boiler house structures. It was not possible to obtain samples from beneath this depth.

- 2.1.7. A 'quick check' field test using a 'Digital Instruments' Lutron PH-220S soil pH meter was conducted to gain a preliminary understanding of the depth to which soils have been contaminated by NaOH. Readings of up to pH 11.56 were measured within the NaOH contaminated area, with soil pH ranges in the order of pH 6.47 to 6.86 within BH01 and BH03. Whilst the field measurement was useful for a 'quick-check' method when determining sampling frequency and location, soil pH values obtained by the UKAS/MCERTS accredited laboratory will be utilised for the purposed of this assessment.
- 2.1.8. Disturbed soil samples were collected from the recovered cores using a stainless-steel trowel, wiped clean between sampling locations. Near surface soil samples were also collected using a stainless-steel hand auger, again, wiped clean between sampling locations. Soil samples were collected directly into pre-labelled sample containers. Care was taken to minimise head space of the sample containers. Once filled sample containers were placed within cool boxes containing ice packs to maintain as cool a temperature as possible, nominally 4°C.
- 2.1.9. Laboratory testing has been scheduled based off ECL's comprehensive soil screening suite, amended as appropriate to cover the chemicals stored on site, outlined in report reference 12588/PB/20/SCR. Samples were collected by courier, on the 15th July 2020, and delivered to the i2 Analytical UKAS/MCERTS accredited laboratory on the 16th July 2020. All test methods were conducted in accordance with ISO17025. The ECL soil suite is MCERTS accredited. All samples were accompanied by detailed chain of custody sheets.

- 2.1.10. A summary of the analytical suites is as follows;
- **Soils Suite:** Screening for heavy metals, semi-metals, pH, phenols, cyanide, sulphide, speciated polycyclic aromatic hydrocarbons (“PAHs”), mineral oil, total petroleum hydrocarbons (“TPH”) including product ID, asbestos screen, VOC and sVOC.
 - **Waters Suite:** Screening for heavy metals, semi metals, pH, cyanide, sulphide, speciated polycyclic aromatic hydrocarbons (“PAHs”), total petroleum hydrocarbons (“TPH: CWG”), VOC, sVOC. Calcium, magnesium, potassium and sodium are covered by this analytical suite.
 - **Leachate Suite:** Screening for heavy metals, semi metals, pH, cyanide, sulphide, speciated polycyclic aromatic hydrocarbons (“PAHs”), total petroleum hydrocarbons (“TPH: CWG”), VOC, sVOC. Calcium, magnesium, potassium and sodium are covered by this analytical suite.
 - **Waste Acceptance Criteria (“WAC”):** solid waste and eluate analysis, 3 stage.

2.1.11. All certificates of analysis are presented in Appendix III.

2.2. Encountered materials summary

2.2.1. The encountered materials were predominantly made ground underlain by superficial deposits comprising sands, silts and gravels. The generalised ground profile encountered at the site is summarised in Table 2 below. Multiple perched water strikes were encountered within the silty sands. Groundwater was encountered in BH03, rising to a depth of 1.89mbgl following completion of drilling.

Table 2: Generalised Ground Profile

Depth (mbgl)	Encountered Material
0.0 - 1.6	Made Ground: Brown/black and yellowish-brown medium to coarse, medium dense, angular GRAVEL of limestone, some coal, occasional wood fragments and anthropogenic materials (observed brick, metal, plastic). Matrix of brownish-black coarse sand. Ash/clinker/industrial slag encountered within BH01.
1.6 - 3.6	Silty, Gravelly, Sand (superficial alluvial deposits): Greyish-brown and reddish-brown (mottled orange), loose, soft, firming towards base, stiff at 3.5mbgl, slightly silty, slightly clayey fine to medium sand with occasional medium to coarse gravel of sandstone.
3.6 - 4.7	Sandy Gravel (superficial alluvial deposits): Greyish-brown becoming yellowish brown, medium to coarse, loose, sub-angular to sub-rounded gravel, becoming increasingly coarse to base, coarse sand matrix/infill.

2.2.2. A mild hydrocarbon odour was noted at 2.2-2.3mbgl within BH03. Black staining and strong hydrocarbon odour were encountered within BH02 at a depth of 0.5-0.75mbgl. The hydrocarbon within BH02 was highly viscous, presumed diesel/fuel oil.

2.2.3. White staining (dried NaOH), was observed on the floor surface within the building the sodium hydroxide spill had originated in. No white staining was observed within ground materials; however, this is likely due to the ground materials being saturated with

infiltrated rainwater.

- 2.2.4. All borehole logs are enclosed within Appendix II of this report.
- 2.2.5. Following completion of the site works, groundwater monitoring and sampling was undertaken from BH03. Groundwater was measured at 1.89mbgl with the base of the borehole measured to be 3.97mbgl. The effective water column height within the 50mm diameter monitoring standpipe at the time of monitoring was 2.08m.
- 2.2.6. A total of approximately 6L was purged prior to the sample being taken on the 14th July 2020. The groundwater level within the borehole had dropped slightly to 1.95mbgl. It should be noted that in any subsequent monitoring visits a total of 3x the well volume (approximately 31L) should be purged prior to sampling, this should be achievable given the permeable nature of the ground materials at this depth.

3. CONTAMINATION CHARACTERISATION

3.1. Legislation

3.1.1. Contaminated Land is defined in Part IIA of the Environmental Protection Act (1990) as: “Any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reasons of substances in, on or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused; or
- *significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused.”

3.1.2. **Section 86 of the Water Act 2003 amends section 78A of Environmental Protection Act 1990 for Controlled Waters.*

3.2. Generic Quantitative Risk Assessment

Human Health Screening

3.2.1. Current legislation and guidance on the assessment of contaminated land promotes a tiered risk approach (CLR 11). The generic quantitative risk assessment (“GQRA”) comprises a screening of identified contaminants against generic guideline values that are appropriate to the site setting and the receptors concerned. For risks to human health the basis for these generic guideline values are the methodologies set out by the Environment Agency’s Contaminated Land Exposure Assessment (“CLEA”) guidelines.

3.2.2. The following regulatory and industry guidance has been utilised for the selection of Generic Assessment Criteria (“GAC”) utilised as part of the GQRA. The order of the guidance listed is in terms of hierarchy for selection of GACs (where the land uses and parameters are considered most applicable).

- Category 4 Screen Levels (C4SLs) – DEFRA (2014);
- Soil Guidance Values (SGVs) – Environment Agency (2009);
- Suitable for Use Levels (“S4UIs”) – LQM/CIEH (2015); and
- CL:AIRE Generic Assessment Criteria (“GAC”) (2009)

3.2.3. In the absence of a published UK derived GAC for cyanide, the GQRA for total cyanide is based upon comparison of recorded values against the Dutch Intervention Value for free cyanide (VROM 2000).

3.2.4. The current site use is industrial. Therefore, the standard land use for the site, for use in the assessment has been defined as “Commercial” in accordance with current guidance.

Controlled Waters Screening

- 3.2.5. Risks to controlled waters have been assessed following current Environment Agency guidance such as “Remedial Targets Methodology – Hydrological Risk Assessment for Land Contamination”. This guidance describes a tiered approach to the assessment and, if necessary, derivation of remedial targets for soils and groundwater with the emphasis on the protection of controlled waters.
- 3.2.6. In accordance with EA guidance a Level 2 soil (leachability) and Level 2 groundwater screening assessment has been undertaken, to identify the contaminants of concern that may pose a risk to controlled waters namely groundwaters and the River Taff. This assessment has been undertaken by the comparison of soil leachate and groundwater contaminant concentrations with criteria applicable to the long-term protection of water quality.
- 3.2.7. Analytical results have been assessed against Environment Agency EQSs for surface waters as presented within H1 Annex D1: Assessment of Hazardous Pollutants within Surface Water Discharges V2.0 (October 2014), River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) 2010, where available. Where such standards are not available, analytical results have been assessed against The Water Supply (Water Quality) Regulations 2010.

3.3. Soil Analysis – Human Health

- 3.3.1. Soil samples were collected and analysed from both made ground and natural soils. Certificates of analysis for the samples are contained within Appendix III.
- 3.3.2. Current guidance for the statistical assessment of environmental data within a contaminated land context is detailed within the CIEH and CL:AIRE joint publication titled ‘Guidance on Comparing Soil Concentration Data with a Critical Concentration’ (2008). However, as judgemental sampling has been undertaken, statistical assessment as detailed in CL:AIRE (2008) has not been carried out as part of this assessment. Therefore, to identify Contaminants of Potential Concern (“COPC”) as part of this assessment, the analytical results for the ground materials sampled have been assessed by the screening of individual analyses against the relevant Tier 1 Site Screening Values (SSVs) adopted.
- 3.3.3. For generic assessment purposes, SSVs have been conservatively selected, where appropriate, based upon a sandy soil and Soil Organic Matter (SOM) of 1%.

Site Background Data

- 3.3.4. 2No. Samples from the made ground (Sample BH01a) and natural strata (BH01b) were scheduled for analysis from the site in order to gain a preliminary understanding of the likely background concentrations, within an area of the site not impacted by the recent NaOH spillage. The certificate of analysis is enclosed within Appendix III.
- 3.3.5. 2No. soil samples from the downgradient borehole BH03 were also been scheduled for chemical analysis to ascertain whether the sodium hydroxide spill has impacted the downgradient soil quality. Again, the certificates of analysis are enclosed within Appendix III.
- 3.3.6. The analytical results for downgradient borehole, BH03, have also been included in this section given the similarity between the analytical results when compared to the upgradient soil analysis. The downgradient soils do not appear to have been impacted by the recent sodium hydroxide spill and appear representative of the site background values.
- 3.3.7. It should be noted that no exceedances of the relevant threshold values, for the protection of human health, were identified in BH01 or BH03 when screening against a 'commercial' land use. Notwithstanding this, asbestos (chrysotile and amosite), likely remnant of historic land use (foundry), in the form of loose fibres and sheeting board debris has been identified within the near surface 'made ground' materials.
- 3.3.8. Table 3 summarises the elevated background concentrations which may be of potential concern in relation to the protection of human health and controlled waters. The measured concentrations of parameters utilised to identify materials that have been contaminated by NaOH (Sulphide and pH) are also presented within Table 3, below.

Table 3: Site Background Soil Concentration Values

Contaminant	BH01a (mg/kg)	BH01b (mg/kg)	BH03a (mg/kg)	BH03b (mg/kg)	Comment
	0.3-0.4 (mbgl)	2.2-2.5 (mbgl)	0.4-0.5 (mbgl)	2.2-2.4 (mbgl)	
Asbestos	Detected	Not detected	Detected	Not detected	Loose Fibres, Amosite-Sheeting/Board Debris
pH	8.7	7.8	8.3	7.8	
Total Sulphate as SO ₄	1700	1700	1300	410	Heavy metals and metalloids are likely to have originated from the historical usage of the site as a foundry.
Sulphide	20	4.9	8.8	< 1.0	
Aluminium	6600	5900	15000	8600	
Arsenic	24	2.2	17	13	
Barium	440	68	590	61	
Iron	130000	6300	33000	38000	Although low levels of PAHs are present, no
Manganese	1500	96	780	990	
Phosphorus	1000	420	3100	690	

Contaminant	BH01a (mg/kg)	BH01b (mg/kg)	BH03a (mg/kg)	BH03b (mg/kg)	Comment
	0.3-0.4 (mbgl)	2.2-2.5 (mbgl)	0.4-0.5 (mbgl)	2.2-2.4 (mbgl)	
Zinc	250	27	1100	99	product is identifiable owing to the low levels.
Sodium	310	140	470	210	
TPH C10 - C40	120	< 10	30	39	

Sodium hydroxide Spill Area

- 3.3.9. 7No. Soil samples from within the spill contaminated area were scheduled for chemical testing. The full certificates of analysis are enclosed within Appendix III. A summary of the parameters utilised to identify materials that have been contaminated by NaOH is presented in Table 4.
- 3.3.10. Table 4 also summarises the determinands which have been elevated. These are predominantly heavy metals and metalloids, likely to be associated with historic land usage of the site (foundry). It is noted that the concentrations identified are broadly consistent with the site background identified in Table 3.
- 3.3.11. Hydrocarbons have been identified within samples BH02b and BH02c, this is consistent with the field observations outlined in Section 2.2.2. where black staining and strong hydrocarbon odour was encountered at a depth of 0.5-0.75mbgl. The hydrocarbon was highly viscous, presumed diesel/fuel oil. The chromatographic profile is consistent with biodegraded diesel fuel.
- 3.3.12. It should be noted that for the parameters for which SSV are available, no exceedances of the relevant threshold values, for the protection of human health, were identified when screening against a 'commercial' land use. Notwithstanding this, asbestos (chrysotile and amosite) in the form of loose fibrous debris and sheeting board debris has been identified within the near surface 'made ground' materials. No large fragments of asbestos containing material ("ACM") were observed on the site surface, it is considered likely that the asbestos contained within made ground materials is likely remnant of historic land use.

Table 4: Soil Analysis Summary – Sodium Hydroxide Spill Area

Contaminant	BH02a	BH02b	BH02c	BH02d	HDP1	HDP2	HDP3	SSV (mg/kg)
	(mg/kg) <i>(mbgl)</i>	(mg/kg) <i>(mbgl)</i>	(mg/kg) <i>(mbgl)</i>	(mg/kg) <i>(mbgl)</i>	(mg/kg) <i>(mbgl)</i>	(mg/kg) <i>(mbgl)</i>	(mg/kg) <i>(mbgl)</i>	
Asbestos	Detected	Detected	Not detected	Not detected	Detected	Detected	Detected	-
pH	10.0	9.7	9.7	9.3	9.8	9.7	10.6	-
Total Sulphate as SO ₄	2200	1200	1600	320	650	6600	2200	-
Sulphide	1.7	99	67	1.3	15	1.6	18	-
Aluminium	3700	7100	14000	6800	4000	6300	22000	-
Arsenic	12	39	19	7.8	18	110	95	640 ^(c)
Barium	270	230	98	36	1300	680	1200	22000 ^(d)
Iron	32000	32000	38000	36000	59000	150000	140000	-
Manganese	460	350	770	250	1300	1200	1100	-
Phosphorus	650	1400	810	200	1500	4900	7100	-
Zinc	88	290	83	94	550	270	1600	730000 ^(c)
Sodium	750	2100	3400	840	1900	2800	14000	-
TPH C10 - C40	290	2400	430	< 10	210	71	900	-
TPH-CWG - Aliphatic >EC12 - EC16	17	390	70	< 2.0	15	2.2	52	9700 ^(c)
TPH-CWG - Aliphatic >EC16 - EC21	33	810	130	< 8.0	66	21	190	9700 ^(c)
TPH-CWG - Aliphatic >EC21 - EC35	10	220	34	< 8.0	72	14	140	9700 ^(c)
TPH-CWG - Aliphatic (EC5 - EC35)	61	1400	240	< 10	160	37	380	-
TPH-CWG - Aromatic >EC12 - EC16	23	210	46	< 2.0	< 2.0	< 2.0	51	16000 ^(c)
TPH-CWG - Aromatic >EC16 - EC21	51	590	100	< 10	20	11	200	16000 ^(c)
TPH-CWG - Aromatic >EC21 - EC35	140	170	42	< 10	23	22	190	16000 ^(c)
TPH-CWG - Aromatic (EC5 - EC35)	210	970	190	< 10	42	34	440	-
sec-Butylbenzene	< 1.0	35	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-

Notes to Table 4:

- a) DEFRA C4SLs (2014) based on "Commercial" end use
- b) Environment Agency SGVs (2009) based on "Commercial" end use
- c) LQM/CIEH S4ULs (2015) based on "Commercial" end use
- d) CL:AIRE, AGS & EIS (2009) based on "Commercial" end use
- e) Dutch Intervention Value for free cyanide (VROM 2000)

- 3.3.13. If released to soil, sodium hydroxide will separate into sodium cations and hydroxide anions when it comes into contact with moisture. Lowered pH values, when compared to the observed site background, have been identified within all intrusive locations within the spill area and proven to a maximum depth of 2.7mbgl.
- 3.3.14. Elevated sodium concentrations are also present within all considered intrusive locations. The most grossly contaminated materials appear to be the made ground encountered between depths of 0.0 and 1.6mbgl, with the highest measured concentration being 3,400mg/kg between 1.4 and 1.6mbgl. It is noted that the concentration below this, within the natural strata, is significantly lower at 840mg/kg. The sodium hydroxide has potentially, to some degree, been contained within the made ground deposits and not infiltrated through into the natural deposits. This is potentially due to a change in permeability associated with change in strata encountered between 1.5 to 1.6mbgl.
- 3.3.15. HDP3 is noted to have been far more substantially impacted by NaOH with sodium concentrations measured at 14,000mg/kg. This highly elevated concentration when compared to the other made ground samples is likely due to the concrete hardstanding encountered at a depth of 0.1mbgl, as per Table 1. The spilled sodium hydroxide in this area has likely been concentrated within the thin soil horizon, pooled atop the concrete footing, not undergoing natural attenuation processes of dilution within the unsaturated zone.
- 3.3.16. Sample HDP2, collected from the northwest site boundary (beyond which lies the Western Power Distribution site) was also identified as having elevated sodium concentrations. Whilst it is noted the near boundary materials have been impacted by the spill, it is deemed unlikely that any liquid NaOH would have 'spilled' onto the adjacent land, beyond the site boundary, due to the observed change in topography, see Figure 2. It is ECL's understanding that the spilled liquid NaOH was encountered pooled against the raised concrete and land seen to the right of Figure 2. Liquid NaOH, pooled on the ground surface, is anticipated to preferentially migrate vertically downwards, through the unsaturated zone, with any quantities migrating horizontally being reasonably limited.

Figure 2: HDP2 Location on Western Power Site Boundary - NW of Spill



3.4. Soil Analysis - Controlled Waters (Leachability)

3.4.1. In absence of groundwater samples being obtained from the spill contaminated area, 3No. soil samples were scheduled for a leachability analysis. The certificates of analysis are enclosed within Appendix III and a summary of results above the LOD, is presented below in Table 5 with exceedances of the relevant EQS highlighted in bold.

Table 5: Soil Leachability Analysis

Contaminant	BH02e	BH02c	BH02f	SSV (µg/l)
	(µg/l) 0.4-0.6mbgl	(ug/l) 1.4-1.6mbgl	(ug/l) 2.3-2.4 mbgl	
Electrical Conductivity	280 (µS/cm)	660 (µS/cm)	150 (µS/cm)	250 µS/cm (b)
Sulphate as SO ₄	16,800	68,000	17,300	250,000 ^(b)
Sulphide	< 5.0	8.7	< 5.0	n/a
Chloride	2,400	39,000	2,000	250,000 ^(b)
Ammonium as NH ₄	40	800	< 15	500 ^(b)
Total Organic Carbon (TOC)	7,930	247,000	114,000	n/a
Aluminium (dissolved)	4,800	8,700	5,000	200 ^(b)
Antimony (dissolved)	< 1.7	16	< 1.7	5 ^(b)
Arsenic (dissolved)	< 1.1	180	11	10 ^(b)
Barium (dissolved)	58	150	27	700 ^(c)
Beryllium (dissolved)	< 0.2	0.8	0.2	12 ^(c)
Boron (dissolved)	29	280	88	1000 ^(b)
Chromium (dissolved)	1.8	7.3	3.5	50 ^(b)
Cobalt (dissolved)	0.6	6.3	3.8	3 (AA)/ 100 (MAC) ^{(a)(e)}
Copper (dissolved)	22	100	57	2000 ^(b)
Iron (dissolved)	160	4,700	34,000	200 ^(b)
Lead (dissolved)	2.8	29	16	10 ^(b)
Manganese (dissolved)	10	690	250	50 ^(b)
Molybdenum (dissolved)	2.6	14	7.0	70
Nickel (dissolved)	1.5	29	4.4	20 ^(b)
Phosphorus (dissolved)	< 30	8900	500	n/a
Selenium (dissolved)	< 4.0	27	< 4.0	10 ^(a)
Vanadium (dissolved)	11	750	28	60 ^(a)
Zinc (dissolved)	6.8	36	18	10.9 ^(a)
Calcium (dissolved)	32,000	14,000	1,900	n/a
Magnesium (dissolved)	300	1,100	370	n/a
Potassium (dissolved)	1,400	1,900	14,000	n/a
Sodium (dissolved)	25,000	160,000	37,000	200,000 ^(b)

Notes:

- a) EQS for Surface Waters (Environment Agency 'H1 Annex D1: Assessment of Hazardous Pollutants within Surface Water Discharges V2.0' (October 2014))
- b) Water Supply (Water Quality Regulations) 2010
- c) Guidelines for Drinking-water Quality (WHO) 2011
- d) SSV based upon Groundwater Threshold Values from The Water Framework Directive (England and Wales)(2010), unless otherwise stated.
- e) Annual Average ("AA") and Maximum Allowable Concentration ("MAC")

3.4.2. Several exceedances of the relevant environmental Quality Standards ("EQS") have been identified at the site. It should however be noted that these exceedances are all likely associated with historic site activity and not the recent sodium hydroxide spill, which is the focus of this report.

3.4.3. Sodium hydroxide separates in water to sodium cations (positively charged sodium atoms) and hydroxide anions (negatively charged oxygen and hydrogen atoms), which ultimately decrease the acidity of the water. The greatest sodium concentrations within the leachate were encountered within sample BH02c at a depth of 1.4-1.6mbgl. This leachate result is consistent with the encountered soil concentrations discussed in Section 3.3.14. Electrical conductivity measurements further support this, with the greatest conductivity values (assumed to be associated with aqueous sodium hydroxide) being measured within sample BH02c.

3.4.4. Electrical conductivity and measured sodium concentrations below 1.6mbgl are again observed to decrease. It should be noted that electrical conductivity is in excess of the relevant EQS up to a depth of 1.6mbgl. Sodium is not noted to breach the relevant EQS of 200,000ug/l.

3.5. Controlled Waters – Groundwater Analysis

3.5.1. 1No. Groundwater sample was taken from BH03, following completion of siteworks, the certificate of analysis is contained within Appendix III and results above the LOD are summarised below in Table 6. All exceedances of the relevant EQS are highlighted in bold.

Table 6: Groundwater Analysis Summary

Contaminant	BH03 (µg/l)	SSV (µg/l)
pH	7.1	n/a
Sulphate as SO4	18,100	250,000 ^(b)
Chloride	56,000	250,000 ^(b)
Ammonium as NH4	2700	500^(b)
Total Organic Carbon (TOC)	5,780	n/a
Nitrite as N	91	n/a
Lithium (dissolved)	5	n/a
Aluminium (dissolved)	72	200 ^(b)
Antimony (dissolved)	0.8	5 ^(b)
Arsenic (dissolved)	0.84	10 ^(b)
Barium (dissolved)	150	700 ^(c)

Boron (dissolved)	66	1000
Cadmium (dissolved)	0.04	5
Calcium (dissolved)	71,000	n/a
Copper (dissolved)	1.8	2000 ^(b)
Iron (dissolved)	350	200^(b)
Magnesium (dissolved)	17,000	n/a
Manganese (dissolved)	3,400	50^(b)
Molybdenum (dissolved)	3.2	70
Nickel (dissolved)	3.2	20 ^(b)
Phosphorus (dissolved)	22.9	n/a
Potassium (dissolved)	7,800	n/a
Selenium (dissolved)	0.7	10 ^(a)
Sodium (dissolved)	38,000	200,000 ^(b)
Tin (dissolved)	0.42	25
Vanadium (dissolved)	0.4	60 ^(a)
Zinc (dissolved)	7.8	10.9 ^(a)

Notes:

- a) EQS for Surface Waters (Environment Agency 'H1 Annex D1: Assessment of Hazardous Pollutants within Surface Water Discharges V2.0' (October 2014))
- b) Water Supply (Water Quality Regulations) 2010
- c) Guidelines for Drinking-water Quality (WHO) 2011
- d) SSV based upon Groundwater Threshold Values from The Water Framework Directive (England and Wales)(2010), unless otherwise stated.
- e) Annual Average ("AA") and Maximum Allowable Concentration ("MAC")

3.5.2. Sodium hydroxide separates in water to sodium cations (positively charged sodium atoms) and hydroxide anions (negatively charged oxygen and hydrogen atoms), which ultimately decrease the acidity of the water. If released to soil, sodium hydroxide will separate into sodium cations and hydroxide anions when it comes into contact with moisture. No downgradient exceedance of the relevant determinands (sodium and pH) have been observed. This is concurrent with the measured soil concentrations, indicating that the sodium hydroxide is likely restricted to the immediate spill area, outlined in Appendix I.

3.5.3. It is noted that iron, ammonium and manganese are in exceedance of the relevant EQS. However, this is considered resultant of historic contamination and not as a result of the recent spill of sodium hydroxide, which is the focus of this report.

3.6. Conceptual Site Model

3.6.1. Hazard Identification

Table 7: Identified Potential Hazards

Identified Hazard/Source	Location	Details
Made ground and natural strata contaminated by the recent sodium hydroxide spill	BH02, HDP1, HDP2, HDP3	Near surface ground materials, within the area outlined in Appendix I, have been contaminated to an approximate depth of (1.6 mbgl). Whilst no exceedances of human health criteria for a 'commercial' land use were identified. The Ground materials are being further considered due to the potential risk to construction workers and controlled waters.
Hydrocarbon contaminated soils	BH02	Hydrocarbon contaminated soils were encountered within BH02 between depths of 0.5-0.75mbgl, whilst these do not breach the relevant SSVs, these materials are being considered further due to their likely future excavation as part of remedial works.
Risk to Controlled Waters (Level 2, leachate and groundwater)	BH02, BH03	Concentrations in excess of the relevant EQS have been measured in leachate and groundwater. Whilst these are noted to be predominantly associated with historic land use, exceedances of electrical conductivity limits in BH02 are likely associated with aqueous sodium hydroxide, have been identified to a depth of 1.6mbgl.

3.6.2. **Identified Potential Receptors and Pathways**

3.6.3. Potential receptors identified as part of the generic risk assessment are:

- Current/future site users;
- Construction workers; and
- Controlled waters (Secondary Aquifer and surface waters)

3.6.4. Potential contaminant pathways identified as part of the generic risk assessment include:

- Dermal contact – contact with soil, dust or water;
- Ingestion - ingestion of soil, dust or water;
- Inhalation – inhalation of soil, dust or vapours; and
- Vertical and horizontal migration of contaminants through the unsaturated and saturated zones – contaminants leached from ground materials by infiltrated rainwater, migrating along preferential pathways.

3.6.5. **Hazard Assessment and Risk Estimation**

3.6.6. Potential significant pollutant linkages identified following completion of the intrusive works are summarised in the Site Conceptual Model presented in Table 8.

Table 8: Site Conceptual Model

Identified Hazard/Source	Identified Receptor	Potential Pathway to Receptor	Associated Hazard	Scale of Impact	Potential Likelihood for and Significance of Significant Source-Receptor Linkage
Historically contaminated made ground and natural strata contaminated and materials contaminated by hydrocarbons and the recent sodium hydroxide spill	Current and future site users and workers	Ingestion, Inhalation and Dermal contact	Risk of harm to human health	Local	Likely – Moderate Risk
	Controlled Waters (Secondary A Aquifer and the River Taff)	Contaminants leached from ground materials by infiltrated surface waters, migrating vertically and horizontally through the unsaturated zone via preferential pathways	Risk of harm to controlled waters	Local to Regional	Low Likelihood to Likely – Moderate Risk

4. CONTAMINATION SUMMARY AND REMEDIAL RECOMMENDATIONS

4.1. Summary

- 4.1.1. 7No. Soil samples from within the spill contaminated area were scheduled for chemical testing, for the parameters for which assessment criteria (SSVs) are available, no exceedances of the threshold values, for the protection of human health, were identified when screening against a 'commercial' land use. Notwithstanding this, asbestos (chrysotile and amosite) in the form of loose fibrous debris and sheeting board debris have been identified within the made ground materials across all intrusive locations.
- 4.1.2. Hydrocarbons, consistent with biodegraded diesel fuel, have been identified within BH02 at depths of between 0.5 to 1.6mbgl.
- 4.1.3. Elevated sodium concentrations, indicative of the sodium hydroxide spill, are present within all considered intrusive locations, BH02, HDP1, HDP2 and HDP3. The most grossly contaminated materials appear to be associated with the made ground encountered to a maximum depth of 1.6mbgl, with the highest measured concentration being 3,400mg/kg (at 1.4 and 1.6mbgl). It is noted that the concentration measured below this level, within the natural strata, are significantly lower at 840mg/kg.
- 4.1.4. The sodium hydroxide has potentially, to some degree, been contained within the made ground deposits and not infiltrated through into the natural deposits, potentially due to a change in permeability associated with change in strata encountered between 1.5 to 1.6mbgl.
- 4.1.5. HDP3 is noted to have been far more substantially impacted by NaOH with sodium concentrations measured at 14,000mg/kg. This highly elevated concentration when compared to the other made ground samples is likely due to the concrete hardstanding encountered at a depth of 0.1mbgl, as per Table 1. The spilled sodium hydroxide in this area has likely been concentrated within the thin soil horizon, pooled atop the concrete footing, not undergoing natural attenuation processes of dilution within the unsaturated zone.
- 4.1.6. Several exceedances of the relevant environmental Quality Standards ("EQS") for the protection of controlled waters have been identified at the site. It should however be noted that these exceedances are predominantly associated with historic site activity and not the recent sodium hydroxide spill, which is the focus of this report. It should be noted that electrical conductivity, associated with the aqueous sodium hydroxide spill, is in excess of the relevant EQS up to a depth of 1.6mbgl. Sodium is not noted to breach the relevant EQS of 200,000ug/l.

The greatest sodium concentrations within the analysed leachate, were encountered within sample BH02c at a depth of 1.4-1.6mbgl. This leachate result is consistent with the encountered soil concentrations discussed in Section 4.1.3. further supported by Electrical conductivity measurements, with the greatest conductivity values (associated with aqueous sodium hydroxide) being encountered at the same depth.

- 4.1.7. Leachate analysis, below 1.6mbgl, for Electrical conductivity and sodium concentrations is again consisted with the soil concentrations. Both parameters are observed to decrease

once within the natural strata.

- 4.1.8. Sample HDP2, collected from the northwest site boundary (beyond which lies the Western Power Distribution site) was also identified as having elevated sodium concentrations and lowered pH. Whilst it is noted the boundary materials have been impacted by the spill, it is deemed unlikely that significant volumes of NaOH would have impacted land beyond the site boundary due to the change in topography, see Figure 2.

4.2. Remedial Recommendations

- 4.2.1. Full conclusions and recommendations are presented in Section 6 of this report. Ground materials, most significantly contaminated by the recent spill of caustic soda, have been encountered to a depth of 1.6mbgl and appear to be limited to the extent of the made ground. In order to protect the sensitive receptors, outlined in Section 3.6.2. of this document, it is recommended that contaminated soils, from the area outlined in Appendix I, are excavated to a minimum depth of 1.6mbgl and disposed of to an appropriately licenced facility. The materials should be replaced with a suitable, clean, fill material and covered with impermeable concrete hardstanding in order to prevent any future uncontrolled releases to land; and provide an impermeable surface to prevent the leaching of any contaminants, by infiltrated surface water, through the unsaturated zone and toward controlled waters.
- 4.2.2. Should ground conditions upon excavations differ from those outlined in this report, the identified materials should be segregated from other arisings into a separate (lined and covered) skip, and further testing would be conducted in line with WM3 and ISO 1038-1 (Guidance on sampling of stockpiles).

5. WM3 WASTE CLASSIFICATION

5.1. Background

Materials and sample methodology

- 5.1.1. This assessment comprises a basic (comprehensive) characterisation. Representative soil samples were collected on the 14th July 2020 and scheduled for analysis (16/07/2020) as outlined in Section 2 of this report, to determine the chemical composition of ground materials and assess the extent and depth of contamination associated with the recent NaOH spill. The certificates of analysis are enclosed within Appendix III.
- 5.1.2. Laboratory testing was scheduled based off ECL's comprehensive soil screening suite, amended as appropriate to cover the chemicals stored and utilised on site, (outlined in the site condition report reference 12588/PB/20/SCR) in order to identify contaminants of potential relevance. All samples were accompanied by detailed chain of custody sheets.
- 5.1.3. A judgemental sampling approach (judgemental sampling approach A, as defined by WM3) was implemented in order to specifically target ground materials contaminated by the recent spill, and as a consequence this WM3 assessment is only applicable to the materials within the site area outlined in Appendix I.
- 5.1.4. It should be noted that all testing has been conducted on samples obtained from in-situ ground materials, no excavation of ground materials has been undertaken to date. The population sampled as part of this assessment is deemed representative of the materials to be excavated as part of future remedial works. Should ground conditions, upon excavation, differ to those outlined in this report; the identified materials would be segregated from other arisings into a separate (lined and covered) skip, and further testing would be conducted in line with WM3 and ISO 1038-1 (Guidance on sampling of stockpiles).

Population Sampled and Number of Samples

- 5.1.5. For the purposes of the WM3 assessment the sampled population comprises both the near surface made ground materials and the natural strata, within the area of the site which has been affected by the recent spill. These materials shall be referred to as the entire population for the remainder of this assessment, no sub-populations are identified.
- 5.1.6. Since no existing analytical or statistical data for the ground materials is available, the number of necessary individual samples was not calculated using the method outlined in Appendix D of WM3. The appropriate number of samples has been identified using the Environment Agency guidance for Waste Sampling and Testing for Disposal to Landfill (2013); a minimum of 5 samples are required for <100 tonnes of heterogeneous waste with a minimum of 8 samples for a population size of <500 tonnes waste. The surface area impacted by the NaOH spill approximates 25m², with ground materials being impacted to 1.6mbgl. It is estimated up to 40m³ of soil may be excavated as part of remedial works. A sample size of 6No. samples is therefore considered appropriate and representative of the quantity of waste being assessed.

- 5.1.7. Each sample comprised a minimum of 810cm³ of material (500ml tub, 250ml amber jar and 60ml amber jar).
- 5.1.8. Samples from BH01 and BH03 utilised for the definition of the site background concentrations are excluded from this assessment. Samples obtained from depth greater than 1.6mbgl (namely sample BH02d) within the spill impacted area have also been excluded from this assessment, as per Section 5 of this report, as these materials will not be excavated as part of the remedial works. In-situ materials fall outside of the scope of the Waste Framework Directive and are therefore not considered by this WM3 assessment.

Analytical Results

- 5.1.9. Analytical results which were below the laboratory limit of detection (“LOD”) have been excluded from the full assessment, the concentrations of these within the ground materials are not considered significant enough to display any hazardous properties, as defined within WM3. A summary of analytical results, considered within this assessment, is presented within Table 9.

Non-Parametric Statistical Method B

- 5.1.10. As per Section 3 of this report, the nature of encountered ground materials was heterogeneous and the concentration of tested parameters varied between sample locations and depths. Due to this within-stratum and special variability, the mean concentration, is therefore the key criteria against which thresholds are to be considered. For waste classification purposes we need to be confident that the uncertainty associated with the sampling mean does not span the relevant threshold concentrations.
- 5.1.11. Assessments of between-stratum and temporal variability are not applicable to this assessment.
- 5.1.12. The purpose of the sampling was to assess and classify the waste ground materials as part of a Basic Comprehensive Characterisation. Due to the inherent variability of ground materials, analytical data is not known to, and is unlikely to, approximate a normal distribution. The statistical mean concentrations and their confidence intervals are therefore calculated using the non-parametric statistical method B, outlined in appendix D of WM3 (Guidance on the classification and assessment of waste, 2015).
- 5.1.13. Non-parametric statistical methods are used when the nature of the statistical distribution is uncertain. They make no assumptions about the distribution and are consequently less precise. The non-parametric method B is based on the 50th percentile and its confidence intervals rather than the sample mean. Samples are ranked, with the lowest result assigned the rank (r) of 1, the second lowest the rank of 2, and so on.
- 5.1.14. The 50th percentile (X₅₀) is estimated as follows:

$$r = (n + 1)/2$$

- 5.1.15. The 90% confidence intervals for the estimate of X₅₀ are defined by the following

cumulative binomial expression:

- r1 is the largest integer satisfying the condition $CumB(r1-1; n, 0.5) \leq 0.05$
- r2 is the smallest integer satisfying the $CumB(r2-1; n, 0.5) \geq 0.95$

- 5.1.16. Where the upper 90% confidence interval is below the hazardous waste threshold, we can be 95% confident that the 50th percentile is below the hazardous waste threshold.
- 5.1.17. Analytical results above the reported laboratory LOD, but below 0.01% in concentration have also been excluded from the full assessment, along with analytical results below the reported LOD. The concentrations of these within the ground materials are not considered significant enough to display any hazardous properties, as defined within WM3.
- 5.1.18. A summary of analytical results and statistical assessment, considered within this assessment, is presented within Table 9.

Table 9: Determinands considered within the WM3 assessment

Determinand	X ₅₀ (mg/kg)	X ₅₀ concentration (%)	R5 (upper 95%)	R5 concentration (%)
Total Sulphate as SO ₄	1900	0.19	2200	0.220
Aluminium	6700	0.67	14000.00	1.40000
Barium	475	0.05	1200.00	0.12000
Copper	60	0.01	100.00	0.01000
Iron	48500	4.85	140000.00	14.00000
Lead	37	0.00	56.00	0.00560
Manganese	935	0.09	1200.00	0.12000
Phosphorus	1450	0.15	4900.00	0.49000
Zinc	280	0.03	550.00	0.05500
Calcium	96500	9.65	81000.00	8.10000
Magnesium	6500	0.65	17000.00	1.70000
Potassium	885	0.09	1100.00	0.11000
Sodium	2450	0.25	3400.00	0.34000
TPH C10 - C40	360	0.04	900.00	0.09000
Asbestos	chrysotile and amosite – loose fibrous debris			

5.2. Hazardous Waste Assessment

- 4.1.1. The hazardous waste assessment was undertaken using WM3 and in particular with reference to the steps identified in Chapter 2 of the guidance. The individual assessment of each step is detailed in the sections below and in accordance with the order of steps as described in the guidance, which are:
- Step 1 – Check if the waste needs to be classified;
 - Step 2 – Identify the code or codes that may apply to the waste;
 - Step 3 – Identify the assessment needed to select the correct code;
 - Step 4 – Determine the chemical composition of the waste;

- Step 5 – Identify if the substances in the waste are ‘hazardous substances’ or ‘Persistent Organic Pollutants’;
- Step 6 – Assess the hazardous properties of the waste; and
- Step 7 - Assign the classification code and describe the classification code.

Step 1

- 5.2.1. The near surface soils contaminated by the recent spillage of NaOH are likely to require excavation as part of the remedial measures, the materials are therefore not excluded from classification as they do not fall outside of the scope of the Waste Framework Directive and prior to assessment, neither are they covered by any other legislation that would deem the materials to be excluded.

Step 2

- 5.2.2. For the purposes of classifying and coding wastes using the List of Wastes (“LoW”), it is important that the Chapter, sub-chapter and waste description all apply to the six-figure waste code. With reference to the LoW codes provided in the WM3 guidance the list of possible codes is detailed below.

- 17 05 03* soil and stones containing hazardous substances
- 17 05 04 soil and stones other than those mentioned in 17 05 03
- 17 06 01* insulation materials containing asbestos
- 17 06 05* construction materials containing asbestos

Step 3

- 5.2.3. Having ascertained that the most appropriate waste codes it is now necessary to determine, through assessment, whether the waste ground materials are a ‘*mirror hazardous*’ or ‘*mirror non-hazardous*’ entry.

Step 4

- 5.2.4. Section 2 of this report describes the analytical suite and the rationale behind it. The substances, identified above the LOD, that are considered as part of this assessment are detailed in Table 9 above.
- 5.2.5. The WM3 guidance requires that the ‘worst case substance’ is used for the assessment. Reference is made to The Classification, Labelling and Packaging of Substances and Mixtures Regulations 1272/2008 (CLP), and in particular Table 3 of Annex VI, March 2019. Where more than one hazardous property exists, then the worst-case substance for each property must be determined, and in combination, where they may reasonably exist in a waste. The guidance also clarifies that the use of the word ‘reasonable’ indicates that substances that cannot exist within a waste because, for example, of their physical or chemical properties can be excluded.

5.3. Step 5

5.3.1. The substances identified through analysis and their worst-case substances were reviewed against the information contained in the latest online version of Table 3 of Annex VI of the CLP (March 2019). The review highlighted that substances contained within the contaminated ground material samples potentially displayed the hazard properties listed below:

- HP3 – Flammable
- HP4 – Irritant, skin irritation & eye damage
- HP5 – Specific Target Organ Toxicity (“STOT”)
- HP6 – Acute Toxicity
- HP7 – Carcinogenic
- HP8 – Corrosive
- HP14 – Ecotoxic

5.3.2. No Persistent Organic Pollutants (“POP’s”) were identified based upon the undertaken analysis.

Step 6

5.3.3. The classification and hazardous concentration and limits associated with the hazardous properties identified above are provided below in Table 10.

Table10: Classification and Hazardous Properties Concentration Limits

Hazard Class & Category	Hazard Statement Code	Hazard Property	Hazardous properties concentration limits
Flammable solid.	H228	HP3	<ul style="list-style-type: none"> Zinc powder/dust 0.3% for fifth indent
Catches fire spontaneously if exposed to air.	H250	HP3	<ul style="list-style-type: none"> Aluminium powder (pyrophoric or stabilised) 0.1% for fifth indent Calcium 0.2% for fifth indent Magnesium powder (pyrophoric) 0.1% for fifth indent)
Self-heating in large quantities; may catch fire	H252	HP3	Concentrations of aluminium, phosphorous, calcium, manganese, potassium and sodium may give rise to HP3. Measured concentrations within the soil materials are above the threshold values for the fifth indent calculations.
In contact with water releases flammable gases which may ignite spontaneously	H260	HP3	
In contact with water releases flammable gases	H261	HP3	
Skin Corr. 1A	H314	HP4 and HP8	Individual 1%, Sum 1% (sum \geq5% for HP8) Individual concentrations are below the threshold value, however the sum of 'worst case' compounds (1.66%) is in excess of the 1% threshold. The waste displays HP4 and HP8.
Skin Irrit. 2	H315	HP4	Individual 1%, Sum (with H319) 20% Both individual and sum thresholds are exceeded.
Eye Dam. 1	H318	HP4	Individual 1%, Sum 10% Insufficient concentration to make this relevant
Eye Irrit 2	H319	HP4	Individual 1%, Sum (with H315) 20% Both individual and sum thresholds are exceeded.

Hazard Class & Category	Hazard Statement Code	Hazard Property	Hazardous properties concentration limits
STOT SE 3	H335	HP5	Individual 20% Insufficient concentration to make this relevant
STOT RE 2 and Carc. Cat 1A	H372 And H350	HP5 and HP7	Individual 0.1% Loose asbestos fibres have been identified within the waste soils. Whilst a quantitative assessment of the % of total mass has not been possible in order to assess the concentration against the relevant threshold. It is noted that these are loose fibres which may become airborne during excavation and transport. The soil is considered to display HP5 and HP7.
STOT RE 2	H373	HP5	Individual 10% Insufficient concentration to make this relevant
Acute Tox. 1 (oral)	H300	HP6	Individual 0.1%, Sum ≥0.1% Both individual and sum thresholds are exceeded.
Acute Tox. 4 (oral)	H302	HP6	Individual 1%, Sum ≥25% Individual thresholds are exceeded.
Acute Tox. 1 (Inhal.)	H330	HP6	Individual 0.1%, Sum ≥0.1% Both individual and sum thresholds are exceeded.
Acute Tox. 3 (Inhal.)	H331	HP6	Individual 0.1%, Sum ≥3.5% Insufficient concentration to make this relevant
Acute Tox. 4 (Inhal.)	H332	HP6	Individual 1%, Sum ≥22.5% Insufficient concentration to make this relevant
Carc. 2	H351	HP7	Individual ≥1.0% Insufficient concentration to make this relevant. Diesel and Benzo(a)Pyrene markers are both below the relevant threshold values.

Hazard Class & Category	Hazard Statement Code	Hazard Property	Hazardous properties concentration limits
Aquatic Acute 1	H400	HP14	Equation 2 for H400 ($[\sum c (H400) \geq 25\%]$) result of 8.93% is below the $\geq 25\%$ threshold.
Aquatic Chronic 1	H410	HP14	
Aquatic Chronic 2	H411	HP14	However equation 3 ($[\sum c (H410) + 10 \times \sum c (H411) + \sum c (H412) \geq 25\%]$) exceeds the $\geq 25\%$ threshold for H410. The soil is therefore considered to display HP14.
Aquatic Chronic 3	H412	HP14	

- 5.3.4. An assessment of the upper 95th percentile for each substance has identified that the waste soils are likely to display the following hazardous properties;
- HP3 – Flammable
 - HP4 – Irritant, skin irritation & eye damage
 - HP5 – Specific Target Organ Toxicity (“STOT”)
 - HP6 – Acute Toxicity
 - HP8 – Corrosive
 - HP14 – Ecotoxic
- 5.3.5. None of the substances identified through analysis are classified as Persistent Organic Pollutants.
- 5.3.6. The waste soils have been identified as containing loose asbestos fibers and sheeting board debris. It has not been possible to quantify the concentrations of asbestos within the sheeting board debris nor within the waste soils as a whole. It is noted that these fibers are loose and not encased within another material, such as concrete, which would justify the use of a mixed waste classification. The fibers are considered a hazardous material within the waste soil.
- 5.3.7. The laboratory has confirmed that the hydrocarbon profile is consistent with the oil being weathered diesel. TPH is present below the 0.1% concentration limit for HP 7 (and HP 11) (H350 and H340). It is noted that the concentration of Benzo-a-pyrene (BaP) is also less than 0.01% of the concentration of TPH, the oil is not carcinogenic or mutagenic.
- 5.3.8. The appropriate waste code for the soils to be excavated as part of remedial works is:
- **17 05 03* - soil and stones containing hazardous substances**

6. CONCLUSIONS

6.1. Conclusions

- 6.1.1. As per Section 4 of this report, elevated sodium concentrations, indicative of the sodium hydroxide spill, are present within intrusive locations, BH02, HDP1, HDP2 and HDP3. The most grossly contaminated materials appear to be associated with the made ground encountered to a maximum depth of 1.6mbgl, with the highest measured concentration being 3,400mg/kg (between 1.4 and 1.6mbgl).
- 6.1.2. It is noted that the concentrations measured below this level, within the natural strata, are significantly lower at 840mg/kg. It is considered that the sodium hydroxide has, to some extent, been contained within the made ground deposits and not infiltrated into the natural deposits, potentially due to a change in permeability associated with change in strata encountered between 1.5 to 1.6mbgl.
- 6.1.3. The greatest sodium (leachate) concentrations, were encountered at a depth of 1.4-1.6mbgl, consistent with the encountered soil concentrations, with the greatest electrical conductivity values (associated with aqueous sodium hydroxide) being encountered at the same depth. It should be noted that electrical conductivity, associated with the aqueous sodium hydroxide spill, is in excess of the relevant EQS up to a depth of 1.6mbgl. Sodium, however, is not noted to breach the relevant EQS of 200,000ug/l. Both parameters are observed to decrease once within the natural strata.
- 6.1.4. Elevated sodium concentrations and lowered pH were identified within sample HDP2 on the north-western site boundary with Western Power. Whilst it is noted the near boundary materials have been impacted by the spill, it is deemed unlikely that any liquid NaOH would have 'spilled' onto the adjacent land, beyond the site boundary, due to the observed change in topography, see Figure 2. It is ECL's understanding that the spilled liquid NaOH was encountered pooled against the raised concrete and land seen to the right of Figure 2. Liquid NaOH, pooled on the ground surface, is anticipated to preferentially migrate vertically downwards, through the unsaturated zone, with any quantities migrating horizontally being reasonably limited.
- 6.1.5. No downgradient groundwater exceedance of the relevant determinands (sodium and pH) have been observed. This is concurrent with the measured soil concentrations, indicating that the sodium hydroxide is likely restricted to the immediate spill area, outlined in Appendix I.
- 6.1.6. It is noted that iron, ammonium and manganese are in exceedance of the relevant EQS. However, this is considered resultant of historic contamination and not as a result of the recent spill, which is the focus of this report.

6.2. Remedial Recommendations

- 6.2.1. In order to protect the sensitive receptors, outlined in Section 3.6.2., it is recommended that contaminated soils, from the area outlined in Appendix I, are excavated to a depth of approximately 1.6mbgl and disposed of to an appropriately licenced facility. The materials

- should be replaced with a suitable, clean, fill material and covered with impermeable concrete hardstanding in order to prevent any future uncontrolled releases to land; and provide an impermeable surface to prevent the leaching of any contaminants, by infiltrated surface water, through the unsaturated zone and toward controlled waters.
- 6.2.2. As per Section 5, the EWC code applicable to the excavated materials is **17-05-03***. Should ground conditions, upon excavation, differ to those outlined in this report; the identified materials should be segregated from other arisings into a separate (lined and covered) skip, and further testing would be conducted in line with WM3 and ISO 1038-1 (Guidance on sampling of stockpiles).
- 6.2.3. Due to the known buried services (medium pressure gas main) within the contaminated area, a safe system of work for the remedial works will need to be agreed with Wales & West Utilities prior to breaking ground. Appropriate PPE considerations should also be made for groundworkers involved in any remedial works.
- 6.2.4. All remedial works will need to be agreed with NRW and undertaken by a suitably licenced and experience remedial contractor.
- 6.2.5. Due to the proximity of the recommended excavations to foundations of existing boiler house structures, due consideration must be given to the stability of their foundations. Deep excavations carry the potential to 'undercut' the footings of these structures and risk damage to the serviceable state of the buildings and pipework, carrying potentially polluting substances.
- 6.2.6. If no safe system for the excavation of contaminated materials is feasible. Alternate remedial options should be sought. It is ECL's understanding that the boiler house structures are approaching the end of their serviceable life (the structures are approximately 35 years old) and Veolia are undertaking negotiation with PB Leiner for the decommissioning of the current plant and the erection of new boiler house structures.
- 6.2.7. It may be possible to undertake the necessary excavation and remediation of impacted materials as part of these decommissioning works. Removal of the boiler house structures and associated foundations would allow for a more thorough remedial approach and removal of all contaminated material. This approach may be feasible given the absence of a groundwater body within the shallow made-ground materials and no immediate downgradient impact from sodium hydroxide being observed. Notwithstanding this, interim measures, such as the installation of an impermeable hardstanding, must be implemented.
- 6.2.8. The installation of an impermeable concrete hardstanding across the impacted site area would break the source-pathway-receptor model for current site users and prevent any future uncontrolled releases to land. Due to the absence of groundwaters within the most grossly impacted strata, the impermeable hardstanding could also prevent the infiltration of surface waters and the leaching of contaminants through the unsaturated zone, toward controlled waters. Some degree of natural attenuation may be achieved over time. However, a downgradient groundwater monitoring regime would be necessary to ascertain if any risk to controlled waters (groundwaters and the river Taff) remains, in the interim of the contaminated soils being excavated.

- 6.2.9. In situ remediation specialist 'Regenesi Ltd' has been contacted regarding possible in-situ remedial options for sodium hydroxide impacted materials. No in-situ remedial technologies are currently available. Removal of the source of contamination remains the most sustainable form of remediation for the relatively small volume of impacted soils, approximately 40m³.

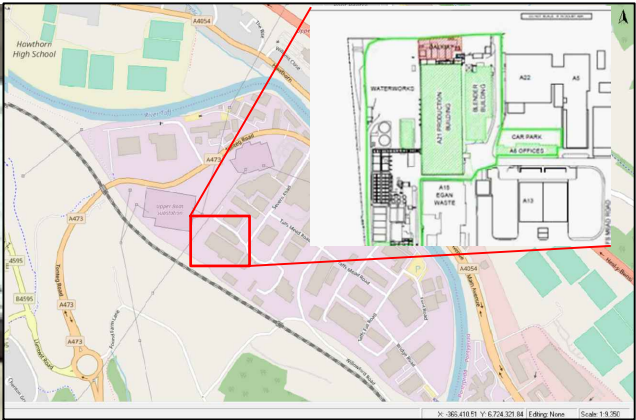
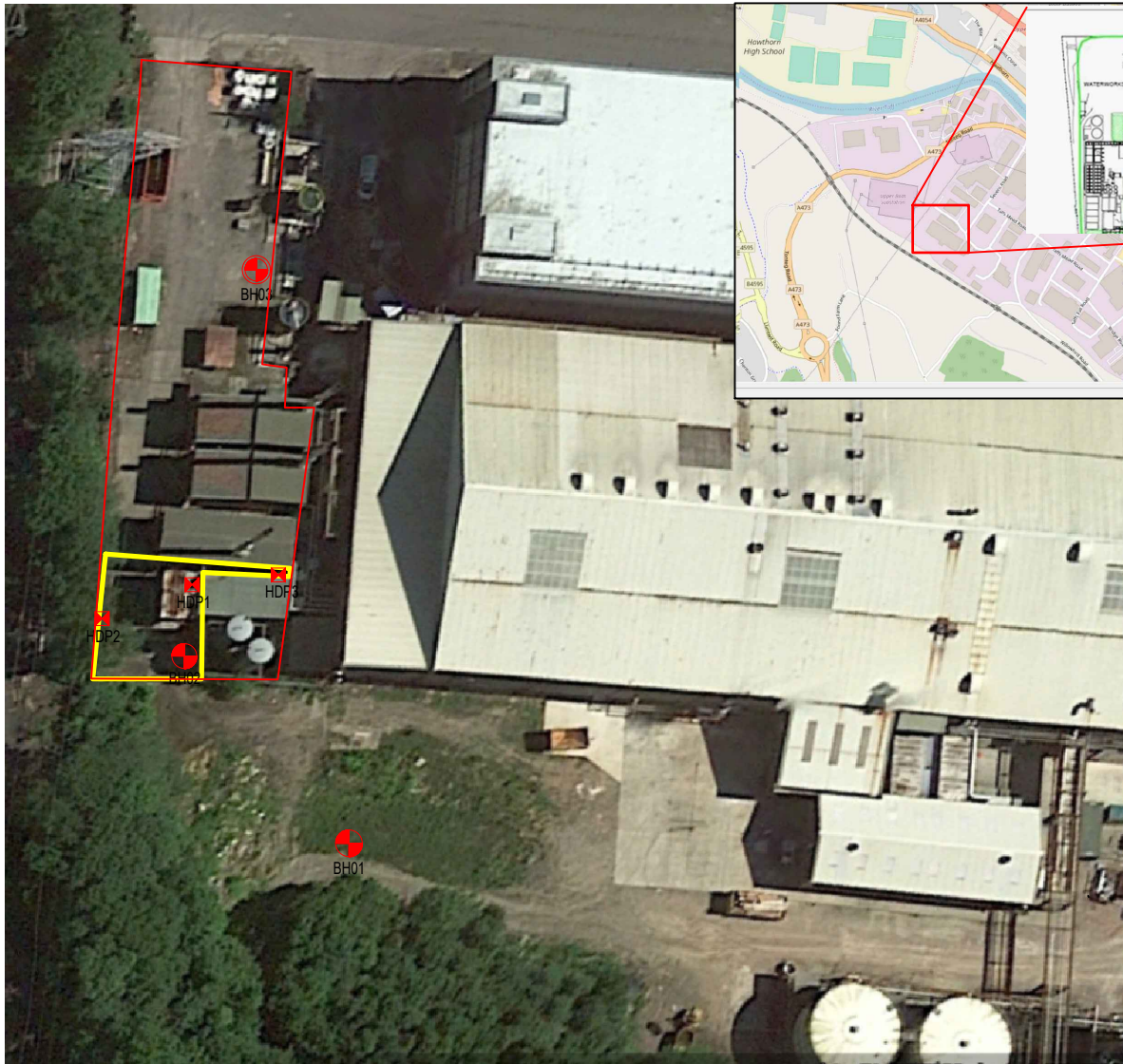
6.3. Waste Acceptance Criteria




- 6.3.1. One composite sample of the contaminated ground materials was taken in accordance with the guidance outlined in ISO 1038-1 (Guidance on sampling of stockpiles) and scheduled for WAC analysis testing in order to inform the likely disposal option and provide the selected landfill operator with the necessary documentation. The certificate of analysis is presented in Appendix IV.
- 6.3.2. The WAC testing was undertaken in accordance with the guidance outlined within the Environment Agency document 'Waste Sampling and Testing for Disposal to Landfill' (EBPRI 11507B; March 2013). Based upon Table 5.3 of the guidance, the WAC test results indicate that sampled materials, required to be disposed of to landfill, may be acceptable as stable non-reactive hazardous waste in a non-hazardous landfill.
- 6.3.3. However, it should be noted that while this initial assessment gives classifications based on industry guidance, the final decision with regard to waste acceptance classification is dependent upon the individual landfill operator. Therefore it is recommended that the basic comprehensive characterisation (WM3 assessment) results, WAC tests data, as well as all total contaminant results (Appendix III) and background information regarding the waste source and origin (as contained within this report) are forwarded to the selected landfill/waste facility to gain confirmation with regards to the acceptability of the waste materials that may be generated from the site.
- 6.3.4. It should also be noted that inert, non-hazardous and hazardous waste must be treated before it can be sent to landfill, in accordance with the requirements of the Landfill Directive and in the context of these works, treatment could include "source segregation". This would involve careful excavation and separation of contaminated ground materials, to demonstrate the minimisation of the disposal of waste to landfill.

6.4. References

- BS10175 British Standards Institute (2011+A2:2017) Investigation of Potentially Contaminated Land - Code of Practice.
- BS5930 British Standards Institute (2015) Code of Practice for Site Investigation.
- CIEH & CL:AIRE (2008) Guidance on Comparing Soil Contamination Data with a Critical Concentration.
- CL:AIRE, AGS & EIC (2009) The Soil Generic Assessment Criteria for Human Health Risk Assessment.
- DEFRA & Environment Agency (2004). Model Procedures for the Management of Land Contamination. R&D Publication CLR11.
- DEFRA (2014) SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document (March 2014).
- Department for the Environment (1995/1996) DOE Industry Profiles.
- Environment Agency (2006) Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination.
- Environment Agency (2009) Soil Guideline Values.
- Environment Agency (2013) Waste Sampling and Testing for Disposal to Landfill.
- Environment Agency (2013) Groundwater Protection: Principles and Practice (GP3) Version 1.1.
- Environment Agency (2019) LCRM - Land contamination: risk management
- LQM & CIEH (2015) The LQM/CIEH S4ULs for Human Health Risk Assessment.
- Environment Agency (2009) Human health toxicological assessment of contaminants in soil. Science Report SC050021/SR2. Bristol: Environment Agency.
- Environment Agency (2009) Updated technical background to the CLEA model. Science Report SC050021/SR3. Bristol: Environment Agency.

APPENDIX I - INTRUSIVE INVESTIGATION LOCATIONS PLAN



-  Exploratory Hole Location:
-  Exploratory Hole with Installation Location:
-  Exploratory Hole Location:

*All Locations are Approximate
 **The approximate NaOH spill area is outlined by the yellow boundary.

Rev	Date	Details	Chkd
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Client

Date	Scale	Drawn by	Checked by	Approved by
22/07/2020	NTS	FT	SB	CB

Drawing Status

Issue 1

Project Title
 Veolia 095.01.01

Drawing Title
 Intrusive Investigation Locations Plan

Drawing Number	Rev
ECL.095.01.01-01	-

APPENDIX II – BOREHOLE LOGS

PROJECT NUMBER 095.01.01	DRILLING DATE 14/07/2020	COORDINATES (X,Y) 310061, 186819
PROJECT NAME PB Leiner	TOTAL DEPTH 3.6mbgl	
CLIENT Veolia	INSTALL DEPTH -	
ADDRESS CF37 5SQ	SCREEN -	
	GROUNDWATER 2.15mbgl	

COMMENTS Upgradient, background location. Drilled first prior to works in main spill area.	LOGGED BY FT
	CHECKED BY SB

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	Additional Observations
		0.2		MADE GROUND: Yellowish-brown and grey, medium to coarse medium dense angular GRAVEL of limestone with occasional anthropogenic materials observed (brick fragments, some coal). Matrix of brownish-black coarse sand.	
BH01a	Soil	0.4			
		0.6		Becomes dark grey-black, loose, soft, silty sand with medium gravel of mudstone, coal, ash/clinker at 0.8mbgl - 1.4mbgl	Assumed waste materials/spoil from historic boiler house.
		0.8			
		1.0			
		1.2			
		1.4		SILTY SAND: Greyish-brown, soft, firming towards base, stiff at 3.5mbgl, slightly silty, slightly clayey fine to medium sand with occasional medium to coarse gravel of sandstone.	
		1.6			
		1.8			
		2.0			
		2.2			
BH01b	Soil	2.4			
		2.6			
		2.8			
		3.0			
		3.2			
		3.4	Recovered materials were saturated, soft to firm, (perched water).		
		3.6	Refusal at 3.6mbgl		
		3.8			
		4.0			
		4.2			
		4.4			
		4.6			
		4.8			



Main Spill Area- BH02 095.01.01

PROJECT NUMBER 095.01.01	DRILLING DATE 14/07/2020	COORDINATES (X,Y) 310060,186843
PROJECT NAME PB Leiner	TOTAL DEPTH 3.6mbgl	
CLIENT Veolia	INSTALL DEPTH -	
ADDRESS CF37 5SQ	SCREEN -	
	GROUNDWATER borehole collapse to 1.4mbgl	

COMMENTS Main spill area. NaOH impacted soils. **LOGGED BY** FT
CHECKED BY SB

Samples	Sample Type	Depth (m)	Graphic Log	Material Description	Additional Observations
		0.2		MADE GROUND: Yellowish-brown and grey, medium to coarse medium dense angular GRAVEL of limestone with anthropogenic materials observed (fragments of brick and slag). Matrix of brownish-black coarse sand.	Black, thick/heavy oil, strong hydrocarbon odour.
BH02a	Soil	0.4			
BH02e	Leachate	0.6			
BH02b	Soil	0.8			
		1.0			
		1.2			Borehole collapse to 1.4mbgl following completion of drilling, no groundwater level measurement possible.
BH02c	Soil +Leachate	1.4			
		1.6		SILTY SAND: Reddish-brown mottled orange, slightly silty, fine to medium sand (soft, very loose), occasional fine gravel of sandstone. [Superficial deposits]	Very saturated (wet), very soft (material extrudes between fingers)
BH02f	Leachate	1.8			
		2.0			
BH02d	Soil	2.2			
		2.4			
		2.6			
		2.8			
		3.0		SILTY SAND: Greyish-brown, soft, firming towards base. Very stiff at 3.55mbgl, slightly silty, fine to medium sand.	
		3.2			
		3.4			
		3.6		Refusal at 3.6mbgl	
		3.8			
		4.0			
		4.2			
		4.4			
		4.6			
		4.8			

PROJECT NUMBER 095.01.01	DRILLING DATE 14/07/2020	COORDINATES (X,Y) 310088,186873
PROJECT NAME PB Leiner	TOTAL DEPTH 4.7mbgl	
CLIENT Veolia	INSTALL DEPTH 4.0mbgl	
ADDRESS CF37 5SQ	SCREEN 1m Plain and 3m (50mm) Slotted Pipe	
	GROUNDWATER 1.89mbgl	

COMMENTS Downgradient, groundwater monitoring borehole	LOGGED BY FT
	CHECKED BY SB

Samples	pH (field measurement)	Sample Type	Depth (m)	Graphic Log	Material Description	Additional Observations	Well Diagram
BH03a		S	0.2		MADE GROUND: Brown/black medium to coarse medium dense angular GRAVEL of limestone, some coal, occasional wood fragments and anthropogenic materials (observed brick, metal, plastic). Matrix of brownish-black coarse sand.		
			0.4				
			0.6				
			0.8				
			1.0				
BH03		GW	1.8		SILTY SAND: Brown, slightly clayey, silty, medium sand (stiff, loose), occasional fine gravel of sandstone. [Superficial deposits]	Very wet, water saturated, between 2.2-2.3mbgl, very soft, very loose. Very mild hydrocarbon odour at 2.2mbgl.	
			2.0				
BH03b	6.47	S	2.2		GRAVELLY SAND: Yellowish-brown, mottled black at 2.8mbgl, soft to firm, loose to medium-dense, slightly silty coarse sand with frequent fine to medium gravel and occasional cobbles of sandstone. [Superficial deposits].	Groundwater strike within Gravel between 2.6 and 3.2mbgl, rising to 1.9mbgl following completion of drilling.	
	6.48		2.4				
			2.6				
			2.8				
			3.0				
			3.8		GRAVEL: Greyish-brown becoming yellowish brown, medium to coarse, loose, sub-angular to sub-rounded gravel, becoming increasingly coarse to base, with coarse sand matrix.		
			4.0				
			4.2				
			4.4				
			4.6				
			4.8				
			5.0		Refusal at 4.7mbgl		
			5.2				

APPENDIX III – CERTIFICATES OF CHEMICAL ANALYSIS



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Analytical Report Number : 20-19786

Project / Site name:	095.01.01	Samples received on:	16/07/2020
Your job number:	095.01.01	Sample instructed/ Analysis started on:	16/07/2020
Your order number:	C1300	Analysis completed by:	27/07/2020
Report Issue Number:	1	Report issued on:	30/07/2020
Samples Analysed:	3 leachate samples - 11 soil samples		

Signed: *A. Czerwińska*

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-19786-1 095.01.01 095.01.01

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report relate only to the sample(s) submitted for testing.

Page 1 of 44

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564682	1564683	1564684	1564685	1564686			
Sample Reference	HDP1	BH01a	BH01b	BH02a	BH02b			
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Depth (m)	0.00-0.30	0.30-0.40	2.20-2.50	0.30-0.40	0.60-0.70			
Date Sampled	14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020			
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	15	29	7.2	19
Total mass of sample received	kg	0.001	NONE	1.7	1.7	1.7	1.7	1.7

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile- Loose Fibres	Chrysotile, Amosite- Loose Fibres, Amosite-Sheeting/Board Debris	-	Chrysotile- Loose Fibres	Chrysotile- Loose Fibrous Debris
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Detected	Detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.8	8.7	7.8	10.0	9.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	650	1700	1700	2200	1200
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	430	69	170	1400
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.066	0.21	0.034	0.084	0.69
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	66.3	214	34.3	84.2	694
Sulphide	mg/kg	1	MCERTS	15	20	4.9	1.7	99
Ammonium as NH ₄	mg/kg	0.5	MCERTS	< 0.5	< 0.5	24	< 0.5	5.2
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.0	2.1	2.8	0.6	3.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.51	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.38	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.49	1.0	< 0.05	2.9	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.17	< 0.05	0.89	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.53	2.1	< 0.05	7.7	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.51	1.8	< 0.05	6.0	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.38	1.8	< 0.05	5.5	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.45	1.5	< 0.05	5.8	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.65	2.2	< 0.05	8.1	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.23	0.76	< 0.05	2.8	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.31	1.3	< 0.05	5.2	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.93	< 0.05	4.1	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.2	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.93	< 0.05	4.9	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.55	14.6	< 0.80	56.0	< 0.80
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4041



Environmental Science

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564682	1564683	1564684	1564685	1564686
Sample Reference	HDP1	BH01a	BH01b	BH02a	BH02b
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.30	0.30-0.40	2.20-2.50	0.30-0.40	0.60-0.70
Date Sampled	14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Aluminium (aqua regia extractable)	mg/kg	30	ISO 17025	4000	6600	5900	3700	7100
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	7.4	7.1	< 1.0	2.6	2.5
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	24	2.2	12	39
Barium (aqua regia extractable)	mg/kg	1	MCERTS	1300	440	68	270	230
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.55	0.58	0.39	0.31	0.71
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	2.6	0.8	0.9	12
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.8	0.4	0.3	0.3	0.8
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	86	15	22	28
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	12	13	2.5	7.3	10
Copper (aqua regia extractable)	mg/kg	1	MCERTS	68	110	7.4	24	52
Iron (aqua regia extractable)	mg/kg	40	MCERTS	59000	130000	6300	32000	32000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	120	11	9.2	47
Lithium (aqua regia extractable)	mg/kg	0.1	NONE	10	18	14	10	22
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	1300	1500	96	460	350
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	1.6	5.4	< 0.25	0.47	1.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	58	8.1	22	36
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	1500	1000	420	650	1400
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tin (aqua regia extractable)	mg/kg	1	MCERTS	5.1	12	1.1	2.1	4.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	18	49	9.0	16	34
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	550	250	27	88	290

Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	180000	63000	2900	110000	83000
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	82000	18000	1300	6500	6500
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	570	690	530	400	780
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	1900	310	140	750	2100

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	210	120	< 10	290	2400
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	3.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4.3	< 1.0	< 1.0	< 1.0	9.7
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	15	< 2.0	< 2.0	17	390
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	66	< 8.0	< 8.0	33	810
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	72	< 8.0	< 8.0	10	220
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	160	< 10	< 10	61	1400

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	4.9	< 2.0	23	210
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	20	21	< 10	51	590
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	23	70	< 10	140	170

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Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564682	1564683	1564684	1564685	1564686
Sample Reference				HDP1	BH01a	BH01b	BH02a	BH02b
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.30-0.40	2.20-2.50	0.30-0.40	0.60-0.70
Date Sampled				14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	42	95	< 10	210	970



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Environmental Science

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564682	1564683	1564684	1564685	1564686
Sample Reference	HDP1	BH01a	BH01b	BH02a	BH02b
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.30	0.30-0.40	2.20-2.50	0.30-0.40	0.60-0.70
Date Sampled	14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	35
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Environmental Science

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564682	1564683	1564684	1564685	1564686
Sample Reference	HDP1	BH01a	BH01b	BH02a	BH02b
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.30	0.30-0.40	2.20-2.50	0.30-0.40	0.60-0.70
Date Sampled	14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	1.0	0.5	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.51	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.38	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.49	1.0	< 0.05	2.9	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.17	< 0.05	0.89	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	0.53	2.1	< 0.05	7.7	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.51	1.8	< 0.05	6.0	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.38	1.8	< 0.05	5.5	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.45	1.5	< 0.05	5.8	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.65	2.2	< 0.05	8.1	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.23	0.76	< 0.05	2.8	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.31	1.3	< 0.05	5.2	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.93	< 0.05	4.1	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.2	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.93	< 0.05	4.9	< 0.05

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Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564682	1564683	1564684	1564685	1564686
Sample Reference				HDP1	BH01a	BH01b	BH02a	BH02b
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.30-0.40	2.20-2.50	0.30-0.40	0.60-0.70
Date Sampled				14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Miscellaneous Organics

Product ID		N/A	NONE	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix
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Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564687	1564688	1564689	1564690	1564691			
Sample Reference	BH02c	BH02d	BH03a	BH03b	HDP2			
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Depth (m)	1.40-1.60	2.50-2.70	0.40-0.50	2.20-2.40	0.00-0.40			
Date Sampled	14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020			
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	20	17	17	24	16
Total mass of sample received	kg	0.001	NONE	0.60	1.7	1.7	1.7	1.7

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite- Loose Fibres	-	Amosite-Sheeting/Board Debris
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.7	9.3	8.3	7.8	9.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1600	320	1300	410	6600
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1000	53	40	22	330
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.52	0.026	0.020	0.011	0.17
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	516	26.3	20.2	10.9	166
Sulphide	mg/kg	1	MCERTS	67	1.3	8.8	< 1.0	1.6
Ammonium as NH ₄	mg/kg	0.5	MCERTS	13	2.1	< 0.5	< 0.5	< 0.5
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.1	1.1	2.2	0.6	2.9

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.32
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	2.8	0.31
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.62	4.4	2.0
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.57
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.69	1.9	3.5
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	1.9	2.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.54	1.4	2.0
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.55	1.2	2.1
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.55	1.7	2.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.33	0.51	1.2
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.38	0.87	1.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.67	0.83
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.25
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.76	0.75

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	4.23	18.1	20.4
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Environmental Science

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564687	1564688	1564689	1564690	1564691
Sample Reference	BH02c	BH02d	BH03a	BH03b	HDP2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1.40-1.60	2.50-2.70	0.40-0.50	2.20-2.40	0.00-0.40
Date Sampled	14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
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Heavy Metals / Metalloids								
Aluminium (aqua regia extractable)	mg/kg	30	ISO 17025	14000	6800	15000	8600	6300
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.8	1.2	5.5	3.2	6.9
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	7.8	17	13	110
Barium (aqua regia extractable)	mg/kg	1	MCERTS	98	36	590	61	680
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.57	0.78	1.0	0.74	0.84
Boron (water soluble)	mg/kg	0.2	MCERTS	2.7	1.3	0.5	0.5	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.7	0.3	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	13	240	82	43
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	14	11	8.8	19	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	10	80	18	100
Iron (aqua regia extractable)	mg/kg	40	MCERTS	38000	36000	33000	38000	150000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	9.4	49	15	56
Lithium (aqua regia extractable)	mg/kg	0.1	NONE	26	16	25	26	24
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	770	250	780	990	1200
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.66	< 0.25	1.4	0.83	5.9
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	17	26	28	42
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	810	200	3100	690	4900
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	9.4
Tin (aqua regia extractable)	mg/kg	1	MCERTS	1.3	< 1.0	5.9	< 1.0	6.1
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	51	21	30	19	39
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	83	94	1100	99	270

Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	2500	1600	110000	2100	81000
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	1800	1800	32000	2000	17000
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	990	580	810	710	1100
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	3400	840	470	210	2800

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	430	< 10	30	39	71
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.5	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	70	< 2.0	< 2.0	< 2.0	2.2
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	130	< 8.0	< 8.0	< 8.0	21
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	34	< 8.0	26	< 8.0	14
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	240	< 10	30	< 10	37

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	46	< 2.0	< 2.0	3.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	100	< 10	< 10	12	11
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	42	< 10	< 10	24	22

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The results included within the report relate only to the sample(s) submitted for testing.

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Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564687	1564688	1564689	1564690	1564691
Sample Reference				BH02c	BH02d	BH03a	BH03b	HDP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.40-1.60	2.50-2.70	0.40-0.50	2.20-2.40	0.00-0.40
Date Sampled				14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	190	< 10	< 10	39	34



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Environmental Science

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564687	1564688	1564689	1564690	1564691
Sample Reference				BH02c	BH02d	BH03a	BH03b	HDP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.40-1.60	2.50-2.70	0.40-0.50	2.20-2.40	0.00-0.40
Date Sampled				14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Environmental Science

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564687				1564688		1564689		1564690		1564691	
Sample Reference	BH02c				BH02d		BH03a		BH03b		HDP2	
Sample Number	None Supplied				None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	1.40-1.60				2.50-2.70		0.40-0.50		2.20-2.40		0.00-0.40	
Date Sampled	14/07/2020				14/07/2020		14/07/2020		14/07/2020		14/07/2020	
Time Taken	None Supplied				None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
SVOCs												
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	2.2	4.1	1.1				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.32		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.4	< 0.2	0.4	< 0.2	0.4		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	2.8	0.31			
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.62	4.4	2.0				
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.57		
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.69	1.9	3.5				
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	1.9	2.7				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.54	1.4	2.0				
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.55	1.2	2.1				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.55	1.7	2.6				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.33	0.51	1.2				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.38	0.87	1.2				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.67	0.83			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.25			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.76	0.75				



Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564687	1564688	1564689	1564690	1564691
Sample Reference				BH02c	BH02d	BH03a	BH03b	HDP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.40-1.60	2.50-2.70	0.40-0.50	2.20-2.40	0.00-0.40
Date Sampled				14/07/2020	14/07/2020	14/07/2020	14/07/2020	14/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Miscellaneous Organics								
Product ID		N/A	NONE	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564692				
Sample Reference				HDP3				
Sample Number				None Supplied				
Depth (m)				0.00-0.10				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	31				
Total mass of sample received	kg	0.001	NONE	1.7				

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile- Loose Fibrous Debris				
Asbestos in Soil	Type	N/A	ISO 17025	Detected				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.6				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Complex Cyanide	mg/kg	1	MCERTS	< 1				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2200				
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	730				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.36				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	363				
Sulphide	mg/kg	1	MCERTS	18				
Ammonium as NH ₄	mg/kg	0.5	MCERTS	2.8				
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.6				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.2				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	0.96				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	0.57				
Pyrene	mg/kg	0.05	MCERTS	0.60				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.33				
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Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564692				
Sample Reference				HDP3				
Sample Number				None Supplied				
Depth (m)				0.00-0.10				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Aluminium (aqua regia extractable)	mg/kg	30	ISO 17025	22000				
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	15				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	95				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	1200				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	3.6				
Boron (water soluble)	mg/kg	0.2	MCERTS	9.1				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	4.9				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	73				
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	44				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	200				
Iron (aqua regia extractable)	mg/kg	40	MCERTS	140000				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110				
Lithium (aqua regia extractable)	mg/kg	0.1	NONE	31				
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	1100				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	8.7				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	94				
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	7100				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	8.5				
Tin (aqua regia extractable)	mg/kg	1	MCERTS	14				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	66				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	1600				
Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	23000				
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	3600				
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	1400				
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	14000				

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	900				
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	52				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	190				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	140				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	380				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.9				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	51				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	200				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	190				



Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564692				
Sample Reference				HDP3				
Sample Number				None Supplied				
Depth (m)				0.00-0.10				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	440				



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Environmental Science

Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564692				
Sample Reference				HDP3				
Sample Number				None Supplied				
Depth (m)				0.00-0.10				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0				
Chloroethane	µg/kg	1	NONE	< 1.0				
Bromomethane	µg/kg	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/kg	1	NONE	< 1.0				
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0				
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloromethane	µg/kg	1	MCERTS	< 1.0				
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0				
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0				
Benzene	µg/kg	1	MCERTS	< 1.0				
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloroethene	µg/kg	1	MCERTS	< 1.0				
Dibromomethane	µg/kg	1	MCERTS	< 1.0				
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0				
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/kg	1	NONE	< 1.0				
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0				
Chlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-Xylene	µg/kg	1	MCERTS	< 1.0				
Styrene	µg/kg	1	MCERTS	< 1.0				
Tribromomethane	µg/kg	1	NONE	< 1.0				
o-Xylene	µg/kg	1	MCERTS	< 1.0				
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0				
Bromobenzene	µg/kg	1	MCERTS	< 1.0				
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0				
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0				
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0				

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The results included within the report relate only to the sample(s) submitted for testing.

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Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564692				
Sample Reference				HDP3				
Sample Number				None Supplied				
Depth (m)				0.00-0.10				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1				
Phenol	mg/kg	0.2	ISO 17025	< 0.2				
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1				
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3				
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05				
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3				
4-Methylphenol	mg/kg	0.2	NONE	< 0.2				
Isophorone	mg/kg	0.2	MCERTS	< 0.2				
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Naphthalene	mg/kg	0.05	MCERTS	1.2				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3				
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1				
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2				
2-Methylnaphthalene	mg/kg	0.1	NONE	2.6				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1				
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2				
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3				
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Azobenzene	mg/kg	0.3	MCERTS	< 0.3				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2				
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Phenanthrene	mg/kg	0.05	MCERTS	0.96				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Carbazole	mg/kg	0.3	MCERTS	< 0.3				
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3				
Fluoranthene	mg/kg	0.05	MCERTS	0.57				
Pyrene	mg/kg	0.05	MCERTS	0.60				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				



Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564692				
Sample Reference				HDP3				
Sample Number				None Supplied				
Depth (m)				0.00-0.10				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)								
	Units	Limit of detection	Accreditation Status					
Miscellaneous Organics								
Product ID		N/A	NONE	See Appendix				



Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564693			1564694			1564695		
Sample Reference	BH02c			BH02e			BH02f		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	1.40-1.60			0.40-0.60			2.30-2.40		
Date Sampled	14/07/2020			14/07/2020			14/07/2020		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status						

General Inorganics

Parameter	Units	Limit of detection	Accreditation Status	1564693	1564694	1564695
Electrical Conductivity	µS/cm	10	ISO 17025	660	280	150
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Complex Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Sulphate as SO ₄	µg/l	100	ISO 17025	68000	16800	17300
Sulphide	µg/l	5	NONE	8.7	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	39	2.4	2.0
Ammonium as NH ₄	mg/l	0.015	NONE	0.80	0.040	< 0.015
Total Organic Carbon (TOC)	mg/l	0.1	NONE	247	7.93	114



Analytical Report Number: 20-19786

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number	1564693			1564694	1564695		
Sample Reference	BH02c			BH02e	BH02f		
Sample Number	None Supplied			None Supplied	None Supplied		
Depth (m)	1.40-1.60			0.40-0.60	2.30-2.40		
Date Sampled	14/07/2020			14/07/2020	14/07/2020		
Time Taken	None Supplied			None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status				

Speciated PAHs

Parameter	Units	Limit of detection	Accreditation Status	1564693	1564694	1564695	
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	

Total PAH

Parameter	Units	Limit of detection	Accreditation Status	1564693	1564694	1564695	
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	

Heavy Metals / Metalloids

Parameter	Units	Limit of detection	Accreditation Status	1564693	1564694	1564695	
Aluminium (dissolved)	mg/l	0.012	ISO 17025	8.7	4.8	5.0	
Antimony (dissolved)	µg/l	1.7	ISO 17025	16	< 1.7	< 1.7	
Arsenic (dissolved)	µg/l	1.1	ISO 17025	180	< 1.1	11	
Barium (dissolved)	µg/l	0.05	ISO 17025	150	58	27	
Beryllium (dissolved)	µg/l	0.2	ISO 17025	0.8	< 0.2	0.2	
Boron (dissolved)	µg/l	10	ISO 17025	280	29	88	
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	
Chromium (hexavalent)	µg/l	5	ISO 17025	U/S*	< 5.0	U/S*	
Chromium (dissolved)	µg/l	0.4	ISO 17025	7.3	1.8	3.5	
Cobalt (dissolved)	µg/l	0.3	ISO 17025	6.3	0.6	3.8	
Copper (dissolved)	µg/l	0.7	ISO 17025	100	22	57	
Iron (dissolved)	mg/l	0.004	ISO 17025	4.7	0.16	34	
Lead (dissolved)	µg/l	1	ISO 17025	29	2.8	16	
Lithium (dissolved)	µg/l	30	NONE	< 30	< 30	< 30	
Manganese (dissolved)	mg/l	0.00006	NONE	0.69	0.010	0.25	
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	14	2.6	7.0	
Nickel (dissolved)	µg/l	0.3	ISO 17025	29	1.5	4.4	
Phosphorus (dissolved)	µg/l	30	NONE	8900	< 30	500	
Selenium (dissolved)	µg/l	4	ISO 17025	27	< 4.0	< 4.0	
Tin (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	
Vanadium (dissolved)	µg/l	1.7	ISO 17025	750	11	28	
Zinc (dissolved)	µg/l	0.4	ISO 17025	36	6.8	18	

Calcium (dissolved)	mg/l	0.012	ISO 17025	14	32	1.9	
Magnesium (dissolved)	mg/l	0.005	ISO 17025	1.1	0.30	0.37	
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.9	1.4	14	
Sodium (dissolved)	mg/l	0.01	ISO 17025	160	25	37	



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Lab Sample Number				1564693	1564694	1564695		
Sample Reference				BH02c	BH02e	BH02f		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.40-1.60	0.40-0.60	2.30-2.40		
Date Sampled				14/07/2020	14/07/2020	14/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10		

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10		
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Your Order No: C1300

Lab Sample Number				1564693	1564694	1564695		
Sample Reference				BH02c	BH02e	BH02f		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.40-1.60	0.40-0.60	2.30-2.40		
Date Sampled				14/07/2020	14/07/2020	14/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		



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Lab Sample Number	1564693			1564694			1564695		
Sample Reference	BH02c			BH02e			BH02f		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	1.40-1.60			0.40-0.60			2.30-2.40		
Date Sampled	14/07/2020			14/07/2020			14/07/2020		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status						

VOCs

Chloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Chloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Bromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
2,2-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Trichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,2-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1-Dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Trans-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Tetrachloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,2-dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Dibromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Bromodichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,3-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Dibromochloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Tetrachloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,2-Dibromoethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Chlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Styrene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Tribromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Isopropylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Bromobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
n-Propylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
2-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
4-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
ter-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
sec-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
P-Isopropyltoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1	< 0.1	< 0.1		
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		



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Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564693	1564694	1564695		
Sample Reference				BH02c	BH02e	BH02f		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.40-1.60	0.40-0.60	2.30-2.40		
Date Sampled				14/07/2020	14/07/2020	14/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs								
Analytical Parameter	Units	Limit of detection	Accreditation Status	1564693	1564694	1564695		
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		



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Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1564693	1564694	1564695		
Sample Reference				BH02c	BH02e	BH02f		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.40-1.60	0.40-0.60	2.30-2.40		
Date Sampled				14/07/2020	14/07/2020	14/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Miscellaneous								
Product ID		N/A	NONE	See Appendix	See Appendix	See Appendix		

*U/S due to high variances between chromium (hexavalent) and chromium (dissolved) caused by method differences.



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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1564682	HDP1	None Supplied	0.00-0.30	Brown loam and clay with gravel.
1564683	BH01a	None Supplied	0.30-0.40	Brown loam and clay with gravel.
1564684	BH01b	None Supplied	2.20-2.50	Brown loam and clay with gravel.
1564685	BH02a	None Supplied	0.30-0.40	Brown loam and clay with gravel.
1564686	BH02b	None Supplied	0.60-0.70	Brown loam and clay with gravel.
1564687	BH02c	None Supplied	1.40-1.60	Brown loam and clay with gravel.
1564688	BH02d	None Supplied	2.50-2.70	Brown loam and clay with gravel.
1564689	BH03a	None Supplied	0.40-0.50	Brown loam and clay with gravel.
1564690	BH03b	None Supplied	2.20-2.40	Brown loam and clay with gravel.
1564691	HDP2	None Supplied	0.00-0.40	Brown loam and clay with gravel and vegetation.
1564692	HDP3	None Supplied	0.00-0.10	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 20-19786

Project / Site name: 095.01.01

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH ₄ in leachate	Determination of ammonium in leachate by addition of buffer solution followed by ion selective electrode.	In-house method	L035-PL	W	NONE
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cations in soil by ICP-OES	Determination of cations in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Complex cyanide in leachate	Determination of complex cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L040-PL	W	ISO 17025
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Electrical conductivity at 20oC of leachate	Determination of electrical conductivity in leachate by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	ISO 17025
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

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Analytical Report Number : 20-19786

Project / Site name: 095.01.01

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Product ID	Determination against standard chromatograms.	In-house method	L064-PL	W	NONE
Product ID in soil	Determination of product ID by interpretation against standard chromatograms - Soil.	In-house method	L064-PL/UK	W	NONE
Semi-volatile organic compounds in leachate	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025

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Analytical Report Number : 20-19786

Project / Site name: 095.01.01

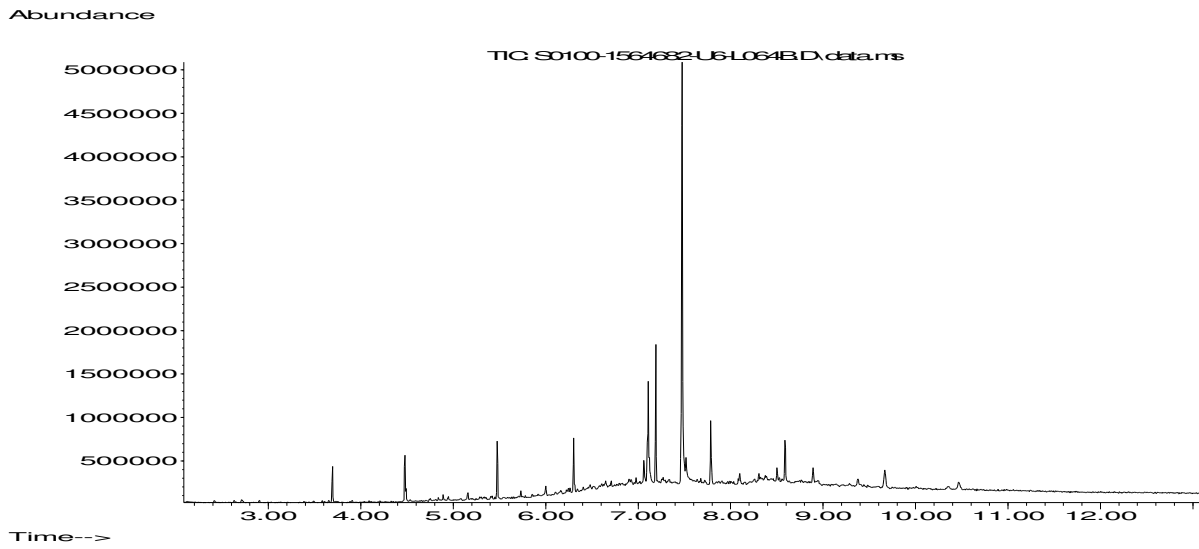
Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/cleanup.	L088/76-PL	W	MCERTS
Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA8260	L073B-PL	W	NONE
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

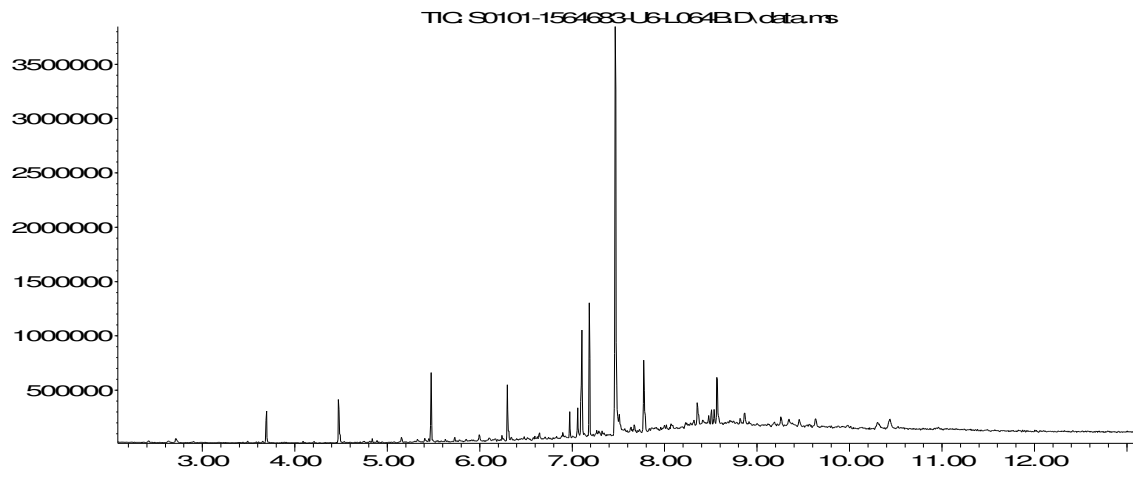
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

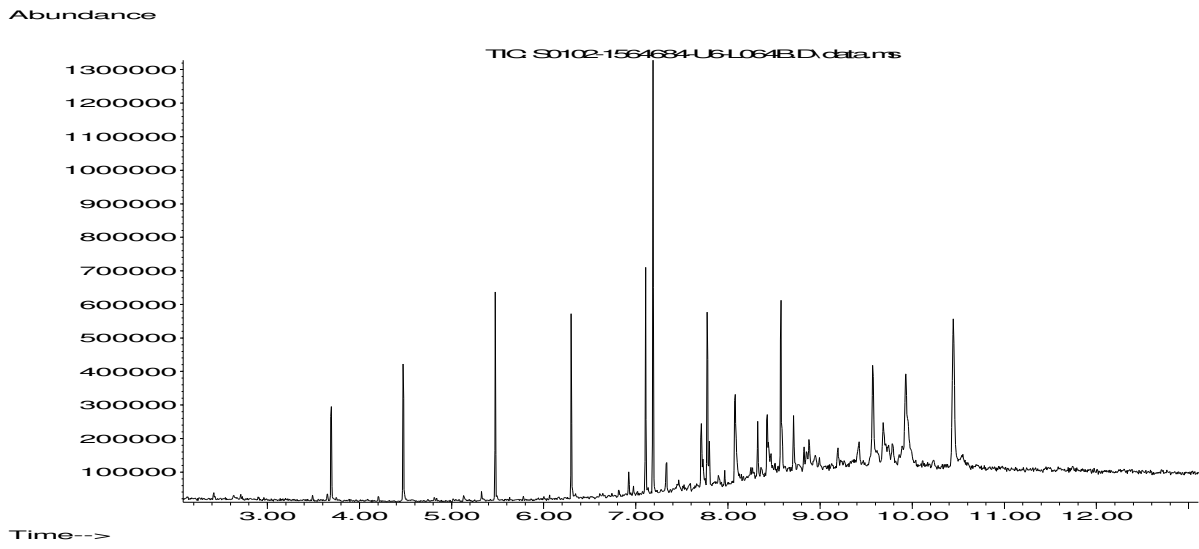


Although low levels of PAHs are visible, no product is identifiable owing to the low levels present.
The sample TIC trace is simple.
The trace does not match the standard product profiles.

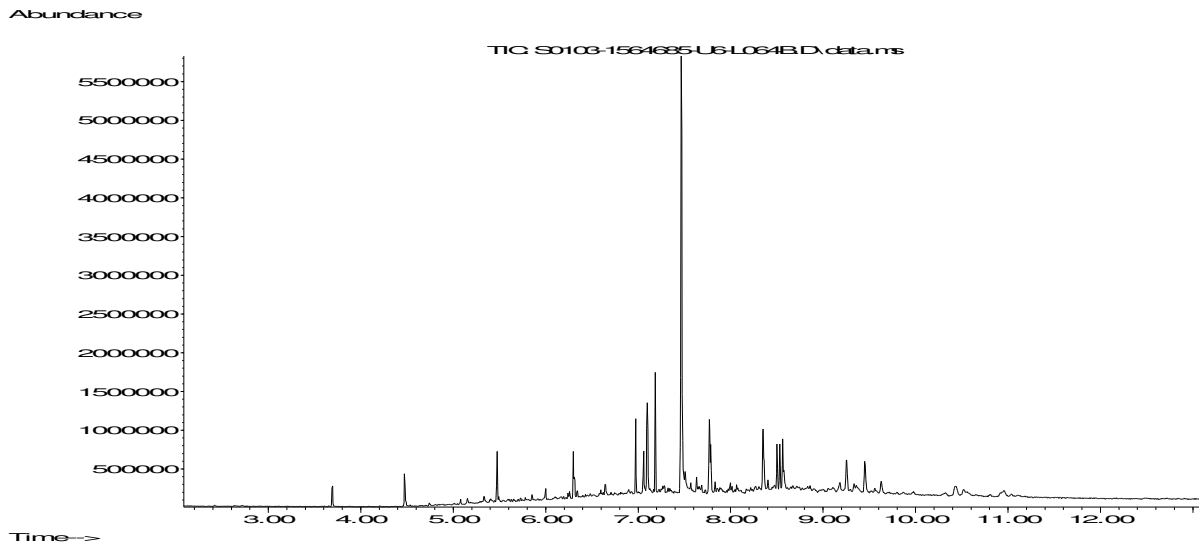
Abundance



Although low levels of PAHs are visible, no product is identifiable owing to the low levels present.
The sample TIC trace is simple.
The trace does not match the standard product profiles.

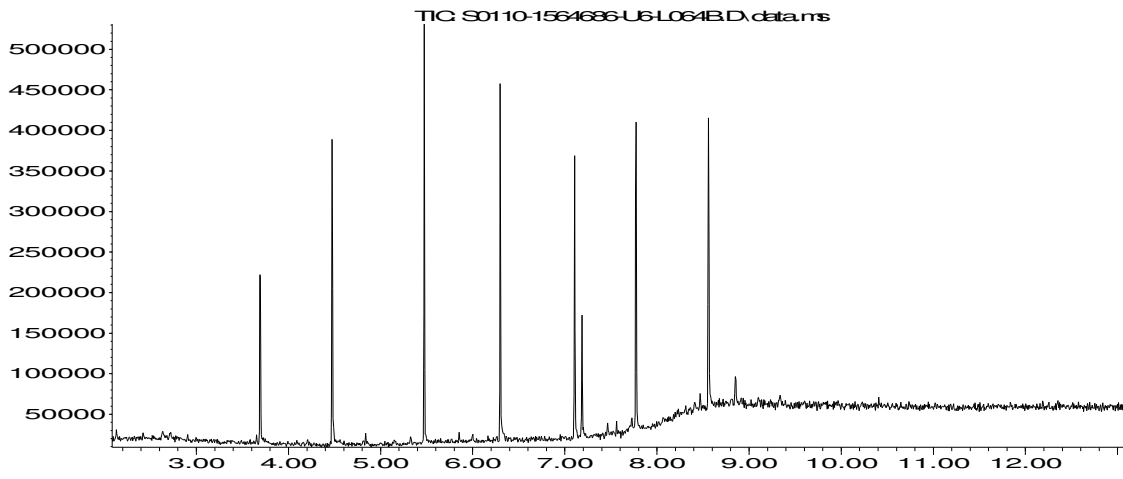


The total ion count (TIC trace) shows no detectable hydrocarbons due to the low levels present. No Product is present.



Although low levels of PAHs are visible, no product is identifiable owing to the low levels present.
The sample TIC trace is simple.
The trace does not match the standard product profiles.

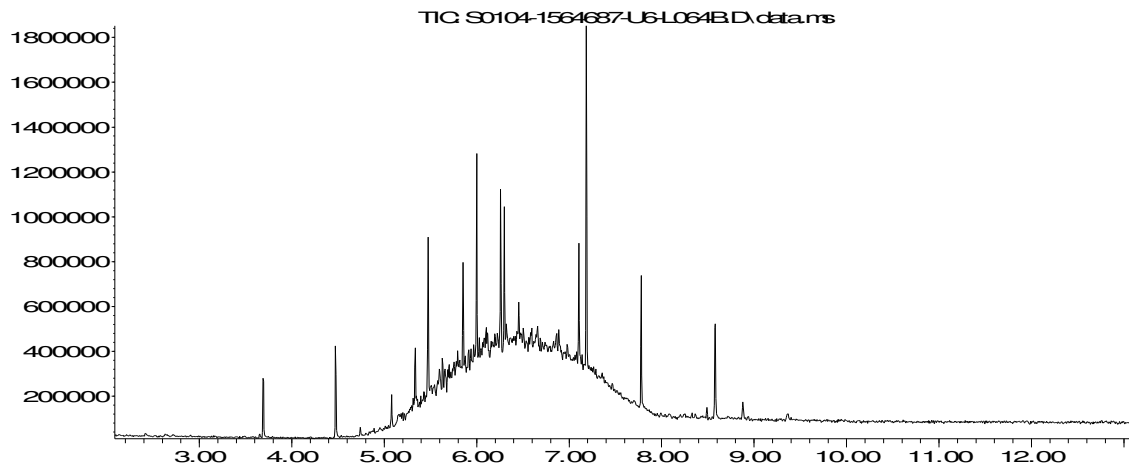
Abundance



Time-->

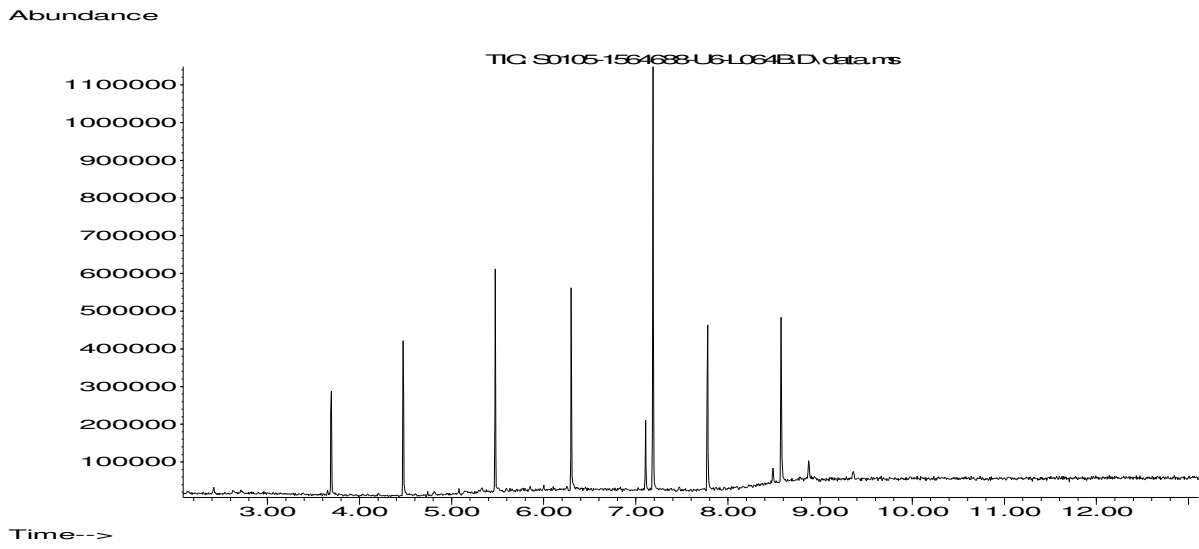
The total ion count (TIC trace) shows no detectable hydrocarbons due to the low levels present. No Product is present.

Abundance

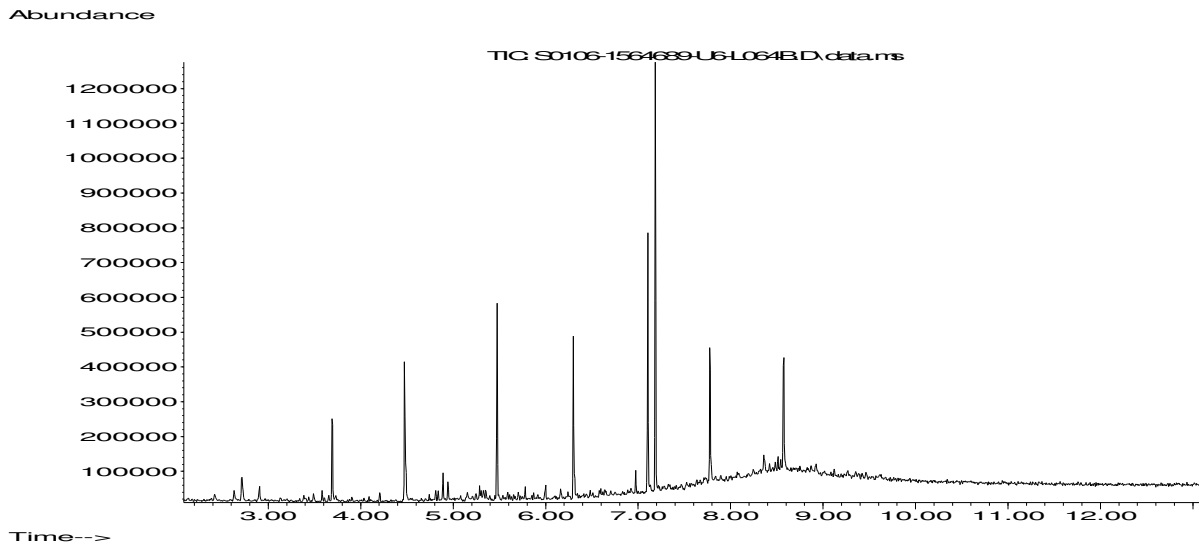


Time-->

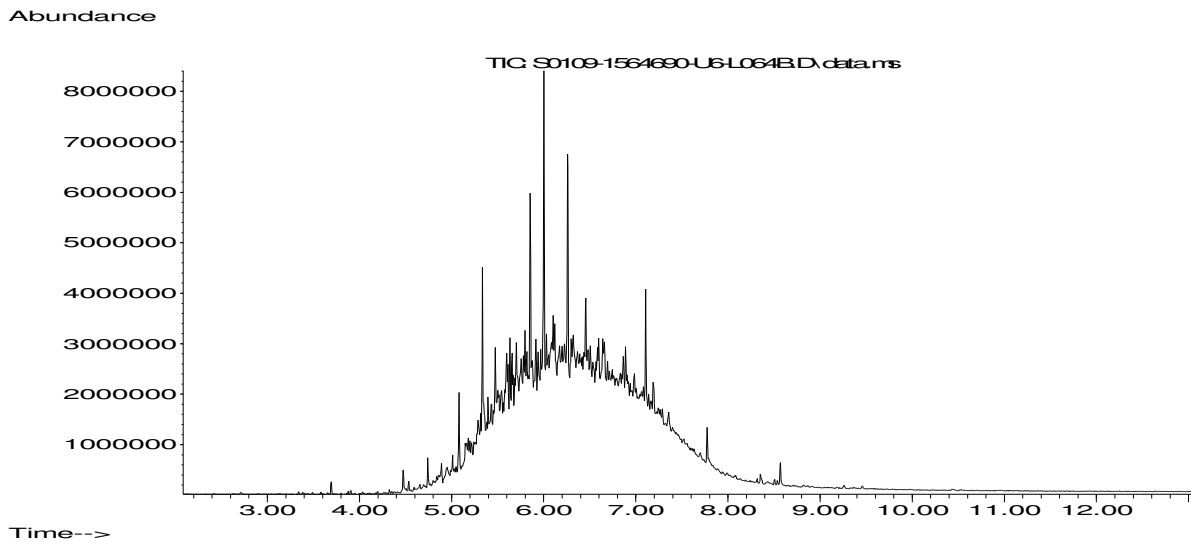
The total ion count (TIC trace) shows a carbon range from C10 to C21.
The sample TIC trace is complex, showing aromatic and aliphatic product sources.
The chromatographic profile is consistent with biodegraded diesel fuel.



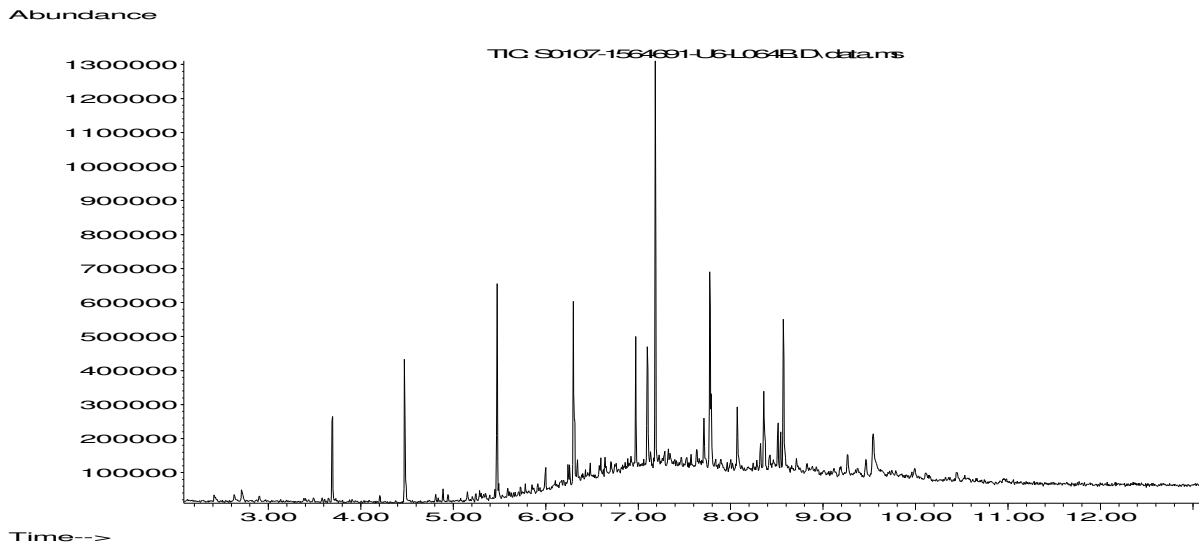
The total ion count (TIC trace) shows no detectable hydrocarbons due to the low levels present. No Product is present.



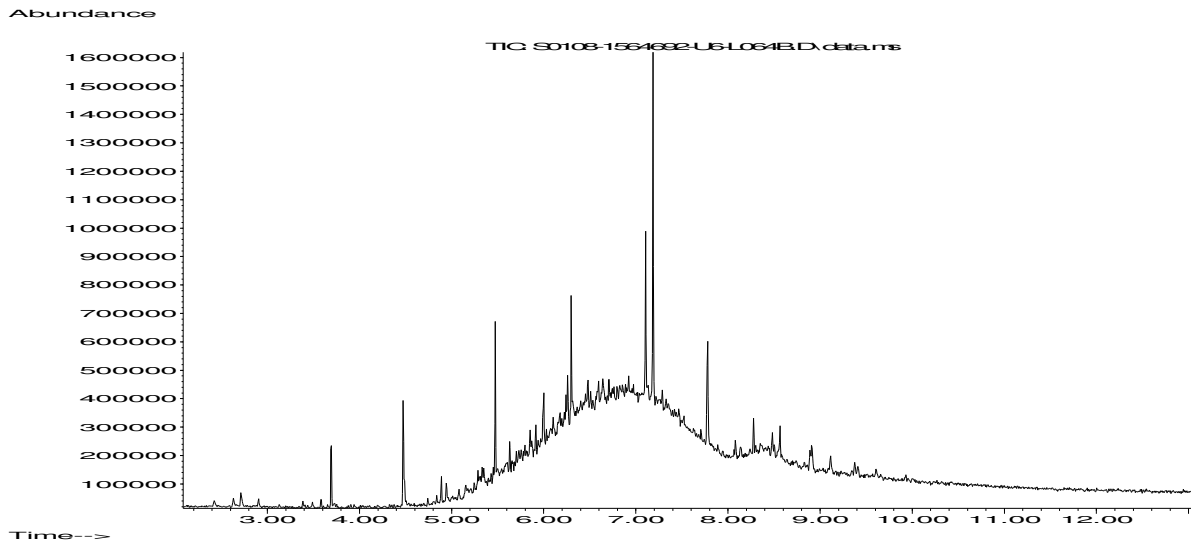
Although low levels of PAHs are visible, no product is identifiable owing to the low levels present.
The sample TIC trace is simple.
The trace does not match the standard product profiles.



The total ion count (TIC trace) shows a carbon range from C10 to C35.
The sample TIC trace is complex, showing aromatic and aliphatic product sources.
The chromatographic profile is consistent with biodegraded diesel fuel.



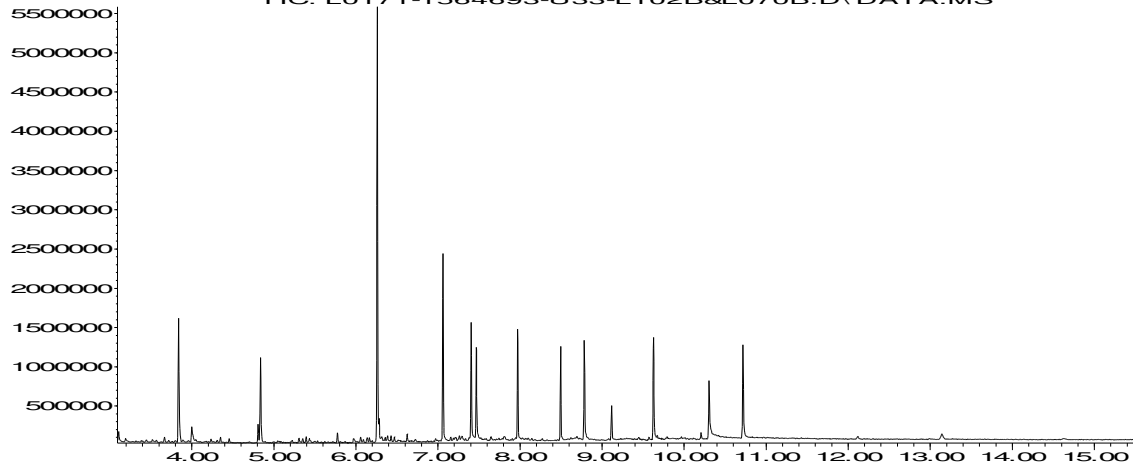
Although low levels of PAHs are visible, no product is identifiable owing to the low levels present.
The sample TIC trace is simple.
The trace does not match the standard product profiles.



Although low levels of PAHs are visible, no product is identifiable owing to the low levels present.
The sample TIC trace is simple.
The trace does not match the standard product profiles.

Abundance

TIC: L0171-1564693-U33-L102B&L070B.D\ DATA.MS

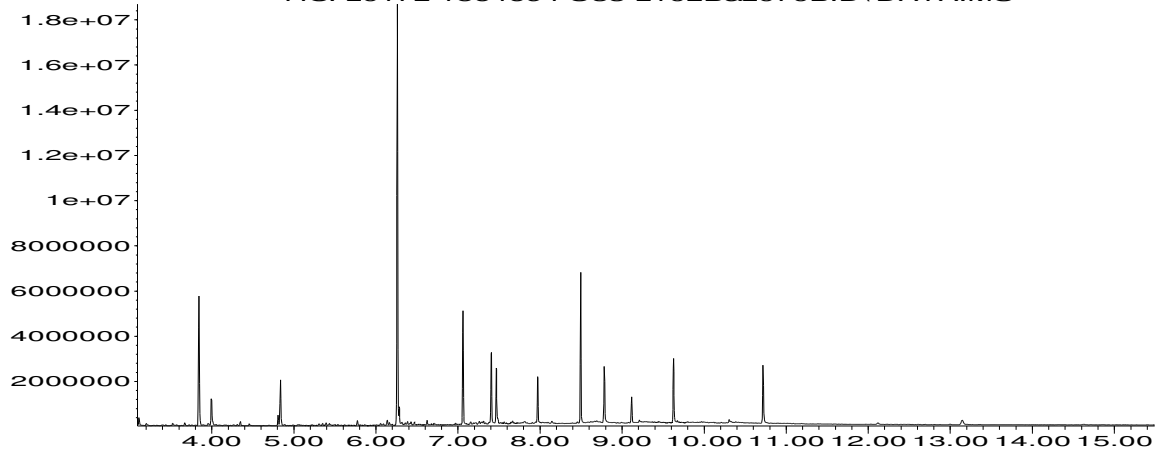


Time-->

The total ion count (TIC trace) shows no detectable hydrocarbons due to the low levels present. No Product is present.

Abundance

TIC: L0172-1564694-U33-L102B&L070B.D\DATA.MS

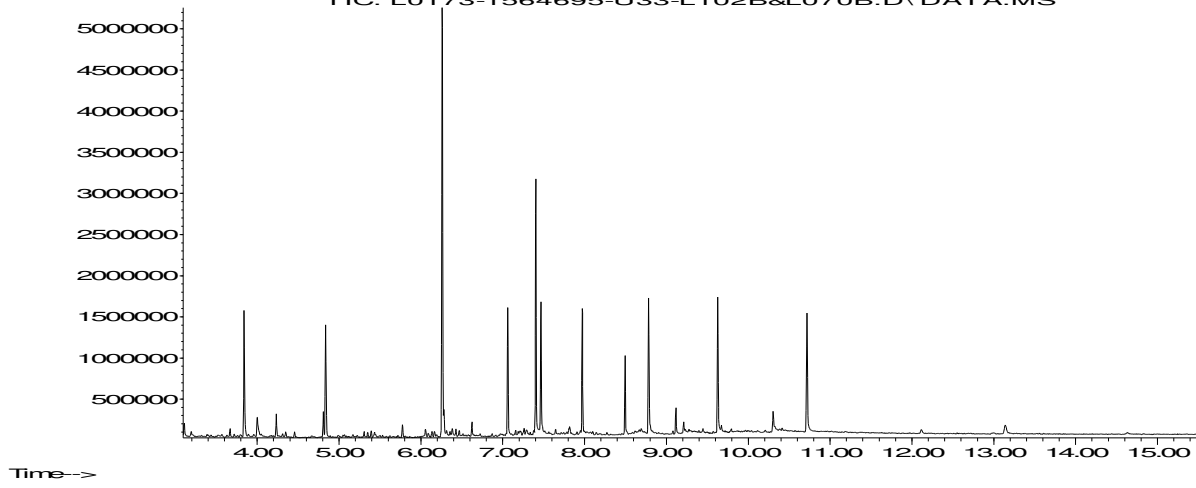


Time-->

The total ion count (TIC trace) shows no detectable hydrocarbons due to the low levels present. No Product is present.

Abundance

TIC: L0173-1564695-U33-L102B&L070B.D\ DATA.MS



Time-->

The total ion count (TIC trace) shows no detectable hydrocarbons due to the low levels present. No Product is present.



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Analytical Report Number : 20-19551

Project / Site name:	095.01.01	Samples received on:	16/07/2020
Your job number:	095.01.01	Sample instructed/ Analysis started on:	16/07/2020
Your order number:	C1300	Analysis completed by:	24/07/2020
Report Issue Number:	1	Report issued on:	07/08/2020
Samples Analysed:	1 water sample		

Signed: *A. Czerwińska*

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 20-19551

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1563345				
Sample Reference				BH03				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.1				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Complex Cyanide	µg/l	10	ISO 17025	< 10				
Free Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO ₄	mg/l	0.045	ISO 17025	18.1				
Sulphide	µg/l	5	NONE	< 5.0				
Chloride	mg/l	0.15	ISO 17025	56				
Ammonium as NH ₄	µg/l	15	ISO 17025	2700				
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	5.78				
Nitrite as N	µg/l	1	ISO 17025	91				

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16				
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Analytical Report Number: 20-19551

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1563345				
Sample Reference				BH03				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Lithium (dissolved)	µg/l	1	NONE	5.0				
Aluminium (dissolved)	µg/l	1	ISO 17025	72				
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.8				
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.84				
Barium (dissolved)	µg/l	0.06	ISO 17025	150				
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1				
Boron (dissolved)	µg/l	10	ISO 17025	66				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04				
Calcium (dissolved)	mg/l	0.012	ISO 17025	71				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Copper (dissolved)	µg/l	0.5	ISO 17025	1.8				
Iron (dissolved)	mg/l	0.004	ISO 17025	0.35				
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Magnesium (dissolved)	mg/l	0.005	ISO 17025	17				
Manganese (dissolved)	µg/l	0.05	ISO 17025	3400				
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05				
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	3.2				
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.2				
Phosphorus (dissolved)	µg/l	20	ISO 17025	22.9				
Potassium (dissolved)	mg/l	0.025	ISO 17025	7.8				
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.7				
Sodium (dissolved)	mg/l	0.01	ISO 17025	38				
Tin (dissolved)	µg/l	0.2	ISO 17025	0.42				
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.4				
Zinc (dissolved)	µg/l	0.5	ISO 17025	7.8				

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				

Petroleum Hydrocarbons

Mineral Oil (C10 - C40)	µg/l	10	NONE	< 10.0				
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TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				



Analytical Report Number: 20-19551

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1563345				
Sample Reference				BH03				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCS

Chloromethane	µg/l	1	ISO 17025	< 1.0				
Chloroethane	µg/l	1	ISO 17025	< 1.0				
Bromomethane	µg/l	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/l	1	NONE	< 1.0				
Trichlorofluoromethane	µg/l	1	NONE	< 1.0				
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0				
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloromethane	µg/l	1	ISO 17025	< 1.0				
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
Benzene	µg/l	1	ISO 17025	< 1.0				
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0				
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloroethene	µg/l	1	ISO 17025	< 1.0				
Dibromomethane	µg/l	1	ISO 17025	< 1.0				
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0				
Chlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-Xylene	µg/l	1	ISO 17025	< 1.0				
Styrene	µg/l	1	ISO 17025	< 1.0				
Tribromomethane	µg/l	1	ISO 17025	< 1.0				
o-Xylene	µg/l	1	ISO 17025	< 1.0				
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0				
Bromobenzene	µg/l	1	ISO 17025	< 1.0				
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0				
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0				
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				



Analytical Report Number: 20-19551

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1563345				
Sample Reference				BH03				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs								
Analytical Parameter	Units	Limit of detection	Accreditation Status	Result				
Aniline	µg/l	0.05	NONE	< 0.05				
Phenol	µg/l	0.05	NONE	< 0.05				
2-Chlorophenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05				
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05				
2-Methylphenol	µg/l	0.05	NONE	< 0.05				
Hexachloroethane	µg/l	0.05	NONE	< 0.05				
Nitrobenzene	µg/l	0.05	NONE	< 0.05				
4-Methylphenol	µg/l	0.05	NONE	< 0.05				
Isophorone	µg/l	0.05	NONE	< 0.05				
2-Nitrophenol	µg/l	0.05	NONE	< 0.05				
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05				
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05				
4-Chloroaniline	µg/l	0.05	NONE	< 0.05				
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05				
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05				
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05				
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05				
Dimethylphthalate	µg/l	0.05	NONE	< 0.05				
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Dibenzofuran	µg/l	0.05	NONE	< 0.05				
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Diethyl phthalate	µg/l	0.05	NONE	< 0.05				
4-Nitroaniline	µg/l	0.05	NONE	< 0.05				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Azobenzene	µg/l	0.05	NONE	< 0.05				
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Carbazole	µg/l	0.05	NONE	< 0.05				
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05				
Anthraquinone	µg/l	0.05	NONE	< 0.05				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				



Analytical Report Number: 20-19551

Project / Site name: 095.01.01

Your Order No: C1300

Lab Sample Number				1563345				
Sample Reference				BH03				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				14/07/2020				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)			Units	Limit of detection	Accreditation Status			
Miscellaneous Organics								
Product ID				N/A	NONE	See Appendix		

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 20-19551

Project / Site name: 095.01.01

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH ₄ in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Complex cyanide in water	Determination of complex cyanide by calculation. Accredited matrices SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Mineral Oil (Waters) C10 - C40	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Product ID	Determination of product ID by interpretation against standard chromatograms - Water.	In-house method	L070-PL/UK	W	NONE
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

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The results included within the report relate only to the sample(s) submitted for testing.



Analytical Report Number : 20-19551

Project / Site name: 095.01.01

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

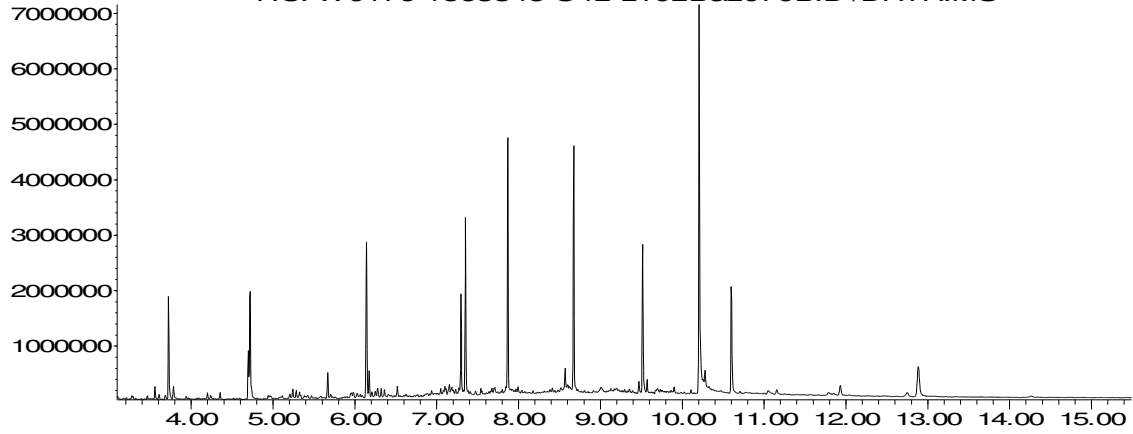
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Abundance

TIC: W0179-1563345-U42-L102B&L070B.D\ DATA.MS



Time-->

The total ion count (TIC trace) shows no detectable hydrocarbons due to the low levels present. No Product is present.

APPENDIX IV – CERTIFICATE OF WAC ANALYSIS



Filip Taylor
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Analytical Report Number : 20-19791

Project / Site name:	095.01.01	Samples received on:	16/07/2020
Your job number:	095.01.01	Sample instructed/ Analysis started on:	16/07/2020
Your order number:	C1300	Analysis completed by:	27/07/2020
Report Issue Number:	1	Report issued on:	30/07/2020
Samples Analysed:	1 wac multi sample		

Signed: *A. Czerwińska*

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing.

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Waste Acceptance Criteria Analytical Results

Report No:	20-19791					
				Client: ECLLTD		
Location	095.01.01					
Lab Reference (Sample Number)	1564720			Landfill Waste Acceptance Criteria		
Sampling Date	14/07/2020			Limits		
Sample ID	HDP4			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	0.00-0.20					
Solid Waste Analysis						
TOC (%)**	3.7			3%	5%	6%
Loss on Ignition (%) **	14			--	--	10%
BTEX (µg/kg) **	< 10			6000	--	--
Sum of PCBs (mg/kg) **	< 0.30			1	--	--
Mineral Oil (mg/kg) #	230			500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--
pH (units)**	11.7			--	>6	--
Acid Neutralisation Capacity (mol / kg)	120			--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test	
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)	
Arsenic *	0.50	0.19		2.2	0.5	2
Barium *	0.97	0.25		3.1	20	100
Cadmium *	0.0047	0.0010		0.013	0.04	1
Chromium *	0.025	0.0059		0.075	0.5	10
Copper *	0.54	0.091		1.3	2	50
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2
Molybdenum *	0.014	0.0040		0.048	0.5	10
Nickel *	0.060	0.012		0.16	0.4	10
Lead *	0.094	0.026		0.32	0.5	10
Antimony *	0.063	0.021		0.25	0.06	0.7
Selenium *	0.048	0.013		0.16	0.1	0.5
Zinc *	1.4	0.3045		4.0	4	50
Chloride *	5.8	< 4.0		< 15	800	15000
Fluoride	0.24	0.13		1.4	10	150
Sulphate *	58	18		210	1000	20000
TDS*	890	330		3800	4000	60000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-
DOC	290	130		1500	500	800
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	0.60					
Dry Matter (%)	70					
Moisture (%)	30					
Stage 1						
Volume Eluate L2 (litres)	0.31					
Filtered Eluate VE1 (litres)	0.15					
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Analytical Report Number : 20-19791

Project / Site name: 095.01.01

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1564720	HDP4	None Supplied	0.00-0.20	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 20-19791

Project / Site name: 095.01.01

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046-PL	W	NONE
BTEX (Sum of BTEX compounds) in soil	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride in WAC leachate (BS EN 12457-3 Prep)	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
DOC in WAC leachate (BS EN 12457-3 Prep)	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037-PL	W	NONE
Fluoride in WAC leachate (BS EN 12457-3 Prep)	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033-PL	W	ISO 17025
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Metals in WAC leachate (BS EN 12457-3 Prep)	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025
Mineral Oil in Soil C10 - C40	Determination of dichloromethane/hexane extractable hydrocarbons in soil by GC-MS.	In-house method based on USEPA 8270	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
PCB's by GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Phenol Index in WAC leachate (BS EN 12457-3 Prep)	Determination of monohydric phenols in leachate by continuous flow analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in WAC leachate (BS EN 12457-3 Prep)	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025
TDS in WAC leachate (BS EN 12457-3 Prep)	Determination of total dissolved solids in leachate by electrometric measurement.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L031-PL	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS

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Analytical Report Number : 20-19791

Project / Site name: 095.01.01

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.