



Technical Summary

TO	Josh Cole c/o Industrial Property Investment Fund (IPIF)	FROM	Ross Maguire - WSP
DATE	22 April 2021	CONFIDENTIALITY	Confidential
SUBJECT	Unit 5 Barton Park Industrial Estate – Ground Contamination Liabilities Summary		

1. INTRODUCTION

WSP was instructed by Industrial Investment Property Fund to undertake a contaminated land ground investigation at Unit 5, Barton Park Industrial Estate, Chickenhall Lane, Eastleigh SO50 6RR ('the Site') to determine if the Site has been impacted by the current leaseholder's activities.

WSP understand that the Site is currently vacant, but until recently was occupied by JPI International Freight Ltd, who sub-lease from Travis Perkins, who in turn had a lease from Industrial Investment Property Fund (IPIF) ('the Client'). JLL manage the assets on behalf of the Client.

This technical summary presents the findings of the ground investigation undertaken in March 2021, outlines potential contaminated land liabilities and recommendations for any potential remediation required.

The site location is shown on **Figure 1**, included in **Appendix A**.

General limitations of the assessment are included in **Appendix B**.

2. BACKGROUND AND SITE SETTING

2.1. Site Description & History

The Site is irregular in shape and comprises a yard associated with a single storey warehouse building located off Site immediately to the east. The Site is located within Barton Park Industrial Estate in Eastleigh, approximately 65 metres (m) east of Eastleigh train station. The ground cover is a mix of hardstanding and rough ground, with at least one set of rails visible cutting through the Site. There is an electrical substation, propane tanks, and drums of lubricant and possible fuel on Site. Publicly available aerial photos show the site in operation with the south of the yard covered in shipping containers, a container telehandler and forklift visible and a probable refuelling tank visible adjacent to the propane tanks. Soils and materials are shown to be stored on Site.

To the west of Site are railway sidings and a mainline railway, to the north, south and east is Barton Park Industrial Estate.

The former active layout of the Site is shown on **Figure 2 (Appendix A)**.

Historically, the Site comprised a locomotive, carriage and wagon works from the 1890s until the Site was redeveloped into Barton Park Industrial Estate in the late 20th Century. Publicly available information appears to show that the former locomotive, carriage and wagon works buildings remain, but the railway infrastructure have been removed.

Surrounding land uses have historically included gas works, sidings, warehouses, rail depot, refuse destructor and allotments; all of which represent potential sources of contamination. The current surrounding land uses include a mix of commercial, infrastructure and light industrial. Immediately to the west of Site are multiple railway lines and an aggregates storage area relating to rail activities. The site is bounded to the north, east and south by commercial or light industrial activities.

2.2. Geology

Geological Map Sheet 315, Southampton, scale 1:50,000, Drift edition (2010), and online British Geological Survey (BGS) published geological data (www.bgs.ac.uk) indicates that the Site is underlain by River Terrace Deposits (silt and clay over sand and gravel), overlying bedrock of Wittering Formation (sand, silt and clay). It is anticipated that Made Ground is present across the Site due to the historical site use.

A publicly available historical borehole located 75 m north of Site, encountered superficial deposits of soft sandy clay to 1.5 m below ground level (bgl) underlain by clayey gravel to 2.7 m bgl, and bedrock of silty clay to 6.0 m bgl, underlain by a water bearing sand which was only proven to 6.1 m bgl.

2.3. Hydrology & Hydrogeology

The nearest surface water is the River Itchen, located 300 m north east, at its closest point, designated as a Site of Special Scientific Interest. The Superficial deposits are Secondary (Undifferentiated) Aquifers. The bedrock is Secondary (A) Aquifer. Groundwater flow direction is likely to be towards the north east, in the direction of the River Itchen.

The site is not located within a groundwater Source Protection Zone (SPZ) for public water.

Groundwater abstraction records were not available at the time of writing this document.

2.4. Preliminary Conceptual Site Model

The preliminary Conceptual Site Model (CSM) is based upon the environmental conditions of the site as described in the previous sections.

The assessment followed a risk-based approach; with the potential environmental risk assessed qualitatively using the 'source-pathway-receptor' contaminant linkage concept introduced in the guidance documents (principally the EA's LCRM guidance) on the practical implementation of the Environmental Protection Act 1990.

Environmental risk can be defined as the combination of the consequence of a harmful effect and the probability of its occurrence. The existence of a contaminant linkage is primarily dependant on site usage and environmental conditions.

The environmental risk assessment has been carried out by identifying and evaluating the significance of the following:

- Potential sources of contamination: these include actual or potentially contaminating materials and activities, located either on or in the vicinity of the Site;
- Potential receptors of contamination: these include future land users, activities or persons at the Site; and,
- Potential pathways for contamination migration: these are the routes or mechanisms by which contaminants may migrate from the source to the receptor.

The **Table 2.1** below provides a summary of the potential sources of contamination that may be present on the site as well as the likely nature of such sources.

Table 2.1 Preliminary Conceptual Site Model

Potential Contaminant Sources	Receptor	Pathways	Comments
ON-SITE			
■ Made Ground relating to historical industrial use and	Human Health ■ Future site users (continued commercial)	■ Dermal contact ■ Ingestion of impacted soil particles on-site, and windblown to	The site has been subject to historical and recent industrial usages and potential sources of contamination. Based on the site's location and information from the Client it is understood that the site is to remain as commercial/ industrial setting.

Potential Contaminant Sources	Receptor	Pathways	Comments
- redevelopment - Hydrocarbons relating to railway and more recent probable refuelling of vehicles on site - Electrical substation – possible oils and PCBs	- Construction / Maintenance workers - Third party neighbours	- adjacent properties - Inhalation of dust, and windblown to adjacent properties - Migration of ground gas and volatile vapours into buildings	Groundcover is mixed, hardstanding and bare ground, therefore human exposure to potentially contaminated soils and groundwater via dermal contact and ingestion is considered to be Moderate. Organic contamination may be present which may have potential for ground gas and vapours to generate and accumulate. These have the potential to migrate into buildings and pose an explosion and/ or asphyxiation risk which is considered to be Low to Moderate. The risk to maintenance workers is considered to be Moderate due to their direct contact with potentially contaminated soils. Owing to the potential risks associated with the migration of ground gases and vapours, the risk to human health of third-party neighbours (surrounding commercial units) is considered to be Low to Moderate.
	Controlled Waters - Secondary (Undifferentiated) Aquifer - Secondary A Aquifer - River Itchen	- Vertical and lateral leaching from impacted soil - Vertical and lateral migration via groundwater - Infiltration into potable water pipework	The site is underlain by River Terrace Deposits (silt and clay over sand and gravel), overlying bedrock of Wittering Formation (sand, silt and clay). There is likely to be hydrological connectivity between the Made Ground and underlying aquifers therefore the risk of vertical migration of contamination to the Secondary Aquifers is Moderate. In addition, any contaminants present within the Made Ground have the potential to leach via drains (present on Site) and surface water infiltration and migrate into potable water pipework (present on Site) or nearby surface water features (River Itchen). Therefore, risks to groundwater from identified on-site potentially contaminative sources are considered to be Low to Moderate.
	Current & Future Structures - Below ground services (e.g. potable water supply pipes) - Future building structures	Direct contact with impacted soils and groundwater	There is a potential for the chemical attack of below ground concrete and permeation of hydrocarbons into plastic pipes. Given the site history and the unknown quantity and composition of Made Ground on the site, the risk is considered Low to Moderate.
OFF-SITE			

Potential Contaminant Sources	Receptor	Pathways	Comments
Adjacent former and current works and general industrial uses	Human Health Construction workers and future maintenance workers	- Migration of ground gas - Lateral migration of contaminants via impacted groundwater	Made Ground is likely to be present in areas adjacent to the Site, and there is the potential for the lateral migration of ground gas. Ground gas poses a risk of explosion or asphyxiation if it accumulates in enclosed spaces. Groundwater within the underlying Secondary A Aquifer is anticipated to flow north east, therefore the commercial and industrial uses to the west present a potential source of off-site contamination including the mainline railway. The overall risk to human health, controlled waters and future structures from off-Site sources is considered to be Low to Moderate.
	Controlled Waters - Secondary (Undifferentiated) Aquifers - Secondary A Aquifer - River Itchen		
	Future Structures - Below ground services (e.g. potable water supply pipes) - Future building structures		

3. SUMMARY OF GROUND INVESTIGATION

3.1. Site Works

Ground investigation works were undertaken on 16 March 2021. The works comprised:

- 4 No. Concrete core locations to allow for follow on Windowless Sampler Drilling;
- 4 No. Boreholes to 5.00 m bgl, with one location (WS05) terminating at 3.0 m due to hole collapse and one location (WS08) terminating at 1.22 m on very dense gravels;
- 8 No. Dynamic Cone Penetrometer Tests (DCP);
- Installation of ground gas and groundwater monitoring wells within each borehole;
- 2 No. rounds of ground gas and groundwater monitoring;
- Groundwater sampling from boreholes where groundwater was at sufficient levels for sample extraction;
- Collection of soil samples for subsequent analysis; and
- Photo-Ionisation Detector (PID) screening of collected samples.

The exploratory hole locations are shown on **Figure 2**. The exploratory hole logs are included in **Appendix C**.

3.2. Ground Conditions Summary

Below in **Table 3.1** is a summary of the stratigraphic sequence of the site and related depth information. A detailed account of ground conditions can be found listed below.

Table 3.1 Summary of Strata Encountered During Site Investigations

Stratum Name	Depth to Base of Strata (m bgl)*	Elevation of Base of Strata (m AOD)*	Thickness (m)*	Typical Description
Asphalt	0.10	14.52	0.10	N/A
Concrete	0.17 to 0.22	14.48 to 13.39	0.17 to 0.22	Grey concrete with flint
Made Ground Granular	0.40 to 2.10	12.60 to 14.16	0.20 to 1.88	Typically, brown or grey silty gravelly sand or silty sandy gravel. Gravels of brick, concrete, flint, chalk, track ballast, clinker and ash
Made Ground Cohesive	0.80 to 2.30	13.98 to 12.40	0.20 to 0.30	Typically, brown and grey silt sandy gravelly clay. Gravel of brick and flint.
River Terrace Deposits	1.55 to 2.65 (3.00)	12.05 to 12.41 (11.56)	0.35 to 0.60 (2.20)	Variable. Brown and grey silty clayey sand and gravel / silty sandy gravelly clay / silty clay.
Wittering Formation	Not proven (5.00)	Not proven (8.56)	Not proven (3.85)	Typically, brown and grey stiff to very stiff silty clay.

* Brackets indicate maximum unproven depth and thickness and the minimum elevation

Surface Conditions

Surfacing comprised asphalt (WS08) or concrete (WS05, WS06 and WS07). Buried concrete was recorded in WS08 directly below the asphalt. The hardstanding was in a poor condition.

Made Ground

Made Ground was recovered at all locations. The thickest Made Ground was recorded at WS06 (2.30 m) in the west of the Site.

The Made Ground deposits were highly variable and comprised both cohesive and granular materials. Where a mix of granular and cohesive soils were recorded (WS05, WS06 and WS08), granular soils were recorded overlying cohesive soils.

Gravel constituents commonly comprised brick, concrete and flint, chalk. At WS06, gravel comprised track ballast, ash and clinker with occasional chalk and brick fragments.

A buried layer of concrete was also recorded in WS05 at 0.40 to 0.60 m bgl.

River Terrace Deposits

The Made Ground was underlain by superficial deposits of the River Terrace Deposit which were encountered at all locations that proved the base of the Made Ground. The River Terrace Deposits were encountered from between 0.55 and 2.30 m bgl and were recorded as being highly variable, comprising both cohesive and granular materials.

Two locations were terminated within the River Terrace Deposits; WS05 at 3.0 m due to hole collapse, and WS08 refused at 1.22 m on very dense gravels.

Wittering Formation

The Wittering Formation was found to be underlying the River Terrace Deposits at all locations that proved the base of the superficial deposits (WS06 and WS07). The material recovered comprised of stiff and very stiff grey and brown sandy, silty clay.

Photographic records of recorded soils can be found presented within **Appendix D**.

3.3. Groundwater

Perched groundwater was identified in WS05 at 1.95 m bgl. Groundwater monitoring during the subsequent two return visits found the following information as shown in **Table 3.2**.

Table 3.2 Summary of Groundwater Monitoring Results

Location	Stratum (Response Zone)	Date	Depth to Water (m bgl)	Depth to Base (m bgl)
WS05	River Terrace Deposits (1.00 – 2.30)	24/03/2021	2.10	2.27
		31/03/2021	2.02	2.12
WS06	Made Ground / River Terrace Deposits (1.00 – 2.50)	24/03/2021	2.20	2.53
		31/03/2021	2.23	2.56
WS07	Wittering Formation (1.50 – 5.00)	24/03/2021	1.90	4.99
		31/03/2021	1.25	5.00
WS08	River Terrace Deposits (0.80 – 1.20)	24/03/2021	DRY	1.27
		31/03/2021	DRY	1.26

3.4. Visual / Olfactory Evidence of Contamination

The following visual / olfactory observations of contamination were made during the works:

- WS05 – 1.95m bgl, RTD: PID reading of 22ppm. Smear area with dark grey staining with hydrocarbon odour;
- WS05 – 2.00m bgl, RTD: Slight oily residue on recovered gravels with hydrocarbon odour;
- WS06 – 2.10m bgl, MG: Oily residue at base of strata and hydrocarbon odour;
- WS06 – 2.30m bgl, RTD: Hydrocarbon odour; and,
- WS06 – 3.00m bgl, WTT: Solvent / possible creosote odour.

3.5. Hydrogeological Model

Groundwater has been identified as being present within the River Terrace Deposits during monitoring. Groundwater was also recorded within the Made Ground at WS06, however the installation was within an area of particularly deep Made Ground, where River Terrace Deposits are thinner than the rest of the Site, suggesting the superficial deposits have been removed previously and replaced with Made Ground. This indicates continuity between the Made Ground and River Terrace Deposits.

Groundwater was recorded within the Wittering Formation during monitoring. However, given that this unit was encountered to be generally cohesive within the ground investigation and slow to recharge during well development, it is considered that the groundwater is perched within isolated sand lenses.

The highest PID readings and most heavily impacted soils were recorded within the granular River Terrace Deposits and it is therefore considered that the cohesive Wittering Formation acts as an aquitard to the vertical migration of contamination.

4. CALIFORNIA BEARING RATIO ASSESSMENT

Dynamic Cone Penetrometer Tests (DCP) were carried out adjacent to each window sample location as well as a further 4 No. locations (total 8 No.) spread across the investigation area. The tests were completed from immediately below the existing surface hardstanding or hardcore to a maximum 0.9 m bgl and provided assessment of the equivalent CBR value of the subgrade.

The in-situ DCP Testing are presented in **Appendix E**.

DCP testing provides a continuous CBR assessment as the penetrometer passes through the subgrade. The testing has shown a variable equivalent CBR value determined through the thick, variable granular Made Ground cover varying between 7% and 107%.

5. HUMAN HEALTH RISK ASSESSMENT

5.1. Rationale

In the United Kingdom, the presence of contamination on a Site is generally only of concern if an actual or potentially unacceptable risk exists. Legislation and guidance on the assessment of contaminated sites, consistent with the European Union best practice, acknowledges the need for a tiered risk-based approach. This report represents a Generic Quantitative Risk Assessment (GQRA), being a comparison of site contaminant levels against highly conservative standards and compliance criteria including an assessment of the risk using the source-pathway-receptor model.

WSP has derived a set of Generic Assessment Criteria (GAC) for the CLEA generic land use scenarios using the CLEA Workbook v1.071 Excel modelling tool.

The CLEA workbook does not currently have capacity to derive criteria to assess risks from the inhalation of vapours derived from contaminants dissolved in groundwater. Therefore, a set of groundwater GACs has also been derived using the Johnson & Ettinger (J&E) approach.

Target concentrations within indoor air are based upon the Health Criteria Values (HCV) for each substance. They are a function of receptor inhalation rates and occupancy periods, as defined by the conceptual exposure model.

Target soil vapour concentrations above the water table have been calculated by dividing the target concentration by the steady-state attenuation factor coefficient between soil and indoor air. The attenuation factor has been calculated in accordance with the Johnson & Ettinger model, presented within the Environment Agency Science Report SC050021/SR3 (2009). The air-water partition coefficient (K_{aw}) has been used to predict the partitioning behaviour of each chemical between soil pore water and air. Where the calculated GAC exceeds the solubility limit for the chemical, no GAC has been proposed.

Further details on the assumptions and methodologies adopted by WSP are presented in **Appendix I**.

Where appropriate, exceedances of GACs are compared against published Category 4 Screening Levels (C4SLs). These are only applicable for six compounds, namely arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI, and lead. C4SLs are a set of generic screening criteria, which are more pragmatic, but represent a level of acceptable risk in the context of Part IIA of the 1990 Environmental Protection Act i.e. soil concentrations below a C4SL limit are considered to be 'definitely not contaminated' and pose at most a 'low level of toxicological concern'.

In assessing the risks to human health receptors, consideration has to be given to the depth of contaminant impacts and likelihood of exposure. Various guidance documents provide differing advice on this, as summarised below.

Environment Agency Report SC050021/SGV Using Soil Guideline Values (2009):

- "For the standard residential or allotment land use, the critical soil volume is the area of an individual garden, communal play area or working plot from the surface to a depth of between 0.5 m and 1.0 m. This is the ground over which children are most likely to come into contact with soil or from which vegetable and fruit produce will be harvested."

Environment Agency Report SC050021/SR3 Updated Technical Background to the CLEA Model (2009):

"The generic CLEA model assumes that the source of outdoor air contamination is present as a continuous layer from the surface to a depth of 1.0 m. This is broadly consistent with the conceptual model for the other direct contact exposure pathways including soil ingestion and dermal contact"

Environment Agency Report SC050021/SR4 CLEA Software (Version 1.05) Handbook (2009):

- "The CLEA software assumes that the contaminant source is uniformly distributed from the soil surface to a depth of at least one metre in open ground."
- "The assumption in the development of SGVs is that soil contamination is uniformly distributed across the site from the surface to a depth of at least one metre. This is consistent with the conceptual model for the other direct contact exposure pathways including soil ingestion and dermal contact."

WSP has given due consideration to the above references and has concluded as follows with regards to influencing depths:

- The SC050021/SR2 & SR3 references to 1.0 m influencing depth are predominately concerned with estimation of the vapour generation rates for volatile contaminants (for calculating screening criteria within the CLEA software), as opposed to an endorsement that depths up to a full metre would be contributing to direct contact, ingestion, and dust inhalation pathways. In terms of our assessments, WSP considers that for volatile contaminants, all depths have to be considered to have the potential to affect receptors; however, if these contaminants are present deeper than 1.0 m, then the risk assessment may require further refinement due to the CLEA assumptions.

The screening criteria for a commercial land use has been selected for the interpretation of the soil laboratory results under the understanding that the site is to be leased again to commercial operations in the future.

Soil organic matter (SOM) content of the soil samples obtained from across the Site were highly variable, 0.741% to 30%, with an average of 8.18%. However, given the high level of variability across the Site a SOM value of 1 % was utilised to generate conservative screening criteria.

To assess the risk to human health from vapours derived from groundwater, a commercial land use and a sand soil type were assumed to generate conservative GAC.

Should the land use of the Site change then re-assessment of the soils laboratory values will be required against revised screening criteria.

5.2. Soil Contamination

Six soil samples were collected and tested for a full suite of contaminants (**Appendix F**). The testing results were screened against Generic Assessment Criteria (GACs) for a commercial end use (**Appendix J**).

Though there are elevated concentrations of Total Petroleum Hydrocarbons (in WS06 and WS07), there are no exceedances of GAC or C4SL for a commercial land use.

Five soil samples were submitted for asbestos identification. One sample (WS05 at 0.3 m) had asbestos containing materials positively identified, this sample was subsequently submitted for quantification. Loose fibres of asbestos were detected with a quantification value of 0.966%. There is considered to be no safe exposure limit for asbestos and given the nature of asbestos, it may be present in other areas of the Site and would therefore pose a risk to human health

5.3. Groundwater Vapour

Three groundwater samples were collected and tested for a full suite of contaminants (**Appendix G**).

The groundwater results have been compared against GAC to assess the risk from vapour derived from dissolved contaminants in groundwater (**Appendix K**). The GAC assumed a future commercial land use and a sand soil type.

No exceedances were encountered.

6. CONTROLLED WATERS - RISK ASSESSMENT

6.1. RATIONALE

The generic controlled waters risk assessment was conducted in accordance with the principles of the EA 'Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination' 2006 and the 'prevent and limit' approach of the Water Framework Directive (2000/60/EC). Generic Controlled Waters risk assessments compare directly measured concentrations with standard assessment criteria.

Water Quality Standards (WQS) are selected based on both a hierarchy of relevance to England and the receptor. In this case, Controlled Waters receptors identified in the CSM were;

Aquifers: Groundwater underlying the Site within the River Terrace Deposits (Undifferentiated Aquifer); Wittering Formation (Secondary A Aquifer), and,

Surface water: River Itchen, located 300 m north east.

The following hierarchies of WQS were considered to be appropriate:

AQUIFERS

- UK Drinking Water Quality Standards (DWS) from The Water Supply (Water Quality) Regulations 2000 (amended 2004);
- World Health Organisation Guidelines for Drinking Water Quality, Fourth Edition, Volume 1, (2011); and,
- World Health Organisation Petroleum Products in Drinking Water (2008).

SURFACE WATER

- Environmental Quality Standards (EQS) from The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Further details on the assumptions and methodologies adopted by WSP are presented in **Appendix I**.

6.2. Soil Leachate

Two samples from WS06 (2.1-2.3m Made Ground and 3.5-4.0m Wittering Formation) were submitted for leachate analysis (**Appendix F**). When compared against the groundwater GACs, there are no exceedances (**Appendix K**).

6.3. Groundwater

One round of groundwater sampling was undertaken and groundwater samples were obtained from three of the four borehole locations (WS05, WS06 and WS07) following the ground investigation works. WS08 was dry during the monitoring visits.

The full screening tables are included in **Appendix K**. Potential contaminants of concern that were encountered above the GAC screening criteria are summarised in **Table 6.1**.

Table 6.1 Summary of Groundwater Exceedances

Analyte	Min µg/L	Max µg/L	EQS µg/L	DWS µg/L	# EQS Exceeds	# DWS Exceeds	Locations
Aliphatic C12-C16	<10	7980	No GAC	300	-	1	WS05
Aromatic C10-C12	<10	30	2	90	1	0	WS05

Analyte	Min µg/L	Max µg/L	EQS µg/L	DWS µg/L	# EQS Exceeds	# DWS Exceeds	Locations
Aromatic C12-C16	<10	695	2	90	1	1	WS05
Aromatic C16-C21	<10	3030	0.1	90	2	1	WS05, WS06
Aromatic C21-C35	<10	2730	0.00017	90	2	2	WS05, WS06
Copper*	1.1	2.48	1	2000	2	0	WS05, WS07
Selenium*	<1	24.7	No GAC	10	-	1	WS07
Nickel*	2.24	7	4	20	1	0	WS07
Zinc*	17.1	17.9	10.9	No GAC	2	-	WS05, WS07
Anthracene	<0.005	0.33	0.1	No GAC	1	-	WS06
Benzo(a)pyrene	0.283	2.37	0.002	0.010	3	3	WS05, WS06 & WS07
Fluoranthene	<0.005	2.7	0.006	No GAC	2	-	WS06, WS07

* metal analysis was only undertaken on WS05 and WS07.

Exceedances of the DWS and EQS criteria were encountered in groundwater samples with respect to metals, TPHs and PAHs.

The exceedances were recorded within all three samples and therefore the contamination is assumed to be widespread within the groundwater across the Site.

6.4. Controlled Waters Risk Evaluation

Exceedances of the DWS criteria in groundwater samples underlying the Site represent a theoretical risk to groundwater within the Secondary Undifferentiated Aquifer within the River Terrace Deposits. However, given the historical and current use of the Site and surrounding area, it is considered that the groundwater underlying the Site is unlikely to be utilised as a drinking water resource in the future. Therefore, based on the available information, the risk from contaminants underlying the Site to groundwater within the Secondary Undifferentiated Aquifer within the River Terrace Deposits, is considered to be **Low to Moderate**.

Although the Wittering Formation is classified as a Secondary A Aquifer, due to the cohesive nature of the deposit at the Site, the stratum is considered to act as an aquitard. Therefore, the risk is considered to be **Low**.

Given that groundwater underlying the Site has been inferred as flowing towards the north east, the exceedances of the EQS criteria in groundwater samples indicate that groundwater underlying the Site has the potential to impact the River Itchen, adjacent to the east. The risk to the River Itchen is considered to be **Moderate**.

7. GROUND GAS RISK ASSESSMENT

7.1. Ground Gases & Vapours

Ground gas monitoring was undertaken on two occasions following the ground investigation works (**Appendix H**). The monitoring rounds were completed on the 24 and 31 March 2021.

Gas Screening Values (GSV) have been calculated based on the ground gas data collected in accordance with CIRIA C665 guidance. The GSV is calculated for each monitoring well as the maximum flow rate multiplied by the maximum methane or carbon dioxide concentration. Where flow rate and/or methane/carbon dioxide concentrations have been encountered below the limit of detection of the instrument, a value of 0.1l/hr and 0.1% v/v have been used to calculate GSV, respectively.

Table 7.1 Summary of Ground Gas Readings and Gas Screening Values

Exploratory Hole	Response Zone Strata	Maximum Flow (l/hr)	Maximum CH ₄ (% v/v)	Maximum CO ₂ (% v/v)	Methane GSV	Carbon Dioxide GSV
WS05	River Terrace Deposits	<0.1	<0.1	1.4	0.0001	0.0014
WS06	Made Ground / River Terrace Deposits	<0.1	<0.1	4.1	0.0001	0.0041
WS07	Wittering Formation	<0.1	<0.1	0.5	0.0001	0.0005
WS08	River Terrace Deposits	<0.1	<0.1	2.0	0.0001	0.0020

Falling atmospheric pressures were recorded during both rounds of monitoring.

Hydrogen sulphide and carbon monoxide did not rise above 0.1 ppm during the two rounds.

Minor PID readings were recorded at all four locations, ranging between <0.1 ppm and 0.4 ppm.

Depleted oxygen concentrations were recorded at WS06 and WS08, with values ranging between 13.50 and 15.20 %v/v.

Based on the monitoring data, a maximum GSV of 0.0001 l/hr was calculated for methane, and a maximum GSV of 0.0041 l/hr was calculated for carbon dioxide. These maximum calculated values are indicative of Characteristic Situation 1 (**Very Low Risk**).

The depleted oxygen concentrations posed a risk to below ground construction workers and maintenance workers and is considered to be **Moderate** and would need to be addressed through appropriate risk assessments and control measures

8. REFINED CONCEPTUAL SITE MODEL

8.1. On-Site

Following the findings of the GQRA, the preliminary Conceptual Site Model (CSM) has been revised. A revised list of contaminant linkages is presented in **Table 8.1** and is based upon an evaluation of the potential sources, future receptors and the environmental setting of the Site.

Table 8.1 – Assessment of On-Site Sources

Source	Pathway	Receptor	Comments
Asbestos	Ingestion of impacted soil particles on-site, and windblown to adjacent properties Inhalation of dust, and windblown to adjacent properties	Future Site users Construction / maintenance workers Third party neighbours	Asbestos containing materials was identified within one sample tested from the Made Ground. The presence of asbestos within other areas of the Site cannot be discounted. There is considered to be a Moderate risk to current Site users and third-party neighbours when construction works for the resurfacing works take place. Following resurfacing the risks are considered to be Low . The risk to construction / maintenance workers and third-party neighbours during construction require management through appropriate risk assessment and control measures.
Contaminants in soils	Dermal contact Ingestion of impacted soil particles on-site, and windblown to adjacent properties Inhalation of dust, and windblown to adjacent properties	Future Site users Construction / maintenance workers Third party neighbours	There were no exceedances of GAC/C4SL within the soil samples tested, though may be present elsewhere on site. The risk to future construction / maintenance workers, Site users and third-party neighbours from contaminants in soils is Negligible as the proposed hardstanding will break any potential contaminant linkage between the contaminant and the receptors.
Dissolved contaminants in groundwater	Inhalation of vapours Direct contact	Future Site users Construction / maintenance workers Third party neighbours	No groundwater samples exceeded the commercial vapour GAC indicating a Very Low risk to future Site users and third-party neighbours from groundwater derived vapours. The risk to construction / maintenance workers during construction phases of the resurfacing from direct contact with contaminants in shallow groundwater is considered to be Moderate and requires management through appropriate risk assessment and control measures.
Leachable Contaminants in soils	Vertical and lateral leaching from impacted soils.	River Terrace Deposits (Secondary Undifferentiated Aquifer) Wittering Formation (Secondary A Aquifer) River Itchen 300m NE	No leachable contaminants were identified in the samples tested. There is a Low risk to controlled waters from leaching of impacted soils as no exceedances were identified and the resurfacing of the hardstanding will limit rainfall infiltration to the subsurface and therefore restricting the leaching of contaminants from shallow soils into the underlying groundwater..
Dissolved metals, PAHs and TPHs in groundwater	Vertical and lateral migration within groundwater	River Terrace Deposits (Secondary Undifferentiated Aquifer) Wittering Formation (Secondary A Aquifer) River Itchen 300m NE	Exceedances of the DWS criteria in groundwater samples underlying the Site represent a theoretical risk to groundwater within the Secondary Undifferentiated Aquifer within the River Terrace Deposits. However, given the historical and current use of the Site and surrounding area, it is considered that the groundwater underlying the Site is unlikely to be utilised as a drinking water resource in the future. Therefore, based on the available information, the risk from contaminants underlying the Site to groundwater within the Secondary Undifferentiated Aquifer within the River Terrace Deposits, is considered to be Low to Moderate .

Source	Pathway	Receptor	Comments
			Although the Wittering Formation is classified as a Secondary A Aquifer, due to the cohesive nature of the deposit at the Site, the stratum is considered to act as an aquitard. Therefore, the risk is considered to be Low. Given that groundwater underlying the Site has been inferred as flowing towards the east, the exceedances of the EQS criteria in groundwater samples indicate that groundwater underlying the Site has the potential to impact the River Itchen, adjacent to the east. The risk to the River Itchen is considered to be Moderate.
Contaminants in soils	Direct contact with impacted soils	Future below ground services (e.g. potable water supply pipes) Future building structures	Based on the available data and the preliminary assessment, barrier pipes are considered to be required if pipes are to be installed where contamination is present. However, it should be noted that this is a preliminary assessment and any pipe design should be subject to the appropriate testing in service trenches and agreed with the relevant statutory authority.
Made Ground and Hydrocarbons	Migration of ground gas and volatile vapours.	Future Site users Construction / maintenance workers Third party neighbours Future building structures	The Site has been classified as being Characteristic Situation 1 (Very Low Risk) with respect to ground gases. This indicates that ground gas protection measures are not required to mitigate the gas risk. Although the number of visits and monitoring period duration are not compliant with the typical/idealised frequency and monitoring periods recommended in CIRIA C665, ground gas was not identified as a significant potential risk on site and two monitoring rounds are considered to be sufficient to provide a baseline site characterisation. The depleted oxygen concentrations, readings of carbon monoxide, and visual / olfactory evidence of contamination and elevated PID concentrations recorded during the intrusive investigation indicate that there is a ground gas and vapour risk posed to below ground construction and maintenance workers. There is therefore considered to be a Moderate risk at the Site which would need to be addressed through appropriate risk assessments and control measures.

8.2. Off-Site

Based on the findings of the ground investigation and subsequent GQRA, a potential risk from off-site sources has been identified details of which have been summarised in **Table 8.2**.

Table 8.1 – Assessment of Off-Site Sources

Source	Pathway	Location	Comments
Historical and current industrial / commercial land use	Vertical and lateral; migration within groundwater	Surrounding the Site	Given the site history and known industrial rail infrastructure and associated works it is believed that there is a potential for migration of contamination within the groundwater from off site sources. Given this, the risk to Controlled Waters from off-site sources is considered to be Moderate.

9. CONCLUSIONS

9.1. Human Health

The findings of the assessment indicate the presence asbestos within the Made Ground. The source of the asbestos is most likely to be the result of historical industrial works and redevelopment at the Site.

There is considered to be a **Moderate** risk to current Site users and third-party neighbours when construction works for the resurfacing works take place. Following resurfacing the risks are considered to be Low as the hardstanding will provide an adequate contaminant pathway break to prevent ingestion; and dermal contact pathways. The risk to construction / maintenance workers and third-party neighbours during construction require management through appropriate risk assessment and control measures.

No groundwater samples exceeded the commercial vapour GAC indicating a **Very Low** risk to future Site users and third-party neighbours from groundwater derived vapours.

The risk to construction / maintenance workers during construction phases of the resurfacing from direct contact with contaminants in shallow groundwater is considered to be **Moderate** and requires management through appropriate risk assessment and control measures.

9.2. Controlled Waters

Exceedances of the DWS criteria in groundwater samples underlying the Site represent a theoretical risk to groundwater within the Secondary Undifferentiated Aquifer within the River Terrace Deposits. However, given the historical and current use of the Site and surrounding area, it is considered that the groundwater underlying the Site is unlikely to be utilised as a drinking water resource in the future. Therefore, based on the available information, the risk from contaminants underlying the Site to groundwater within the Secondary Undifferentiated Aquifer within the River Terrace Deposits, is considered to be **Low to Moderate**.

Although the Wittering Formation is classified as a Secondary A Aquifer, due to the cohesive nature of the deposit at the Site, the stratum is considered to act as an aquitard. Therefore, the risk is considered to be **Low**.

Given that groundwater underlying the Site has been inferred as flowing towards the east, the exceedances of the EQS criteria in groundwater samples indicate that groundwater underlying the Site has the potential to impact the River Itchen, adjacent to the east. The risk to the River Itchen is considered to be **Moderate**.

9.3. Ground Gas and Vapour Risk

The ground gas characterisation of the Site is CS1 (**Very Low Risk**). Off site migration of gasses and vapours is considered to present a very low risk given the negligible flow rates observed. In future should the land use change then further gas monitoring and assessment will be required in line with good working practises with CIRIA C665 and BS8484:2015+A1:2019.

The monitoring strategy was designed to provide an initial indication of whether ground gas may represent a potential risk to the future end-users. Although the number of visits and monitoring period duration are not compliant with the typical/idealised frequency and monitoring periods recommended in CIRIA C665, ground gas was not identified as a significant potential risk on site and two monitoring rounds are considered to be sufficient to provide a baseline site characterisation.

9.4. Contamination Source

The presence asbestos within the Made Ground is most likely to be the result of historical industrial works and redevelopment at the Site.

Hydrocarbon contaminants were identified within soils on Site above limits of detection; however, concentrations were below the GAC screening criteria for human health. The samples were predominantly obtained from Made Ground soils.

Visual and olfactory evidence of hydrocarbon contamination and elevated PID readings were recorded predominantly within the River Terrace Deposits and are likely to be associated with the groundwater. There was a general absence of hydrocarbon contamination recorded within the Made Ground at the four exploratory hole locations progressed during the intrusive works with the exception of at WS06, however the superficial deposits appear to have been removed at this location and replaced with Made Ground that is considered to have been impacted by the groundwater.

Evidence obtained during the site walkover and publicly available aerial images of the past decade suggest that there have been some potentially contaminative Site activities have included storage of soils, materials, plant and equipment and refuelling. Except for the propane tanks, any above ground storage tanks that were located on Site have been removed. The ground investigation did not find evidence of widespread gross contamination within the shallow soils that could be attributed to the recent leaseholder's activities, however there is potential for previously unidentified isolated hotspots to present at the Site.

Based on the Site being within an urban area of historically industrial usage it is likely that the general groundwater quality of the area is poor. However, it is unclear as to whether the previous leaseholder's activities have contributed to the hydrocarbon contamination identified within the groundwater.

9.5. California Bearing Ratio Assessment

DCP testing provides a continuous CBR assessment as the penetrometer passes through the subgrade. The testing has shown a variable equivalent CBR value determined through the thick, variable granular Made Ground cover varying between 7% and 107%.

10. RECOMMENDATIONS

Resurfacing of the Site is recommended as the hardstanding will provide an adequate contaminant pathway break to prevent ingestion; and dermal contact pathways. Implementation of a permeable layer across the Site will also limit the leaching of any contaminants within the subsurface soils.

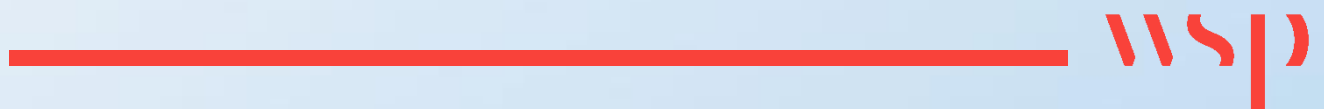
If gross hydrocarbon contamination (free product) is identified during future construction / maintenance works, this should be removed and adequately disposed off-Site as it could represent a source of contamination that is impacting the groundwater.

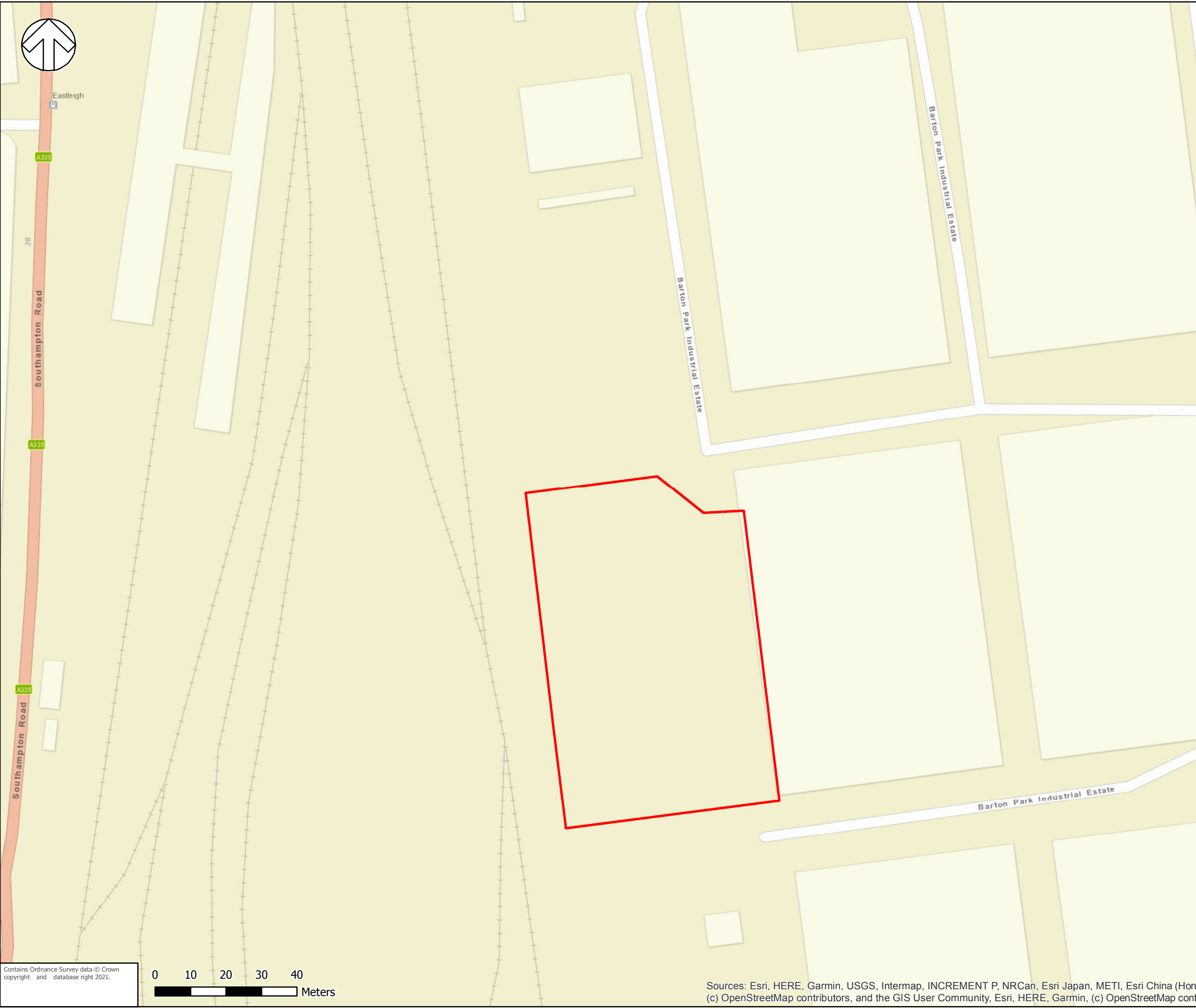
The risk to construction / maintenance workers and third-party neighbours during construction require management through appropriate risk assessment and control measures. Suitable health and safety protocols should be in place during all construction and maintenance work to prevent adverse health effects from Made Ground soils, in accordance with the Health and Safety at Work Act 1974.

It should be noted that contaminants such as asbestos can be present in soil in discrete pockets and any sampling frequency cannot guarantee the absence of contaminants of this nature in areas between sample locations. The Client should ensure that suitable precautions, controls and monitoring are in place during excavation activities and suspicious materials should be managed through procedures defined by the Client, and in accordance with the Control of Asbestos Regulations 2012, to ensure the health and safety of all workers and future site users, and to protect the environment from contamination.

Appendix A

FIGURES & DRAWINGS





Legend

Site Boundary



TITLE:
Unit 5 Barton Park, Eastleigh
Exploratory Hole Plan

FIGURE No:

70080743 - FIGURE 2

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Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hon
(c) OpenStreetMap contributors, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap cont



Legend

- Site Boundary
- DCP Points
- Exploratory Holes
- WS Locations

wsp

TITLE:
Unit 5 Barton Park, Eastleigh
Exploratory Hole Plan

FIGURE No:
70080743 - FIGURE 2

Appendix B

GENERAL LIMITATIONS



REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

GENERAL

1. WSP UK Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.
2. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP UK Limited standard Terms and Conditions as included within our proposal to the Client.
3. Project specific appointment documents may be agreed at our discretion and a charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP UK Limited reserves the right to amend the fee should any changes to the appointment terms create an increase risk to WSP UK Limited.
4. The report needs to be considered in the light of the WSP UK Limited proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

PHASE 1 GEO ENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

Coverage: *This section covers reports with the following titles or combination of titles: phase 1; desk top study; geo environmental assessment; development appraisal; preliminary environmental risk assessment; constraints report; due diligence report; geotechnical development review; environmental statement; environmental chapter; project scope summary report (PSSR), program environmental impact report (PEIR), geotechnical development risk register; and, baseline environmental assessment.*

5. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. WSP UK Limited cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.
6. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP UK Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.
7. It should be noted that any risks identified in this report are perceived risks based on the information reviewed. Actual risks can only be assessed following intrusive investigations of the site.
8. WSP UK Limited does not warrant work / data undertaken / provided by others.

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

INTRUSIVE INVESTIGATION REPORTS

Coverage: *The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; and, geotechnical risk register.*

9. The investigation has been undertaken to provide information concerning either:
 - i. The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
 - ii. Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.
10. The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.
11. For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.
12. For geotechnical investigations the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.
13. The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.
14. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.
15. The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, WSP UK Limited has used reasonable skill and care to extrapolate conditions between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation. Conditions can change between investigation points and these interpretations should be considered indicative.
16. The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

effects of any future changes or amendments to these values. Specific assumptions associated with the WSP UK Limited risk assessment process have been outlined within the body or associated appendix of the report.

17. Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.
18. Where soil contamination concentrations recorded as part of this investigation are used for commentary on potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed.
19. The results of the asbestos testing are factually reported and interpretation given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and / or trace loose asbestos fibres within the soil matrix at the site.
20. If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

EUROCODE 7: GEOTECHNICAL DESIGN

21. On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.
22. In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIAL STRATEGY REPORTS

23. These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

- 24. The outputs of the Detailed Quantitative Risk Assessments are based upon WSP UK Limited manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.
- 25. Prior to adoption on site they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP UK Limited. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

GEOTECHNICAL DESIGN REPORT (GDR)

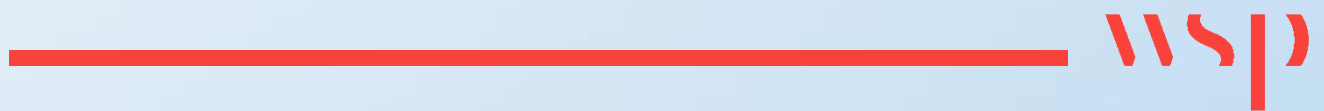
- 26. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS)

- 27. These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.
- 28. The data is presented and will be compared with assessment criteria.

Appendix C

EXPLORATORY HOLE LOGS



 WSP UK Ltd Grosvenor House, Grosvenor Square Southampton, SO15 2BE Telephone: 02380 101 700	WINDOW SAMPLE LOG		Hole No. WS05	
	Project Unit 5 Barton Park		Sheet	
Job No 70080743	Client Industrial Investment Property Fund		Date 16-03-21 16-03-21	
Contractor / Driller South Coast Drilling	Method/Plant Used Dando Terrier Mk 2	Logged By DrC	Co-Ordinates (NGR) E 445886.75 N 118960.54	Ground Level (m AOD) 14.56

SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. mm
0.30	ES	.	0				14.36	0.20	Reinforced CONCRETE. Grey.		CONC	
							14.16	0.40	Dark brown and reddish brown silty gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of flint, brick, ash, occasional metal fragments. (MADE GROUND)		GMG	
							13.96	0.60	CONCRETE. With gravel of concrete debris. (MADE GROUND)		CONC	
0.70	ES	.	0				13.76	0.80	Firm locally stiff dark greyish brown silty slightly gravelly slightly sandy slightly organic CLAY. Gravel is fine to coarse subrounded of flint, with scattered brick fragments. Slight organic odour. (MADE GROUND)		CMG	
							(0.60)		Dense light brown and dark brown very silty very clayey fine to coarse SAND. (RIVER TERRACE DEPOSITS)		RT	
							13.16	1.40	Dense grey white brown silty slightly clayey slightly sandy fine to coarse subangular and subrounded GRAVEL of flint. (RIVER TERRACE DEPOSITS)		RT	
1.40-1.80	ES	.	0									
1.95-2.50	ES	.	22					(1.60)	1.95 - 2.00 Smear area with dark grey staining with hydrocarbon odour 2.00 - 3.00 Slight oily residue on recovered gravels with hydrocarbon odour.		RT	
							11.56	3.00	End of exploratory Hole		END	

Hole Diameter			Recovery			Water Strikes					
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing
2.00	85	85				16-03-21		1.95			
3.00	75	75									
						General Remarks Hole terminated at 3m following collapse back to 2.30m bgl					
Scale 1:37.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

17 WSP WINDOW SAMPLE LOG - UNIT 5 BARTON PARK.GPJ WSPTEMPLATE7.00.GDT 17/3/21

 WSP UK Ltd Grosvenor House, Grosvenor Square Southampton. SO15 2BE Telephone: 02380 101 700		WINDOW SAMPLE LOG		Hole No. WS06	
Project Unit 5 Barton Park		Sheet			
Job No 70080743		Client Industrial Investment Property Fund		Date 16-03-21 16-03-21	
Contractor / Driller South Coast Drilling		Method/Plant Used Dando Terrier Mk 2		Logged By DrC	
		Co-Ordinates (NGR) E 445850.17 N 118940.41		Ground Level (m AOD) 14.70	

SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. mm
0.30-0.40	ES	.	0				14.48	0.22	CONCRETE. Grey. Flint aggregate.		CONC	
1.00	ES	.	0					(1.88)	Black and dark grey silty sandy fine to coarse angular to subrounded GRAVEL of track ballast aggregate and clinker. Occasional chalk debris. Occasional brick fragments. (MADE GROUND)			
2.10-2.30	ES	.	0				12.60	2.10	1.00 m bgl Little or no ballast. Clinker and ash largely		GMG	
2.50	ES	.	0				12.40	2.30	Soft locally firm red dark grey silty very gravelly sandy CLAY. Gravel is fine to coarse rough of flint. Oily residue at base of strata and hydrocarbon odour. (MADE GROUND)		CMG	
							(0.35)	2.65	Firm locally stiff grey mottled black mottled dark grey organic silty CLAY. Psudo fibrous rootlet remains. Hydrocarbon odour. (RIVER TERRACE DEPOSITS / ALLUVIUM)		RT	
							(0.35)	3.00	Stiff light brown and pale reddish brown silty CLAY. WITTERING FORMATION).		WTT	
3.50-4.00	ES	.	1					(2.00)	Very stiff locally hard grey and greenish brown very silty slightly sandy CLAY. Solvent / possile creosote odour. (WITTERING FORMATION).		WTT	
4.50-5.00	ES	.	0				9.70	5.00	4.50 - 5.00 No odour			
									End of Exploratory Hole		END	

Hole Diameter			Recovery			Water Strikes					
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing
2.00	85	85									
3.00	75	75									
4.00	65	65									
5.00	55	55									
General Remarks						Hole terminated at 5.0m. No groundwater encountered					
Scale 1:37.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

17 WSP WINDOW SAMPLE LOG 70080743 - UNIT 5 BARTON PARK.GPJ WSPTEMPLATE7.00.GDT 17/3/21

 WSP UK Ltd Grosvenor House, Grosvenor Square Southampton. SO15 2BE Telephone: 02380 101 700		WINDOW SAMPLE LOG		Hole No. WS07	
Job No 70080743		Project Unit 5 Barton Park		Sheet	
Client Industrial Investment Property Fund		Date 16-03-21 16-03-21			
Contractor / Driller South Coast Drilling		Method/Plant Used Dando Terrier Mk 2		Logged By DrC	
		Co-Ordinates (NGR) E 445894.06 N 118925.89		Ground Level (m AOD) 13.56	

SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick-ness)	Description	Legend	Geology	Dia. mm
0.20-0.40	ES	.	0				13.39	0.17	CONCRETE. Grey.		CONC	
								(0.38)	Dark brown red sandy fine to coarse angular and subangular rough GRAVEL of brick and concrete fragments. High cobble content of brick. (MADE GROUND)		GMG	
0.60-0.90	ES	.	0				13.01	0.55	Dense brown slightly silty very sandy fine to coarse subangular to subrounded GRAVEL of flint with medium flint cobbles content. (RIVER TERRACE DEPOSITS)		RT	
							12.61	0.95	Firm locally soft greyish brown silty CLAY. Orange brown relic rootlets. (RIVER TERRACE DEPOSITS)		RT	
							12.41	1.15	Stiff locally very stiff orangish brown and pale greyish brown silty CLAY. (WITTERING FORMATION).		WTT	
1.50-1.70	ES	.	0					(0.65)	Very stiff pale grey and dark grey silty CLAY. WITTERING FORMATION).		WTT	
							11.76	1.80			WTT	
2.50-2.70	ES	.	0					(3.20)			WTT	
							8.56	5.00	End of Exploratory Hole		END	

Hole Diameter			Recovery			Water Strikes					
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing
2.00	85	85									
3.00	75	75									
4.00	65	65									
5.00	55	55									
General Remarks						Hole terminated at 5.0m . No groundwater encountered					
Scale 1:37.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

17 WSP WINDOW SAMPLE LOG 70080743 - UNIT 5 BARTON PARK.GPJ WSPTEMPLATE7.00.GDT 17/3/21

 WSP UK Ltd Grosvenor House, Grosvenor Square Southampton, SO15 2BE Telephone: 02380 101 700		WINDOW SAMPLE LOG		Hole No. WS08	
Project Unit 5 Barton Park		Sheet			
Job No 70080743		Client Industrial Investment Property Fund		Date 16-03-21 16-03-21	
Contractor / Driller South Coast Drilling		Method/Plant Used Dando Terrier Mk 2		Logged By DrC	
		Co-Ordinates (NGR) E 445863.45 N 118888.12		Ground Level (m AOD) 14.62	

SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. mm
0.40	ES	.	1				14.52	0.10	ASPHALT.		TARMAC	
							14.32	0.30	CONCRETE. Grey flint aggregate.		CONC	
							14.10	0.52	Brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse subangular and subrounded of flint. Compacted. (MADE GROUND)		GMG	
							13.98	0.64	Hard locally very stiff brown silty CLAY. (MADE GROUND)		CMG	
0.70	ES	.	1				13.80	0.82	Hard dark brown and grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse rounded to subangular of flint and occasional brick. (MADE GROUND)		CMG	
							(0.40)		Very dense reddish brown and light brown silty clayey fine to coarse angular to subrounded GRAVEL of flint with medium flint cobble content. RIVER TERRACE DEPOSITS)		RT	
							13.40	1.22	End of Exploratory Hole		END	

Hole Diameter			Recovery			Water Strikes					
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing
						General Remarks Hole terminated at 1.22m as unable to penetrate very dense strata. No groundwater encountered.					
Scale 1:37.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

Appendix D

PHOTOGRAPHS





Photo 1: WS05 1.0 to 3.0m

wsp



Photo 2: WS06 1.0 to 5.0m

wsp



Photo 3: WS07 1.0 to 5.0m

wsp

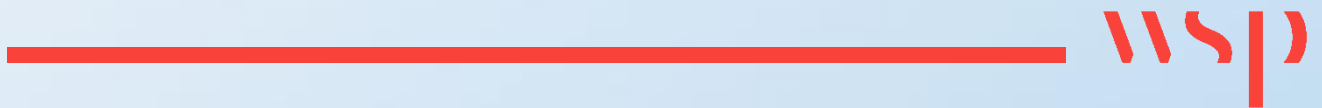


Photo 4: WS08 arisings

wsp

Appendix E

DYNAMIC CONE PENETROMETER RESULTS



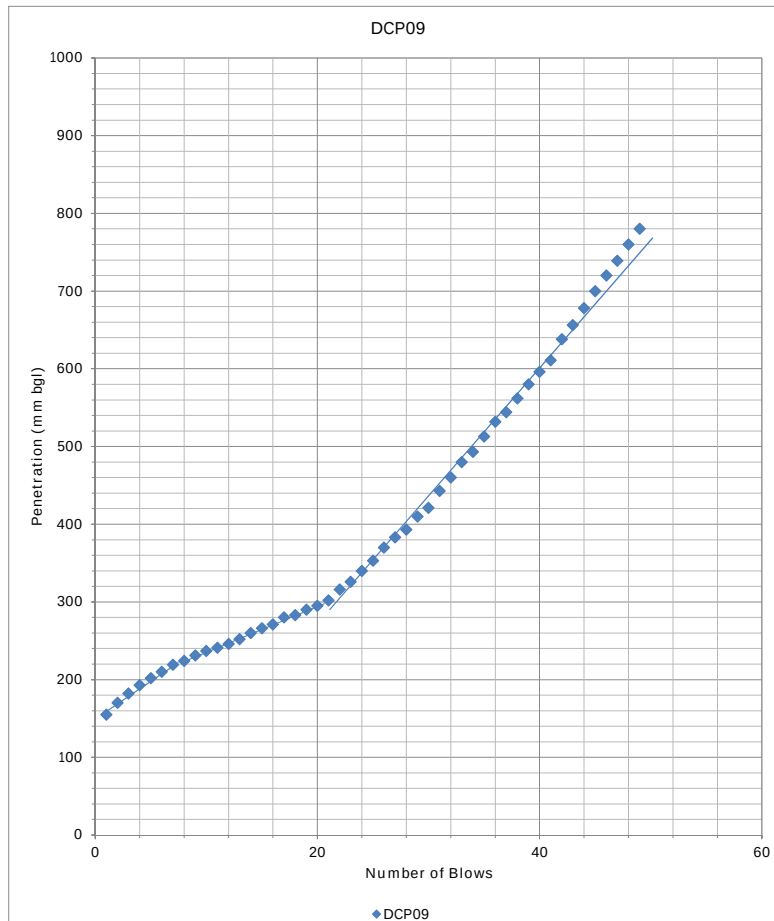
Dynamic Cone Penetrometer Test Results
Project Number 70081914
Project Name: Unit 5 Barton Park
Client: Industrial Property Investment Fund
Test Location: DCP09
Depth at Start of Test: 0.13 mbgl
Date of Test: 17/03/2021

No. of Blows (cumulative)	Reading (mm)
0	200
1	225
2	240
3	252
4	263
5	272
6	280
7	289
8	294
9	301
10	307
11	311
12	316
13	322
14	330
15	336
16	341
17	350
18	353
19	360
20	365
21	372
22	386
23	396
24	410
25	423
26	440
27	453
28	463
29	480
30	491
31	513
32	530
33	550
34	563
35	583
36	602
37	614
38	632
39	650
40	666
41	681
42	708
43	726
44	748
45	770
46	790
47	809
48	830
49	850

[illegible][illegible]



Dynamic Cone Penetrometer Test Results
Project Number: 70081914
Project Name: Unit 5 Barton Park
Client: Industrial Property Investment Fund
Test Location: DCP09
Depth at Start of Test: 0.13 mbgl
Date of Test: 17/03/2021



Range Top	Range Bottom	Blow count	Penetration Rate(mm/blow)	CBR(%)	Stratum
155	224	6	11.50	22.8	
224	295	12	5.92	46.1	
295	780	29	16.72	15.4	

Notes

DCP09 Test commenced at 0.13m bgl

Dynamic Cone Penetrometer Test Results

Project Number 70081914

Project Name: Unit 5 Barton Park

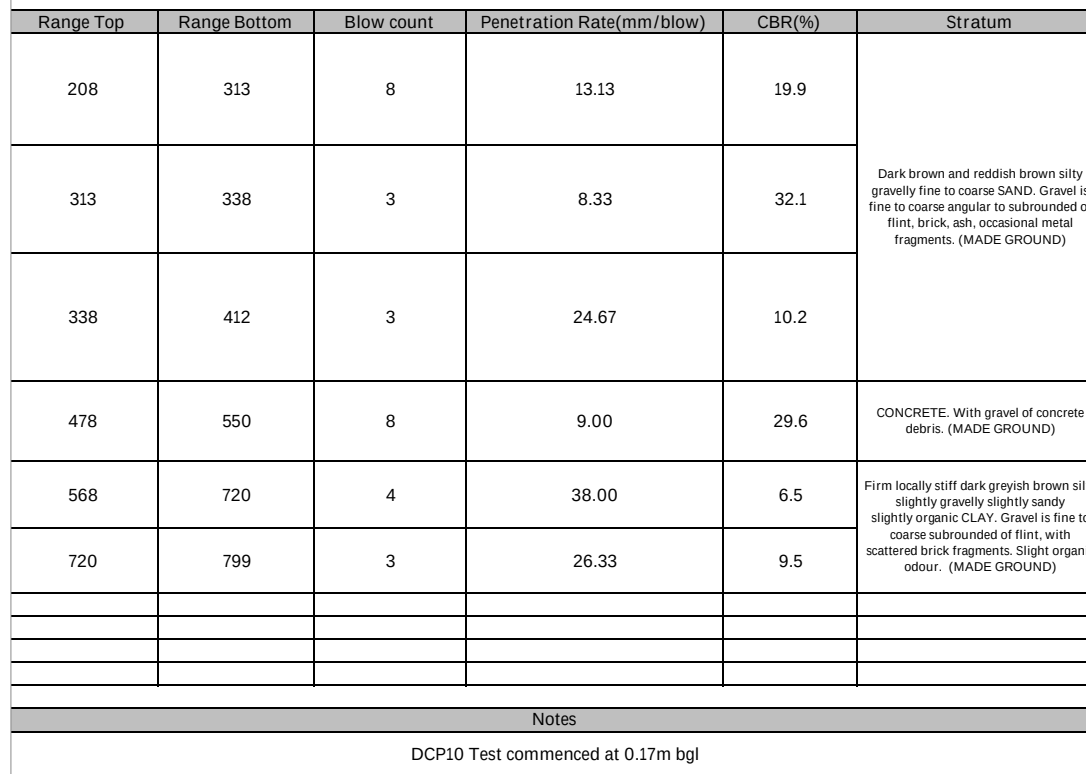
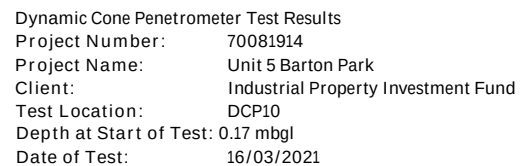
Client: Industrial Property Investment Fund

Test Location: DCP10

Depth at Start of Test: 0.17 mbgl

Date of Test: 16/03/2021

[illegible][illegible][illegible]



Dynamic Cone Penetrometer Test Results

Project Number 70081914

Project Name: Unit 5 Barton Park

Client: Industrial Property Investment Fund

Test Location: DCP11

Depth at Start of Test: 0.24 mbgl

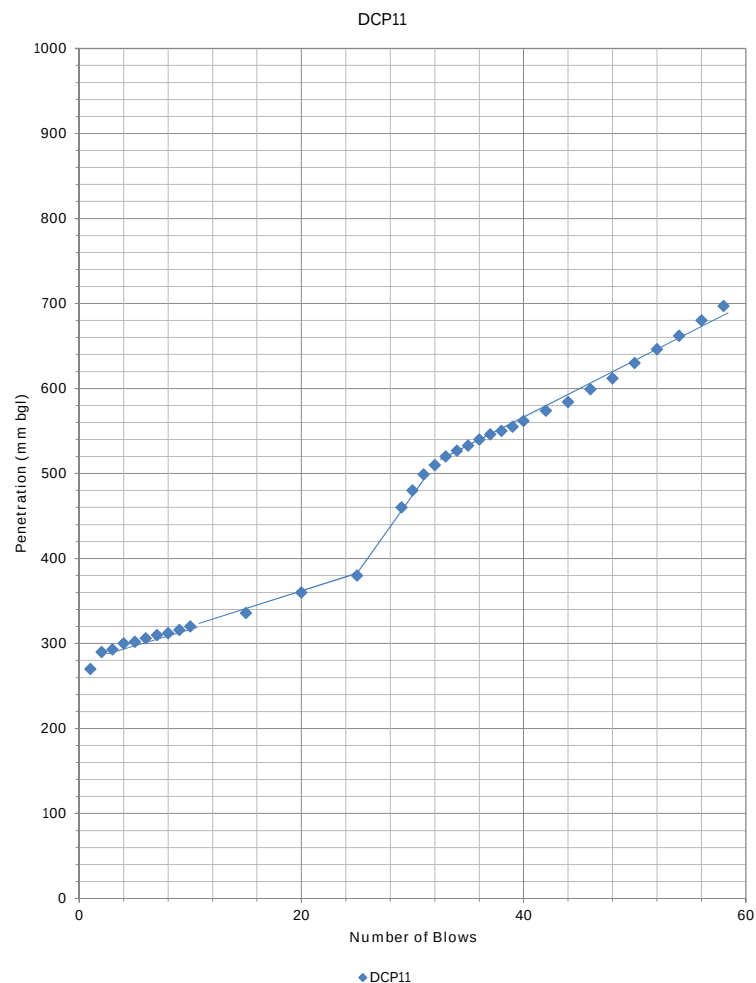
Date of Test: 16/03/2021

[illegible][illegible][illegible]

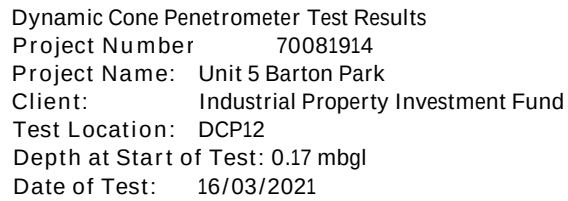


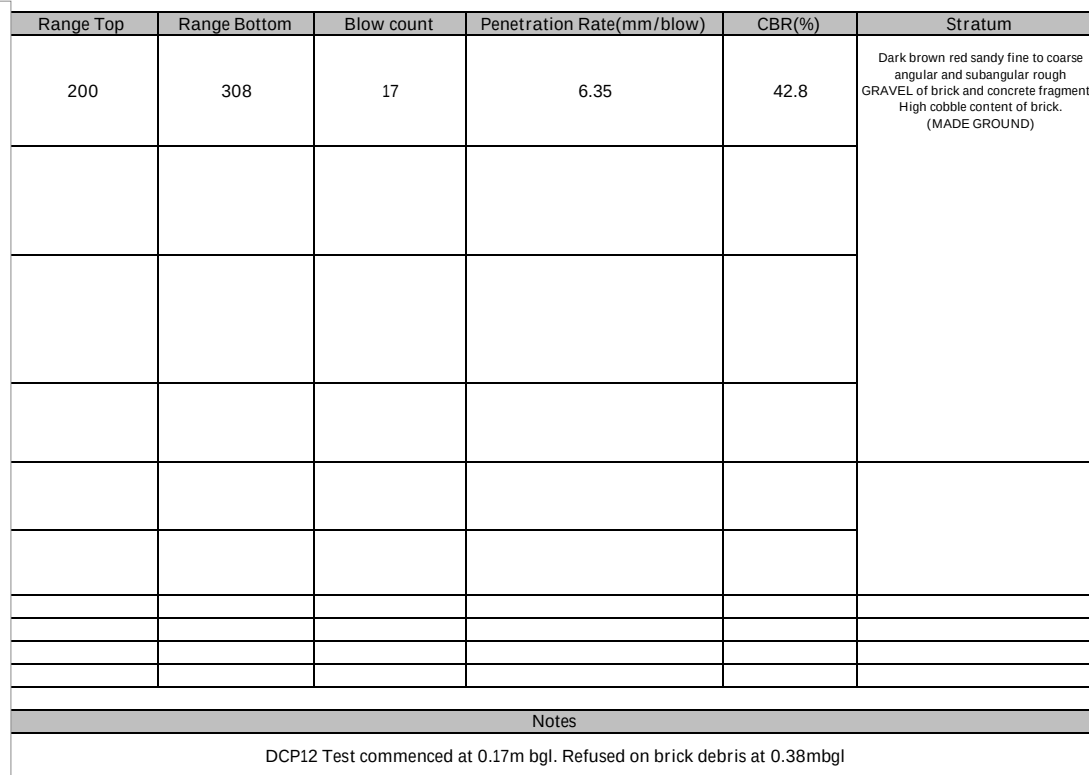
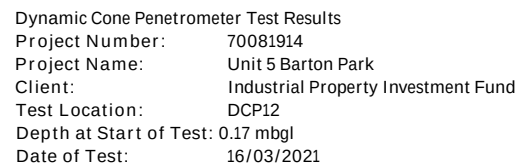
Dynamic Cone Penetrometer Test Results

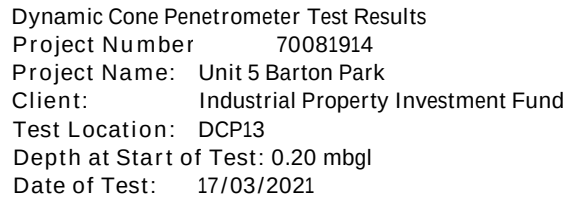
Project Number: 70081914
Project Name: Unit 5 Barton Park
Client: Industrial Property Investment Fund
Test Location: DCP11
Depth at Start of Test: 0.24 mbgl
Date of Test: 16/03/2021



Range Top	Range Bottom	Blow count	Penetration Rate(mm/blow)	CBR(%)	Stratum
290	320	8	3.75	74.7	Black and dark grey silty sandy fine to coarse angular to subrounded GRAVEL of track ballast aggregate and clinker. Occasional chalk debris. Occasional brick fragments. (MADE GROUND)
320	380	15	4.00	69.8	
380	510	7	18.57	13.8	
510	697	26	7.19	37.5	
Notes					

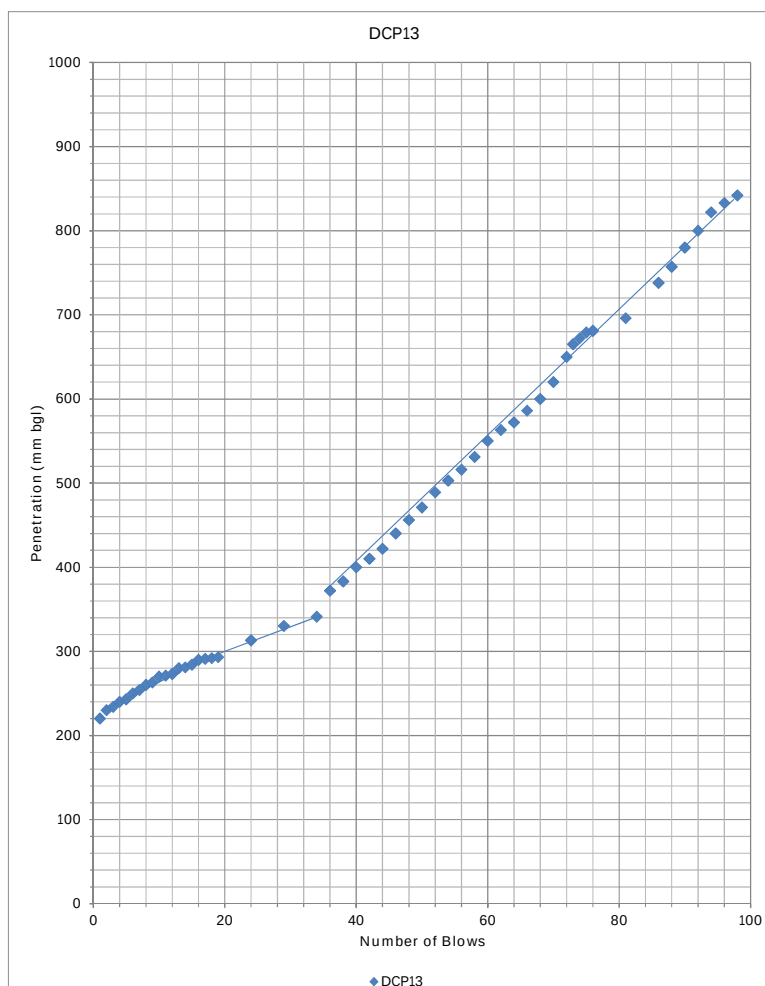
[illegible][illegible]



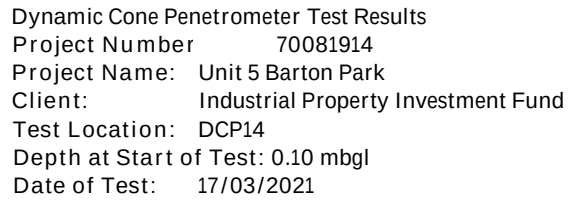
[illegible]



Dynamic Cone Penetrometer Test Results
Project Number: 70081914
Project Name: Unit 5 Barton Park
Client: Industrial Property Investment Fund
Test Location: DCP13
Depth at Start of Test: 0.20 mbgl
Date of Test: 17/03/2021

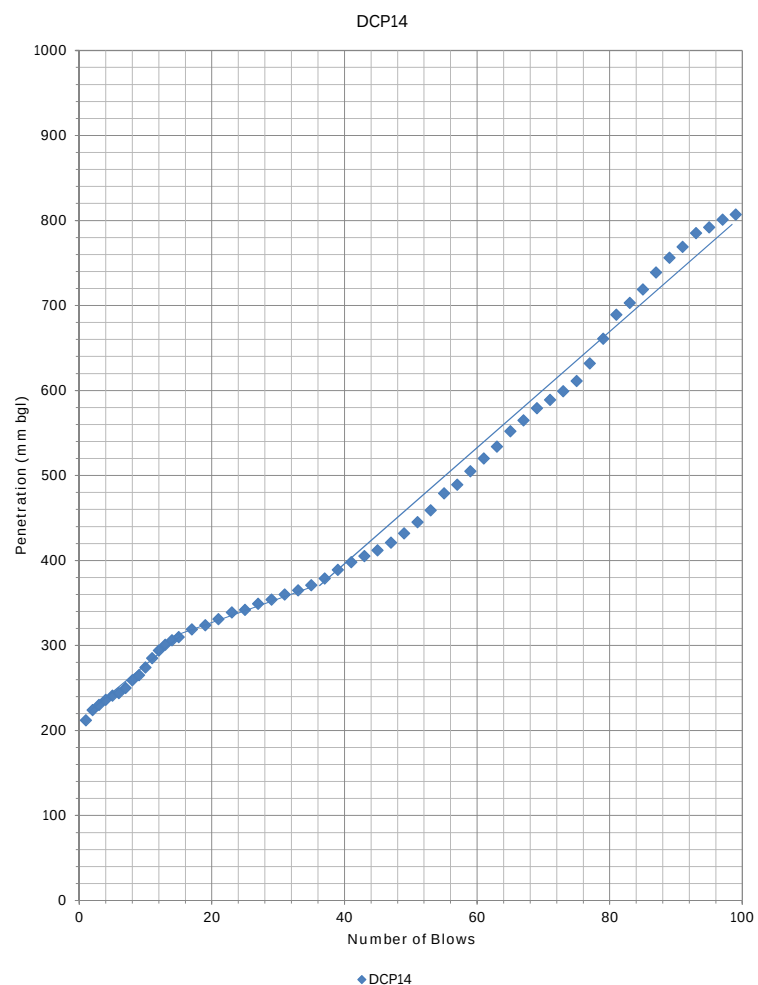


Range Top	Range Bottom	Blow count	Penetration Rate(mm/blow)	CBR(%)	Stratum
220	280	12	5.00	55.1	
280	341	21	2.90	97.8	
372	842	62	7.58	35.5	
Notes					
DCP13 Test commenced at 0.20m bgl.					

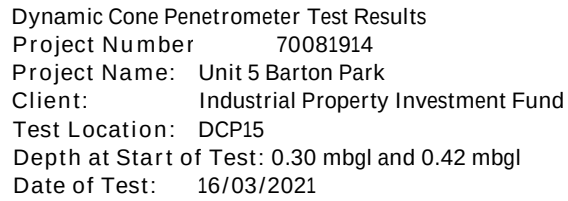
[illegible][illegible]



Dynamic Cone Penetrometer Test Results
Project Number: 70081914
Project Name: Unit 5 Barton Park
Client: Industrial Property Investment Fund
Test Location: DCP14
Depth at Start of Test: 0.10 mbgl
Date of Test: 17/03/2021

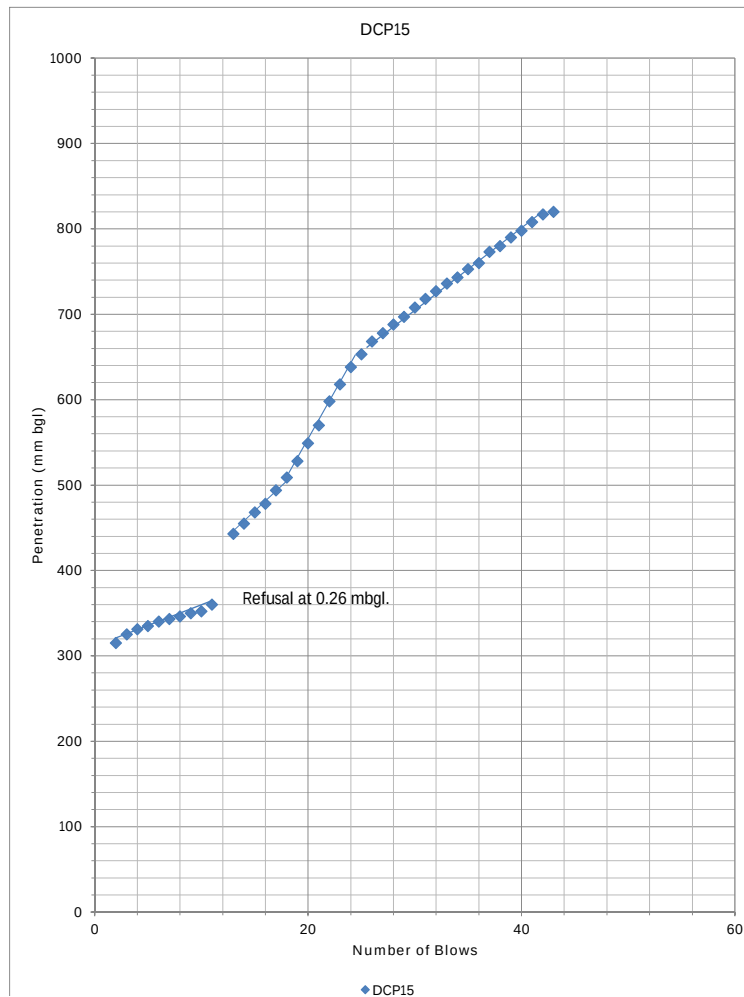


Range Top	Range Bottom	Blow count	Penetration Rate(mm/blow)	CBR(%)	Stratum
224	310	13	6.62	41.0	
310	371	20	3.05	92.9	
371	807	64	6.81	39.7	
Notes					
DCP14 Test commenced at 0.10m bgl.					

[illegible][illegible]

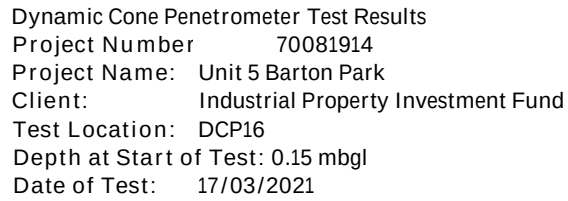


Dynamic Cone Penetrometer Test Results
 Project Number: 70081914
 Project Name: Unit 5 Barton Park
 Client: Industrial Property Investment Fund
 Test Location: DCP15
 Depth at Start of Test: 0.30 mbgl
 Date of Test: 16/03/2021



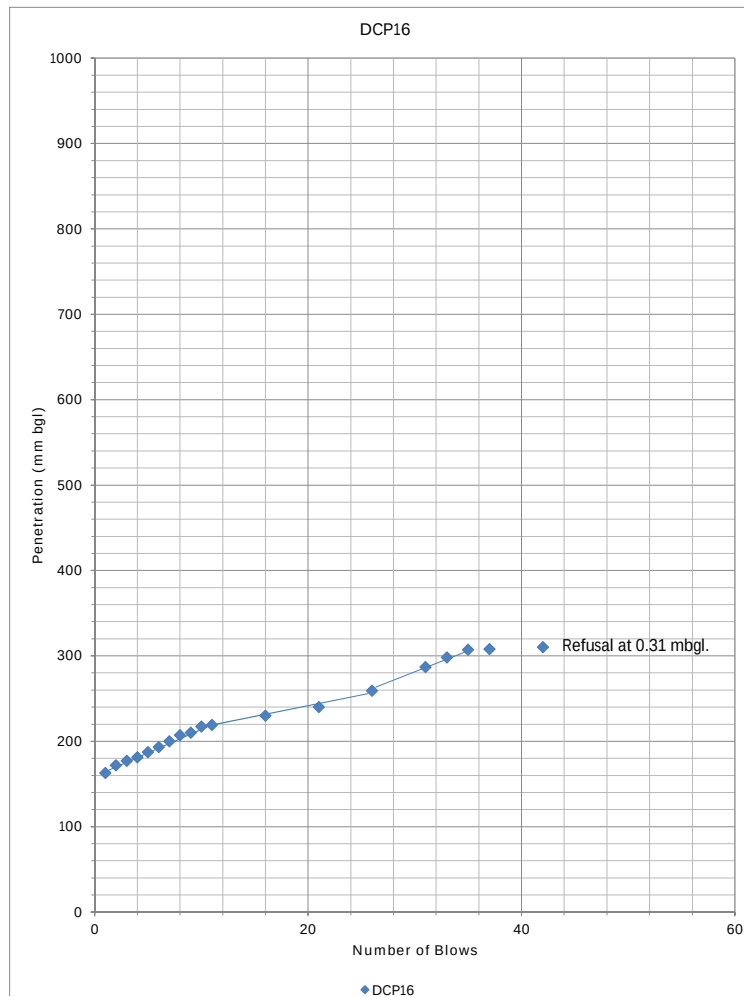
Range Top	Range Bottom	Blow count	Penetration Rate(mm/blow)	CBR(%)	Stratum
315	360	9	5.00	55.1	Brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse subangular and subrounded of flint. Compacted. (MADE GROUND)
443	509	5	13.20	19.7	
509	653	7	20.57	12.4	Hard locally very stiff brown silty CLAY. (MADE GROUND)
653	817	17	9.65	27.5	Hard dark brown and grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse rounded to subangular of flint and occasional brick. (MADE GROUND)

Notes
DCP15 Test commenced at 0.30 mbgl. Refused at 0.36m bgl. Recommended test from 0.42m bgl

[illegible][illegible]



Dynamic Cone Penetrometer Test Results
 Project Number: 70081914
 Project Name: Unit 5 Barton Park
 Client: Industrial Property Investment Fund
 Test Location: DCP16
 Depth at Start of Test: 0.15 mbgl
 Date of Test: 17/03/2021



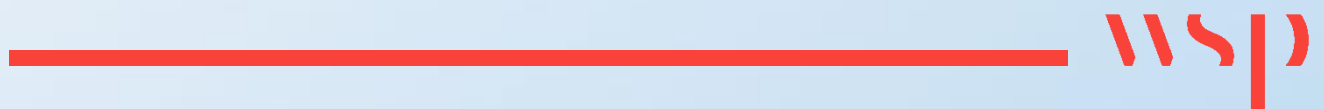
Range Top	Range Bottom	Blow count	Penetration Rate(mm/blow)	CBR(%)	Stratum
163	219	10	5.60	48.9	
219	259	15	2.67	107.1	
259	307	9	5.33	51.5	

Notes

DCP16 Test commenced at 0.15 mbgl. Refused at 0.31m bgl

Appendix F

LABORATORY CERTIFICATES - SOILS





Unit 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

WSP PB LBH
WSP PB
4th Floor
6 Devonshire Square
London
EC2M 4YE

Attention: David Crellin

CERTIFICATE OF ANALYSIS

Date of report Generation: 31 March 2021
Customer: WSP PB LBH
Sample Delivery Group (SDG): 210318-97
Your Reference: 70080743
Location: Unit 5 Barton Park
Report No: 592601

This report has been revised and directly supersedes 592138 in its entirety.

We received 17 samples on Thursday March 18, 2021 and 6 of these samples were scheduled for analysis which was completed on Wednesday March 31, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23927095	WS05	ES	0.30 - 0.30	16/03/2021
23927102	WS05	ES	0.70 - 0.70	16/03/2021
23927111	WS05	ES	1.40 - 1.80	16/03/2021
23927122	WS05	ES	1.95 - 2.50	16/03/2021
23927027	WS06	ES	0.30 - 0.40	16/03/2021
23927035	WS06	ES	1.00 - 1.00	16/03/2021
23927043	WS06	ES	2.10 - 2.30	16/03/2021
23927054	WS06	ES	2.50 - 2.50	16/03/2021
23927068	WS06	ES	3.50 - 4.00	16/03/2021
23927076	WS06	ES	4.50 - 5.00	16/03/2021
23927131	WS07	ES	0.20 - 0.40	16/03/2021
23927140	WS07	ES	0.60 - 0.90	16/03/2021
23927147	WS07	ES	1.50 - 1.70	16/03/2021
23927015	WS07	ES	2.50 - 2.70	16/03/2021
23927155	WS08	ES	0.30	16/03/2021
23927003	WS08	ES	0.40 - 0.40	16/03/2021
23927084	WS08	ES	0.70 - 0.70	16/03/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97 Client Reference: 70080743 Report Number: 592601
Location: Unit 5 Barton Park Order Number: 70080743-EXP Superseded Report: 592138

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23927003	23927131	23927068	23927043	23927027	23927095
						WS08	WS07	WS06	WS06	WS06	WS05
						ES	ES	ES	ES	ES	ES
						0.40 - 0.40	0.20 - 0.40	3.50 - 4.00	2.10 - 2.30	0.30 - 0.40	0.30 - 0.30
						60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S	S	S	S
						S	S	S	S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 5									
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1									
Boron Water Soluble	All	NDPs: 0 Tests: 6									
CEN Readings	All	NDPs: 0 Tests: 2									
Chromium III	All	NDPs: 0 Tests: 6									
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 2									
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 2									
EPH CWG GC (S)	All	NDPs: 0 Tests: 6									
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6									
GRO by GC-FID (W)	All	NDPs: 0 Tests: 2									
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 6									
Metals in solid samples by OES	All	NDPs: 0 Tests: 6									
PAH by GCMS	All	NDPs: 0 Tests: 6									
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 2									
pH	All	NDPs: 0 Tests: 6									



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97 Client Reference: 70080743 Report Number: 592601
Location: Unit 5 Barton Park Order Number: 70080743-EXP Superseded Report: 592138

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

Phenols by HPLC (S)

All

NDPs: 0
Tests: 6

X

X

X

X

X

X

Sample description

All

NDPs: 0
Tests: 6

X

X

X

X

X

X

Semi Volatile Organic Compounds

All

NDPs: 0
Tests: 1

X

SVOC MS (W) - Aqueous

All

NDPs: 0
Tests: 1

X

Total Organic Carbon

All

NDPs: 0
Tests: 4

X

X

X

X

TPH CWG (W)

All

NDPs: 0
Tests: 2

X

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 6

X

X

X

X

X

X

VOC MS (S)

All

NDPs: 0
Tests: 6

X

X

X

X

X

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 592601
Superseded Report: 592138

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23927095	WS05	0.30 - 0.30	Dark Brown	Loamy Sand	Stones	Brick
23927027	WS06	0.30 - 0.40	Dark Brown	Sand	None	Stones
23927043	WS06	2.10 - 2.30	Dark Brown	Clay	Stones	N/A
23927068	WS06	3.50 - 4.00	Grey	Silty Clay Loam	None	None
23927131	WS07	0.20 - 0.40	Dark Brown	Sand	Stones	Crushed Brick
23927003	WS08	0.40 - 0.40	Light Brown	Loamy Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97 Client Reference: 70080743 Report Number: 592601
Location: Unit 5 Barton Park Order Number: 70080743-EXP Superseded Report: 592138

Results Legend			Customer Sample Ref.	WS05	WS06	WS06	WS06	WS07	WS08
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.30 - 0.30 Soil/Solid (S)	0.30 - 0.40 Soil/Solid (S)	2.10 - 2.30 Soil/Solid (S)	3.50 - 4.00 Soil/Solid (S)	0.20 - 0.40 Soil/Solid (S)	0.40 - 0.40 Soil/Solid (S)
M	mCERTS accredited.			16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4*5@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	11	12	18	16	11	7.1	
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	
Soil Organic Matter (SOM)	<0.35 %	TM132	1.06 #	30 #			0.903 #	0.741 #	
pH	1 pH Units	TM133	9.35 M	8.17 M	8.49 M	7.49 M	8.65 M	9.35 M	
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	
Chromium, Trivalent	<0.9 mg/kg	TM181	7.44 M	3.83 M	14.2 M	16 M	12.3 M	6.38 M	
Arsenic	<0.6 mg/kg	TM181	5.47 M	35 M	6.37 M	10.2 M	13.7 M	7.18 M	
Barium	<0.6 mg/kg	TM181	109 #	719 #	28.9 #	18.7 #	313 #	100 #	
Beryllium	<0.01 mg/kg	TM181	0.212 M	0.959 M	0.659 M	0.592 M	0.215 M	0.302 M	
Cadmium	<0.02 mg/kg	TM181	0.348 M	<0.02 M	0.103 M	<0.02 M	0.443 M	0.351 M	
Chromium	<0.9 mg/kg	TM181	7.44 M	3.83 M	14.2 M	16 M	12.3 M	6.38 M	
Copper	<1.4 mg/kg	TM181	23.8 M	1070 M	17.7 M	11.1 M	45.8 M	12.9 M	
Lead	<0.7 mg/kg	TM181	130 M	850 M	22.3 M	9.97 M	158 M	55.1 M	
Mercury	<0.1 mg/kg	TM181	0.123 M	0.314 M	<0.1 M	<0.1 M	0.161 M	<0.1 M	
Nickel	<0.2 mg/kg	TM181	6.85 M	49 M	26.8 M	22.6 M	18.8 M	11.7 M	
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Vanadium	<0.2 mg/kg	TM181	16.1 #	28.5 #	29.1 #	26.5 #	32.6 #	18 #	
Zinc	<1.9 mg/kg	TM181	143 M	751 M	92.9 M	50.2 M	162 M	69.4 M	
Boron, water soluble	<1 mg/kg	TM222	<1 M	<1 M	<1 M	<1 M	<1 M	<1 M	
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304	0.961 #						
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304	0.0053 #						
Additional Asbestos Components (Using TM048)		TM304	None #						
Analysts Comments		TM304	N/A						
Asbestos Quantification - Total - %	<0.001 %	TM304	0.966 #						



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton ParkClient Reference: 70080743
Order Number: 70080743-EXPReport Number: 592601
Superseded Report: 592138

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	WS06				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	3.50 - 4.00 Soil/Solid (S) 16/03/2021 18/03/2021 210318-97 23927068 ES				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Phenol	<0.1 mg/kg	TM157	<0.1				
Pentachlorophenol	<0.1 mg/kg	TM157	<0.1				
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157	<0.1				
Nitrobenzene	<0.1 mg/kg	TM157	<0.1				
Isophorone	<0.1 mg/kg	TM157	<0.1				
Hexachloroethane	<0.1 mg/kg	TM157	<0.1				
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157	<0.1				
Hexachlorobutadiene	<0.1 mg/kg	TM157	<0.1				
Hexachlorobenzene	<0.1 mg/kg	TM157	<0.1				
n-Dioctyl phthalate	<0.1 mg/kg	TM157	<0.1				
Dimethyl phthalate	<0.1 mg/kg	TM157	<0.1				
Diethyl phthalate	<0.1 mg/kg	TM157	<0.1				
n-Dibutyl phthalate	<0.1 mg/kg	TM157	<0.1				
Dibenzofuran	<0.1 mg/kg	TM157	<0.1				
Carbazole	<0.1 mg/kg	TM157	<0.1				
Butylbenzyl phthalate	<0.1 mg/kg	TM157	<0.1				
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157	<0.1				
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157	<0.1				
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157	<0.1				
Azobenzene	<0.1 mg/kg	TM157	<0.1				
4-Nitrophenol	<0.1 mg/kg	TM157	<0.5				
4-Nitroaniline	<0.1 mg/kg	TM157	<0.1				
4-Methylphenol	<0.1 mg/kg	TM157	<0.1				
4-Chlorophenylphenylether	<0.1 mg/kg	TM157	<0.1				
4-Chloroaniline	<0.1 mg/kg	TM157	<0.1				
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157	<0.1				
4-Bromophenylphenylether	<0.1 mg/kg	TM157	<0.1				
3-Nitroaniline	<0.1 mg/kg	TM157	<0.1				
2-Nitrophenol	<0.1 mg/kg	TM157	<0.1				
2-Nitroaniline	<0.1 mg/kg	TM157	<0.1				
2-Methylphenol	<0.1 mg/kg	TM157	<0.1				
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157	<0.1				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

TPH CWG (S)

Results Legend		Customer Sample Ref.	WS05	WS06	WS06	WS06	WS07	WS08
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.30 - 0.30 Soil/Solid (S)	0.30 - 0.40 Soil/Solid (S)	2.10 - 2.30 Soil/Solid (S)	3.50 - 4.00 Soil/Solid (S)	0.20 - 0.40 Soil/Solid (S)	0.40 - 0.40 Soil/Solid (S)
M	mCERTS accredited.		16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		18/03/2021	18/03/2021	18/03/2021	18/03/2021	18/03/2021	18/03/2021
(F)	Trigger breach confirmed		210318-97	210318-97	210318-97	210318-97	210318-97	210318-97
1-4*5@	Sample deviation (see appendix)		23927095	23927027	23927043	23927068	23927131	23927003
			ES	ES	ES	ES	ES	ES
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	89.7	92.5	91.4	142	101	115
Aliphatics >C5-C6	<0.01 mg/kg	TM089	0.0294	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	<0.01 mg/kg	TM089	0.0655	<0.01	0.0146	0.0381	0.0258	0.0129
Aliphatics >C8-C10	<0.01 mg/kg	TM089	0.0373	<0.01	0.0232	0.378	0.0874	0.014
Aliphatics >C10-C12	<1 mg/kg	TM414	<1	2.04	<1	<1	<1	<1
Aliphatics >C12-C16	<1 mg/kg	TM414	<1	5.71	16.9	<1	275	<1
Aliphatics >C16-C21	<1 mg/kg	TM414	6.83	33.2	252	<1	805	2.8
Aliphatics >C16-C35	<1 mg/kg	TM414	13.8	81.1	1120	<1	1100	9.16
Aliphatics >C21-C35	<1 mg/kg	TM414	7.01	47.9	865	<1	296	6.36
Aliphatics >C35-C44	<1 mg/kg	TM414	<1	6.41	274	<1	<1	7.05
Total Aliphatics >C10-C44	<5 mg/kg	TM414	15	95.2	1410	<5	1380	16.5
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	TM414	264	1720	1810	<10	1480	110
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	0.0249	<0.01	0.0159	0.252	0.0582	<0.01
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1	<1	<1	<1	1.28	<1
Aromatics > EC12-EC16	<1 mg/kg	TM414	1.02	5.98	7.46	<1	22	<1
Aromatics > EC16-EC21	<1 mg/kg	TM414	16.8	99.3	11.6	<1	29.3	5
Aromatics > EC16-EC35	<1 mg/kg	TM414	149	1160	396	<1	73.3	76.9
Aromatics > EC21-EC35	<1 mg/kg	TM414	132	1060	384	<1	44	71.9
Aromatics >EC35-EC44	<1 mg/kg	TM414	98.3	459	<1	<1	4.77	16.9
Aromatics > EC40-EC44	<1 mg/kg	TM414	19.5	<1	<1	<1	1.25	4.23
Total Aromatics > EC10-EC44	<5 mg/kg	TM414	249	1620	404	<5	101	93.9
Total Aliphatics & Aromatics >C5-C44	<10 mg/kg	TM414	264	1720	1810	<10	1480	110
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089	0.132	<0.05	<0.05	0.417	0.113	<0.05
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05	0.252	0.0582	<0.05
GRO >C5-C10	<0.02 mg/kg	TM089	0.132	<0.02	<0.02	0.669	0.171	<0.02



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

VOC MS (S)

Results Legend			Customer Sample Ref.	WS05	WS06	WS06	WS06	WS07	WS08
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.30 - 0.30 Soil/Solid (S) 16/03/2021	0.30 - 0.40 Soil/Solid (S) 16/03/2021	2.10 - 2.30 Soil/Solid (S) 16/03/2021	3.50 - 4.00 Soil/Solid (S) 16/03/2021	0.20 - 0.40 Soil/Solid (S) 16/03/2021	0.40 - 0.40 Soil/Solid (S) 16/03/2021
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			18/03/2021 210318-97 23927095 ES	18/03/2021 210318-97 23927027 ES	18/03/2021 210318-97 23927043 ES	18/03/2021 210318-97 23927068 ES	18/03/2021 210318-97 23927131 ES	18/03/2021 210318-97 23927003 ES
(F)	Trigger breach confirmed								
1-4*5@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116					112		
Toluene-d8**	%	TM116					102		
4-Bromofluorobenzene**	%	TM116					91		
Dichlorodifluoromethane	<0.006 mg/kg	TM116					<0.06 M		
Chloromethane	<0.007 mg/kg	TM116					<0.07 #		
Vinyl Chloride	<0.006 mg/kg	TM116					<0.06 M		
Bromomethane	<0.01 mg/kg	TM116					<0.1 M		
Chloroethane	<0.01 mg/kg	TM116					<0.1 M		
Trichlorofluoromethane	<0.006 mg/kg	TM116					<0.06 M		
1,1-Dichloroethene	<0.01 mg/kg	TM116					<0.1 #		
Carbon Disulphide	<0.007 mg/kg	TM116					<0.07 M		
Dichloromethane	<0.01 mg/kg	TM116					<0.1 #		
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
trans-1,2-Dichloroethene	<0.01 mg/kg	TM116					<0.1 M		
1,1-Dichloroethane	<0.008 mg/kg	TM116					<0.08 M		
cis-1,2-Dichloroethene	<0.006 mg/kg	TM116					<0.06 M		
2,2-Dichloropropane	<0.01 mg/kg	TM116					<0.1 M		
Bromochloromethane	<0.01 mg/kg	TM116					<0.1 M		
Chloroform	<0.008 mg/kg	TM116					<0.08 M		
1,1,1-Trichloroethane	<0.007 mg/kg	TM116					<0.07 M		
1,1-Dichloropropene	<0.01 mg/kg	TM116					<0.1 M		
Carbontetrachloride	<0.01 mg/kg	TM116					<0.1 M		
1,2-Dichloroethane	<0.005 mg/kg	TM116					<0.05 M		
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Trichloroethene	<0.009 mg/kg	TM116					<0.09 #		
1,2-Dichloropropane	<0.01 mg/kg	TM116					<0.1 M		
Dibromomethane	<0.009 mg/kg	TM116					<0.09 M		
Bromodichloromethane	<0.007 mg/kg	TM116					<0.07 M		
cis-1,3-Dichloropropene	<0.01 mg/kg	TM116					<0.1 M		
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
trans-1,3-Dichloropropene	<0.01 mg/kg	TM116					<0.1 M		
1,1,2-Trichloroethane	<0.01 mg/kg	TM116					<0.1 M		



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

VOC MS (S)

Results Legend			Customer Sample Ref.	WS05	WS06	WS06	WS06	WS07	WS08
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.30 - 0.30	0.30 - 0.40	2.10 - 2.30	3.50 - 4.00	0.20 - 0.40	0.40 - 0.40
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / filtered sample.			16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
+	Subcontracted - refer to subcontractor report for accreditation status.			18/03/2021	18/03/2021	18/03/2021	18/03/2021	18/03/2021	18/03/2021
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			210318-97	210318-97	210318-97	210318-97	210318-97	210318-97
(F)	Trigger breach confirmed			23927095	23927027	23927043	23927068	23927131	23927003
1-4+5@	Sample deviation (see appendix)			ES	ES	ES	ES	ES	ES
Component	LOD/Units	Method							
1,3-Dichloropropane	<0.007 mg/kg	TM116					<0.07 M		
Tetrachloroethene	<0.005 mg/kg	TM116					<0.05 M		
Dibromochloromethane	<0.01 mg/kg	TM116					<0.1 M		
1,2-Dibromoethane	<0.01 mg/kg	TM116					<0.1 M		
Chlorobenzene	<0.005 mg/kg	TM116					<0.05 M		
1,1,1,2-Tetrachloroethane	<0.01 mg/kg	TM116					<0.1 M		
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	0.0985 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Styrene	<0.01 mg/kg	TM116					<0.1 #		
Bromoform	<0.01 mg/kg	TM116					<0.1 M		
Isopropylbenzene	<0.005 mg/kg	TM116					<0.05 #		
1,1,2,2-Tetrachloroethane	<0.01 mg/kg	TM116					<0.1 #		
1,2,3-Trichloropropane	<0.016 mg/kg	TM116					<0.16 M		
Bromobenzene	<0.01 mg/kg	TM116					<0.1 M		
Propylbenzene	<0.01 mg/kg	TM116					<0.1 M		
2-Chlorotoluene	<0.009 mg/kg	TM116					<0.09 M		
1,3,5-Trimethylbenzene	<0.008 mg/kg	TM116					<0.08 M		
4-Chlorotoluene	<0.01 mg/kg	TM116					<0.1 M		
tert-Butylbenzene	<0.014 mg/kg	TM116					<0.14 M		
1,2,4-Trimethylbenzene	<0.009 mg/kg	TM116					<0.09 #		
sec-Butylbenzene	<0.01 mg/kg	TM116					<0.1		
4-Isopropyltoluene	<0.01 mg/kg	TM116					<0.1 M		
1,3-Dichlorobenzene	<0.008 mg/kg	TM116					<0.08 M		
1,4-Dichlorobenzene	<0.005 mg/kg	TM116					<0.05 M		
n-Butylbenzene	<0.011 mg/kg	TM116					<0.11		
1,2-Dichlorobenzene	<0.01 mg/kg	TM116					<0.1 M		
1,2-Dibromo-3-chloropropane	<0.014 mg/kg	TM116					<0.14 M		
Tert-amyl methyl ether	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
1,2,4-Trichlorobenzene	<0.02 mg/kg	TM116					<0.2		
Hexachlorobutadiene	<0.02 mg/kg	TM116					<0.2		
Naphthalene	<0.013 mg/kg	TM116					<0.13 M		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97 **Client Reference:** 70080743 **Report Number:** 592601
Location: Unit 5 Barton Park **Order Number:** 70080743-EXP **Superseded Report:** 592138

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&S@ Sample deviation (see appendix)

Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
22/03/2021	Barbara Urbanek-Walsh	Loose fibres in soil.	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
22/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
23/03/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
23/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
23/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Asbestos Quantification - Full

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*S@ Sample deviation (see appendix)

		Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM	Asbestos Quantification - Total - %
Cust. Sample Ref.	WS05ES 0.30 - 0.30 SOLID	None (#)	N/A	0.9608 (#)	0.0053 (#)	0.9661 (#)
Depth (m)						
Sample Type	16/03/2021 00:00:00					
Date Sampled	18/03/2021 05:00:00					
Date Received	210318-97					
SDG	23927095					
Original Sample	TM304					
Method Number						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/

Client Reference		Site Location	Unit 5 Barton Park
Mass Sample taken (kg)	0.222	Natural Moisture Content (%)	26.5
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	79.1
Particle Size <4mm	>95%		

Case

SDG	210318-97
Lab Sample Number(s)	23927043
Sampled Date	16-Mar-2021
Customer Sample Ref.	WS06 ESZ
Depth (m)	2.10 - 2.30

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
PAH Spec MS - Aqueous (W)				
Naphthalene by GCMS	<0.00002	<0.00002	<0.00004	<0.00004
Acenaphthene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Acenaphthylene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Fluoranthene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Anthracene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Phenanthrene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Fluorene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Chrysene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Pyrene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Benz(a)anthracene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Benzo(b)fluoranthene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Benzo(k)fluoranthene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Benzo(a)pyrene by GCMS	<0.000004	<0.000004	<0.000008	<0.000008
Dibenzo(ah)anthracene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Benzo(ghi)perylene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
Indeno(123cd)pyrene by GCMS	<0.00001	<0.00001	<0.00002	<0.00002
PAH 16 EPA Total by GCMS	<0.000164	<0.000164	<0.000328	<0.000328
TPH CWG (W)				
Surrogate Recovery	-	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.1	<0.1
Aliphatics C5-C6	<0.01	<0.01	<0.02	<0.02
Aliphatics >C6-C8	<0.01	<0.01	<0.02	<0.02
Aliphatics >C8-C10	<0.01	<0.01	<0.02	<0.02
Aliphatics >C10-C12	<0.01	<0.01	<0.02	<0.02
Aliphatics >C12-C16	<0.02	<0.02	<0.04	<0.04
Aliphatics >C16-C21	<0.02	<0.02	<0.04	<0.04
Aliphatics >C21-C35	<0.02	<0.02	<0.04	<0.04
Total Aliphatics >C12-C35	<0.02	<0.02	<0.04	<0.04
Aromatics C6-C7	<0.01	<0.01	<0.02	<0.02
Aromatics >C7-C8	<0.01	<0.01	<0.02	<0.02
MTBE GC-FID	<0.003	<0.003	<0.006	<0.006
Aromatics >EC8 -EC10	<0.01	<0.01	<0.02	<0.02
Aromatics >EC10-EC12	<0.01	<0.01	<0.02	<0.02
Aromatics >EC12-EC16	<0.02	<0.02	<0.04	<0.04
Aromatics >EC16-EC21	<0.02	<0.02	<0.04	<0.04
Aromatics >EC21-EC35	<0.02	<0.02	<0.04	<0.04

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	8.68
Conductivity (µS/cm)	221.00
Temperature (°C)	19.30
Volume Leachant (Litres)	0.303
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

31/03/2021 09:06:50

09:06:34 31/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/

Client Reference		Site Location	Unit 5 Barton Park
Mass Sample taken (kg)	0.222	Natural Moisture Content (%)	26.5
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	79.1
Particle Size <4mm	>95%		

Case

SDG	210318-97
Lab Sample Number(s)	23927043
Sampled Date	16-Mar-2021
Customer Sample Ref.	WS06 ESZ
Depth (m)	2.10 - 2.30

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
TPH CWG (W)				
Total Aromatics >EC12-EC35	<0.02	<0.02	<0.04	<0.04
Benzene by GC	<0.007	<0.007	<0.014	<0.014
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.02	<0.02	<0.04	<0.04
Toluene by GC	<0.004	<0.004	<0.008	<0.008
Ethylbenzene by GC	<0.005	<0.005	<0.01	<0.01
m & p Xylene by GC	<0.008	<0.008	<0.016	<0.016
o Xylene by GC	<0.003	<0.003	<0.006	<0.006
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.022	<0.022
Sum of BTEX by GC	<0.028	<0.028	<0.056	<0.056
Aliphatics >C16-C35	<0.02	<0.02	<0.04	<0.04

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	8.68
Conductivity (µS/cm)	221.00
Temperature (°C)	19.30
Volume Leachant (Litres)	0.303
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

31/03/2021 09:06:50

09:06:34 31/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/

Client Reference		Site Location	Unit 5 Barton Park
Mass Sample taken (kg)	0.216	Natural Moisture Content (%)	23.5
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	81
Particle Size <4mm	>95%		

Case

SDG	210318-97
Lab Sample Number(s)	23927068
Sampled Date	16-Mar-2021
Customer Sample Ref.	WS06 ESZ
Depth (m)	3.50 - 4.00

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
PAH Spec MS - Aqueous (W)				
Naphthalene by GCMS	0.0000738	<0.00001	0.000148	<0.00002
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Fluoranthene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Anthracene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Phenanthrene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Fluorene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Chrysene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Pyrene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.000004	<0.000004
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00001	<0.00001
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.000164	<0.000164
SVOC MS (W) - Aqueous				
1,2,4-Trichlorobenzene	<0.001	<0.001	<0.002	<0.002
1,2-Dichlorobenzene	<0.001	<0.001	<0.002	<0.002
1,3-Dichlorobenzene	<0.001	<0.001	<0.002	<0.002
1,4-Dichlorobenzene	<0.001	<0.001	<0.002	<0.002
2,4,5-Trichlorophenol	<0.001	<0.001	<0.002	<0.002
2,4,6-Trichlorophenol	<0.001	<0.001	<0.002	<0.002
2,4-Dichlorophenol	<0.001	<0.001	<0.002	<0.002
2,4-Dimethylphenol	<0.001	<0.001	<0.002	<0.002
2,4-Dinitrotoluene	<0.001	<0.001	<0.002	<0.002
2,6-Dinitrotoluene	<0.001	<0.001	<0.002	<0.002
2-Chloronaphthalene	<0.001	<0.001	<0.002	<0.002
2-Chlorophenol	<0.001	<0.001	<0.002	<0.002
2-Methylnaphthalene	<0.001	<0.001	<0.002	<0.002
2-Methylphenol	<0.001	<0.001	<0.002	<0.002
2-Nitroaniline	<0.001	<0.001	<0.002	<0.002
2-Nitrophenol	<0.001	<0.001	<0.002	<0.002
3-Nitroaniline	<0.001	<0.001	<0.002	<0.002
4-Bromophenylphenylether	<0.001	<0.001	<0.002	<0.002

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	7.99
Conductivity (µS/cm)	573.00
Temperature (°C)	19.80
Volume Leachant (Litres)	0.309
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

31/03/2021 09:06:50

09:06:34 31/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 592601
Superseded Report: 592138

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/7

Client Reference		Site Location	Unit 5 Barton Park
Mass Sample taken (kg)	0.216	Natural Moisture Content (%)	23.5
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	81
Particle Size <4mm	>95%		

Case

SDG	210318-97
Lab Sample Number(s)	23927068
Sampled Date	16-Mar-2021
Customer Sample Ref.	WS06 ESZ
Depth (m)	3.50 - 4.00

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
SVOC MS (W) - Aqueous				
4-Chloro-3-methylphenol	<0.001	<0.001	<0.002	<0.002
4-Chloroaniline	<0.001	<0.001	<0.002	<0.002
4-Chlorophenylphenylether	<0.001	<0.001	<0.002	<0.002
4-Methylphenol	<0.001	<0.001	<0.002	<0.002
4-Nitroaniline	<0.001	<0.001	<0.002	<0.002
4-Nitrophenol	<0.001	<0.001	<0.002	<0.002
Azobenzene	<0.001	<0.001	<0.002	<0.002
Bis(2-chloroethyl)ether	<0.001	<0.001	<0.002	<0.002
Bis(2-chloroethoxy)methane	<0.001	<0.001	<0.002	<0.002
Bis(2-ethylhexyl) phthalate	<0.002	<0.002	<0.004	<0.004
Butylbenzyl phthalate	<0.001	<0.001	<0.002	<0.002
Carbazole	<0.001	<0.001	<0.002	<0.002
Dibenzofuran	<0.001	<0.001	<0.002	<0.002
Di-n-butyl phthalate	<0.001	<0.001	<0.002	<0.002
Diethyl phthalate	<0.001	<0.001	<0.002	<0.002
Dimethyl phthalate	<0.001	<0.001	<0.002	<0.002
Di-n-Octyl phthalate	<0.005	<0.005	<0.01	<0.01
Hexachlorobenzene	<0.001	<0.001	<0.002	<0.002
Hexachlorobutadiene	<0.001	<0.001	<0.002	<0.002
Pentachlorophenol	<0.001	<0.001	<0.002	<0.002
Phenol	<0.001	<0.001	<0.002	<0.002
N-nitrosodi-n-propylamine	<0.001	<0.001	<0.002	<0.002
Hexachloroethane	<0.001	<0.001	<0.002	<0.002
Nitrobenzene	<0.001	<0.001	<0.002	<0.002
Isophorone	<0.001	<0.001	<0.002	<0.002
Hexachlorocyclopentadiene	<0.001	<0.001	<0.002	<0.002
TPH CWG (W)				
Surrogate Recovery	-	-	-	-
GRO TOT (C5-C12)	0.068	<0.05	0.136	<0.1
Aliphatics C5-C6	<0.01	<0.01	<0.02	<0.02
Aliphatics >C6-C8	<0.01	<0.01	<0.02	<0.02
Aliphatics >C8-C10	<0.01	<0.01	<0.02	<0.02
Aliphatics >C10-C12	0.015	<0.01	0.03	<0.02
Aliphatics >C12-C16	<0.01	<0.01	<0.02	<0.02
Aliphatics >C16-C21	<0.01	<0.01	<0.02	<0.02
Aliphatics >C21-C35	<0.01	<0.01	<0.02	<0.02

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	7.99
Conductivity (µS/cm)	573.00
Temperature (°C)	19.80
Volume Leachant (Litres)	0.309
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

31/03/2021 09:06:50

09:06:34 31/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/

Client Reference		Site Location	Unit 5 Barton Park
Mass Sample taken (kg)	0.216	Natural Moisture Content (%)	23.5
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	81
Particle Size <4mm	>95%		

Case

SDG	210318-97
Lab Sample Number(s)	23927068
Sampled Date	16-Mar-2021
Customer Sample Ref.	WS06 ESZ
Depth (m)	3.50 - 4.00

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
TPH CWG (W)				
Total Aliphatics >C12-C35	<0.01	<0.01	<0.02	<0.02
Aromatics C6-C7	<0.01	<0.01	<0.02	<0.02
Aromatics >C7-C8	<0.01	<0.01	<0.02	<0.02
MTBE GC-FID	<0.003	<0.003	<0.006	<0.006
Aromatics >EC8 -EC10	0.03	<0.01	0.06	<0.02
Aromatics >EC10-EC12	0.01	<0.01	0.02	<0.02
Aromatics >EC12-EC16	0.03	<0.01	0.06	<0.02
Aromatics >EC16-EC21	0.015	<0.01	0.03	<0.02
Aromatics >EC21-EC35	0.018	<0.01	0.036	<0.02
Total Aromatics >EC12-EC35	0.063	<0.01	0.126	<0.02
Benzene by GC	<0.007	<0.007	<0.014	<0.014
TPH (Total Aliphatics + Total Aromatics) >C5-C35	0.131	<0.01	0.262	<0.02
Toluene by GC	<0.004	<0.004	<0.008	<0.008
Ethylbenzene by GC	0.011	<0.005	0.022	<0.01
m & p Xylene by GC	<0.008	<0.008	<0.016	<0.016
o Xylene by GC	0.008	<0.003	0.016	<0.006
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.022	<0.022
Sum of BTEX by GC	<0.028	<0.028	<0.056	<0.056
Aliphatics >C16-C35	<0.01	<0.01	<0.02	<0.02
VOC MS (W)				
Dibromofluoromethane	-	-	-	-
Toluene-d8	-	-	-	-
4-Bromofluorobenzene	-	-	-	-
Dichlorodifluoromethane	<0.001	<0.001	<0.002	<0.002
Chloromethane	<0.001	<0.001	<0.002	<0.002
Vinyl Chloride	<0.001	<0.001	<0.002	<0.002
Bromomethane	<0.001	<0.001	<0.002	<0.002
Chloroethane	<0.001	<0.001	<0.002	<0.002
Trichlorofluoromethane	<0.001	<0.001	<0.002	<0.002
1,1-Dichloroethene	<0.001	<0.001	<0.002	<0.002
Carbon Disulphide	0.00193	<0.001	0.00386	<0.002
Dichloromethane	<0.003	<0.003	<0.006	<0.006
Tert-butyl methyl ether	<0.001	<0.001	<0.002	<0.002
Trans-1,2-Dichloroethene	<0.001	<0.001	<0.002	<0.002
1,1-Dichloroethane	<0.001	<0.001	<0.002	<0.002
Cis-1,2-Dichloroethene	<0.001	<0.001	<0.002	<0.002

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	7.99
Conductivity (µS/cm)	573.00
Temperature (°C)	19.80
Volume Leachant (Litres)	0.309
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/

Client Reference		Site Location	Unit 5 Barton Park
Mass Sample taken (kg)	0.216	Natural Moisture Content (%)	23.5
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	81
Particle Size <4mm	>95%		

Case

SDG	210318-97
Lab Sample Number(s)	23927068
Sampled Date	16-Mar-2021
Customer Sample Ref.	WS06 ESZ
Depth (m)	3.50 - 4.00

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
VOC MS (W)				
2,2-Dichloropropane	<0.001	<0.001	<0.002	<0.002
Bromochloromethane	<0.001	<0.001	<0.002	<0.002
Chloroform	<0.001	<0.001	<0.002	<0.002
1,1,1-Trichloroethane	<0.001	<0.001	<0.002	<0.002
1,1-Dichloropropene	<0.001	<0.001	<0.002	<0.002
Carbontetrachloride	<0.001	<0.001	<0.002	<0.002
1,2-Dichloroethane	<0.001	<0.001	<0.002	<0.002
Benzene	<0.001	<0.001	<0.002	<0.002
Trichloroethene	<0.001	<0.001	<0.002	<0.002
1,2-Dichloropropane	<0.001	<0.001	<0.002	<0.002
Dibromomethane	<0.001	<0.001	<0.002	<0.002
Bromodichloromethane	<0.001	<0.001	<0.002	<0.002
Cis-1,3-Dichloropropene	<0.001	<0.001	<0.002	<0.002
Toluene	<0.001	<0.001	<0.002	<0.002
Trans-1,3-Dichloropropene	<0.001	<0.001	<0.002	<0.002
1,1,2-Trichloroethane	<0.001	<0.001	<0.002	<0.002
1,3-Dichloropropane	<0.001	<0.001	<0.002	<0.002
Tetrachloroethene	<0.001	<0.001	<0.002	<0.002
Dibromochloromethane	<0.001	<0.001	<0.002	<0.002
1,2-Dibromoethane	<0.001	<0.001	<0.002	<0.002
Chlorobenzene	<0.001	<0.001	<0.002	<0.002
1,1,1,2-Tetrachloroethane	<0.001	<0.001	<0.002	<0.002
Ethylbenzene	0.0111	<0.001	0.0222	<0.002
p/m-Xylene	0.00634	<0.001	0.0127	<0.002
o-Xylene	0.00764	<0.001	0.0153	<0.002
Styrene	<0.001	<0.001	<0.002	<0.002
Bromoform	<0.001	<0.001	<0.002	<0.002
Isopropylbenzene	<0.001	<0.001	<0.002	<0.002
1,1,2,2-Tetrachloroethane	<0.001	<0.001	<0.002	<0.002
1,2,3-Trichloropropane	<0.001	<0.001	<0.002	<0.002
Bromobenzene	<0.001	<0.001	<0.002	<0.002
Propylbenzene	<0.001	<0.001	<0.002	<0.002
2-Chlorotoluene	<0.001	<0.001	<0.002	<0.002
1,3,5-Trimethylbenzene	<0.001	<0.001	<0.002	<0.002
4-Chlorotoluene	<0.001	<0.001	<0.002	<0.002

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	7.99
Conductivity (µS/cm)	573.00
Temperature (°C)	19.80
Volume Leachant (Litres)	0.309
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

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09:06:34 31/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 592601
Superseded Report: 592138

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/

Client Reference	
Mass Sample taken (kg)	0.216
Mass of dry sample (kg)	0.175
Particle Size <4mm	>95%

Site Location	Unit 5 Barton Park
Natural Moisture Content (%)	23.5
Dry Matter Content (%)	81

Case	
SDG	210318-97
Lab Sample Number(s)	23927068
Sampled Date	16-Mar-2021
Customer Sample Ref.	WS06 ESZ
Depth (m)	3.50 - 4.00

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
VOC MS (W)				
Tert-Butylbenzene	<0.001	<0.001	<0.002	<0.002
1,2,4-Trimethylbenzene	0.004	<0.001	0.008	<0.002
Sec-Butylbenzene	<0.001	<0.001	<0.002	<0.002
4-Isopropyltoluene	<0.001	<0.001	<0.002	<0.002
1,3-Dichlorobenzene	<0.001	<0.001	<0.002	<0.002
1,4-Dichlorobenzene	<0.001	<0.001	<0.002	<0.002
n-Butylbenzene	<0.001	<0.001	<0.002	<0.002
1,2-Dichlorobenzene	<0.001	<0.001	<0.002	<0.002
1,2-Dibromo-3-Chloropropane	<0.001	<0.001	<0.002	<0.002
1,2,4-Trichlorobenzene	<0.001	<0.001	<0.002	<0.002
Hexachlorobutadiene	<0.001	<0.001	<0.002	<0.002
Tert-amyl methyl ether	<0.001	<0.001	<0.002	<0.002
Naphthalene	0.00189	<0.001	0.00378	<0.002
1,2,3-Trichlorobenzene	<0.001	<0.001	<0.002	<0.002
1,3,5-Trichlorobenzene	<0.001	<0.001	<0.002	<0.002

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	7.99
Conductivity (µS/cm)	573.00
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CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 592601
Superseded Report: 592138

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	23927095	23927027	23927043	23927068	23927131	23927003
	WS05	WS06	WS06	WS06	WS07	WS08
	ES	ES	ES	ES	ES	ES
	0.30 - 0.30	0.30 - 0.40	2.10 - 2.30	3.50 - 4.00	0.20 - 0.40	0.40 - 0.40
	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	22-Mar-2021	22-Mar-2021	23-Mar-2021		23-Mar-2021	23-Mar-2021
Asbestos Quantification - Full	31-Mar-2021					
Boron Water Soluble	25-Mar-2021	25-Mar-2021	25-Mar-2021	25-Mar-2021	25-Mar-2021	25-Mar-2021
CEN 2:1 Leachate (1 Stage)			20-Mar-2021	20-Mar-2021		
CEN Readings			24-Mar-2021	24-Mar-2021		
Chromium III	25-Mar-2021	25-Mar-2021	25-Mar-2021	24-Mar-2021	25-Mar-2021	24-Mar-2021
EPH CWG (Aliphatic) Aqueous GC (W)			25-Mar-2021	25-Mar-2021		
EPH CWG (Aromatic) Aqueous GC (W)			25-Mar-2021	25-Mar-2021		
EPH CWG GC (S)	23-Mar-2021	22-Mar-2021	23-Mar-2021	23-Mar-2021	23-Mar-2021	22-Mar-2021
GRO by GC-FID (S)	22-Mar-2021	22-Mar-2021	23-Mar-2021	22-Mar-2021	22-Mar-2021	22-Mar-2021
GRO by GC-FID (W)			25-Mar-2021	25-Mar-2021		
Hexavalent Chromium (s)	23-Mar-2021	23-Mar-2021	23-Mar-2021	23-Mar-2021	23-Mar-2021	24-Mar-2021
Metals in solid samples by OES	25-Mar-2021	25-Mar-2021	25-Mar-2021	24-Mar-2021	25-Mar-2021	24-Mar-2021
Moisture at 105C			20-Mar-2021	20-Mar-2021		
PAH by GCMS	22-Mar-2021	22-Mar-2021	24-Mar-2021	22-Mar-2021	24-Mar-2021	23-Mar-2021
PAH Spec MS - Aqueous (W)			25-Mar-2021	25-Mar-2021		
pH	23-Mar-2021	23-Mar-2021	22-Mar-2021	23-Mar-2021	22-Mar-2021	23-Mar-2021
Phenols by HPLC (S)	23-Mar-2021	25-Mar-2021	24-Mar-2021	24-Mar-2021	25-Mar-2021	23-Mar-2021
Sample description	19-Mar-2021	19-Mar-2021	20-Mar-2021	19-Mar-2021	20-Mar-2021	19-Mar-2021
Semi Volatile Organic Compounds				23-Mar-2021		
SVOC MS (W) - Aqueous				25-Mar-2021		
Total Organic Carbon	25-Mar-2021	23-Mar-2021			25-Mar-2021	25-Mar-2021
TPH CWG (W)			25-Mar-2021	25-Mar-2021		
TPH CWG GC (S)	23-Mar-2021	22-Mar-2021	23-Mar-2021	23-Mar-2021	23-Mar-2021	22-Mar-2021
VOC MS (S)	23-Mar-2021	23-Mar-2021	23-Mar-2021	23-Mar-2021	23-Mar-2021	23-Mar-2021
VOC MS (W)				24-Mar-2021		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton ParkClient Reference: 70080743
Order Number: 70080743-EXPReport Number: 592601
Superseded Report: 592138

ASSOCIATED AQC DATA

Boron Water Soluble

Component	Method Code	QC 2302	QC 2363
Water Soluble Boron	TM222	100.5 84.00 : 111.00	101.0 84.00 : 111.00

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2357
Total Aliphatics >C10-C40	TM174	92.74 69.79 : 134.39

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2366
Total Aromatics >EC10-EC40	TM174	101.71 59.92 : 128.54

EPH CWG GC (S)

Component	Method Code	QC 2365	QC 2307
EPH >C8-C40 Raw	TM414	88.04 71.20 : 116.13	98.25 73.48 : 116.68
Total Aliphatics Raw	TM414	94.94 70.55 : 116.56	105.61 72.61 : 118.71
Total Aromatics Raw	TM414	87.84 58.66 : 132.26	100.59 63.37 : 122.69

GRO by GC-FID (S)

Component	Method Code	QC 2378	QC 2339	QC 2349
QC	TM089	92.08 70.75 : 114.19	90.28 70.34 : 111.95	80.49 70.34 : 111.95

GRO by GC-FID (W)

Component	Method Code	QC 2351
Benzene by GC	TM245	98.0 79.13 : 118.84
Ethylbenzene by GC	TM245	101.5 79.54 : 115.99
m & p Xylene by GC	TM245	102.0 78.44 : 116.32



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

GRO by GC-FID (W)

		QC 2351
MTBE GC-FID	TM245	93.5 81.43 : 120.09
o Xylene by GC	TM245	101.5 76.85 : 120.29
QC	TM245	87.01 71.58 : 131.01
Toluene by GC	TM245	100.0 79.00 : 121.96

Hexavalent Chromium (s)

Component	Method Code	QC 2385	QC 2300	QC 2358
Hexavalent Chromium	TM151	98.0 92.00 : 111.20	100.0 92.00 : 111.20	108.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2386	QC 2323	QC 2352	QC 2311
Aluminium	TM181	92.04 73.56 : 108.85	95.58 73.56 : 108.85	101.77 73.56 : 108.85	100.88 73.56 : 108.85
Antimony	TM181	100.81 76.89 : 111.24	89.84 76.89 : 111.24	92.68 76.89 : 111.24	104.07 76.89 : 111.24
Arsenic	TM181	102.33 88.53 : 111.01	105.81 88.53 : 111.01	105.23 88.53 : 111.01	103.49 88.53 : 111.01
Barium	TM181	95.41 77.67 : 105.35	99.08 77.67 : 105.35	99.08 77.67 : 105.35	96.33 77.67 : 105.35
Beryllium	TM181	101.49 85.44 : 109.61	104.48 85.44 : 109.61	104.1 85.44 : 109.61	103.73 85.44 : 109.61
Boron	TM181	91.4 73.51 : 104.66	96.28 73.51 : 104.66	97.99 73.51 : 104.66	100.57 73.51 : 104.66
Cadmium	TM181	91.77 77.67 : 104.12	93.83 77.67 : 104.12	94.65 77.67 : 104.12	91.36 77.67 : 104.12
Chromium	TM181	89.86 79.64 : 105.83	92.09 79.64 : 105.83	94.32 79.64 : 105.83	94.93 79.64 : 105.83
Cobalt	TM181	92.45 84.60 : 104.13	94.03 84.60 : 104.13	94.34 84.60 : 104.13	93.08 84.60 : 104.13
Copper	TM181	94.01 82.40 : 105.45	98.94 82.40 : 105.45	98.24 82.40 : 105.45	96.83 82.40 : 105.45
Iron	TM181	92.86 82.95 : 110.58	93.65 82.95 : 110.58	102.38 82.95 : 110.58	92.06 82.95 : 110.58
Lead	TM181	98.2 78.24 : 104.05	92.12 78.24 : 104.05	93.24 78.24 : 104.05	93.02 78.24 : 104.05
Manganese	TM181	108.33 94.29 : 119.51	111.11 94.29 : 119.51	112.5 94.29 : 119.51	111.11 94.29 : 119.51
Mercury	TM181	98.31 83.16 : 107.81	99.76 83.16 : 107.81	100.97 83.16 : 107.81	100.48 83.16 : 107.81
Molybdenum	TM181	102.47 87.11 : 106.87	100.82 87.11 : 106.87	99.18 87.11 : 106.87	103.7 87.11 : 106.87
Nickel	TM181	92.67 80.26 : 102.28	93.15 80.26 : 102.28	96.33 80.26 : 102.28	95.35 80.26 : 102.28



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Metals in solid samples by OES

		QC 2386	QC 2323	QC 2352	QC 2311
Phosphorus	TM181	107.47 94.56 : 124.28	112.93 94.56 : 124.28	112.93 94.56 : 124.28	110.1 94.56 : 124.28
Selenium	TM181	102.35 82.28 : 110.48	105.1 82.28 : 110.48	104.31 82.28 : 110.48	102.75 82.28 : 110.48
Strontium	TM181	93.99 79.13 : 102.79	97.77 79.13 : 102.79	97.77 79.13 : 102.79	99.11 79.13 : 102.79
Thallium	TM181	100.44 82.94 : 111.86	105.75 82.94 : 111.86	101.33 82.94 : 111.86	102.65 82.94 : 111.86
Tin	TM181	101.9 86.72 : 110.03	103.42 86.72 : 110.03	104.18 86.72 : 110.03	104.56 86.72 : 110.03
Titanium	TM181	85.5 66.23 : 102.06	88.55 66.23 : 102.06	90.08 66.23 : 102.06	91.6 66.23 : 102.06
Vanadium	TM181	98.9 86.19 : 109.45	104.76 86.19 : 109.45	102.2 86.19 : 109.45	107.69 86.19 : 109.45
Zinc	TM181	100.0 84.68 : 113.99	103.08 84.68 : 113.99	103.49 84.68 : 113.99	105.34 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2378	QC 2314	QC 2345
Acenaphthene	TM218	92.5 73.47 : 109.80	95.0 78.59 : 112.16	85.5 80.97 : 105.99
Acenaphthylene	TM218	92.0 70.00 : 130.00	94.0 75.11 : 109.01	83.0 74.76 : 107.36
Anthracene	TM218	89.0 68.68 : 111.89	93.5 73.99 : 113.85	80.5 73.04 : 106.97
Benz(a)anthracene	TM218	86.0 68.12 : 118.39	95.5 69.31 : 119.18	92.5 68.79 : 119.64
Benzo(a)pyrene	TM218	81.5 71.72 : 115.31	89.5 66.97 : 114.92	84.5 66.17 : 117.52
Benzo(b)fluoranthene	TM218	83.0 66.89 : 120.40	96.5 67.41 : 114.46	94.5 66.40 : 118.34
Benzo(ghi)perylene	TM218	86.0 67.82 : 118.49	99.0 62.92 : 114.36	83.0 67.68 : 112.07
Benzo(k)fluoranthene	TM218	85.0 73.10 : 117.03	99.0 69.98 : 116.49	84.0 72.84 : 114.66
Chrysene	TM218	85.0 69.58 : 115.47	95.0 69.86 : 114.50	87.0 68.39 : 115.56
Dibenzo(ah)anthracene	TM218	79.5 67.32 : 121.35	92.5 64.54 : 115.22	78.0 69.03 : 110.45
Fluoranthene	TM218	94.5 75.16 : 117.28	96.5 72.56 : 111.70	85.5 69.37 : 117.19
Fluorene	TM218	90.5 73.81 : 108.66	94.5 79.13 : 111.49	83.5 75.38 : 105.98
Indeno(123cd)pyrene	TM218	84.5 68.91 : 117.62	103.0 61.22 : 113.25	83.0 65.91 : 113.61
Naphthalene	TM218	94.5 72.12 : 106.18	94.5 77.96 : 110.91	86.5 71.40 : 105.87
Phenanthrene	TM218	93.0 69.01 : 113.72	96.0 76.83 : 113.25	85.5 74.04 : 109.30
Pyrene	TM218	92.5 64.28 : 115.75	95.0 72.45 : 110.77	85.0 69.68 : 115.27

PAH Spec MS - Aqueous (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97 Client Reference: 70080743 Report Number: 592601
Location: Unit 5 Barton Park Order Number: 70080743-EXP Superseded Report: 592138

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2374
Acenaphthene by GCMS	TM178	106.8 90.45 : 118.63
Acenaphthylene by GCMS	TM178	107.6 90.13 : 116.27
Anthracene by GCMS	TM178	105.6 92.40 : 114.00
Benz(a)anthracene by GCMS	TM178	107.2 89.51 : 117.69
Benzo(a)pyrene by GCMS	TM178	104.8 89.43 : 118.57
Benzo(b)fluoranthene by GCMS	TM178	108.4 87.80 : 121.80
Benzo(ghi)perylene by GCMS	TM178	95.2 87.10 : 119.30
Benzo(k)fluoranthene by GCMS	TM178	106.8 93.23 : 123.57
Chrysene by GCMS	TM178	104.0 88.68 : 116.92
Dibenzo(ah)anthracene by GCMS	TM178	94.4 86.24 : 118.56
Fluoranthene by GCMS	TM178	106.8 86.04 : 121.96
Fluorene by GCMS	TM178	104.0 90.76 : 121.24
Indeno(123cd)pyrene by GCMS	TM178	102.0 88.39 : 119.61
Naphthalene by GCMS	TM178	106.4 89.40 : 121.80
Phenanthrene by GCMS	TM178	107.6 90.41 : 119.19
Pyrene by GCMS	TM178	105.2 91.00 : 120.20

pH

Component	Method Code	QC 2362	QC 2339	QC 2336	QC 2371	QC 2384
pH	TM133	100.26 99.08 : 102.24	100.92 99.08 : 102.24	100.79 99.08 : 102.24	100.79 99.08 : 102.24	101.58 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2301	QC 2393	QC 2387
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.3 70.71 : 116.42	51.95 70.71 : 116.42	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.61 64.54 : 117.79	47.37 64.54 : 117.79	47.95 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	44.05 74.40 : 108.98	44.68 74.40 : 108.98	46.14 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	51.66 69.44 : 122.18	52.32 69.44 : 122.18	53.64 69.44 : 122.18



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton ParkClient Reference: 70080743
Order Number: 70080743-EXPReport Number: 592601
Superseded Report: 592138

Phenols by HPLC (S)

		QC 2301	QC 2393	QC 2387
Xylenols by HPLC (S)	TM062 (S)	48.96 76.56 : 106.38	49.9 76.56 : 106.38	51.56 76.56 : 106.38

Semi Volatile Organic Compounds

Component	Method Code	QC 2394
4-Bromophenylphenylether (Soil)	TM157	94.5 66.75 : 125.25
Benzo(a)anthracene (Soil)	TM157	86.5 67.40 : 120.50
Hexachlorobutadiene (Soil)	TM157	95.5 68.25 : 126.75
Naphthalene (Soil)	TM157	94.0 67.55 : 125.45
Nitrobenzene (Soil)	TM157	90.0 66.50 : 123.50
Phenol (Soil)	TM157	85.5 69.92 : 114.02

SVOC MS (W) - Aqueous

Component	Method Code	QC 2329
4-Bromophenylphenylether	TM176	90.4 61.60 : 106.72
Benzo(a)anthracene	TM176	88.8 64.64 : 115.52
Benzo(a)pyrene	TM176	92.8 60.56 : 115.28
Butylbenzyl phthalate	TM176	90.4 57.12 : 116.16
Hexachlorobutadiene	TM176	70.24 52.88 : 95.12
Naphthalene	TM176	93.6 65.68 : 110.32
Nitrobenzene	TM176	88.8 57.12 : 109.44
Phenol	TM176	48.32 37.60 : 70.72

Total Organic Carbon

Component	Method Code	QC 2348	QC 2300	QC 2368
Total Organic Carbon	TM132	103.13 87.02 : 113.45	96.48 87.02 : 113.45	104.69 87.02 : 113.45

VOC MS (S)



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 592601
Superseded Report: 592138

VOC MS (S)

Component	Method Code	QC 2384	QC 2308
1,1,1,2-tetrachloroethane	TM116	109.4 86.59 : 118.97	97.8 86.59 : 118.97
1,1,1-Trichloroethane	TM116	105.0 86.26 : 117.53	103.0 86.26 : 117.53
1,1,2-Trichloroethane	TM116	103.8 75.16 : 112.70	98.8 75.16 : 112.70
1,1-Dichloroethane	TM116	113.6 83.27 : 122.16	114.4 83.27 : 122.16
1,2-Dichloroethane	TM116	113.6 89.30 : 133.10	113.4 89.30 : 133.10
1,4-Dichlorobenzene	TM116	122.6 82.59 : 123.23	109.4 82.59 : 123.23
2-Chlorotoluene	TM116	113.0 66.81 : 118.43	98.8 66.81 : 118.43
4-Chlorotoluene	TM116	105.2 65.88 : 114.76	89.6 65.88 : 114.76
Benzene	TM116	103.8 93.16 : 123.63	101.0 93.16 : 123.63
Carbon Disulphide	TM116	103.0 75.11 : 124.81	103.8 75.11 : 124.81
Carbontetrachloride	TM116	104.0 82.35 : 126.46	98.0 82.35 : 126.46
Chlorobenzene	TM116	109.6 85.07 : 118.13	98.4 85.07 : 118.13
Chloroform	TM116	111.0 88.13 : 122.71	110.6 88.13 : 122.71
Chloromethane	TM116	111.4 61.62 : 145.66	135.0 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	107.4 78.27 : 128.90	106.6 78.27 : 128.90
Dibromomethane	TM116	93.6 77.47 : 121.29	92.6 77.47 : 121.29
Dichloromethane	TM116	116.0 87.89 : 134.72	118.0 87.89 : 134.72
Ethylbenzene	TM116	102.0 79.92 : 110.05	90.6 79.92 : 110.05
Hexachlorobutadiene	TM116	110.4 16.78 : 153.29	62.8 16.78 : 153.29
Isopropylbenzene	TM116	106.6 64.20 : 119.59	86.2 64.20 : 119.59
Naphthalene	TM116	122.6 79.29 : 125.59	104.6 79.29 : 125.59
o-Xylene	TM116	98.0 72.86 : 102.10	85.8 72.86 : 102.10
p/m-Xylene	TM116	97.2 74.06 : 106.47	83.5 74.06 : 106.47
Sec-Butylbenzene	TM116	110.4 44.71 : 117.87	69.2 44.71 : 117.87
Tetrachloroethene	TM116	103.4 85.86 : 122.95	92.0 85.86 : 122.95
Toluene	TM116	100.4 87.82 : 116.21	95.2 87.82 : 116.21
Trichloroethene	TM116	99.4 79.80 : 112.33	93.6 79.80 : 112.33



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97 Client Reference: 70080743 Report Number: 592601
Location: Unit 5 Barton Park Order Number: 70080743-EXP Superseded Report: 592138

VOC MS (S)

		QC 2384	QC 2308
Trichlorofluoromethane	TM116	103.6 80.52 : 132.12	102.6 80.52 : 132.12
Vinyl Chloride	TM116	117.4 74.57 : 146.88	121.0 74.57 : 146.88

VOC MS (W)

Component	Method Code	QC 2380
1,1,1,2-Tetrachloroethane	TM208	91.5 81.85 : 113.65
1,1,1-Trichloroethane	TM208	107.0 84.51 : 110.07
1,1-Dichloroethane	TM208	110.0 79.60 : 118.57
1,2-Dichloroethane	TM208	106.5 77.72 : 133.33
2-Chlorotoluene	TM208	100.0 82.89 : 116.61
4-Chlorotoluene	TM208	100.0 79.46 : 115.88
Benzene	TM208	112.0 81.22 : 118.60
Bromomethane	TM208	101.0 79.31 : 116.90
Carbontetrachloride	TM208	108.0 86.16 : 119.10
Chlorobenzene	TM208	103.5 87.25 : 116.65
Chloroform	TM208	108.5 83.01 : 121.64
Chloromethane	TM208	119.5 65.28 : 130.05
Cis-1,2-Dichloroethene	TM208	106.0 85.03 : 112.75
Dichloromethane	TM208	108.0 78.23 : 120.65
Ethylbenzene	TM208	99.0 79.55 : 110.51
Hexachlorobutadiene	TM208	99.5 68.58 : 117.78
o-Xylene	TM208	100.5 85.06 : 114.91
p/m-Xylene	TM208	96.25 82.09 : 109.18
Tert-butyl methyl ether	TM208	104.5 68.39 : 125.81
Tetrachloroethene	TM208	98.0 82.09 : 113.14
Toluene	TM208	101.0 79.88 : 116.83
Trichloroethene	TM208	100.5 82.30 : 112.45
Vinyl Chloride	TM208	112.5 71.34 : 122.34



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

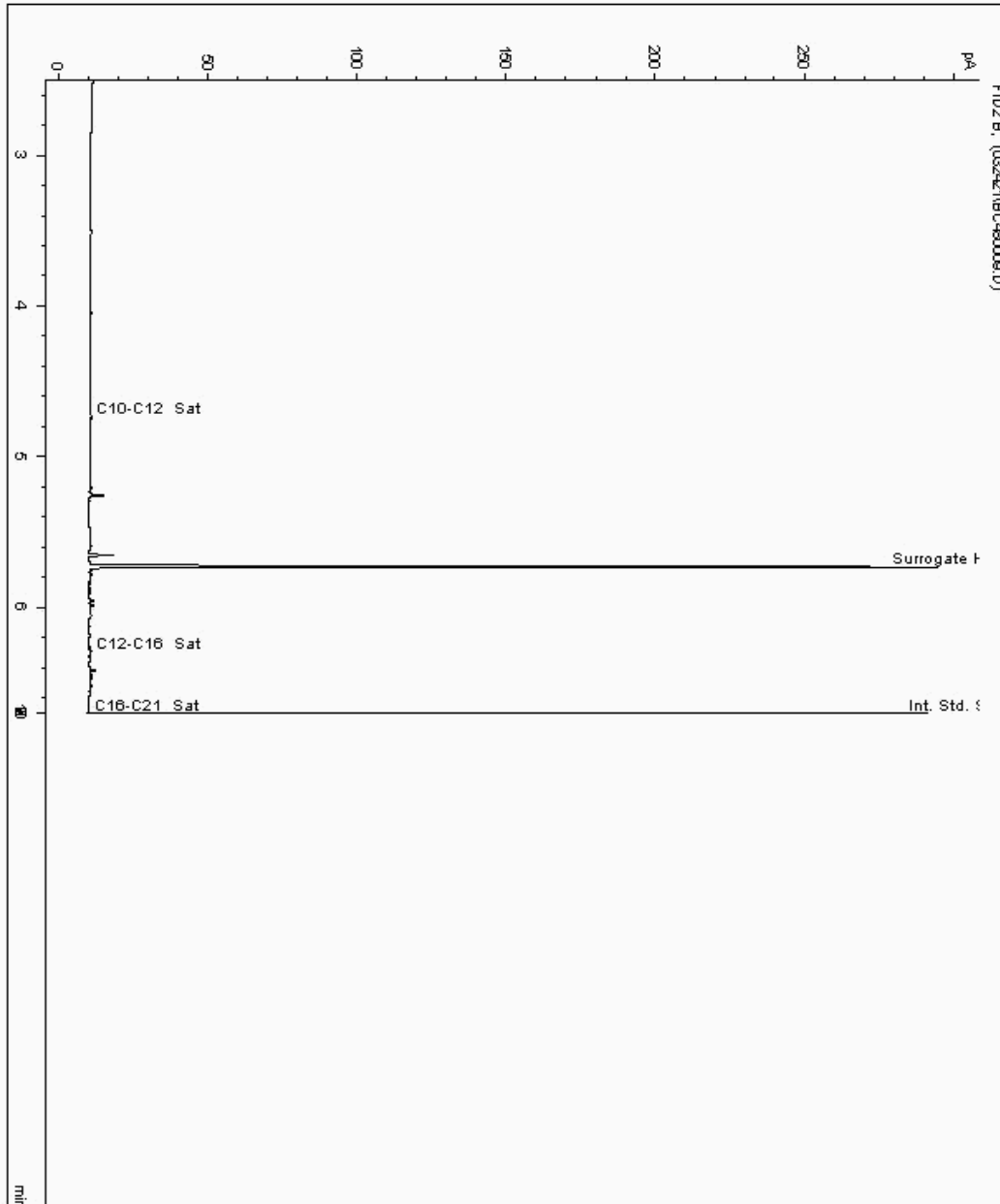
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 23956778
Sample ID : WS06

Depth : 3.50 - 4.00

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

Sample Identity: 22430732-
Date Acquired : 24/03/2021 22:48:00 PM
Units : ppb
Dilution : WS06 [3.50 - 4.00] CEN 2 1->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

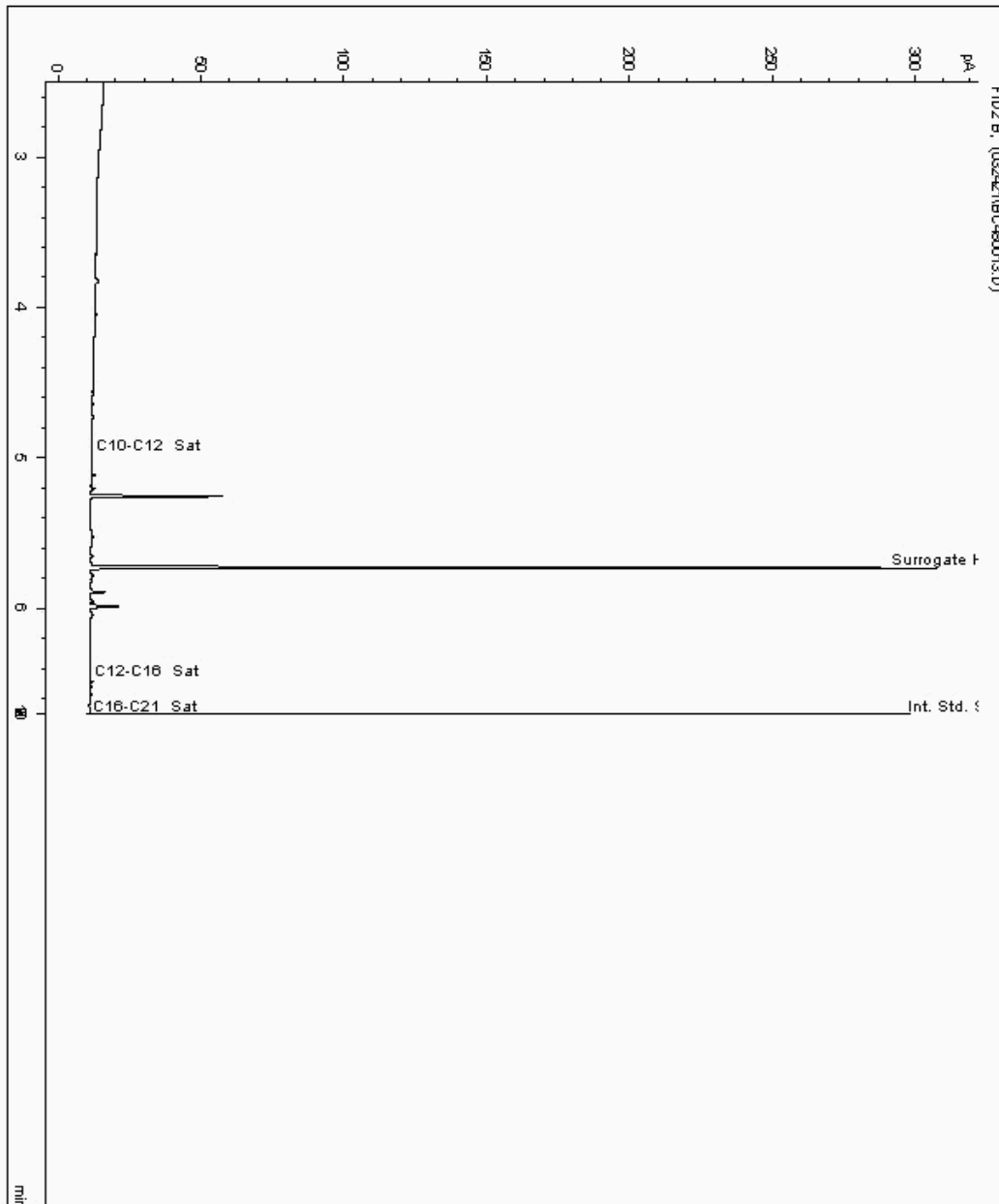
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 23959276
Sample ID : WS06

Depth : 2.10 - 2.30

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

Sample Identity: 22430722-
Date Acquired : 25/03/2021 00:20:03 PM
Units : ppb
Dilution : WS06 [2.10 - 2.30] CEN 2 1->
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 592601
Superseded Report: 592138

Chromatogram

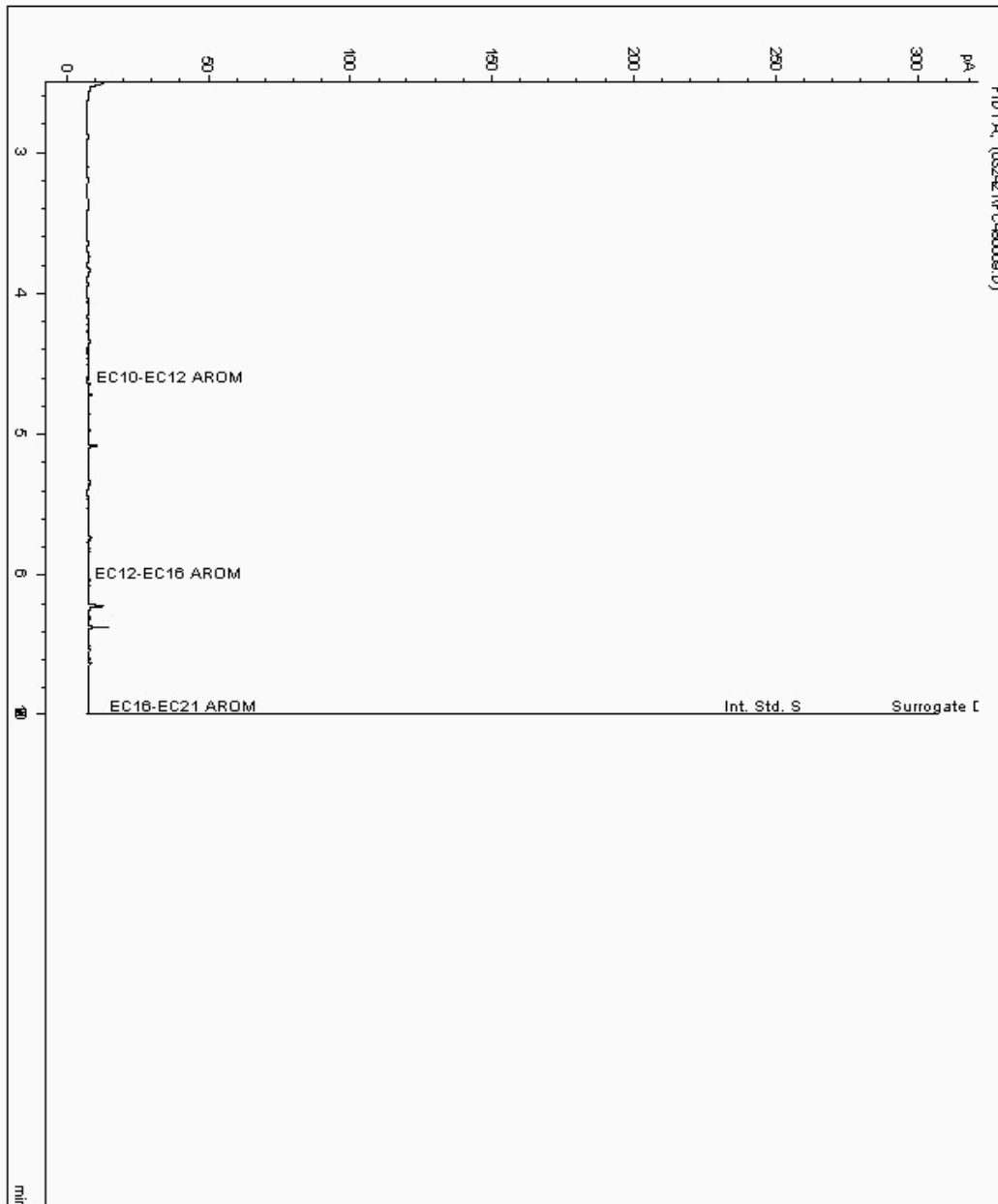
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 23956778
Sample ID : WS06

Depth : 3.50 - 4.00

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

Sample Identity: 22430733-
Date Acquired : 24/03/2021 22:48:00 PM
Units : ppb
Dilution : WS06 [3.50 - 4.00] CEN 2 1->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 592601
Superseded Report: 592138

Chromatogram

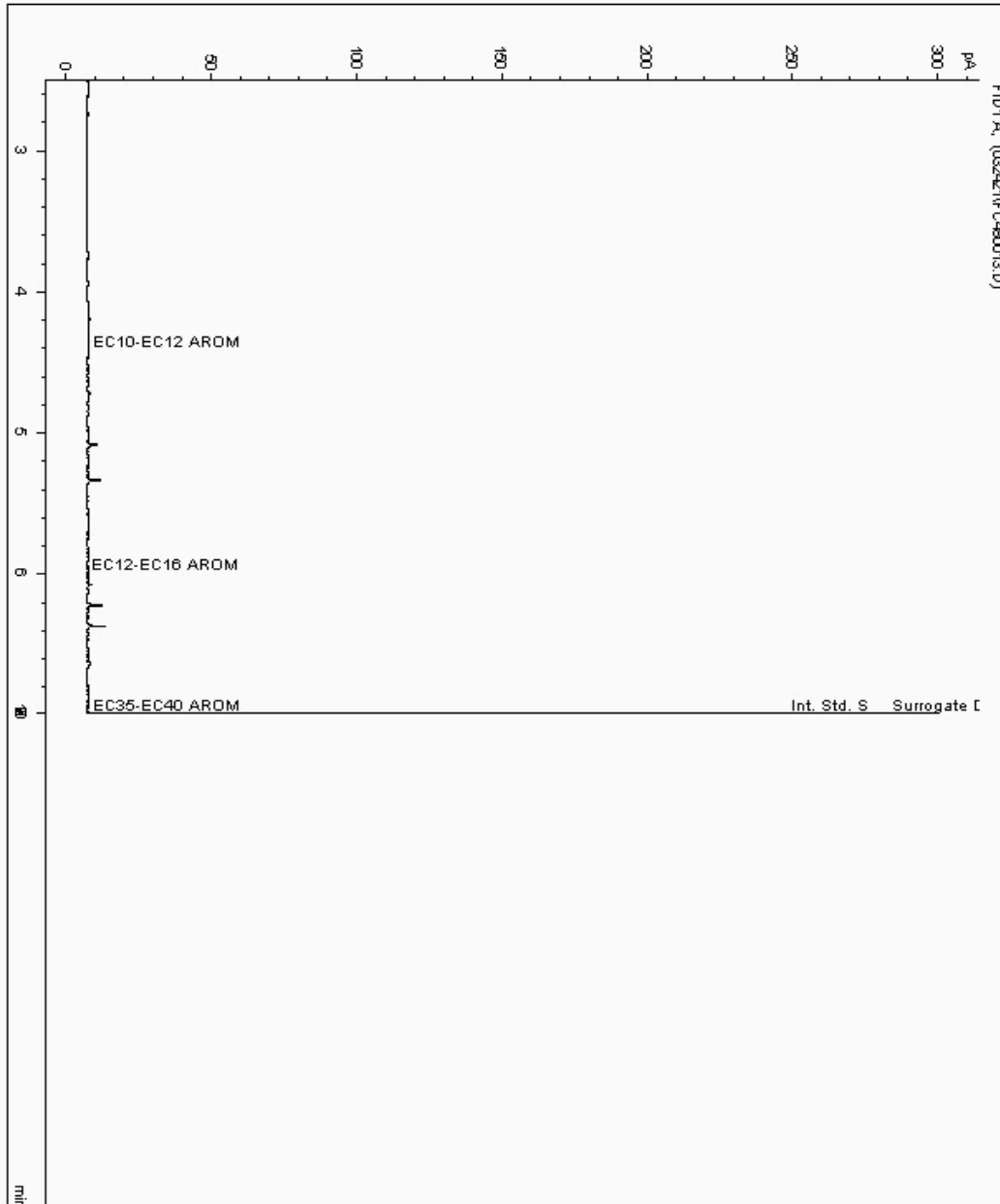
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 23959276
Sample ID : WS06

Depth : 2.10 - 2.30

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

Sample Identity: 22430723-
Date Acquired : 25/03/2021 00:20:03 PM
Units : ppb
Dilution : WS06 [2.10 - 2.30] CEN 2 1->
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

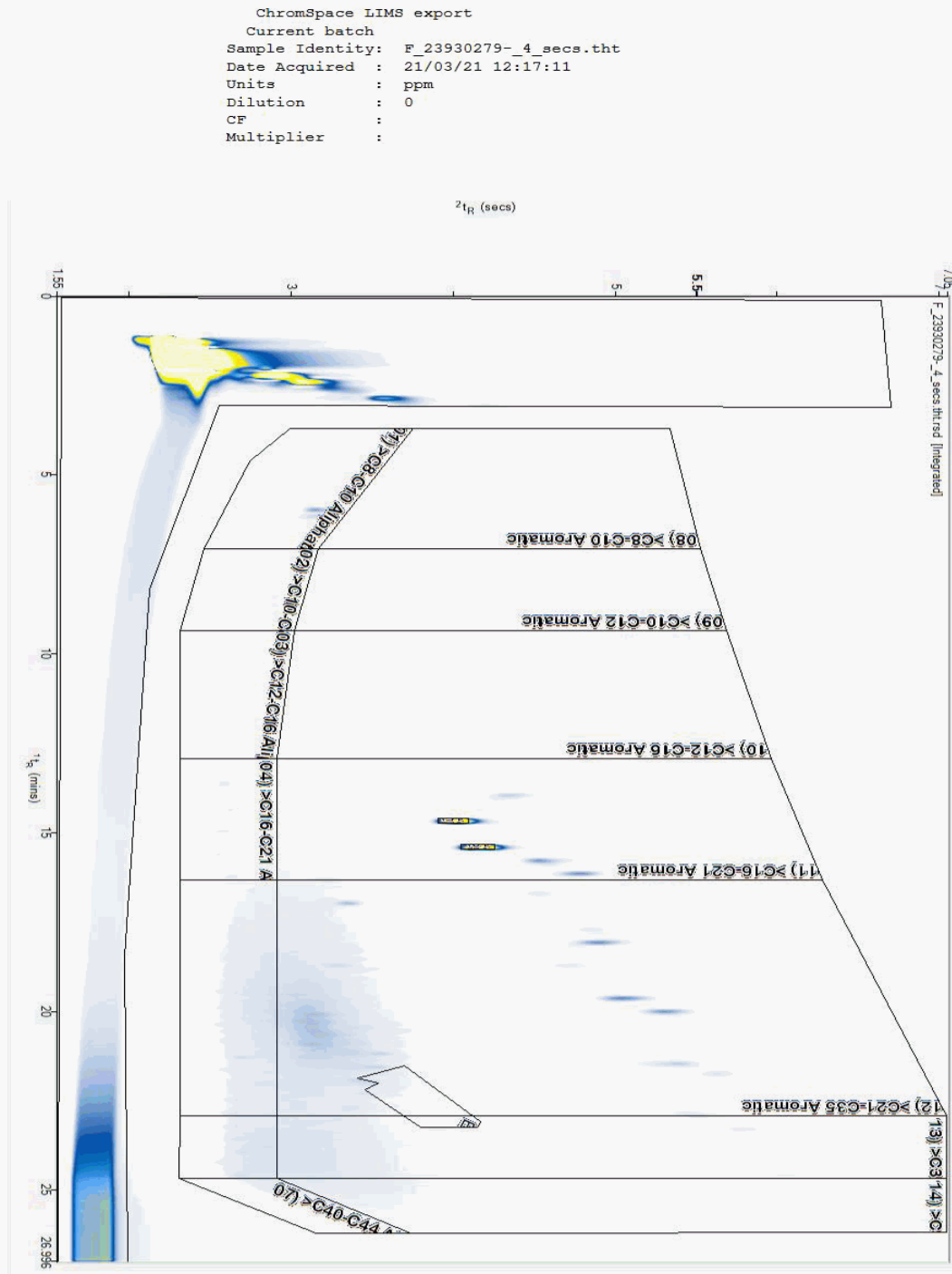
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23930279
Sample ID : WS08

Depth : 0.40 - 0.40





CERTIFICATE OF ANALYSIS

Validated

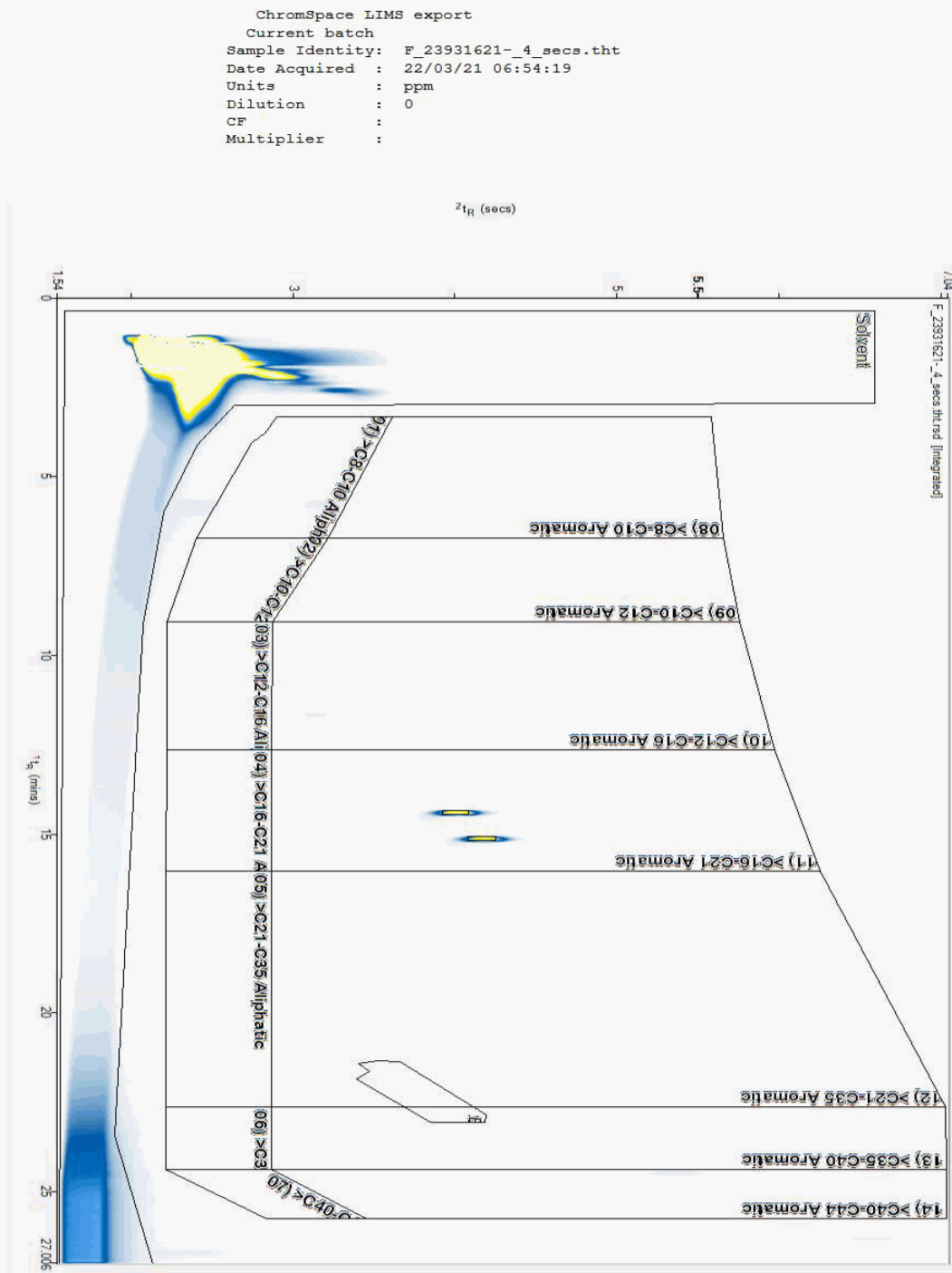
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23931621
Sample ID : WS06

Depth : 3.50 - 4.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-97
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

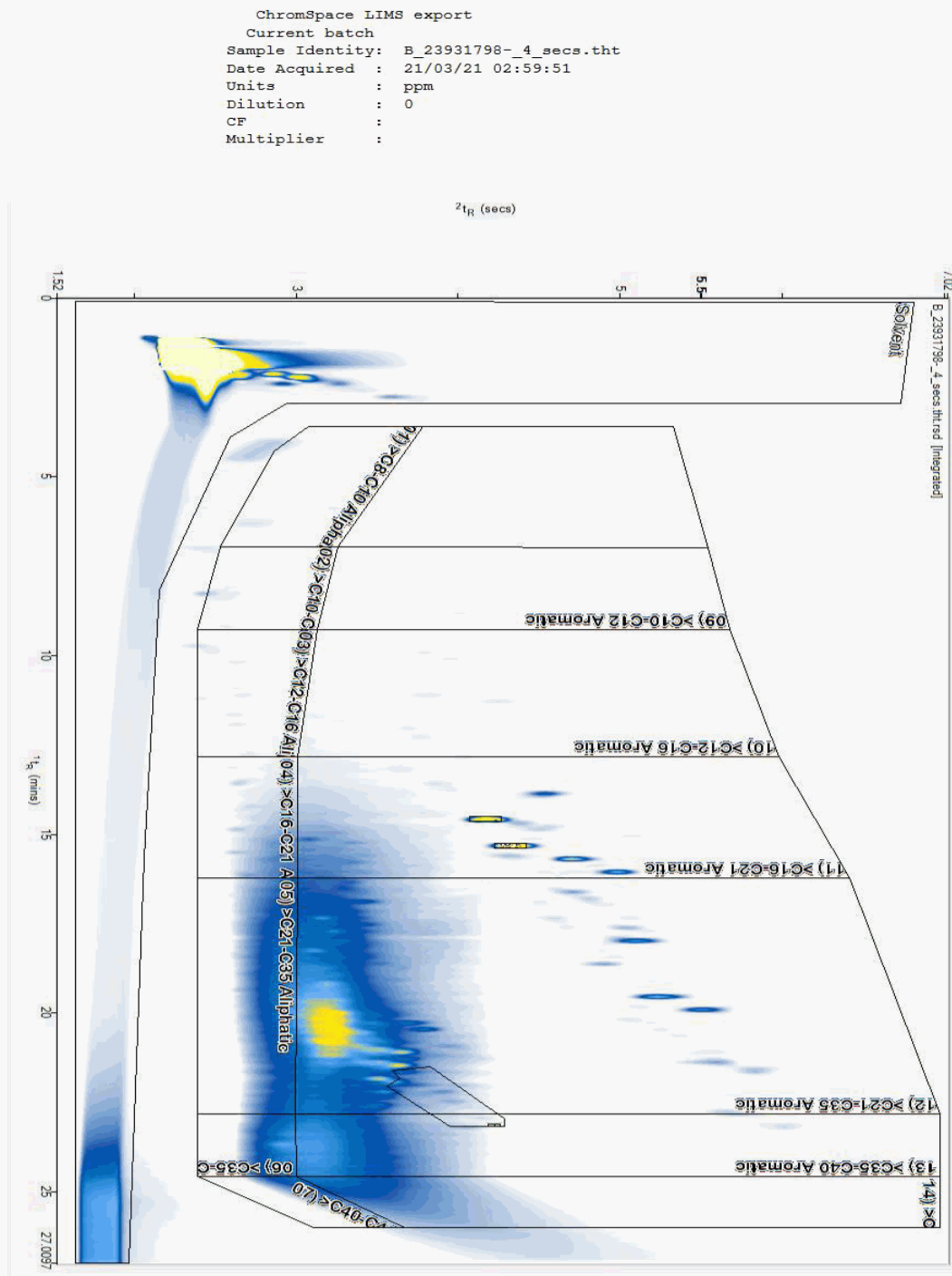
Report Number: 592601
Superseded Report: 592138

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23931798
Sample ID : WS06

Depth : 0.30 - 0.40





CERTIFICATE OF ANALYSIS

Validated

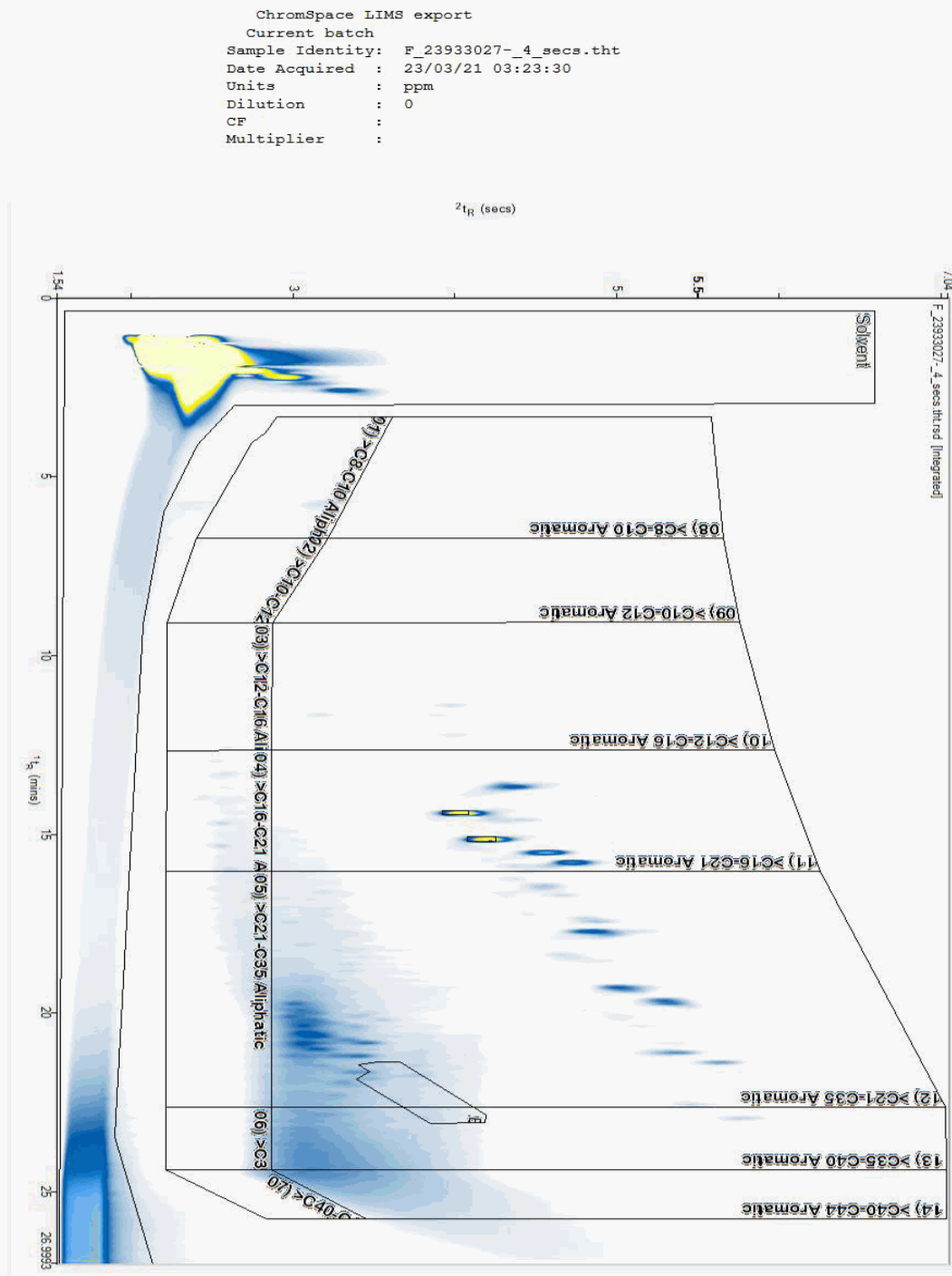
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23933027
Sample ID : WS05

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

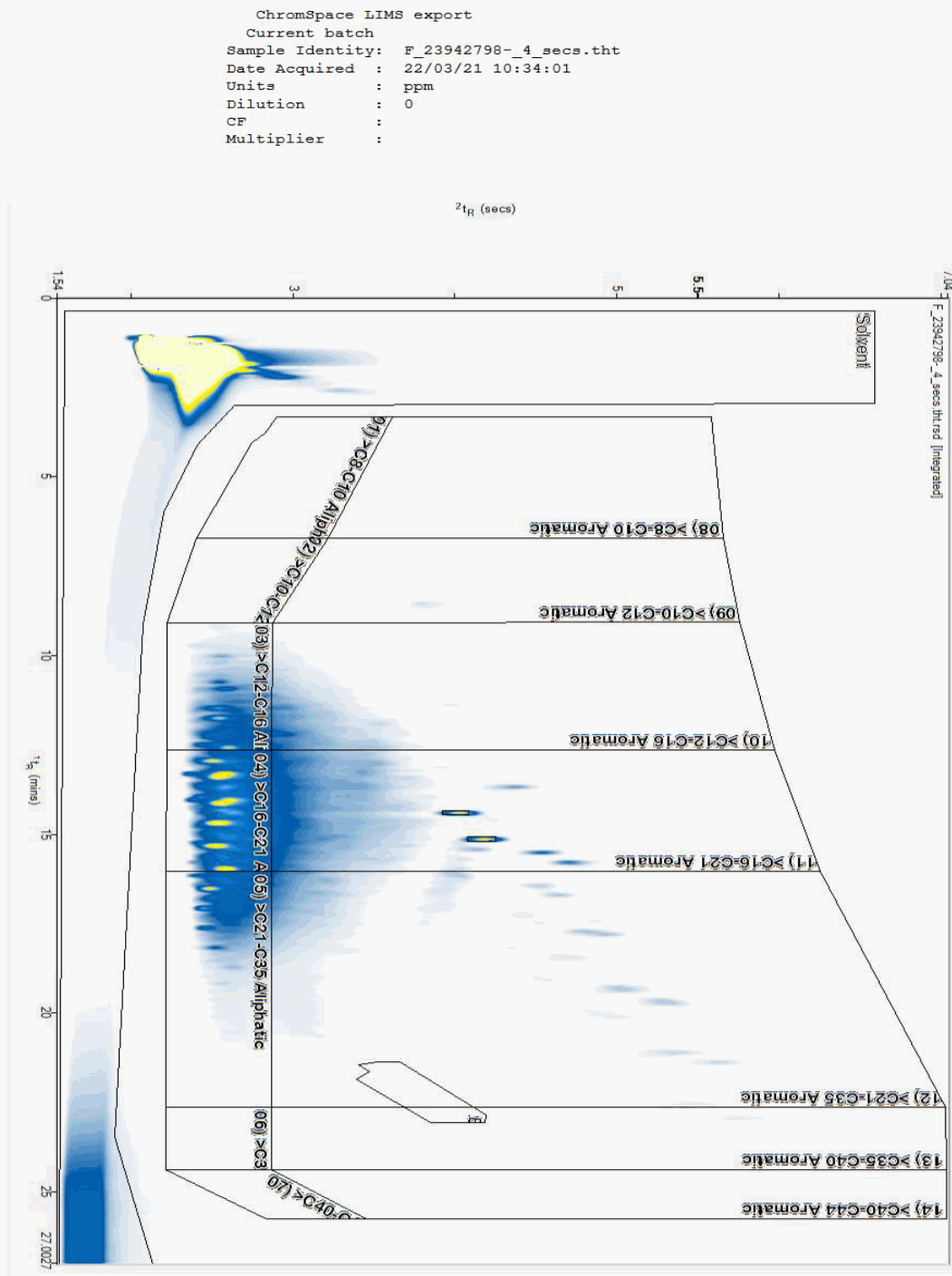
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23942798
Sample ID : WS07

Depth : 0.20 - 0.40



SDG:	210318-97
Location:	Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

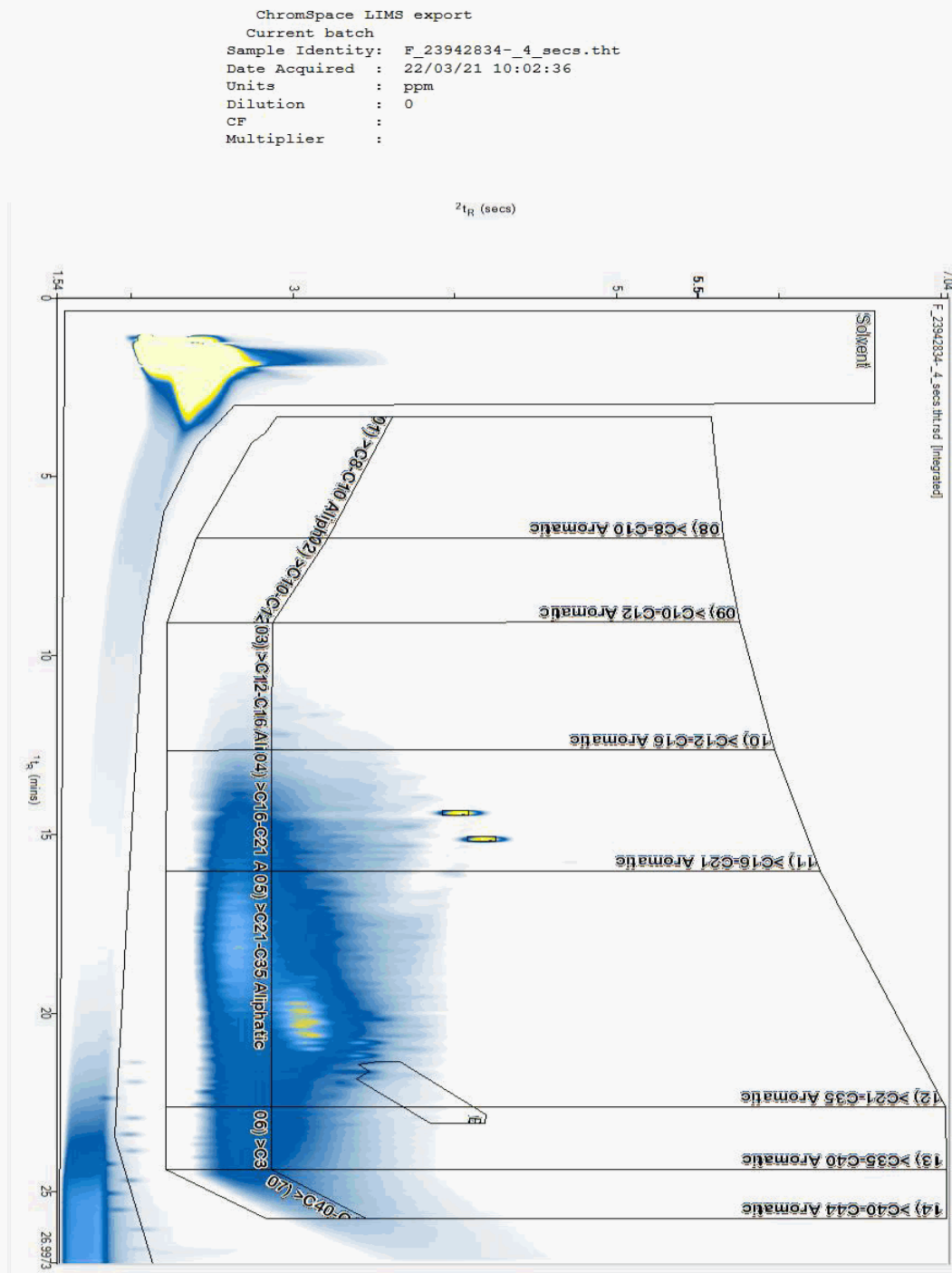
Report Number:	592601
Superseded Report:	592138

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23942834
Sample ID : WS06

Depth : 2.10 - 2.30





CERTIFICATE OF ANALYSIS

Validated

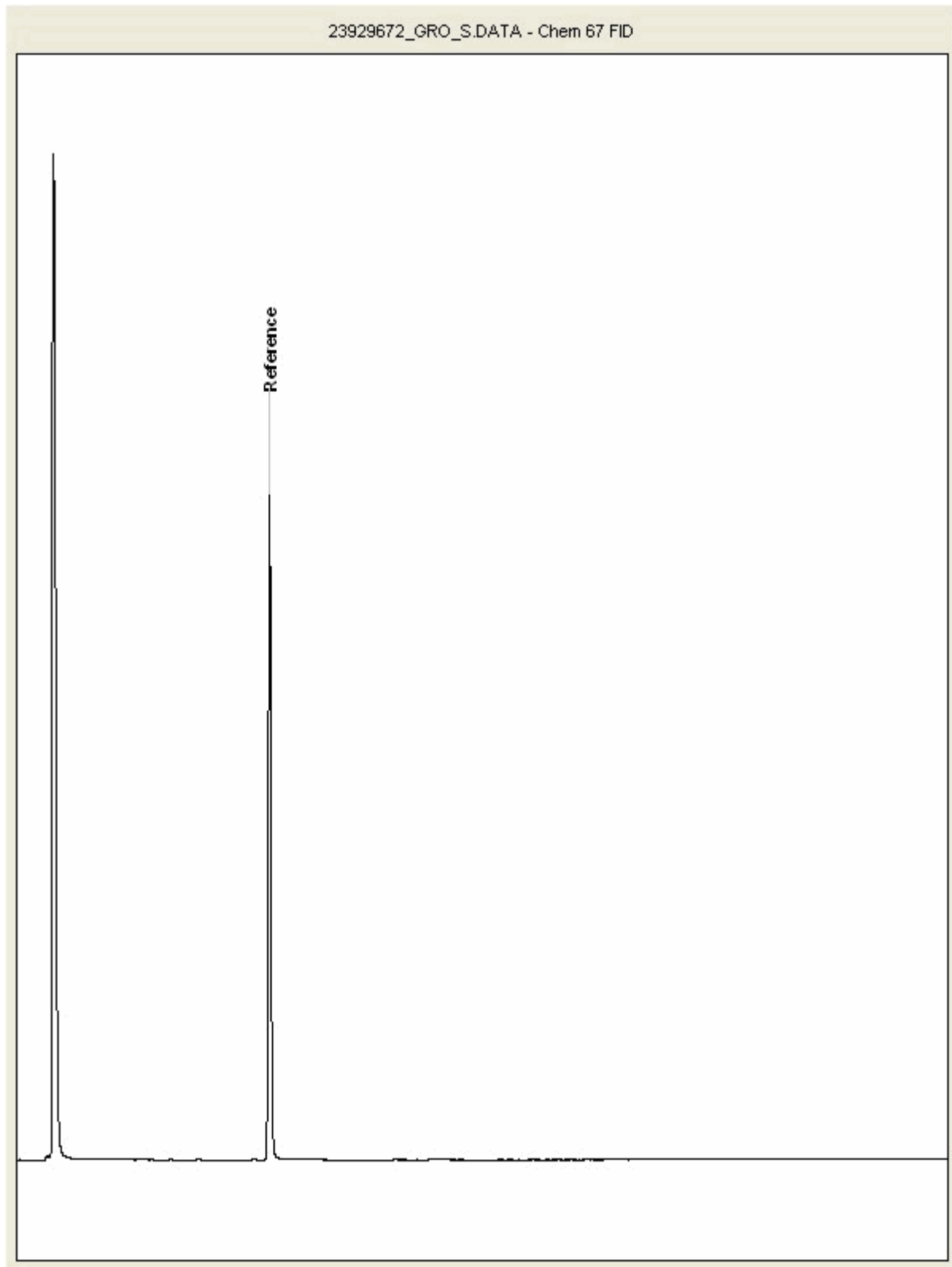
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23929672
Sample ID : WS08

Depth : 0.40 - 0.40





CERTIFICATE OF ANALYSIS

Validated

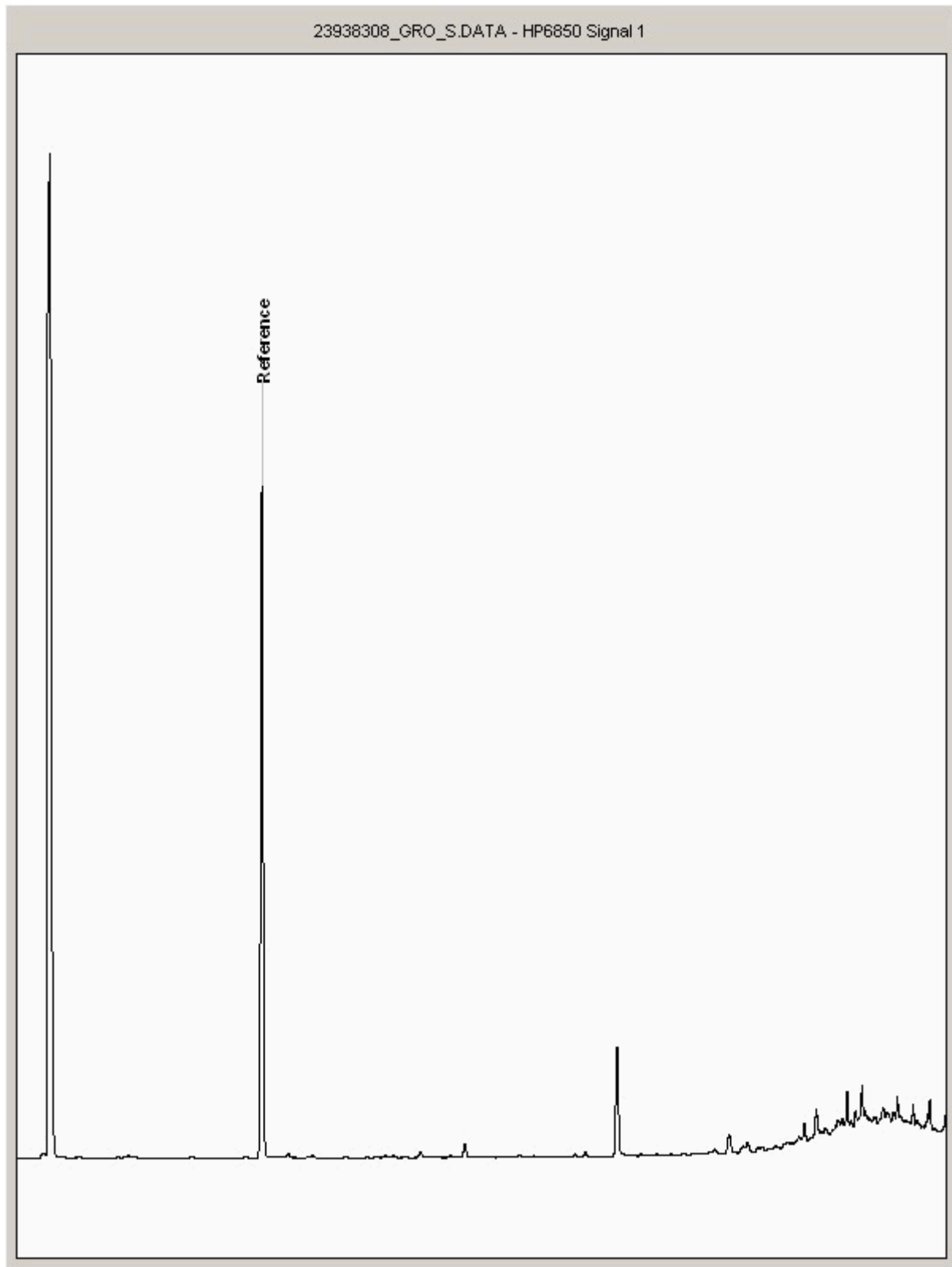
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23938308
Sample ID : WS07

Depth : 0.20 - 0.40





CERTIFICATE OF ANALYSIS

Validated

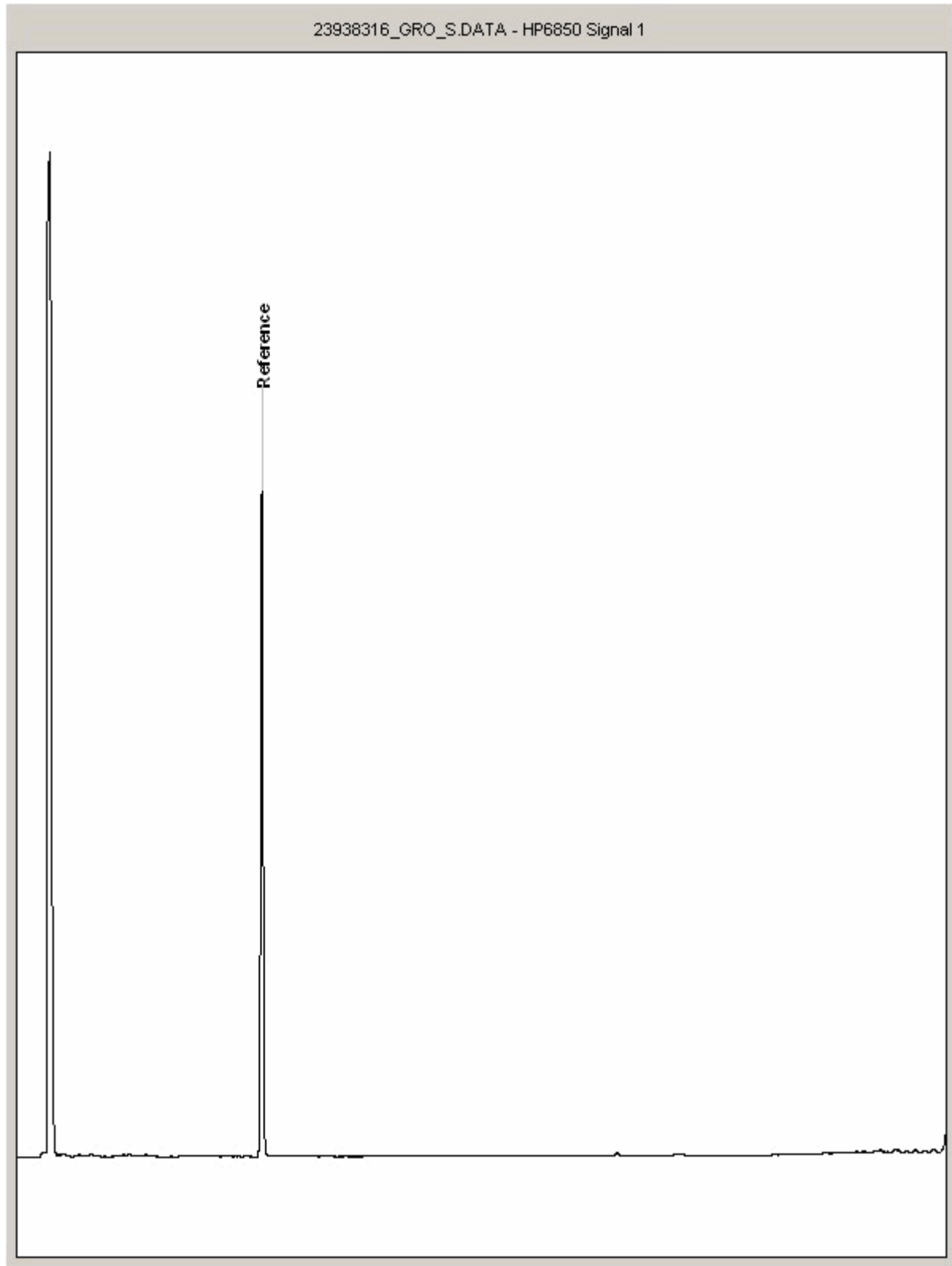
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23938316
Sample ID : WS05

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

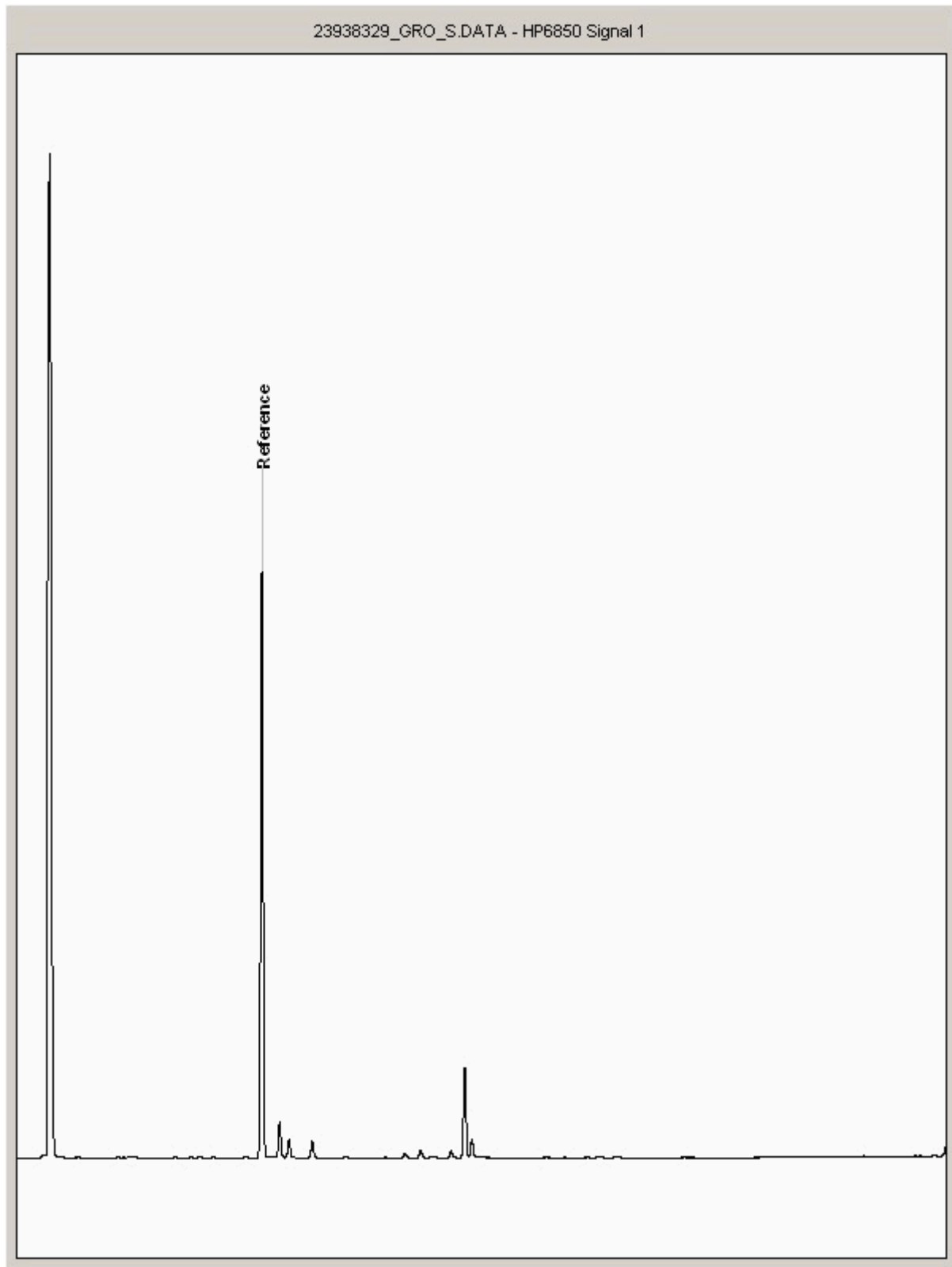
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23938329
Sample ID : WS06

Depth : 3.50 - 4.00





CERTIFICATE OF ANALYSIS

Validated

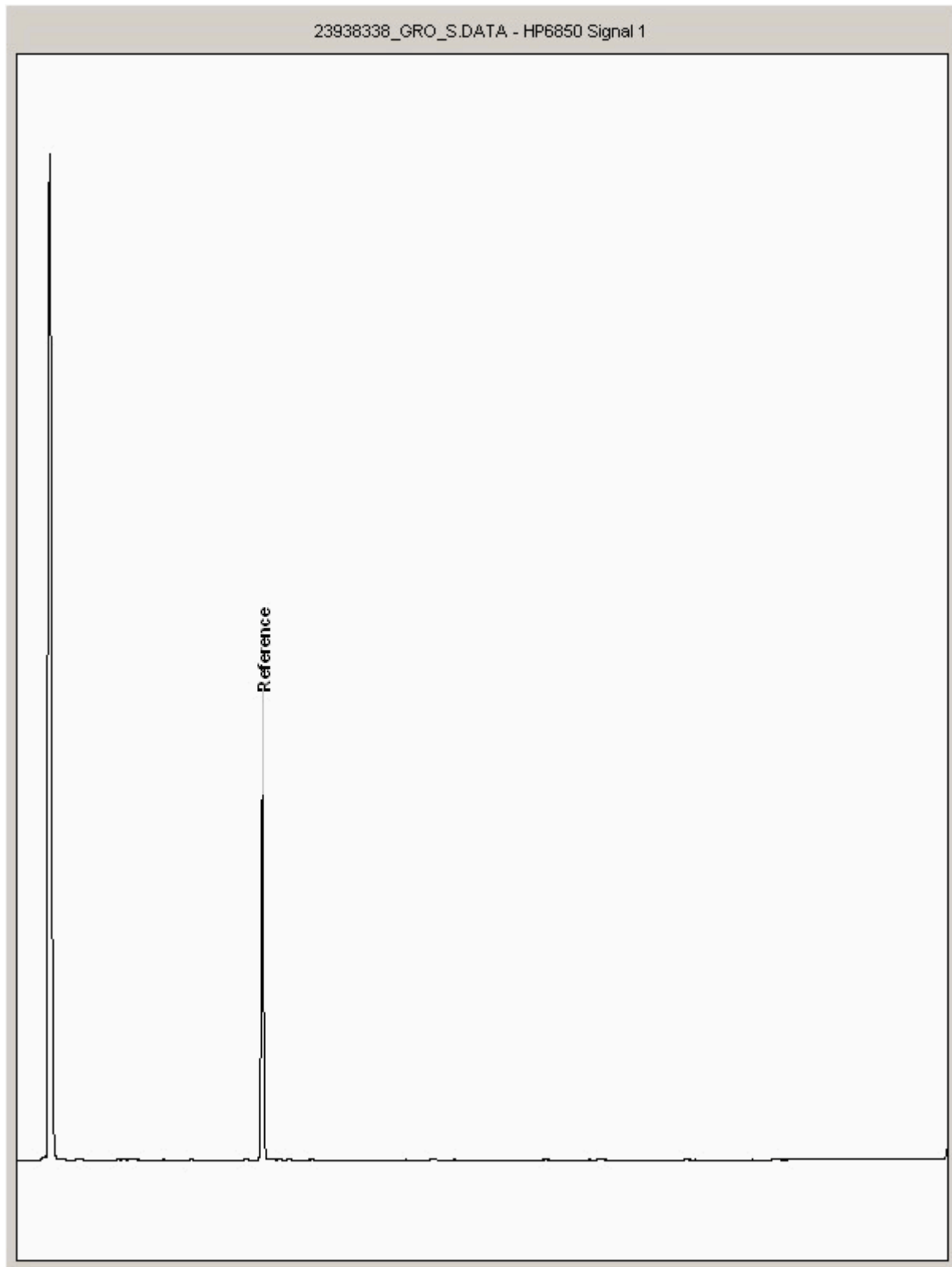
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23938338
Sample ID : WS06

Depth : 0.30 - 0.40





CERTIFICATE OF ANALYSIS

Validated

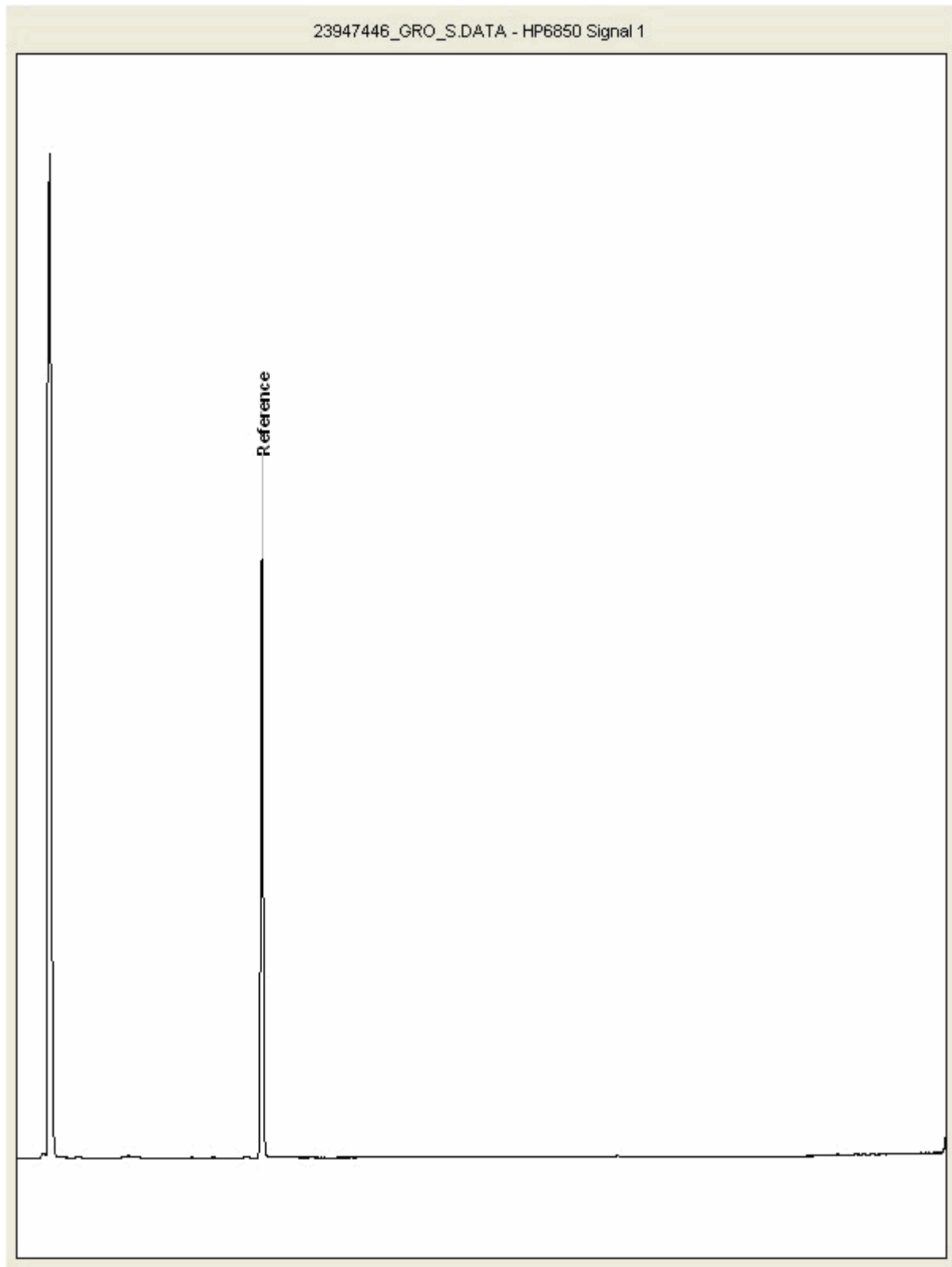
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23947446
Sample ID : WS06

Depth : 2.10 - 2.30





CERTIFICATE OF ANALYSIS

Validated

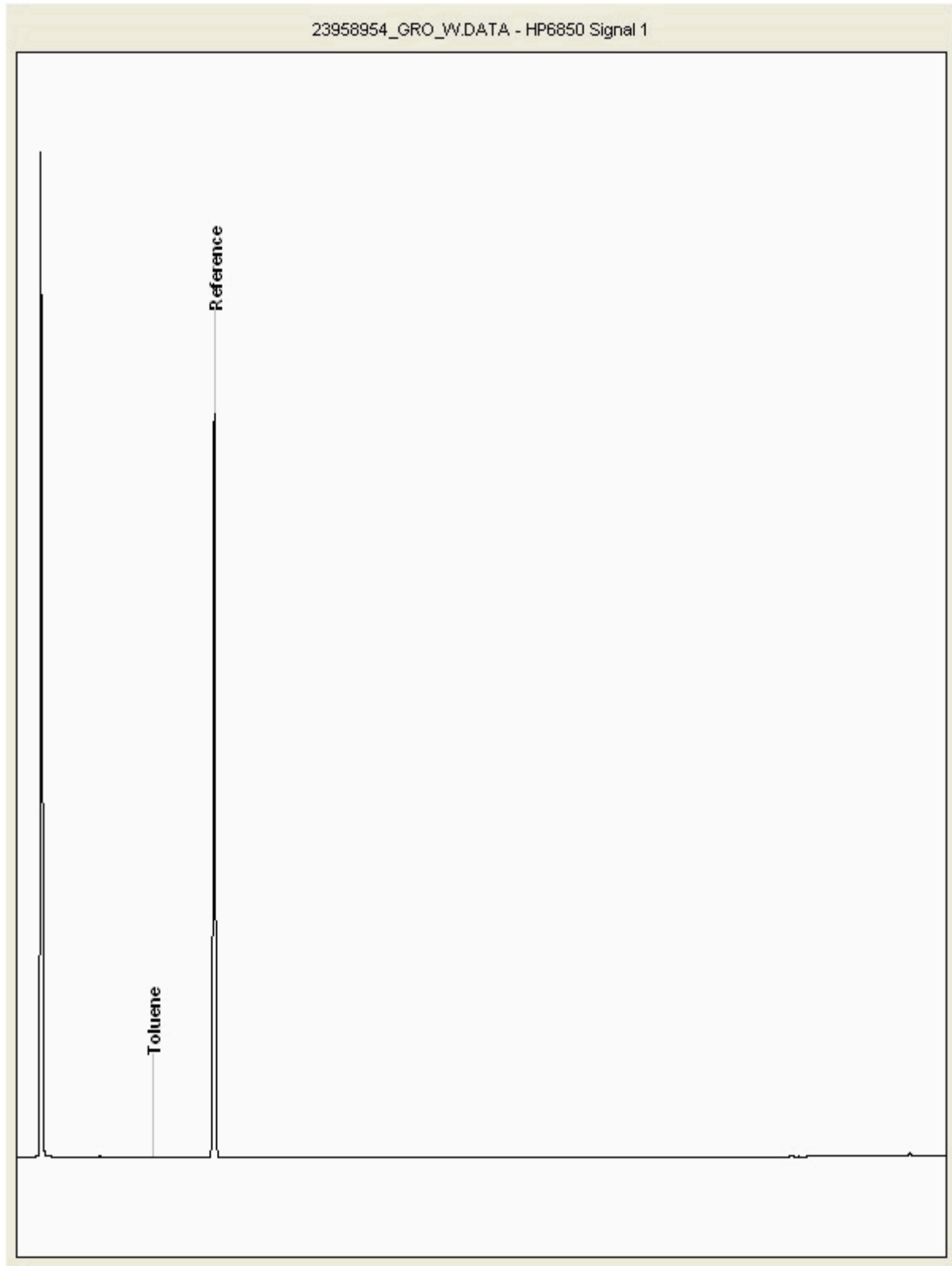
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 23958954
Sample ID : WS06

Depth : 2.10 - 2.30





CERTIFICATE OF ANALYSIS

Validated

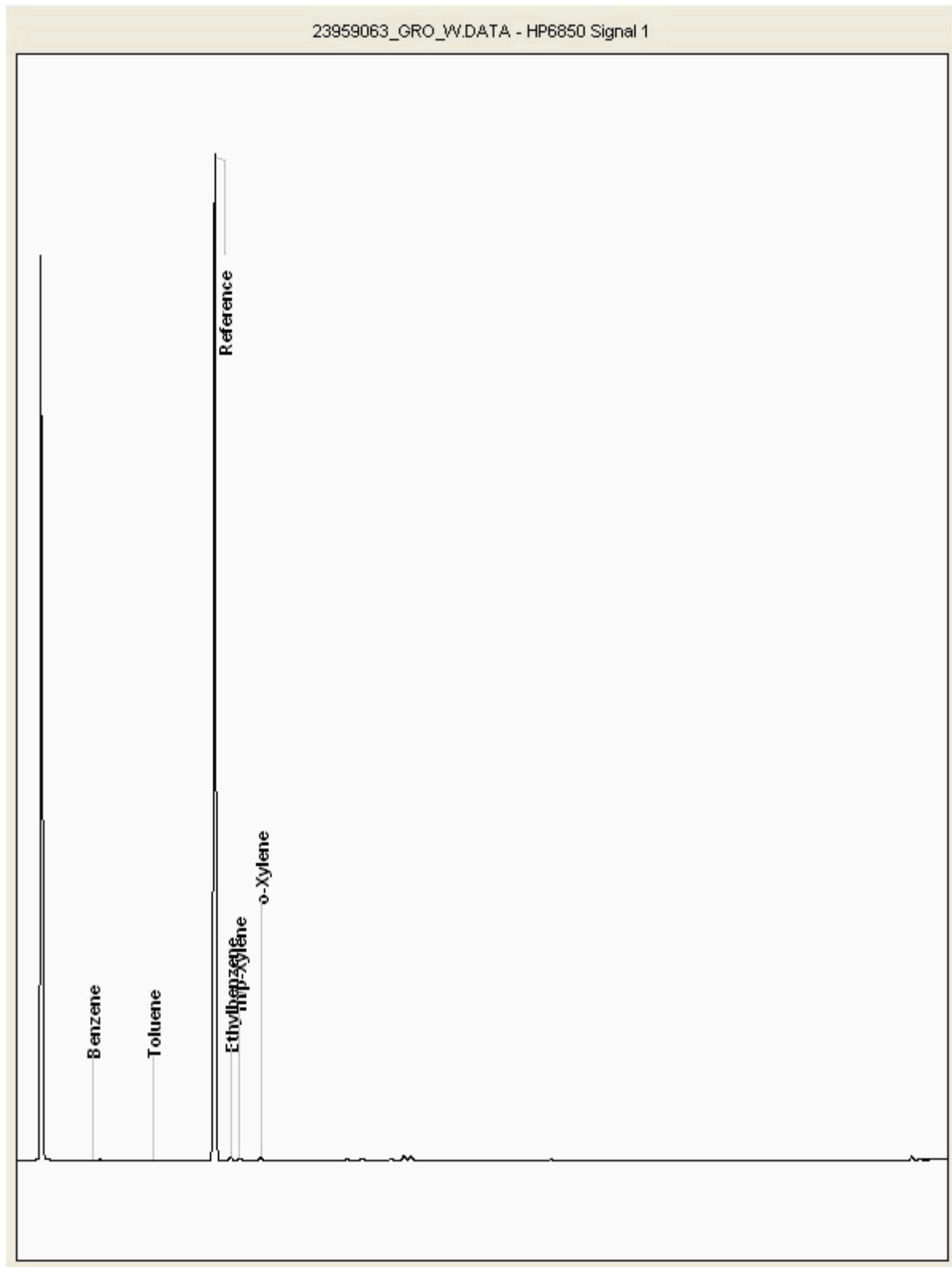
SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 23959063
Sample ID : WS06

Depth : 3.50 - 4.00





CERTIFICATE OF ANALYSIS

SDG:	210318-97	Client Reference:	70080743	Report Number:	592601
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	592138

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

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

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

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

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

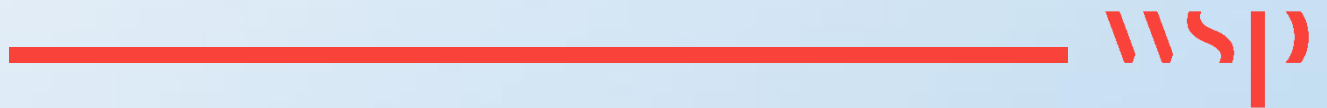
Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix G

LABORATORY CERTIFICATES - WATERS





Unit 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

WSP PB LBH
WSP PB
4th Floor
6 Devonshire Square
London
EC2M 4YE

Attention: David Crellin

CERTIFICATE OF ANALYSIS

Date of report Generation: 15 April 2021
Customer: WSP PB LBH
Sample Delivery Group (SDG): 210402-67
Your Reference: 70080743
Location: Unit 5 Barton Park
Report No: 594151

This report has been revised and directly supersedes 594129 in its entirety.

We received 3 samples on Friday April 02, 2021 and 3 of these samples were scheduled for analysis which was completed on Thursday April 15, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24020309	WS05	EW20210331	1.00 - 2.30	31/03/2021
24020323	WS06	EW20210331	1.00 - 2.50	31/03/2021
24020332	WS07	EW20210331	1.50 - 5.00	31/03/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-67
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 594151
Superseded Report: 594129

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	WS05	WS06	WS07			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.30 Ground Water (GW) 31/03/2021	1.00 - 2.50 Ground Water (GW) 31/03/2021	1.50 - 5.00 Ground Water (GW) 31/03/2021			
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4*5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2-Chlorophenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2-Methylphenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2-Nitroaniline (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
2-Nitrophenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
3-Nitroaniline (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
4-Chloroaniline (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
4-Methylphenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
4-Nitroaniline (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
4-Nitrophenol (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
Azobenzene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
Acenaphthylene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
Acenaphthene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
Anthracene (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<20 #	<20 #	<2 #			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<10 #	<10 #	<1 #			



CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.	WS05	WS06	WS07			
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.30 Ground Water (GW) 31/03/2021	1.00 - 2.50 Ground Water (GW) 31/03/2021	1.50 - 5.00 Ground Water (GW) 31/03/2021			
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
+	Subcontracted - refer to subcontractor report for accreditation status.			02/04/2021	02/04/2021	02/04/2021			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			210402-67	210402-67	210402-67			
(F)	Trigger breach confirmed			24020309	24020323	24020332			
1-4&5@	Sample deviation (see appendix)			EW20210331	EW20210331	EW20210331			
Component	LOD/Units	Method							
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Carbazole (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Chrysene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Dibenzofuran (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Diethyl phthalate (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Dimethyl phthalate (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<50 #	<50 #	<5 #			
Fluoranthene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Fluorene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Hexachlorobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Pentachlorophenol (aq)	<1 µg/l	TM176		<10	<10	<1			
Phenol (aq)	<1 µg/l	TM176		<10	<10	<1			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Hexachloroethane (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Nitrobenzene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Naphthalene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Isophorone (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<10	<10	<1			
Phenanthrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			
Pyrene (aq)	<1 µg/l	TM176		<10 #	<10 #	<1 #			



CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

VOC MS (W)

Results Legend		Customer Sample Ref.	WS05	WS06	WS07			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.30 Ground Water (GW) 31/03/2021	1.00 - 2.50 Ground Water (GW) 31/03/2021	1.50 - 5.00 Ground Water (GW) 31/03/2021			
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4+5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	124	120	118			
Toluene-d8**	%	TM208	99.4	99.9	101			
4-Bromofluorobenzene**	%	TM208	96.8	98.2	99.5			
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Chloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Vinyl chloride	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Bromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Chloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Trichlorofluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #	<3 #			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
2,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Bromochloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Chloroform	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Carbontetrachloride	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,2-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Trichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Dibromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Bromodichloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			



CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

VOC MS (W)

Results Legend			Customer Sample Ref.	WS05	WS06	WS07			
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 2.30 Ground Water (GW) 31/03/2021	1.00 - 2.50 Ground Water (GW) 31/03/2021	1.50 - 5.00 Ground Water (GW) 31/03/2021			
M	mCERTS accredited.								
sq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
+	Subcontracted - refer to subcontractor report for accreditation status.			02/04/2021	02/04/2021	02/04/2021			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			210402-67	210402-67	210402-67			
(F)	Trigger breach confirmed			24020309	24020323	24020332			
1-4+5@	Sample deviation (see appendix)			EW20210331	EW20210331	EW20210331			
Component	LOD/Units	Method							
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #			



CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Table of Results - Appendix

Method No	Reference	Description
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Test Completion Dates

Lab Sample No(s)	24020309	24020323	24020332
Customer Sample Ref.	WS05	WS06	WS07
AGS Ref.	EW20210331	EW20210331	EW20210331
Depth	1.00 - 2.30	1.00 - 2.50	1.50 - 5.00
Type	Ground Water	Ground Water	Ground Water

Dissolved Metals by ICP-MS	09-Apr-2021		09-Apr-2021
EPH CWG (Aliphatic) Aqueous GC (W)	14-Apr-2021	14-Apr-2021	14-Apr-2021
EPH CWG (Aromatic) Aqueous GC (W)	14-Apr-2021	14-Apr-2021	14-Apr-2021
GRO by GC-FID (W)	12-Apr-2021	12-Apr-2021	12-Apr-2021
Hexavalent Chromium (w)	07-Apr-2021	06-Apr-2021	06-Apr-2021
Mercury Dissolved	08-Apr-2021		08-Apr-2021
PAH Spec MS - Aqueous (W)	14-Apr-2021	14-Apr-2021	13-Apr-2021
Phenols by HPLC (W)	08-Apr-2021	08-Apr-2021	08-Apr-2021
SVOC MS (W) - Aqueous	12-Apr-2021	12-Apr-2021	12-Apr-2021
TPH CWG (W)	14-Apr-2021	14-Apr-2021	15-Apr-2021
VOC MS (W)	12-Apr-2021	12-Apr-2021	12-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-67
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 594151
Superseded Report: 594129

ASSOCIATED AQC DATA

Dissolved Metals by ICP-MS

Component	Method Code	QC 2470
Aluminium	TM152	104.0 90.98 : 111.82
Antimony	TM152	103.67 90.44 : 113.04
Arsenic	TM152	100.33 88.00 : 112.00
Barium	TM152	102.17 90.20 : 111.19
Beryllium	TM152	105.33 87.77 : 113.97
Bismuth	TM152	100.5 91.90 : 112.20
Borate	TM152	105.56 88.00 : 112.00
Boron	TM152	105.67 96.48 : 114.93
Cadmium	TM152	104.67 96.43 : 110.53
Calcium	TM152	100.67 81.38 : 119.09
Chromium	TM152	96.83 91.84 : 108.67
Cobalt	TM152	93.33 88.00 : 112.00
Copper	TM152	97.33 92.47 : 118.11
Iron	TM152	98.0 92.00 : 113.00
Lead	TM152	101.83 88.00 : 112.00
Lithium	TM152	105.0 91.62 : 113.12
Magnesium	TM152	93.33 93.14 : 107.91
Manganese	TM152	99.83 95.03 : 110.58
Molybdenum	TM152	97.33 88.00 : 112.00
Nickel	TM152	96.67 88.00 : 112.00
Phosphorus	TM152	95.67 88.00 : 112.00
Potassium	TM152	100.67 93.90 : 112.36
Selenium	TM152	104.33 91.58 : 115.98
Silver	TM152	99.5 88.80 : 122.30
Sodium	TM152	94.67 94.28 : 110.71
Strontium	TM152	104.33 88.00 : 112.00



CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-67
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 594151
Superseded Report: 594129

Dissolved Metals by ICP-MS

		QC 2470
Tellurium	TM152	102.5 93.32 : 114.66
Thallium	TM152	97.5 88.00 : 112.00
Tin	TM152	101.0 92.63 : 109.70
Titanium	TM152	105.33 95.58 : 111.68
Tungsten	TM152	99.33 81.32 : 124.72
Uranium	TM152	102.17 88.00 : 112.00
Vanadium	TM152	104.67 88.00 : 112.00
Zinc	TM152	101.0 92.98 : 118.95

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2472	QC 2484
Total Aliphatics >C10-C40	TM174	107.43 68.59 : 134.82	90.43 65.58 : 141.57

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2478	QC 2431
Total Aromatics >EC10-EC40	TM174	94.63 60.75 : 129.09	90.24 60.75 : 129.09

GRO by GC-FID (W)

Component	Method Code	QC 2440
Benzene by GC	TM245	96.5 81.54 : 119.70
Ethylbenzene by GC	TM245	99.5 80.99 : 121.09
m & p Xylene by GC	TM245	100.25 82.77 : 123.19
MTBE GC-FID	TM245	94.0 80.06 : 123.27
o Xylene by GC	TM245	101.5 84.26 : 121.50
QC	TM245	90.56 67.65 : 138.14
Toluene by GC	TM245	99.0 82.78 : 121.99

Hexavalent Chromium (w)



CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-67 Client Reference: 70080743 Report Number: 594151
Location: Unit 5 Barton Park Order Number: 70080743-EXP Superseded Report: 594129

Hexavalent Chromium (w)

Component	Method Code	QC 2429	QC 2479
Hexavalent Chromium	TM241	99.6 94.17 : 106.17	100.6 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2484
Mercury Dissolved (CVAf)	TM183	86.6 69.30 : 128.70

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2485	QC 2465
Acenaphthene by GCMS	TM178	110.0 97.60 : 116.80	112.0 90.45 : 118.63
Acenaphthylene by GCMS	TM178	95.6 89.20 : 113.20	110.8 90.13 : 116.27
Anthracene by GCMS	TM178	96.8 92.40 : 116.40	104.4 92.40 : 114.00
Benz(a)anthracene by GCMS	TM178	98.0 84.40 : 110.80	106.4 89.51 : 117.69
Benzo(a)pyrene by GCMS	TM178	99.2 88.40 : 110.00	107.6 89.43 : 118.57
Benzo(b)fluoranthene by GCMS	TM178	95.2 81.20 : 114.80	106.8 87.80 : 121.80
Benzo(ghi)perylene by GCMS	TM178	106.4 93.60 : 112.80	105.6 87.10 : 119.30
Benzo(k)fluoranthene by GCMS	TM178	102.0 90.40 : 119.20	111.6 93.23 : 123.57
Chrysene by GCMS	TM178	102.0 96.80 : 113.60	108.8 88.68 : 116.92
Dibenzo(ah)anthracene by GCMS	TM178	96.0 88.00 : 112.00	106.4 86.24 : 118.56
Fluoranthene by GCMS	TM178	106.8 93.49 : 118.20	114.0 86.04 : 121.96
Fluorene by GCMS	TM178	108.8 94.39 : 118.66	110.0 90.76 : 121.24
Indeno(123cd)pyrene by GCMS	TM178	98.8 90.40 : 114.40	106.0 88.39 : 119.61
Naphthalene by GCMS	TM178	106.4 94.00 : 115.60	111.2 89.40 : 121.80
Phenanthrene by GCMS	TM178	100.8 94.80 : 114.00	106.0 90.41 : 119.19
Pyrene by GCMS	TM178	111.2 96.40 : 115.60	115.2 91.00 : 120.20

Phenols by HPLC (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-67
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 594151
Superseded Report: 594129

Phenols by HPLC (W)

Component	Method Code	QC 2457
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	47.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	44.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	47.33 76.60 : 126.28
Naphthol by HPLC (W)	TM259	46.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	48.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	47.33 79.09 : 131.82

SVOC MS (W) - Aqueous

Component	Method Code	QC 2481
4-Bromophenylphenylether	TM176	96.0 52.80 : 111.84
Benzo(a)anthracene	TM176	98.4 59.28 : 107.76
Benzo(a)pyrene	TM176	100.8 54.40 : 105.76
Butylbenzyl phthalate	TM176	102.4 51.68 : 117.92
Hexachlorobutadiene	TM176	84.0 48.64 : 95.68
Naphthalene	TM176	94.4 63.04 : 111.04
Nitrobenzene	TM176	87.2 59.92 : 108.40
Phenol	TM176	53.2 36.88 : 72.40

VOC MS (W)

Component	Method Code	QC 2445
1,1,1,2-Tetrachloroethane	TM208	97.5 81.85 : 113.65
1,1,1-Trichloroethane	TM208	98.5 84.51 : 110.07
1,1-Dichloroethane	TM208	105.0 79.60 : 118.57
1,2-Dichloroethane	TM208	106.0 77.72 : 133.33
2-Chlorotoluene	TM208	101.0 82.89 : 116.61
4-Chlorotoluene	TM208	101.5 79.46 : 115.88
Benzene	TM208	102.5 81.22 : 118.60
Bromomethane	TM208	107.5 79.31 : 116.90
Carbontetrachloride	TM208	100.5 86.16 : 119.10



CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

VOC MS (W)

		QC 2445
Chlorobenzene	TM208	103.5 87.25 : 116.65
Chloroform	TM208	107.5 83.01 : 121.64
Chloromethane	TM208	125.0 65.28 : 130.05
Cis-1,2-Dichloroethene	TM208	106.0 85.03 : 112.75
Dichloromethane	TM208	107.5 78.23 : 120.65
Ethylbenzene	TM208	99.0 79.55 : 110.51
Hexachlorobutadiene	TM208	91.0 68.58 : 117.78
o-Xylene	TM208	99.0 85.06 : 114.91
p/m-Xylene	TM208	97.25 82.09 : 109.18
Tert-butyl methyl ether	TM208	96.5 68.39 : 125.81
Tetrachloroethene	TM208	98.5 82.09 : 113.14
Toluene	TM208	100.5 79.88 : 116.83
Trichloroethene	TM208	99.5 82.30 : 112.45
Vinyl Chloride	TM208	113.0 71.34 : 122.34

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

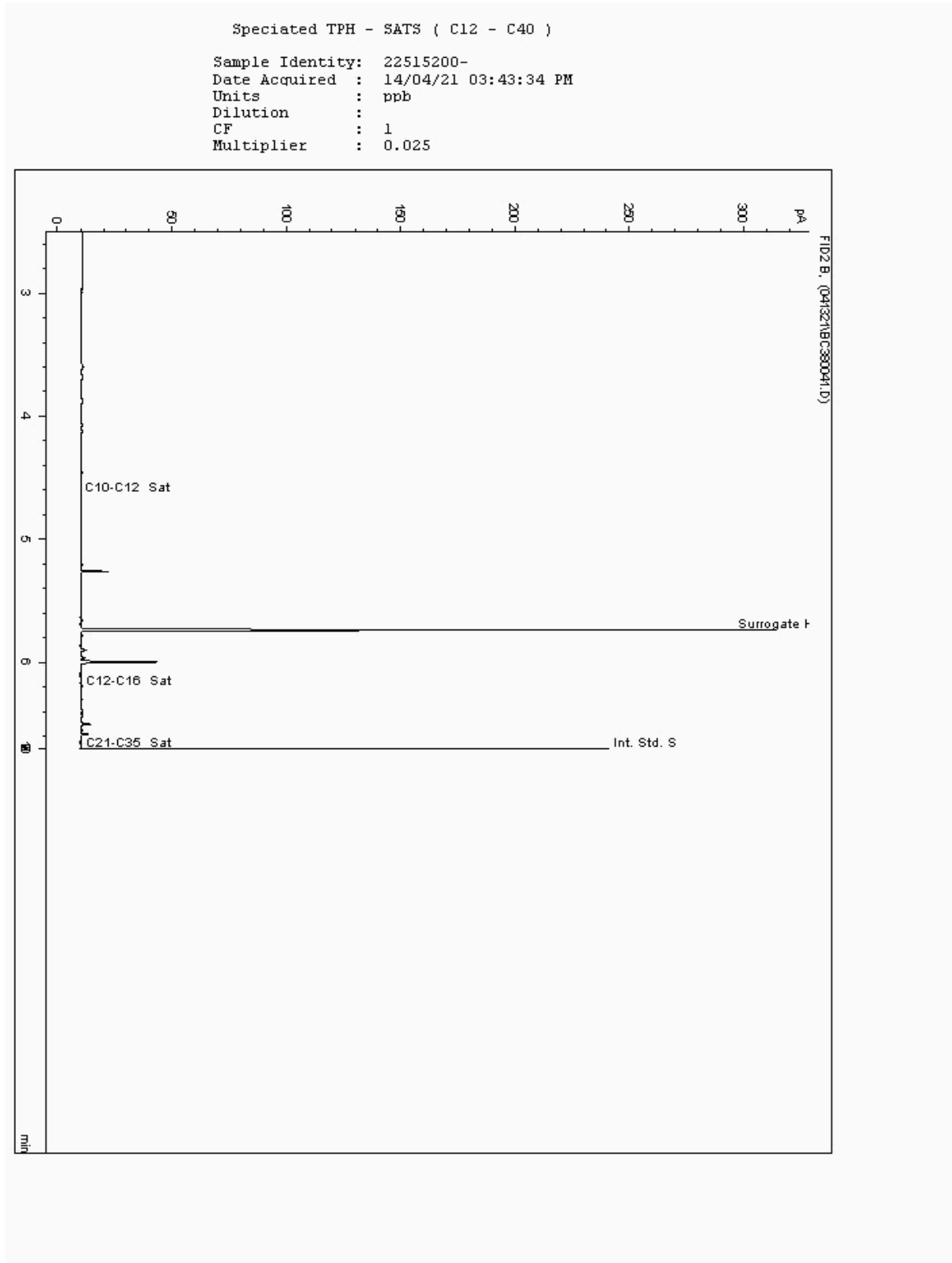
SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Chromatogram

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

Sample No : 24021811
Sample ID : WS07

Depth : 1.50 - 5.00





CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Chromatogram

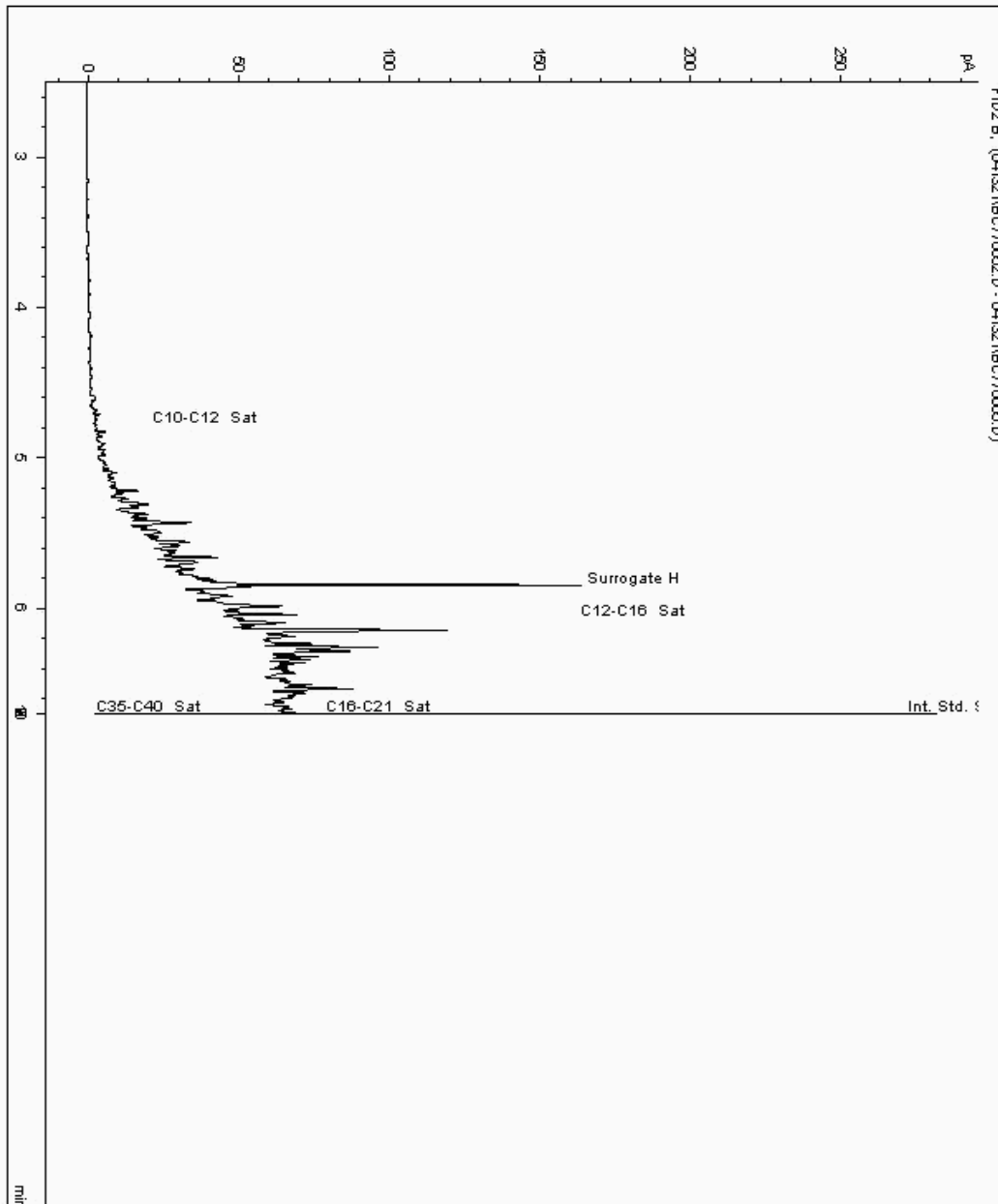
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 24021827
Sample ID : WS05

Depth : 1.00 - 2.30

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

Sample Identity: 22515176-
Date Acquired : 4/14/2021 4:33:12 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Chromatogram

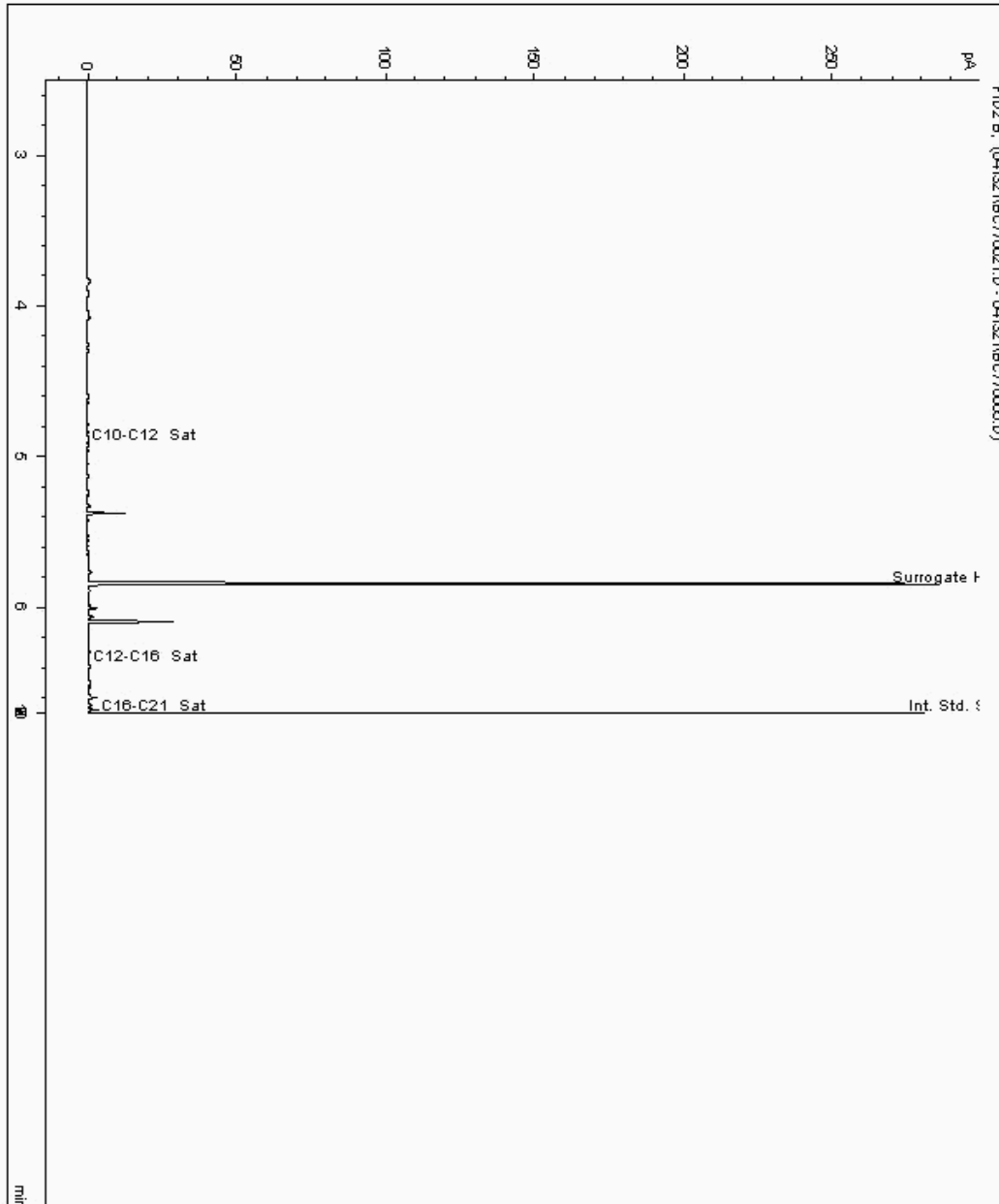
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 24021851
Sample ID : WS06

Depth : 1.00 - 2.50

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

Sample Identity: 22515187-
Date Acquired : 4/14/2021 4:23:28 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Chromatogram

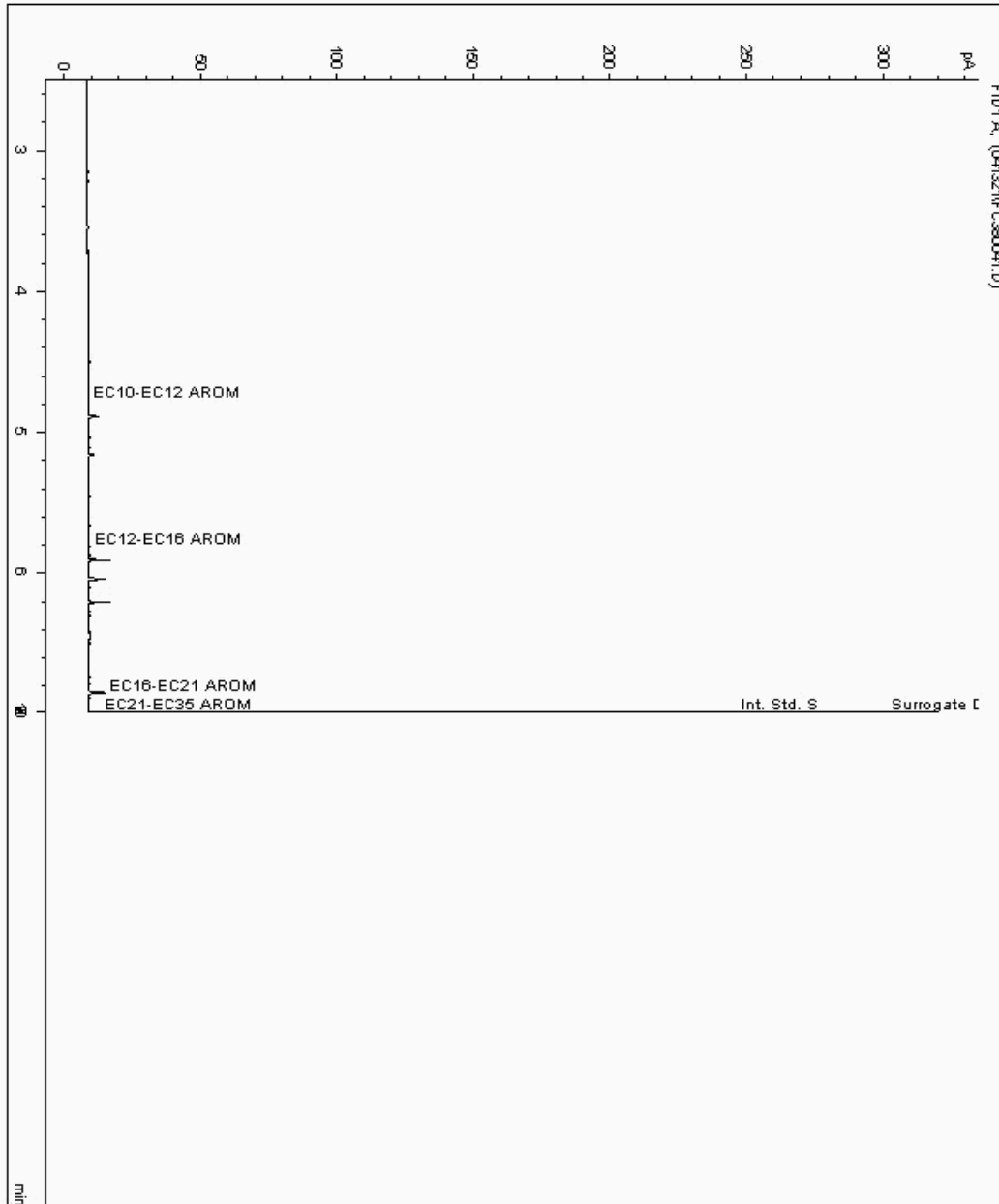
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 24021811
Sample ID : WS07

Depth : 1.50 - 5.00

Speciated TPH - AROM (C12 - C40)

Sample Identity: 22515201-
Date Acquired : 14/04/21 03:43:34 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-67
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 594151
Superseded Report: 594129

Chromatogram

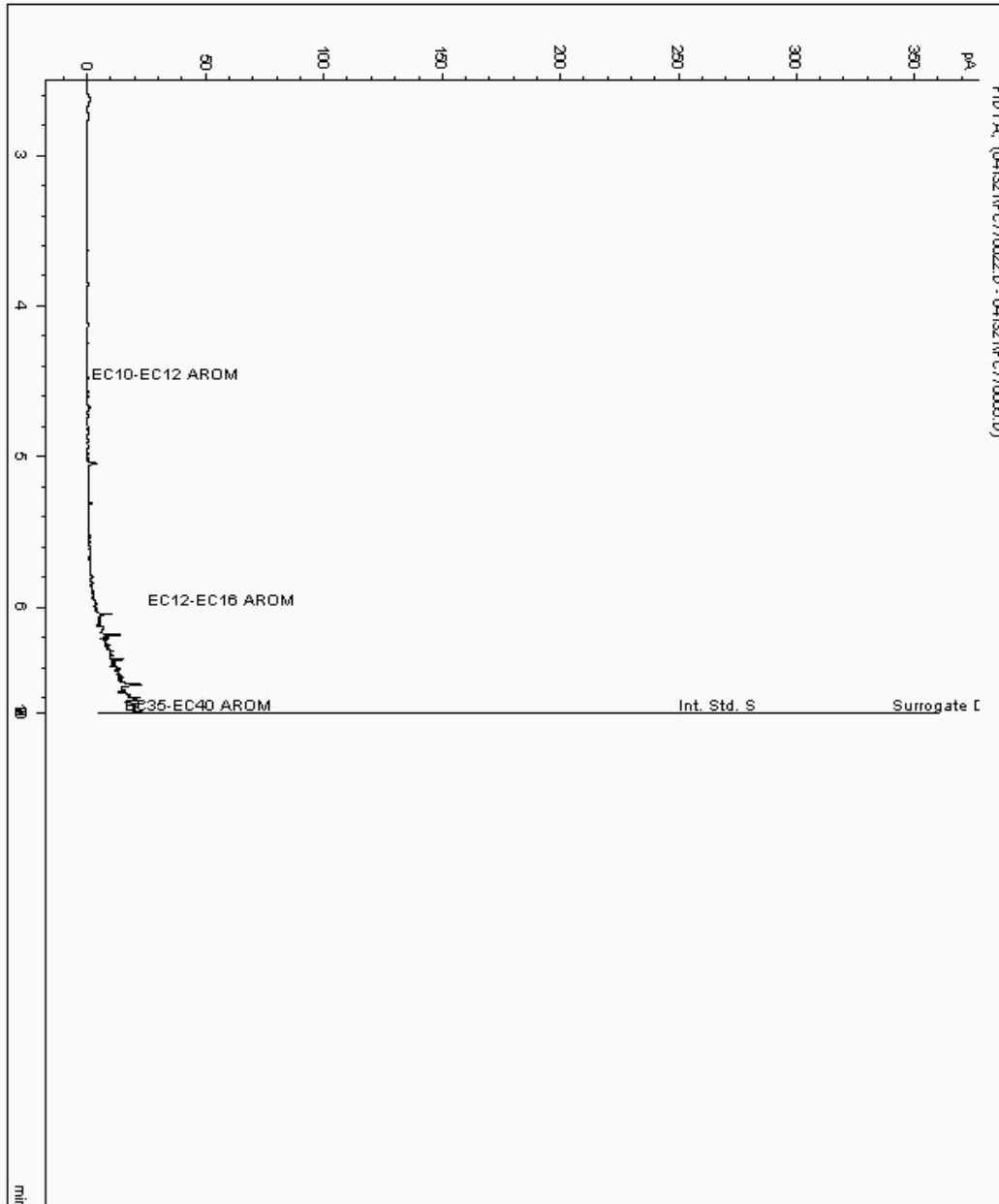
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 24021827
Sample ID : WS05

Depth : 1.00 - 2.30

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

Sample Identity: 22515177-
Date Acquired : 4/14/2021 4:47:10 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-67
Location: Unit 5 Barton Park

Client Reference: 70080743
Order Number: 70080743-EXP

Report Number: 594151
Superseded Report: 594129

Chromatogram

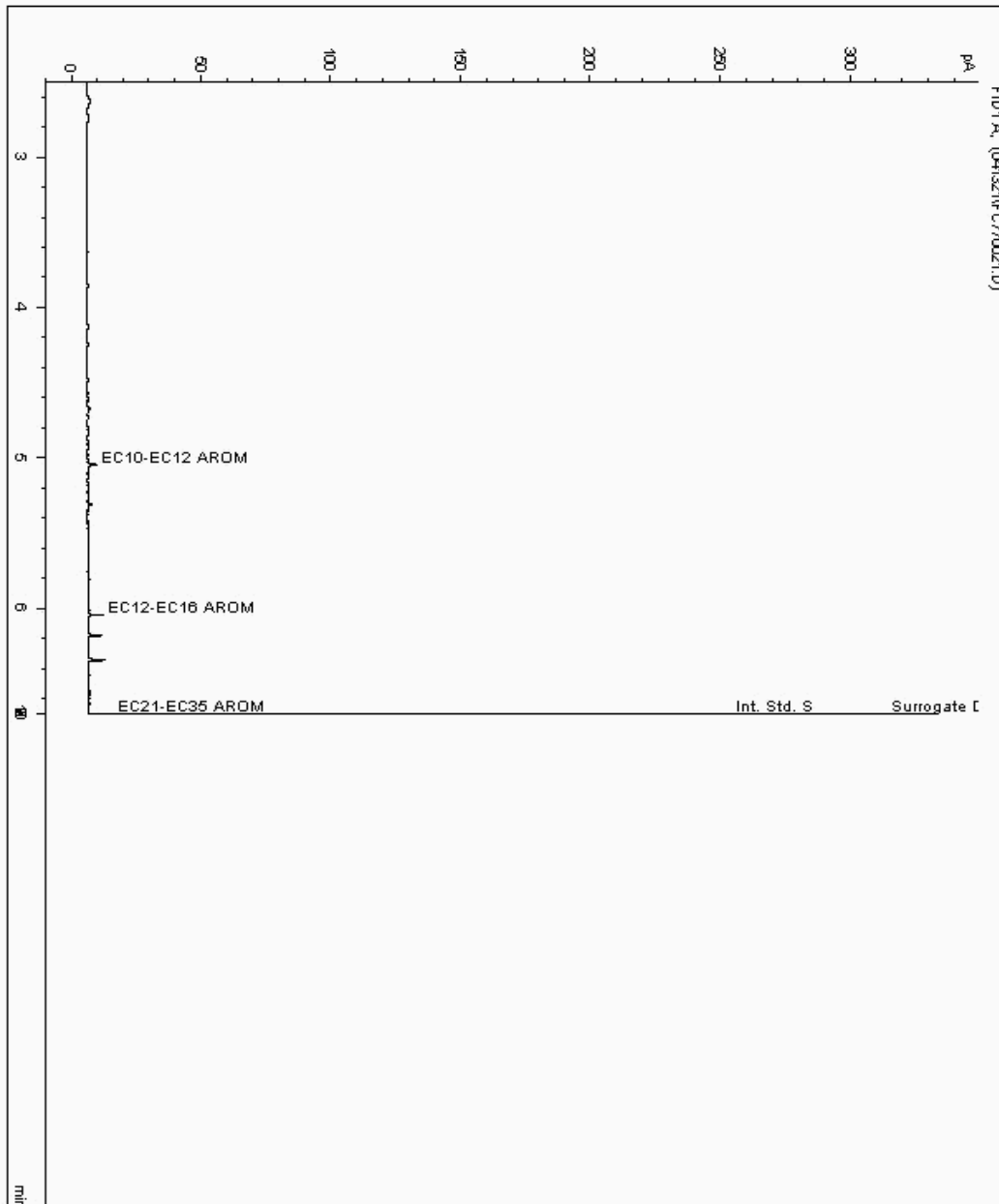
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 24021851
Sample ID : WS06

Depth : 1.00 - 2.50

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

Sample Identity: 22515188-
Date Acquired : 4/14/2021 4:23:28 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

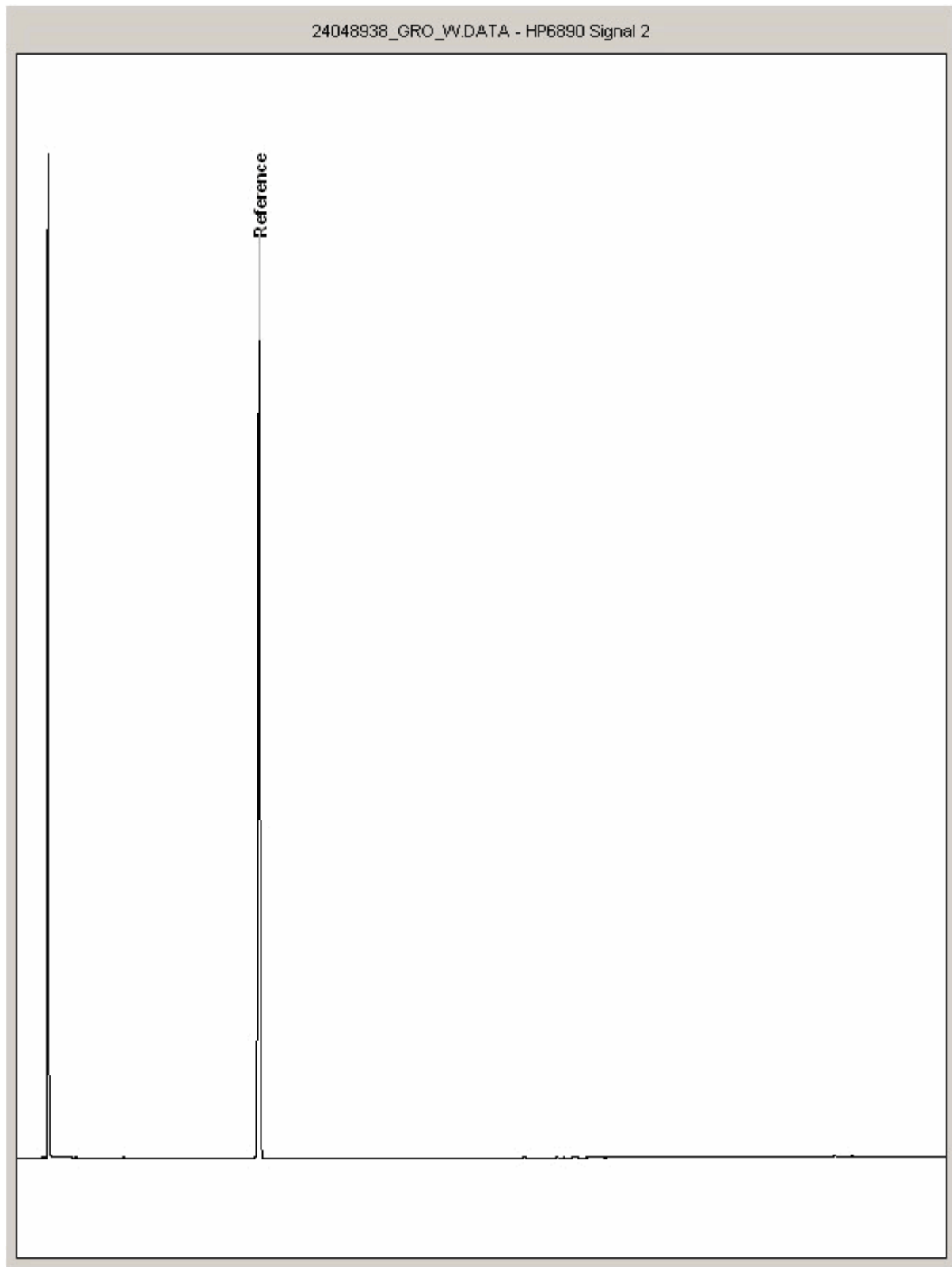
SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 24048938
Sample ID : WS05

Depth : 1.00 - 2.30





CERTIFICATE OF ANALYSIS

Validated

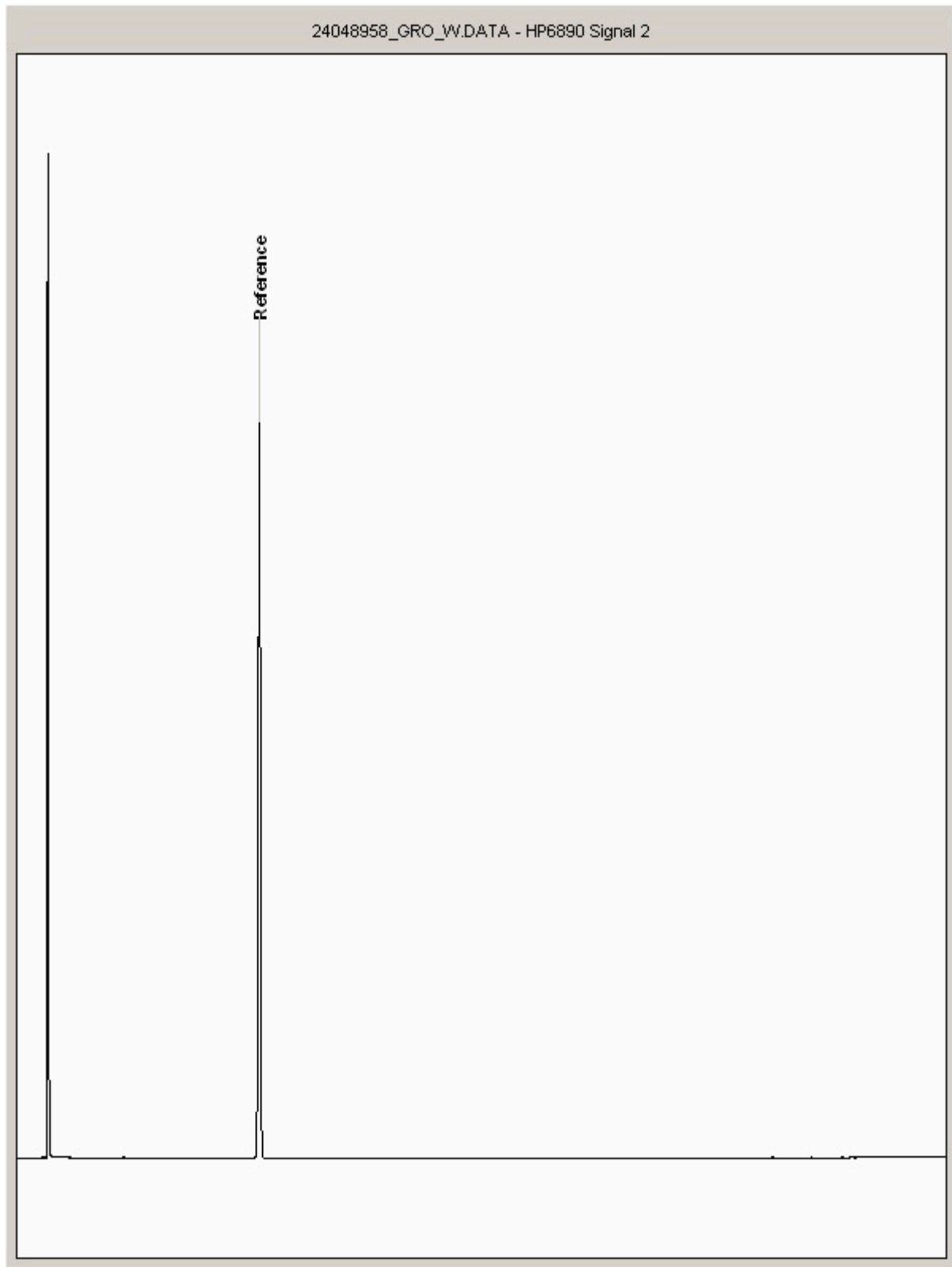
SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 24048958
Sample ID : WS07

Depth : 1.50 - 5.00





CERTIFICATE OF ANALYSIS

Validated

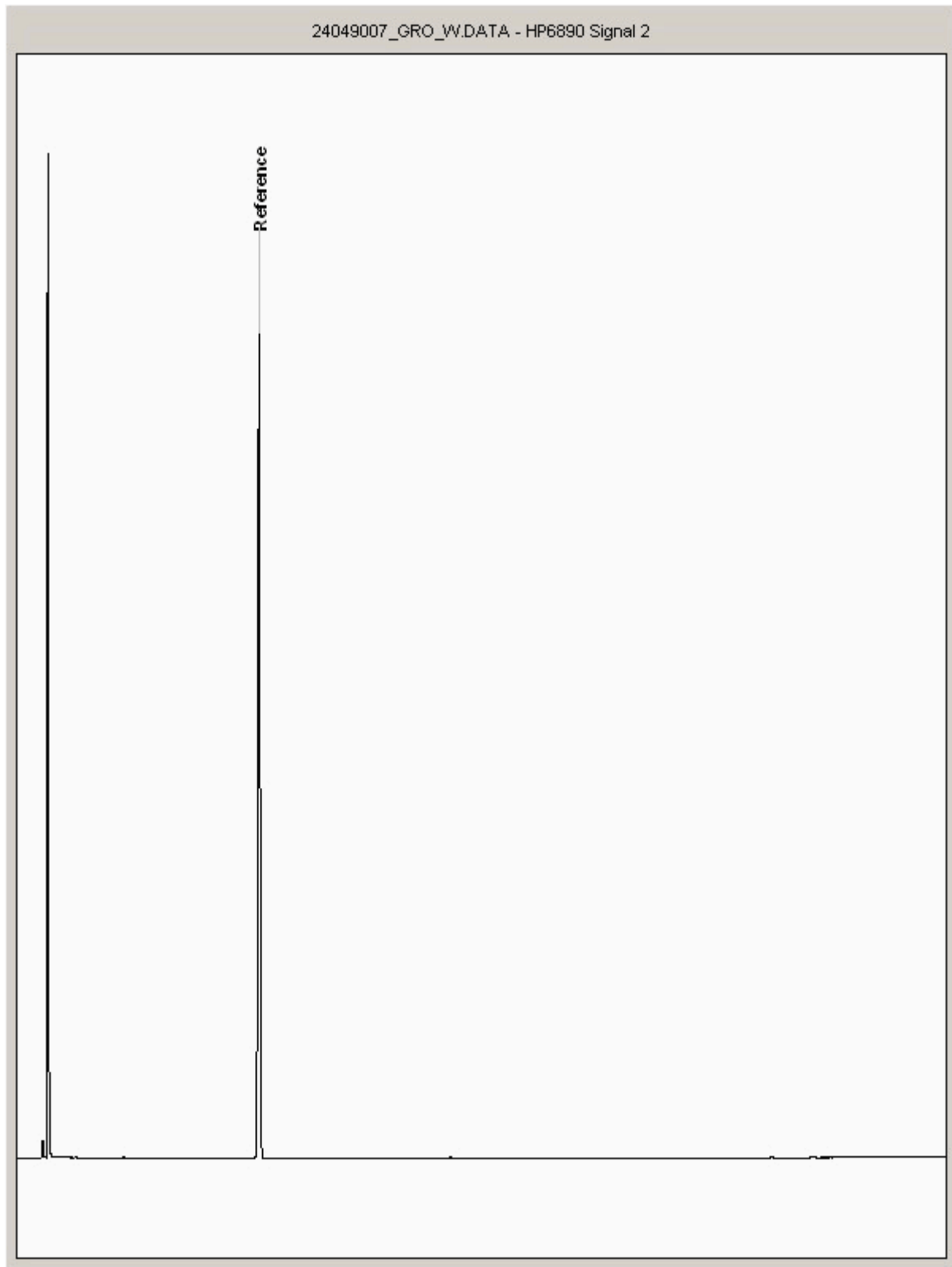
SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 24049007
Sample ID : WS06

Depth : 1.00 - 2.50





CERTIFICATE OF ANALYSIS

SDG:	210402-67	Client Reference:	70080743	Report Number:	594151
Location:	Unit 5 Barton Park	Order Number:	70080743-EXP	Superseded Report:	594129

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

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

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

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

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix H

MONITORING RESULTS



Key:

Depth to water			Methane	Carbon Dioxide	Gas Flow
	Response zone <i>fully</i> flooded during sampling		> 1% v/v	> 5% v/v	> 70 l/hr
	Response zone <i>significantly</i> flooded during sampling				
	Datum or response zone information missing. Response zone flooding cannot be calculated				

Visit 1, Event: Round 1, Date: 24/03/2021

Sheet 1 of 1

Engineer	David Crellin	Equipment	SerialNo	Calibrated	Comments and Ground Conditions:
Start/End Time	14:03 - 14:58	Gas Analyser	GFM 11974	Yes	
Pressure Start/End (mB)	1020 - 1019	PID	T-108426	Yes	
Temperature (Deg C)	12.00	Interface Probe	VAN WALT IF310	Yes	
Weather Conditions	Overcast				

Borehole	Response Zone (m)		Gas Flow (l/hr)		Borehole Differential Pressure	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Other Gases (ppmV)			Depth to Water	Depth to Base	Thickness of product	Sampled ?
	Top	Base	Initial	Steady		Initial	Steady	Initial	Steady	Initial	Steady	PID	H2S	CO	m	m	mm	Y/N
WS05	1.00	2.30	0.00	0.00	0	0.00	0.00	0.00	1.40	20.30	18.70	0.40	0.00	0.00	2.01	2.27	N/A	No
WS06	1.00	2.50	0.00	0.00	0	0.00	0.00	0.00	4.10	20.30	13.50	0.20	0.00	0.00	2.20	2.53	N/A	No
WS07	1.50	5.00	0.00	0.00	0	0.00	0.00	0.00	0.50	20.60	19.60	0.20	0.00	0.00	1.90	4.99	N/A	No
WS08	0.80	1.20	0.00	0.00	0	0.00	0.00	0.00	2.00	20.60	14.80	0.20	0.00	0.00		1.27	N/A	No

Key:

Depth to water			Methane	Carbon Dioxide	Gas Flow
	Response zone <i>fully</i> flooded during sampling		> 1% v/v	> 5% v/v	> 70 l/hr
	Response zone <i>significantly</i> flooded during sampling				
	Datum or response zone information missing. Response zone flooding cannot be calculated				

Visit 2, Event: Round 2, Date: 31/03/2021

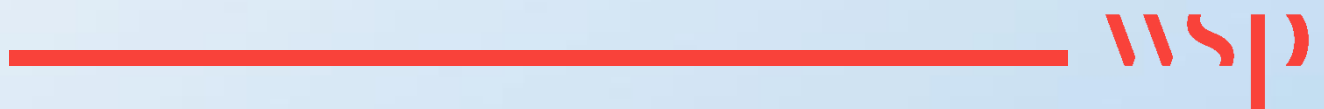
Sheet 1 of 1

Engineer	David Crellin	Equipment	SerialNo	Calibrated	Comments and Ground Conditions:
Start/End Time	11:40 - 17:15	Gas Analyser	GFM 11974	Yes	
Pressure Start/End (mB)	1020 - 1019	PID	T-108426	Yes	
Temperature (Deg C)	16.00	Interface Probe	349930	Yes	
Weather Conditions	Scattered Cloud				

Borehole	Response Zone (m)		Gas Flow (l/hr)		Borehole Differential Pressure	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Other Gases (ppmV)			Depth to Water	Depth to Base	Thickness of product	Sampled ?
	Top	Base	Initial	Steady		Initial	Steady	Initial	Steady	Initial	Steady	PID	H2S	CO	m	m	mm	Y/N
WS05	1.00	2.30	0.00	0.00	0	0.00	0.00	0.10	1.00	20.30	19.10	0.30	0.00	0.00	2.02	2.12	N/A	Yes
WS06	1.00	2.50	0.00	0.00	0	0.00	0.00	0.00	3.90	20.50	14.30	0.10	0.00	0.00	2.23	2.56	N/A	Yes
WS07	1.50	5.00	0.00	0.00	0	0.00	0.00	0.00	0.10	20.30	20.10	0.10	0.00	0.00	1.25	5.00	N/A	Yes
WS08	0.80	1.20	0.00	0.00	0	0.00	0.00	0.00	1.90	20.40	15.20	0.40	0.00	0.00		1.26	N/A	No

Appendix I

HUMAN HEALTH ASSESSMENT METHODOLOGY



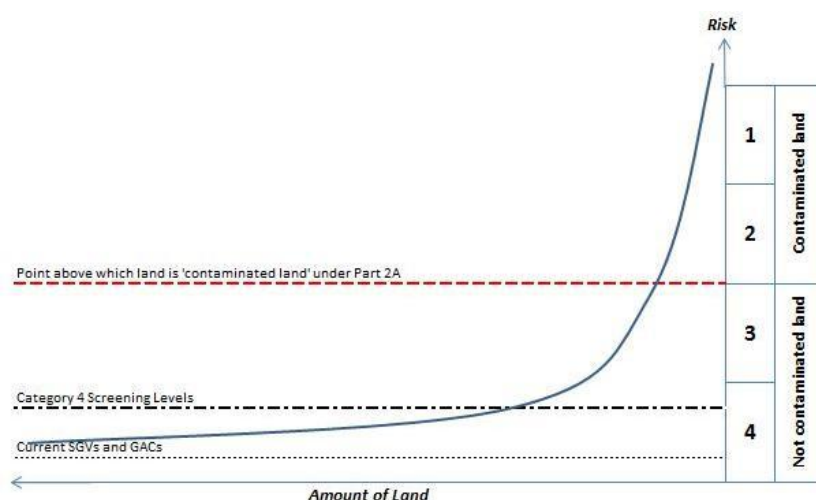
METHODOLOGY FOR THE DERIVATION OF GENERIC QUANTITATIVE ASSESSMENT CRITERIA TO EVALUATE RISKS TO HUMAN HEALTH FROM SOIL & GROUNDWATER CONTAMINATION

UK APPROACH

In the UK, the potential risks to human health from contamination in the ground are usually evaluated through a generic quantitative risk assessment (GQRA) approach. This allows generic and conservative exposure assumptions to be readily applied to risk assessments, and can be a useful tool for rapidly screening data and to identify those contaminants or scenarios that could benefit from further investigation and/or site-specific detailed quantitative risk assessment (DQRA). Current industry good practice is to use the approach presented in the Environment Agency (EA) publications SR2¹ and SR3². This approach allows the derivation of Generic Assessment Criteria (GACs), primarily for chronic exposure.

In April 2012, the Department of Environment, Food and Rural Affairs (Defra) published updated statutory guidance³ which introduced a four category approach to determining whether land in England and Wales is contaminated or not on the grounds of significant possibility of significant harm (SPOSH). **Figure 1** presents a graphical representation of the categories.

Figure 1: Four Categories for Determining if Land Represent a SPOSH



Cases classified as Category 1 are considered to be SPOSH based on actual evidence or an unacceptably high probability of harm existing. Category 4 cases are those where there is no risk, or a low risk of SPOSH.

¹ Environment Agency 'Human Health Toxicological Assessment of Contaminants in Soil', Report SC050021/SR2. January 2009.

² Environment Agency 'Updated Technical Background to the CLEA Model,' Report SC050021/SR3. January 2009.

³ Defra 'Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance'. April 2012.

GACs represent a minimal risk level, well within Category 4. A 2014 publication by Contaminated Land: Applications in Real Environments (CL:AIRE), SP1010⁴ and endorsed by Defra⁵ provided an approach to determine Category 4 Screening Levels (C4SLs) which are higher than the GACs whilst being “more pragmatic but still strongly precautionary”. It also provided C4SLs for six contaminants of concern. Although the C4SLs were designed to support Part 2A assessments to determine ‘contaminated land’ they are specifically mentioned, along with reference to the Part 2A statutory guidance, by the Department for Communities and Local Government (DCLG) for use in a planning context⁶.

An updated version the Contaminated Land Exposure Assessment (CLEA) Workbook (v1.071) was released by the EA in September 2015 to take into account the publication of SP1010. The updates comprised: additional toxicity data for the six chemicals for which C4SLs were derived; two new public open space land use scenarios; updated exposure parameters; options to run the model using C4SL exposure assumptions; and increased functionality. There were no changes to algorithms, so it is still possible to replicate the withdrawn SGVs using the input parameters held within v1.071.

It should be noted that the four category approach has not been adopted in Scotland under Part 2A or the planning regime. The Part 2A statutory guidance applicable in Scotland (Paper SE/2006/44 dated May 2006) does not reflect the changes introduced by Defra in April 2012 which allow for the use of C4SLs within Part 2A risk assessments. Additionally, it is considered that the principal of ‘minimal risk’ should still apply under planning in Scotland, based on current guidance.

WSP APPROACH

Following the withdrawal of the SGVs, and in the absence of an industry-wide, accepted set of GACs it is down to individual practitioners to derive their own soil assessment criteria. WSP has used the approach provided within SR2, SR3, SP1010, CLEA Workbook v1.071 and SR4⁷ to produce a set of minimal risk GACs. The chemical-specific data within two key publications were considered during their production: CL:AIRE 2010⁸ and LQM 2015⁹. Both documents provide comprehensive sets of GACs for different contaminants of concern.

The LQM Suitable For Use Levels (S4ULs) have selected exposure parameters consistent with the C4SL exposure scenarios. This approach was rejected by WSP as not representing minimal risk. However, the LQM S4UL document was critically reviewed and the approach and chemical input parameters were utilised where considered to be appropriate.

An industry-led C4SL Working Group is in the process of deriving a larger set of C4SLs in the near future, for approximately 20 contaminants. This will include a critical review of the chemical input data for all selected substances, and may therefore lead to further amendments to the chemical input data used in the WSP in-house screening values. It is considered likely that the contaminant list will

⁴ CL:AIRE ‘Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination’ SP1010, Final Project Report (Revision 2). September 2014.

⁵ Defra ‘SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document’. December 2014.

⁶ DCLG Planning Practice Guidance ‘Land Affected by Contamination’, particularly Paragraphs 001 and 007. Ref IDs: 33-001-20140306 & 33-007-20140612.

⁷ Environment Agency ‘CLEA Software (Version 1.05) Handbook (and Software)’, Report SC050021/SR4. September 2009.

⁸ CL:AIRE ‘The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment’. ISBN 978-1-05046-20-1. January 2010.

⁹ Nathanail et al ‘The LQM/CIEH S4ULs for Human Health Risk Assessment’, Land Quality Press, ISBN 978-0-9931084-0-2. 2015.

crossover with the 2009 EIC/AGS/CL:AIRE GACs. As such, this document was not critically reviewed by WSP.

WSP's current approach to the assessment of risks to human health is to continue to evaluate minimal risk through the use of in-house derived GACs, and to use the published C4SLs as a secondary tier of assessment until such time as additional C4SLs are published and/or in-house values are derived.

EXPOSURE MODELS

LAND USES

WSP has largely adopted the exposure assumptions of the generic land use scenarios included within SR3, with two additional public open space scenarios included from within SP1010:

- à Residential with homegrown produce consumption;
- à Residential without homegrown produce consumption;
- à Allotments;
- à Commercial;
- à Public open space near residential housing (POS_{resi}); and
- à Public park (POS_{park}).

Exceptions are described in the following Sections.

SOIL PROPERTIES

SR3 assumes a sandy loam soil with a pH of 7 and a Soil Organic Matter (SOM) content of 6% for its generic land uses, based on the geographical spread of topsoils in the UK. WSP has adopted these default values. In addition, GACs based on an SOM of 1% and 2.5% have been derived, based on common experience of the nature of Made Ground and lack of topsoil on many brownfield sites.

RECEPTOR CHARACTERISTICS AND BEHAVIOURS

SP1010 provides some updated exposure parameters for long-term inhalation rates¹⁰ and the consumption rates for homegrown produce¹¹ compared to those provided in SR3. This data was used to derived WSP's GACs.

The changes in inhalation rates do not apply to the allotment generic land use scenario, as these are based on the breathing rates for short-term exposure of light to moderate intensity activity which were derived from a study that was not updated in USEPA 2011, so the SR3 rates were retained.

¹⁰ USEPA, National Centre for Environmental Assessment 'Exposure Factors Handbook: 2011 Edition' EPA/600/R-09/052F. September 2011.

¹¹ National Diet and Nutrition Survey 2008/2009 to 2010/2011.

CHEMICAL DATA

PHYSICO-CHEMICAL PARAMETERS

Physico-chemical properties for the contaminants for which GACs have been derived have been obtained following critical review of the following hierarchy of data sources:

1. Environment Agency/Defra SGV reports where available;
2. Environment Agency '*Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values*', Report SC050021/SR7, November 2008; and
3. Published fate and transport reviews within Nathanail et. al 2015 and CL:AIRE 2010.

Where appropriate, and where sufficient data is available, values were adjusted to reflect a UK soil temperature of 10°C (e.g. K_{aw}).

TOXICOLOGICAL DATA

Toxicological data for the derivation of minimal risk Health Criteria Values (HCV) for each contaminant was selected with due regard to the approach presented in SR2. Where appropriate, the following hierarchy of data sources was used:

1. UK toxicity reviews published by authoritative bodies including:
 - < EA;
 - < Public Health England (PHE);
 - < Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT); and
 - < Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC).
2. Authoritative European sources such as European Food Standards Agency (EFSA)
3. International organisations including:
 - < World Health Organisation (WHO); and
 - < Joint FAO/WHO Expert Committee on Food Additives (JECFA).
4. Authoritative country-specific sources including:
 - < United States Environmental Protection Agency (USEPA);
 - < US Agency for Toxic Substances and Disease Registry (ATSDR);
 - < US Integrated Risk Information System (IRIS); and
 - < Netherlands National Institute for Public Health and the Environment (RIVM).

Factors such as the applicability of the data to human health (e.g. epidemiological vs. animal studies), the quality of the data, the level of uncertainty in the results and the age of the data were also taken into account in the final selection. Details for specific substances are available on request.

MEAN DAILY INTAKES

Estimations of background exposure for each threshold substance have been updated. In line with the SR2 approach, the exposure from non-threshold substances in the soil does not take into account exposure from other sources, and as such GACs were derived without consideration of the Mean Daily Intake (MDI) for those substances.

The data published by the EA in its series of TOX reports between 2002 and 2009 was evaluated to determine whether the values were considered to remain valid today. Values from these current UK published sources were not amended unless they were considered to be significantly different so that the GACs remained as comparable as possible with the revoked SGVs.

ORAL MEAN DAILY INTAKES

Oral MDI were generally estimated as the sum of exposure via the ingestion of food and drinking water using the default adult physiological parameters presented in Table 3.3 of SR2.

Data on the exposure of substances from food ingestion was generally obtained from UK Total Diet Studies (TDS) published by the Food Standards Agency (FSA) and its predecessor the Ministry of Agriculture, Fisheries and Food (MAFF) and from studies commissioned by COT. Where no UK-specific data was available, MDI were derived from the European Food Safety Authority (EFSA), Health Canada and US sources. This was a rare occurrence, and in these instances, the data was evaluated to determine its applicability to the UK.

Data on the concentrations of substances in tap water was obtained from a variety of sources. UK data was used where available, with preference given to Drinking Water Inspectorate (DWI) 2014 data from water company tap water testing (LOD, 1st and 99th percentile data is available). Where the substance was not included in tap water testing, other UK sources of information were considered including:

- à DWI data from water company tap water testing from previous years;
- à COT; and
- à FSA.

Where UK data was not available, a number of other data sources were considered, largely WHO International Programme on Chemical Safety (IPCS) Concise International Chemical Assessment Documents (CICADs) and background documents for the development of Guidelines for Drinking Water Quality, using professional judgement on the relevance of the data to the UK. The final decision on the MDI from drinking water was made using professional judgement on the balance of relevance and probability, taking into account the detection limit where not detected, Koc and solubility, reduction in use of the substance, banned substances, tight controls (e.g. on explosives) and with due consideration to the SR2 instruction that “if no data or information in background exposure are available, background exposure should be assumed to be negligible and the MDI set to zero....”.

Data from other countries was generally not used because it was considered that the hydrogeology of these countries along with industrial practices were unlikely to be reflective of the UK.

INHALATION MEAN DAILY INTAKES

Inhalation MDIs were based on estimates of average daily exposure by the inhalation pathway and calculated using the default adult physiological parameters presented in Table 3.3 of SR2.

The inhalation MDIs were generally estimated using background exposure data from the UK, derived from Defra's UK-AIR: Air Information Resource¹², which provides ambient air quality data from a number of sites forming a UK-wide monitoring network. The MDIs for heavy metals were based on rolling annual average metal mass concentration data from Defra's UK Heavy Metals Monitoring Network from the period October 2009 to September 2010¹³.

Information for some substances was obtained from UK sources including Environment Agency TOX reports and data from the UK Expert Panel on Air Quality Standards (EPAQS). Where recent UK data was not available, data was sourced from the International Programme on Chemical Safety (IPCS), the World Health Organisation (WHO), the Agency for Toxic Substances and Diseases Registry (ATSDR), Health Canada, and various other peer-reviewed sources summarised by LQM/CIEH¹⁴.

For other substances, where no data or information on background exposure was available, background exposure was assumed to be negligible and the MDI set at 0.5*TDI in accordance with guidance in SR2.

PLANT UPTAKE

Soil to plant concentration factors are available in CLEA v1.071 for arsenic, cadmium, hexavalent chromium, lead, mercury, nickel and selenium. For all remaining inorganic chemicals, concentration factors were obtained using the PRISM model. Substance-specific correction factors have been selected in accordance with the guidance established within SR3. This is consistent to the approach utilised in the derivation of the LQM S4UL and the EIC/AGS/CL:AIRE GAC.

Where there is a lack of appropriate data to enable the derivation of specific soil to plant concentrations factors for organic chemicals, plant uptake was modelled within CLEA v1.071 using the generic equations recommended within SR3, as follows:

- à Green Vegetables – Ryan et al. (1988);
- à Root Vegetables – Trapp (2002);
- à Tuber Vegetables – Trapp et al. (2007); and
- à Tree Fruit – Trapp et al. (2003).

There are no suitable models available for modelling uptake for herbaceous fruit or shrub fruit. Exposure is considered negligible.

¹² Crown 2016 copyright Defra via uk-air.defra.gov.uk, licenced under the Open Government Licence (OGL).

¹³ Defra, 2013 Spreadsheet of historic data for multiple years for the Metals network. Available online at: <http://uk-air.defra.gov.uk/data/metals-data>. [Accessed 13/03/2016].

¹⁴ LQM/CIEH, 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment.

SOIL SATURATION LIMITS

GACs are not limited to their theoretical soil saturation within CLEA, although where either the aqueous or the vapour-based saturation is exceeded, this is highlighted within the Workbook (compared with the lower of the two values). This affects pathways which depend on partitioning calculations so in reality this only affects the vapour pathways and is relevant to organic substances and other substances, such as elemental mercury, that have a significant volatile component. However, the Workbook highlights saturation for direct contact pathways to indicate to the user where further qualitative consideration of free phase contamination at the surface may be required.

Where the lower of the two saturation limits is exceeded and the vapour pathway is the only exposure route being considered, the chronic risks to human health are likely to be negligible. Further evaluation could be undertaken using an alternative model suitable for evaluating non-aqueous phase liquids (NAPLs), such as the Johnson & Ettinger (J&E) approach described in USEPA 2003. However, WSP considers that if NAPLs are suspected, given the known limitations and over-simplifications of J&E, soil vapour monitoring is a more accurate way of assessing potential risks.

Where the lower saturation limit is exceeded for the vapour pathway and a number of exposure routes are being considered, then the contribution from the NAPL via vapour inhalation to the overall exposure can be evaluated using the procedure provided in SR4. WSP would evaluate this as part of a DQRA process or through soil vapour monitoring on-site to determine site-specific soil vapour concentrations.

CHEMICAL SPECIFIC ASSUMPTIONS

CYANIDES

Cyanide has high acute toxicity, and short term exposure is an important consideration when assessing the risks from soils contaminated with cyanide. The primary risk to human receptors from free cyanide in soils is an acute risk.

There is no current UK guidance available for calculating acute risks from free cyanide. Consequently, GAC for acute exposure were derived using the algorithms presented in MADEP 1992¹⁵ and assuming a one-off ingestion of 10g of soil (this conservative value has been taken as an upper bound estimate for a one-off soil ingestion rate amongst children). Receptor body weights have been selected according to the critical receptor for each exposure scenario. The lowest of the chronic and acute GAC for each land use scenario were adopted by WSP. Brinckerhoff.

LEAD

The SGV for lead was withdrawn by the EA in 2009, and in 2011 the EA withdrew their published TOX report in light of new scientific evidence. The C4SL for lead was derived using the latest scientific evidence from a large human dataset. As such, no chemical-specific margin was applied in the derivation of the C4SL for lead. It may be possible for WSP to derive a GAC for lead using the same dataset and applying a chemical-specific margin, but the value is likely to be lower than UK natural background concentrations. Therefore, WSP has adopted the toxicological data used to derive the C4SLs in deriving the GAC for lead until such time as alternative GACs are published by an authoritative body. The relative bioavailability was set at 100% in line with the approach taken for other GACs, whereas the C4SL assumes 60% for soil and 64% for airborne dust. Thus, the WSP GAC are lower than the C4SLs.

¹⁵ MADEP 'Background Documentation for the Development of an "Available Cyanide" Benchmark Concentration' 1992. http://www.mass.gov/dep/toxics/cn_soil.htm

POLYCYCLIC AROMATIC HYDROCARBONS

WSP's approach to the assessment of polycyclic aromatic hydrocarbons (PAHs) uses the surrogate marker approach. BaP was used as a surrogate marker for all genotoxic PAHs in line with the Health Protection Agency 2010¹⁶ recommendations and SP1010. This assumes that the PAH profile of the data is similar to that of the coal tars used in the Culp *et al* oral carcinogenicity study from which the toxicity data for BaP was produced. In reality, this profile has been shown by HPA to be applicable on the majority of contaminated sites based on assessment of sites across the country.

The alternative is the Toxic Equivalency Factor (TEF) approach which uses a reference compound and assigns TEFs for other compounds based on estimates of potency. Key uncertainties with this approach include the assumption that all compounds have the same toxic mechanism of action within the body and that no compounds with a greater potency than the reference compound are present. It is considered by the HPA that the TEF approach is likely to under predict the true carcinogenicity of PAHs and therefore favours the surrogate marker approach.

For these reasons, WSP considers that the adoption of BaP as a surrogate marker for genotoxic PAHs, as opposed to the TEF approach, is reasonable. In rare cases where the PAH profile may differ from the wide definitions of the Culp *et al* study the user should discuss their project with an experienced risk assessor. In addition, WSP has derived a GAC for naphthalene, which is commonly a risk driver due to its high volatility, relative to other PAH compounds.

TRIMETHYLBENZENES

The GAC for trimethylbenzenes can be used for the assessment of any individual isomer (1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene or 1,3,5-trimethylbenzene), or a mixture of the three isomers.

CHEMICAL GROUPS

For a number of chemical groups, the available toxicity data is for combinations of chemicals. Given that the physico-chemical parameters may differ between the chemicals, the GACs for the chemicals within the groups have been calculated and then the lowest GAC selected to represent the entire group. This was the approach taken by the EA for m-, o- and p-xylenes, and has also been adopted by WSP for:

- à 2-chlorophenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol and 2,3,4,6-tetrachlorophenol;
- à 2-, 3- and 4-methylphenol (total cresols);
- à aldrin and dieldrin; and
- à α - and β -endosulphan.

¹⁶ HPA Contaminated Land Information Sheet 'Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs) 2010

EXPOSURE TO VAPOURS

INHALATION OF MEASURED VAPOURS

WSP has derived a set of soil vapour GACs (GAC_{sv}) that allow for the assessment of measured site soil vapour concentrations, using J&E, in order to establish potential risks via indoor inhalation of vapours. This methodology enables a more robust assessment of exposure via the inhalation of soil vapours indoors than using CLEA-derived soil GAC, as it is based upon measured soil vapour concentrations beneath the site. It also allows for the assessment of vapours from all source terms (i.e. groundwater, soil or NAPL). Outdoor inhalation was not included. WSP considers that the indoor inhalation pathway is the significantly dominant risk-driver.

The generic land use scenarios within CLEA (residential and commercial) that were used to derive the soil GAC were used to define the receptor and building characteristics for the soil vapour GAC. Only residential and commercial generic land use scenarios include the indoor inhalation of vapours pathway.

The GAC_{sv} were derived for three different soil types; sand, sandy loam and clay, reflecting the importance of this parameter within the J&E model. A depth to contamination of 0.85 m below the base of the building foundation was assumed (i.e. 1 m below ground level). This differs from the depth assumed for the soil GAC (0.5 m bgl), but was selected by WSP as a reasonable worst case scenario.

It is acknowledged that the J&E commonly over-predicts indoor vapour concentrations. In particular, it will significantly over-predict vapour concentrations for suspended floor slabs, which many new builds are constructed with, it does not take into account lateral migration and assumes an infinite source of contamination at steady state conditions. In addition, it is common for soil gas/vapour wells to be installed with at least 1 m of plain riser at the surface and this equates to a total depth of 0.85 m below the building foundation plus a 0.15 m thick foundation, and so is more representative of the depth that samples will be taken from.

The TDSIs and IDs for each substance were converted from $\mu g kg^{-1} bw day^{-1}$ to $\mu g m^{-3}$ using the standard conversions quoted in Table 3.3 of SR2, thereby replacing the need to model C_{air} in the equation:

$$C_{air} = \alpha \cdot C_{vap} \cdot 1,000,000 cm^3 m^{-3}$$

Where:

C_{air} is the concentration of vapours within the building, $mg m^{-3}$

α is the steady state attenuation coefficient between soil and indoor air, dimensionless

C_{vap} is the soil vapour concentration, $mg cm^{-3}$

The target concentrations within indoor air for each substance (C_{air}) are a function of receptor inhalation rates and occupancy periods, as defined by the site conceptual exposure model (assuming standard CLEA occupancy periods and receptors).

The attenuation factor was calculated using J&E (Equation 10.4 in SR3) and the resulting C_{vap} is equivalent to the GAC_{sv} for the modelled exposure scenario.

Where reported soil vapour concentrations exceed the relevant saturated vapour concentration, free product may occur, and the user should discuss their project with an experienced risk assessor.

INHALATION OF GROUNDWATER-DERIVED VAPOURS

WSP has derived a set of groundwater GACs (GAC_{gw}) to evaluate the potential risks through the indoor inhalation of groundwater-derived vapours by first applying the approach described above for the derivation of the WSP GAC_{sv} to determine the acceptable concentration in soil vapour directly above the water table.

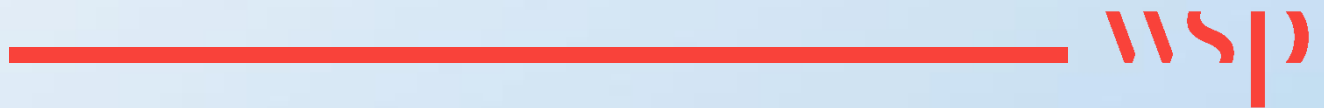
The depth to groundwater was assumed to be 1 m bgl (i.e. 0.85 m below the base of the building foundation). This depth was considered to be more representative of commonly encountered groundwater conditions than the 0.5 m below the base of the building foundation (i.e. 0.65 m bgl) that is used by CLEA for an unsaturated source present in the overlying soil.

The GAC_{gw} was then back-calculated from the GAC_{sv} using the air-water partition coefficient (K_{aw}) for each substance.

The WSP Groundwater Vapour GAC are protective against a dissolved phase contaminant source only. If the presence of NAPL is suspected, the risks from this source will need to be assessed. Where reported groundwater concentrations exceed the relevant solubility limit, free product may occur, and the user should discuss their project with an experienced risk assessor.

Appendix J

CONTAMINATION ASSESSMENT SCREENERS - SOILS



Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Unrecognised analytes

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Aliphatics & Aromatics >C10-44 (Unrecognised code)	1,480	1,600	1,720	-	-	-	-	mg/kg	4	6	5	0	
Aliphatics >C5-10 (Unrecognised code)	0.050	0.069	0.11	-	-	-	-	mg/kg	4	6	3	0	
Aromatics >C5-10 (Unrecognised code)	0.050	0.042	0.058	-	-	-	-	mg/kg	4	6	2	0	
Bis(2-chloroisopropyl)ether (TIC) (Unrecognised code)	-	-	-	-	-	-	-	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Aliphatics and Aromatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Aliphatic C05-C06	0.010	0.005	0.010	-	-	-	3,190	mg/kg	4	6	1	0	
Aliphatic C06-C08	0.010	0.015	0.026	-	-	-	7,780	mg/kg	4	6	5	0	
Aliphatic C08-C10	0.010	0.046	0.087	-	-	-	2,000	mg/kg	4	6	5	0	
Aliphatic C10-C12	1.00	1.27	2.04	-	-	-	9,690	mg/kg	4	6	1	0	
Aliphatic C10-C44	95.2	738	1,380	-	-	-	-	mg/kg	4	6	5	0	
Aliphatic C12-C16	5.71	140	275	-	-	-	58,800	mg/kg	4	6	3	0	
Aliphatic C16-C21	33.2	419	805	-	-	-	-	mg/kg	4	6	5	0	
Aliphatic C16-C35	81.1	591	1,100	-	-	-	1,580,000	mg/kg	4	6	5	0	
Aliphatic C21-C35	47.9	172	296	-	-	-	-	mg/kg	4	6	5	0	
Aliphatic C35-C44	1.00	3.46	6.41	-	-	-	1,580,000	mg/kg	4	6	3	0	
Aromatic C06-C07	0.010	0.005	0.010	-	-	-	-	mg/kg	4	6	0	0	
Aromatic C07-C08	0.010	0.005	0.010	-	-	-	56,100	mg/kg	4	6	0	0	
Aromatic C08-C10	0.010	0.032	0.058	-	-	-	3,460	mg/kg	4	6	4	0	
Aromatic C10-C12	1.00	0.89	1.28	-	-	-	16,200	mg/kg	4	6	1	0	
Aromatic C10-C44	101	861	1,620	-	-	-	-	mg/kg	4	6	5	0	
Aromatic C12-C16	5.98	14.0	22.0	-	-	-	36,200	mg/kg	4	6	4	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Aliphatics and Aromatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Aromatic C16-C21	29.3	64.3	99.3	-	-	-	28,200	mg/kg	4	6	5	0	
Aromatic C16-C35	73.3	617	1,160	-	-	-	-	mg/kg	4	6	5	0	
Aromatic C21-C35	44.0	552	1,060	-	-	-	28,400	mg/kg	4	6	5	0	
Aromatic C35-C44	4.77	232	459	-	-	-	28,400	mg/kg	4	6	4	0	
Aromatic C40-C44	1.00	0.88	1.25	-	-	-	-	mg/kg	4	6	3	0	
Total Aliphatics and Aromatics (C5-C44)	1,480	1,600	1,720	-	-	-	-	mg/kg	4	6	5	0	
TPH Hazard Index	0.009	0.033	0.058	-	-	-	1.00	mg/kg	4	6	N/A	0	

Alkali and Alkaline Earth Metals

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Barium	313	516	719	-	-	-	22,100	mg/kg	4	6	6	0	
Beryllium	0.22	0.59	0.96	-	-	-	12.0	mg/kg	4	6	6	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Asbestos

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Asbestos Quantification - Gravimetric	-	-	-	-	-	-	-	%	1	1	1	0	
Asbestos Quantification - PCM Evaluation	-	-	-	-	-	-	-	%	1	1	1	0	
Asbestos Quantification - Total %	-	-	-	-	-	-	-	%	1	1	1	0	
Additional Asbestos Components using TM048 (Quantification)	-	-	-	-	-	-	-	No units	1	1	0	0	
Asbestos Ex. actinolite	-	-	-	-	-	-	-	No units	4	5	0	0	
Asbestos Ex. Amosite	-	-	-	-	-	-	-	No units	4	5	0	0	
Asbestos Ex. anthophyllite	-	-	-	-	-	-	-	No units	4	5	0	0	
Asbestos Ex. Chrysotile	-	-	-	-	-	-	-	No units	4	5	0	0	
Asbestos Ex. crocidolite	-	-	-	-	-	-	-	No units	4	5	0	0	
Asbestos Ex. tremolite	-	-	-	-	-	-	-	No units	4	5	0	0	
Asbestos Quantification Comments	-	-	-	-	-	-	-	No units	1	1	0	0	
Non-Asbestos Fibres	-	-	-	-	-	-	-	No units	4	5	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

BTEX and Fuel Additives

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
1,2,4-Trimethylbenzene	-	-	-	-	-	-	611	mg/kg	1	1	0	0	
1,3,5-Trimethylbenzene	-	-	-	-	-	-	611	mg/kg	1	1	0	0	
Benzene	0.090	0.045	0.090	-	-	-	27.0	mg/kg	4	6	0	0	
Ethylbenzene	0.040	0.020	0.040	-	-	-	5,710	mg/kg	4	6	1	0	
Methyl t-butylether (MTBE)	0.10	0.050	0.10	-	-	-	7,480	mg/kg	4	6	0	0	
Tertiary Amyl Methyl Ether (TAME)	0.10	0.050	0.10	-	-	-	-	mg/kg	4	6	0	0	
Toluene	0.070	0.035	0.070	-	-	-	56,300	mg/kg	4	6	0	0	
Xylene - Total (Summed)	0.10	0.10	0.10	-	-	-	5,920	mg/kg	4	6	6	0	
Xylene-m & p	0.10	0.050	0.10	-	-	-	5,920	mg/kg	4	6	0	0	
Xylene-o	0.10	0.050	0.10	-	-	-	5,920	mg/kg	4	6	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Chlorinated Aliphatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	108	mg/kg	1	1	0	0	
1,1,1-Trichloroethane	-	-	-	-	-	-	1,580	mg/kg	1	1	0	0	
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	274	mg/kg	1	1	0	0	
1,1,2-Trichloroethane	-	-	-	-	-	-	89.0	mg/kg	1	1	0	0	
1,1-Dichloroethane	-	-	-	-	-	-	263	mg/kg	1	1	0	0	
1,1-Dichloroethene	-	-	-	-	-	-	24.0	mg/kg	1	1	0	0	
1,1-Dichloropropene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
1,2,3-Trichloropropane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
1,2-Dichloroethane	-	-	-	-	-	-	0.67	mg/kg	1	1	0	0	
1,2-Dichloropropane	-	-	-	-	-	-	3.10	mg/kg	1	1	0	0	
1,3-Dichloropropane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
2,2-Dichloropropane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Carbon tetrachloride	-	-	-	-	-	-	31.0	mg/kg	1	1	0	0	
Chloroethane	-	-	-	-	-	-	904	mg/kg	1	1	0	0	
Chloroform	-	-	-	-	-	-	99.0	mg/kg	1	1	0	0	
Chloromethane	-	-	-	-	-	-	0.96	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Chlorinated Aliphatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Cis 1,2-Dichloroethene	-	-	-	-	-	-	14.0	mg/kg	1	1	0	0	
Cis 1,3-Dichloropropene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Dichloromethane	-	-	-	-	-	-	257	mg/kg	1	1	0	0	
Hexachlorobutadiene	-	-	-	-	-	-	31.0	mg/kg	1	1	0	0	
Hexachloroethane	-	-	-	-	-	-	21.0	mg/kg	1	1	0	0	
Tetrachloroethene (PCE)	-	-	-	-	-	-	19.0	mg/kg	1	1	0	0	
Trans-1,2-Dichloroethene	-	-	-	-	-	-	21.0	mg/kg	1	1	0	0	
Trans-1,3-Dichloropropene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Trichloroethene (TCE)	-	-	-	-	-	-	1.20	mg/kg	1	1	0	0	
Vinyl chloride	-	-	-	-	-	-	0.059	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Chlorinated Aromatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
1,2,3-Trichlorobenzene	-	-	-	-	-	-	102	mg/kg	1	1	0	0	
1,2,4-Trichlorobenzene	-	-	-	-	-	-	265	mg/kg	1	1	0	0	
1,2-Dichlorobenzene	-	-	-	-	-	-	2,020	mg/kg	1	1	0	0	
1,3,5-Trichlorobenzene	-	-	-	-	-	-	22.0	mg/kg	1	1	0	0	
1,3-Dichlorobenzene	-	-	-	-	-	-	30.0	mg/kg	1	1	0	0	
1,4-Dichlorobenzene	-	-	-	-	-	-	584	mg/kg	1	1	0	0	
2-Chlorotoluene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
4-Chlorotoluene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Chlorobenzene	-	-	-	-	-	-	58.0	mg/kg	1	1	0	0	
Hexachlorobenzene	-	-	-	-	-	-	105	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Chlorinated Phenols

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
2,4,5-Trichlorophenol	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
2,4,6-Trichlorophenol	-	-	-	-	-	-	2,700	mg/kg	1	1	0	0	
2,4-Dichlorophenol	-	-	-	-	-	-	2,700	mg/kg	1	1	0	0	
2-Chlorophenol	-	-	-	-	-	-	2,700	mg/kg	1	1	0	0	
4-Chloro-3-Methylphenol	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Chlorophenols - Total (Summed Isomers)	-	-	-	-	-	-	2,700	mg/kg	1	1	1	0	

Dioxins and Furans

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Dibenzofuran	-	-	-	-	-	-	-	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Dyes

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
3-Nitroaniline	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
4-Nitroaniline	-	-	-	-	-	-	-	mg/kg	1	1	0	0	

Explosives

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
2,4-Dinitrotoluene	-	-	-	-	-	-	3,720	mg/kg	1	1	0	0	
2,6-Dinitrotoluene	-	-	-	-	-	-	1,850	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

General Chemistry

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
pH	8.17	8.41	8.65	-	-	-	-	pH Units	4	6	6	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Halogenated Hydrocarbons

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
1,2-Dibromo-3-Chloropropane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
1,2-Dibromoethane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Bromobenzene	-	-	-	-	-	-	91.0	mg/kg	1	1	0	0	
Bromochloromethane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Bromodichloromethane	-	-	-	-	-	-	2.00	mg/kg	1	1	0	0	
Bromoform	-	-	-	-	-	-	714	mg/kg	1	1	0	0	
Bromomethane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Dibromochloromethane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Dibromomethane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Dichlorodifluoromethane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Trichlorofluoromethane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Ketones

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Isophorone	-	-	-	-	-	-	-	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Metals

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Arsenic	13.7	24.4	35.0	-	-	-	635	mg/kg	4	6	6	0	
Boron	1.00	0.50	1.00	-	-	-	207,000	mg/kg	4	6	0	0	
Cadmium	0.020	0.23	0.44	-	-	-	223	mg/kg	4	6	4	0	
Chromium	3.83	8.07	12.3	-	-	-	-	mg/kg	4	6	6	0	
Chromium III	3.83	8.07	12.3	-	-	-	9,550	mg/kg	4	6	6	0	
Copper	45.8	558	1,070	-	-	-	69,800	mg/kg	4	6	6	0	
Hexavalent Chromium	0.60	0.30	0.60	-	-	-	24.0	mg/kg	4	6	0	0	
Lead	158	504	850	-	-	-	1,390	mg/kg	4	6	6	0	
Mercury	0.16	0.24	0.31	-	-	-	1,110	mg/kg	4	6	3	0	
Nickel	18.8	33.9	49.0	-	-	-	1,710	mg/kg	4	6	6	0	
Selenium	1.00	0.50	1.00	-	-	-	12,300	mg/kg	4	6	0	0	
Vanadium	28.5	30.6	32.6	-	-	-	9,220	mg/kg	4	6	6	0	
Zinc	162	457	751	-	-	-	1,050,000	mg/kg	4	6	6	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Other

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Soil Organic Matter (SOM)	0.90	15.5	30.0	-	-	-	-	%	4	4	4	0	
2-Chloronaphthalene	-	-	-	-	-	-	370	mg/kg	1	1	0	0	
4-Bromophenylphenyl ether	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
4-Chloroaniline	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Azobenzene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Bis (2-chloroethoxy) methane	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Bis (2-chloroethyl) ether	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Carbazole	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Carbon Disulphide	-	-	-	-	-	-	11.0	mg/kg	1	1	0	0	
Nitrobenzene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
n-Nitrosodi-n-Propylamine	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Styrene	-	-	-	-	-	-	3,170	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

PAHs

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
2-Methylnaphthalene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Acenaphthene	0.023	0.12	0.22	-	-	-	-	mg/kg	4	6	4	0	
Acenaphthylene	0.019	0.044	0.069	-	-	-	-	mg/kg	4	6	2	0	
Anthracene	0.12	0.21	0.30	-	-	-	-	mg/kg	4	6	4	0	
Benzo (a) anthracene	0.46	0.81	1.16	-	-	-	-	mg/kg	4	6	5	0	
Benzo (a) pyrene	0.46	0.70	0.93	-	-	-	38.0	mg/kg	4	6	5	0	
Benzo (b) fluoranthene	0.76	1.18	1.60	-	-	-	-	mg/kg	4	6	5	0	
Benzo (ghi) perylene	0.49	0.53	0.57	-	-	-	-	mg/kg	4	6	4	0	
Benzo (k) fluoranthene	0.26	0.34	0.42	-	-	-	-	mg/kg	4	6	4	0	
Chrysene	0.50	0.88	1.26	-	-	-	-	mg/kg	4	6	5	0	
Dibenzo (ah) anthracene	0.085	0.090	0.095	-	-	-	-	mg/kg	4	6	4	0	
Fluoranthene	0.93	1.63	2.33	-	-	-	-	mg/kg	4	6	5	0	
Fluorene	0.028	0.11	0.20	-	-	-	-	mg/kg	4	6	4	0	
Indeno (1,2,3-cd) pyrene	0.49	0.59	0.68	-	-	-	-	mg/kg	4	6	4	0	
Naphthalene	0.11	0.48	0.85	-	-	-	193	mg/kg	4	6	4	0	
PAH Total (EPA 16)	6.15	10.4	14.6	-	-	-	-	mg/kg	4	6	5	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

PAHs

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Phenanthrene	0.48	1.12	1.75	-	-	-	-	mg/kg	4	6	4	0	
Pyrene	0.86	1.54	2.22	-	-	-	-	mg/kg	4	6	5	0	

Pesticides, Herbicides and Insecticides

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Hexachlorocyclopentadiene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Pentachlorophenol	-	-	-	-	-	-	406	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Pharmaceuticals

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
2-Nitroaniline	-	-	-	-	-	-	-	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Phenols

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
2,4-Dimethylphenol	-	-	-	-	-	-	15,700	mg/kg	1	1	0	0	
2-Methylphenol (o-Cresol)	-	-	-	-	-	-	160,000	mg/kg	1	1	0	0	
2-Nitrophenol	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
4-Methylphenol	-	-	-	-	-	-	160,000	mg/kg	1	1	0	0	
4-Nitrophenol	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Cresols	0.010	0.005	0.010	-	-	-	160,000	mg/kg	4	6	0	0	
Methylphenols Total (Summed)	-	-	-	-	-	-	160,000	mg/kg	1	1	1	0	
Phenol	0.010	0.005	0.010	-	-	-	760	mg/kg	4	6	0	0	
Phenol (Monohydric)	0.035	0.018	0.035	-	-	-	-	mg/kg	4	6	0	0	
Xylenols	0.015	0.008	0.015	-	-	-	-	mg/kg	4	6	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Phthalates

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Bis (2-ethylhexyl) phthalate	-	-	-	-	-	-	85,200	mg/kg	1	1	0	0	
Butyl benzyl phthalate	-	-	-	-	-	-	940,000	mg/kg	1	1	0	0	
Diethyl phthalate	-	-	-	-	-	-	144,000	mg/kg	1	1	0	0	
Dimethyl phthalate	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Di-n-butyl phthalate	-	-	-	-	-	-	15,400	mg/kg	1	1	0	0	
Di-n-octyl phthalate	-	-	-	-	-	-	89,100	mg/kg	1	1	0	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

QA Standard

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
4-Bromofluorobenzene	-	-	-	-	-	-	-	%	1	1	1	0	
Acenaphthene-d10	86.9	91.0	95.1	-	-	-	-	%	4	6	6	0	
Chrysene-d12	84.0	84.9	85.8	-	-	-	-	%	4	6	6	0	
Dibromofluoromethane	-	-	-	-	-	-	-	%	1	1	1	0	
Naphthalene-d8	85.2	88.1	90.9	-	-	-	-	%	4	6	6	0	
Perylene-d12**	79.9	85.0	90.1	-	-	-	-	%	4	6	6	0	
Phenanthrene-d10**	88.6	91.3	93.9	-	-	-	-	%	4	6	6	0	
Toluene-d8 Surrogate	-	-	-	-	-	-	-	%	1	1	1	0	

Unit 5 Barton Park



Commercial, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

TPH/EPH

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
GRO Surrogate	92.5	96.8	101	-	-	-	-	%	4	6	6	0	
PRO (>C5-C10)	0.020	0.091	0.17	-	-	-	-	mg/kg	4	6	3	0	

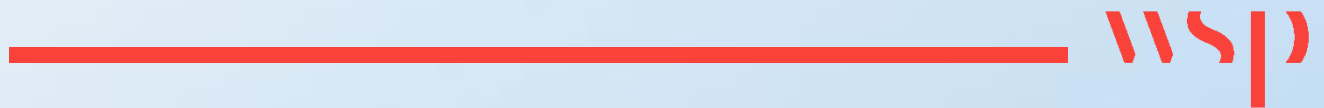
VOCs

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
4-Isopropyltoluene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
iso-Propylbenzene	-	-	-	-	-	-	1,300	mg/kg	1	1	0	0	
n-Butylbenzene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
n-Propylbenzene	-	-	-	-	-	-	3,860	mg/kg	1	1	0	0	
Sec-Butylbenzene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	
Tert-Butylbenzene	-	-	-	-	-	-	-	mg/kg	1	1	0	0	

THERE WERE NO EXCEEDANCES OF Commercial, SOM=1%

Appendix K

CONTAMINATION ASSESSMENT SCREENERS - WATER



Region	Wales and England	Hardness	NA
Water Body	Groundwater	Recieving surface water status	NA
Water Body Type	NA		
Surface Water Type	NA	Altitude	NA



LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
C16-C35 Aliphatics (Unrecognised code)	ug/l				<20	< 10	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Aliphatics and Aromatics

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
Aliphatic C05-C06	ug/l		WHO 2008	15,000	< 10	< 10	
Aliphatic C06-C08	ug/l		WHO 2008	15,000	< 10	< 10	
Aliphatic C08-C10	ug/l		WHO 2008	300	< 10	< 10	
Aliphatic C10-C12	ug/l		WHO 2008	300	< 10	15	
Aliphatic C12-C16	ug/l		WHO 2008	300	< 20	< 10	
Aliphatic C16-C21	ug/l				< 20	< 10	
Aliphatic C21-C35	ug/l				< 20	< 10	
Aliphatics C12-C35	ug/l				< 20	< 10	
Aromatic C06-C07	ug/l				< 10	< 10	
Aromatic C07-C08	ug/l				< 10	< 10	
Aromatic C08-C10	ug/l		WHO 2008	300	< 10	30	
Aromatic C10-C12	ug/l		WHO 2008	90.0	< 10	10	
Aromatic C12-C16	ug/l		WHO 2008	90.0	< 20	30	
Aromatic C12-C35	ug/l				< 20	63	
Aromatic C16-C21	ug/l		WHO 2008	90.0	< 20	15	
Aromatic C21-C35	ug/l		WHO 2008	90.0	< 20	18	
Total Aliphatics and Aromatics (C5-C35)	ug/l				< 20	131	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

BTEX and Fuel Additives

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
1,2,4-Trimethylbenzene	ug/l					4	
1,3,5-Trimethylbenzene	ug/l					<1	
Benzene	ug/l		UK DWS	1.00	<7		<1
BTEX	ug/l				<28		<28
Ethylbenzene	ug/l		WHO 2017	300	<5		11.1
Methyl t-butylether (MTBE)	ug/l		WHO 2017	15.0	<3		<1
Tertiary Amyl Methyl Ether (TAME)	ug/l						<1
Toluene	ug/l		WHO 2017	700	<4		<1
Xylene - Total (Summed)	ug/l	-999			8		8
Xylene-m & p	ug/l				<8		6.34
Xylene-o	ug/l				<3		8

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Aliphatics

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
1,1,1,2-Tetrachloroethane	ug/l				<1	
1,1,1-Trichloroethane	ug/l		WHO 2017	2,000	<1	
1,1,2,2-Tetrachloroethane	ug/l				<1	
1,1-Dichloroethane	ug/l				<1	
1,1-Dichloroethene	ug/l		WHO 2017	140	<1	
1,1-Dichloropropene	ug/l		WHO 2017	20.0	<1	
1,2,3-Trichloropropane	ug/l				<1	
1,2-Dichloroethane	ug/l		UK DWS	3.00	<1	
1,2-Dichloropropane	ug/l		WHO 2017	40.0	<1	
1,3-Dichloropropane	ug/l				<1	
2,2-Dichloropropane	ug/l				<1	
Carbon tetrachloride	ug/l		UK DWS	3.00	<1	
Chloroethane	ug/l				<1	
Chloroform	ug/l				<1	
Chloromethane	ug/l				<1	
Cis 1,2-Dichloroethene	ug/l		WHO 2017	50.0	<1	
Cis 1,3-Dichloropropene	ug/l				<1	
Dichloromethane	ug/l		WHO 2017	20.0	<3	
Hexachlorobutadiene	ug/l		WHO 2017	0.60	<1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Aliphatics

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
Hexachloroethane	ug/l				< 1	
Tetrachloroethene (PCE)	ug/l				< 1	
Trans-1,2-Dichloroethene	ug/l		WHO 2017	50.0	< 1	
Trans-1,3-Dichloropropene	ug/l				< 1	
Vinyl chloride	ug/l		UK DWS	0.50	< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Aromatics

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
1,2,3-Trichlorobenzene	ug/l				< 1	
1,2-Dichlorobenzene	ug/l		WHO 2017	1,000	< 1	
1,3,5-Trichlorobenzene	ug/l				< 1	
1,3-Dichlorobenzene	ug/l				< 1	
1,4-Dichlorobenzene	ug/l		WHO 2017	300	< 1	
2-Chlorotoluene	ug/l				< 1	
4-Chlorotoluene	ug/l				< 1	
Chlorobenzene	ug/l		WHO 2017	300	< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Phenols

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
2,4,5-Trichlorophenol	ug/l				< 1	
2,4,6-Trichlorophenol	ug/l		WHO 2017	200	< 1	
2,4-Dichlorophenol	ug/l				< 1	
2-Chlorophenol	ug/l				< 1	
4-Chloro-3-Methlphenol	ug/l				< 1	
Chlorophenols - Total (Summed Isomers)	ug/l	-999			1	



LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Dioxins and Furans

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
Dibenzofuran	ug/l				< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Dyes

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
3-Nitroaniline	ug/l				< 1	
4-Nitroaniline	ug/l				< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Explosives

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
2,4-Dinitrotoluene	ug/l				< 1	
2,6-Dinitrotoluene	ug/l				< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

General Chemistry

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
Electrical conductivity	uS/cm		UK DWS	2,500	221	640	
pH	pH Units		UK DWS	6.50 / 10.0	8.68	7.69	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Halogenated Hydrocarbons

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
1,2-Dibromo-3-Chloropropane	ug/l		WHO 2017	1.00	< 1	
1,2-Dibromoethane	ug/l		WHO 2017	0.40	< 1	
Bromobenzene	ug/l				< 1	
Bromochloromethane	ug/l				< 1	
Bromodichloromethane	ug/l				< 1	
Bromoform	ug/l				< 1	
Bromomethane	ug/l				< 1	
Dibromochloromethane	ug/l		WHO 2017	100	< 1	
Dibromomethane	ug/l				< 1	
Dichlorodifluoromethane	ug/l				< 1	
Trichlorofluoromethane	ug/l				< 1	



LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Ketones

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
Isophorone	ug/l				< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

OtherAquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
2-Chloronaphthalene	ug/l				< 1	
4-Bromophenylphenyl ether	ug/l				< 1	
4-Chloroaniline	ug/l				< 1	
4-Chlorophenyl phenyl ether	ug/l				< 1	
Azobenzene	ug/l				< 1	
Bis (2-chloroethoxy) methane	ug/l				< 1	
Bis (2-chloroethyl) ether	ug/l				< 1	
Carbazole	ug/l				< 1	
Carbon Disulphide	ug/l				1.93	
Nitrobenzene	ug/l				< 1	
n-Nitrosodi-n-Propylamine	ug/l				< 1	
Styrene	ug/l		WHO 2017	20.0	< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

PAHs Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
2-Methylnaphthalene	ug/l					< 1	
Acenaphthene	ug/l				<0.01	<0.005	
Acenaphthylene	ug/l				<0.01	<0.005	
Anthracene	ug/l				<0.01	<0.005	
Benzo (a) anthracene	ug/l				<0.01	<0.005	
Benzo (a) pyrene	ug/l		UK DWS	0.010	<0.004	<0.002	
Benzo (b) fluoranthene	ug/l				<0.01	<0.005	
Benzo (ghi) perylene	ug/l				<0.01	<0.005	
Benzo (k) fluoranthene	ug/l				<0.01	<0.005	
Chrysene	ug/l				<0.01	<0.005	
Dibenzo (ah) anthracene	ug/l				<0.01	<0.005	
Fluoranthene	ug/l				<0.01	<0.005	
Fluorene	ug/l				<0.01	<0.005	
Indeno (1,2,3-cd) pyrene	ug/l				<0.01	<0.005	
Naphthalene	ug/l				<0.02	1.89	
PAH (Total)	ug/l				<0.164	<0.082	
Phenanthrene	ug/l				<0.01	<0.005	
Pyrene	ug/l				<0.01	<0.005	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Pesticides, Herbicides and Insecticides

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
Hexachlorocyclopentadiene	ug/l				< 1	
Pentachlorophenol	ug/l		WHO 2017	9.00	< 1	



LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Pharmaceuticals

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
2-Nitroaniline	ug/l				< 1	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

PhenolsAquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
2,4-Dimethylphenol	ug/l						<1
2-Methylphenol (o-Cresol)	ug/l						<1
2-Nitrophenol	ug/l						<1
4-Methylphenol	ug/l						<1
4-Nitrophenol	ug/l						<1
Methylphenols Total (Summed)	ug/l	-999					1
Phenol	ug/l						<1
Xylenols	ug/l					<11	<11

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Phthalates

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
Bis (2-ethylhexyl) phthalate	ug/l		WHO 2017	8.00	<2	
Butyl benzyl phthalate	ug/l				<1	
Diethyl phthalate	ug/l				<1	
Dimethyl phthalate	ug/l				<1	
Di-n-butyl phthalate	ug/l				<1	
Di-n-octyl phthalate	ug/l				<5	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Physical

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
Temperature	DegC				19.3	19.8	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

QA Standard

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
4-Bromofluorobenzene	%				90.5	
Dibromofluoromethane	%				116	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

TPH/EPH

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06	
					Response Zone Depth (m bgl)	2.1 - 2.3	3.5 - 4
					Sample Date	16/03/21	16/03/21
Analyte	Units	LOD	Reference	GAC			
GRO Surrogate	%				74	98	
PRO (C5-C12)	ug/l				<50	68	

LEACHATE

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

VOCs

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
4-Isopropyltoluene	ug/l				< 1	
iso-Propylbenzene	ug/l				< 1	
n-Butylbenzene	ug/l				< 1	
n-Propylbenzene	ug/l				< 1	
Sec-Butylbenzene	ug/l				< 1	
Tert-Butylbenzene	ug/l				< 1	



WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

QA Standard

Aquifer: N/A

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS06
					Response Zone Depth (m bgl)	3.5 - 4
					Sample Date	16/03/21
Analyte	Units	LOD	Reference	GAC		
Toluene-d8 Surrogate	%				98.3	

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Aliphatics and Aromatics

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Aliphatic C05-C06	ug/l	10.0	WHO 2008	15,000		< 10	< 10	< 10
Aliphatic C06-C08	ug/l	10.0	WHO 2008	15,000		17	< 10	< 10
Aliphatic C08-C10	ug/l	10.0	WHO 2008	300		16	< 10	< 10
Aliphatic C10-C12	ug/l	10.0	WHO 2008	300		44	< 10	< 10
Aliphatic C12-C16	ug/l	10.0 - 20.0	WHO 2008	300		7980	< 10	< 10
Aliphatic C16-C21	ug/l	10.0 - 20.0				8240	77	< 10
Aliphatic C16-C35	ug/l	10.0 - 20.0				12100	518	< 10
Aliphatic C21-C35	ug/l	10.0 - 20.0				3900	441	< 10
Aliphatics C12-C35	ug/l	10.0 - 20.0				20100	518	< 10
Aromatic C06-C07	ug/l	10.0				< 10	< 10	< 10
Aromatic C07-C08	ug/l	10.0				< 10	< 10	< 10
Aromatic C08-C10	ug/l	10.0	WHO 2008	300		11	< 10	< 10
Aromatic C10-C12	ug/l	10.0	WHO 2008	90.0		30	< 10	< 10
Aromatic C12-C16	ug/l	10.0	WHO 2008	90.0		695	< 10	< 10
Aromatic C12-C35	ug/l	10.0				6450	312	< 10
Aromatic C16-C21	ug/l	10.0	WHO 2008	90.0		3030	40	< 10
Aromatic C16-C35	ug/l	10.0				5760	312	< 10
Aromatic C21-C35	ug/l	10.0	WHO 2008	90.0		2730	272	< 10
Total Aliphatics and Aromatics (C5-C35)	ug/l	10.0				26700	830	< 10

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Alkali and Alkaline Earth Metals

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1.5 - 5
					Sample Date	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC			
Barium	ug/l	0.20	WHO 2017	700		35.1	33
Beryllium	ug/l	0.10	WHO 2017	12.0		<0.1	<0.1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

BTEX and Fuel Additives

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,2,4-Trimethylbenzene	ug/l	1.00				<1	<1	<1
1,3,5-Trimethylbenzene	ug/l	1.00				<1	<1	<1
Benzene	ug/l	1.00	UK DWS	1.00		<1	<1	<1
Ethylbenzene	ug/l	1.00	WHO 2017	300		<1	<1	<1
Methyl t-butylether (MTBE)	ug/l	1.00	WHO 2017	15.0		<1	<1	<1
Tertiary Amyl Methyl Ether (TAME)	ug/l	1.00				<1	<1	<1
Toluene	ug/l	1.00	WHO 2017	700		<1	<1	<1
Xylene	ug/l	2.00	WHO 2017	500		<2	<2	<2
Xylene - Total (Summed)	ug/l	-999				1	1	1
Xylene-m & p	ug/l	1.00				<1	<1	<1
Xylene-o	ug/l	1.00				<1	<1	<1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Aliphatics

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,1,1,2-Tetrachloroethane	ug/l	1.00			<1	<1	<1	
1,1,1-Trichloroethane	ug/l	1.00	WHO 2017	2,000	<1	<1	<1	
1,1,2,2-Tetrachloroethane	ug/l	1.00			<1	<1	<1	
1,1-Dichloroethane	ug/l	1.00			<1	<1	<1	
1,1-Dichloroethene	ug/l	1.00	WHO 2017	140	<1	<1	<1	
1,1-Dichloropropene	ug/l	1.00	WHO 2017	20.0	<1	<1	<1	
1,2,3-Trichloropropane	ug/l	1.00			<1	<1	<1	
1,2-Dichloroethane	ug/l	1.00	UK DWS	3.00	<1	<1	<1	
1,2-Dichloropropane	ug/l	1.00	WHO 2017	40.0	<1	<1	<1	
1,3-Dichloropropane	ug/l	1.00			<1	<1	<1	
2,2-Dichloropropane	ug/l	1.00			<1	<1	<1	
Carbon tetrachloride	ug/l	1.00	UK DWS	3.00	<1	<1	<1	
Chloroethane	ug/l	1.00			<1	<1	<1	
Chloroform	ug/l	1.00			<1	<1	<1	
Chloromethane	ug/l	1.00			<1	<1	<1	
Cis 1,2-Dichloroethene	ug/l	1.00	WHO 2017	50.0	<1	<1	<1	
Cis 1,3-Dichloropropene	ug/l	1.00			<1	<1	<1	
Dichloromethane	ug/l	3.00	WHO 2017	20.0	<3	<3	<3	
Hexachlorobutadiene	ug/l	1.00	WHO 2017	0.60	<1	<1	<1	

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Aliphatics

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Hexachloroethane	ug/l	1.00 - 10.0				< 10	< 10	< 1
Tetrachloroethene (PCE)	ug/l	1.00				< 1	< 1	< 1
Trans-1,2-Dichloroethene	ug/l	1.00	WHO 2017	50.0		< 1	< 1	< 1
Trans-1,3-Dichloropropene	ug/l	1.00				< 1	< 1	< 1
Vinyl chloride	ug/l	1.00	UK DWS	0.50		< 1	< 1	< 1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Aromatics

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,2,3-Trichlorobenzene	ug/l	1.00				<1	<1	<1
1,2-Dichlorobenzene	ug/l	1.00	WHO 2017	1,000		<1	<1	<1
1,3,5-Trichlorobenzene	ug/l	1.00				<1	<1	<1
1,3-Dichlorobenzene	ug/l	1.00				<1	<1	<1
1,4-Dichlorobenzene	ug/l	1.00	WHO 2017	300		<1	<1	<1
2-Chlorotoluene	ug/l	1.00				<1	<1	<1
4-Chlorotoluene	ug/l	1.00				<1	<1	<1
Chlorobenzene	ug/l	1.00	WHO 2017	300		<1	<1	<1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Chlorinated Phenols

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2,4,5-Trichlorophenol	ug/l	1.00 - 10.0				< 10	< 10	< 1
2,4,6-Trichlorophenol	ug/l	1.00 - 10.0	WHO 2017	200		< 10	< 10	< 1
2,4-Dichlorophenol	ug/l	1.00 - 10.0				< 10	< 10	< 1
2-Chlorophenol	ug/l	1.00 - 10.0				< 10	< 10	< 1
4-Chloro-3-Methlphenol	ug/l	1.00 - 10.0				< 10	< 10	< 1
Chlorophenols - Total (Summed Isomers)	ug/l	-999				10	10	1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Dioxins and Furans

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Dibenzofuran	ug/l	1.00 - 10.0				< 10	< 10	< 1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

DyesAquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
3-Nitroaniline	ug/l	1.00 - 10.0				< 10	< 10	< 1
4-Nitroaniline	ug/l	1.00 - 10.0				< 10	< 10	< 1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Explosives

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2,4-Dinitrotoluene	ug/l	1.00 - 10.0				< 10	< 10	< 1
2,6-Dinitrotoluene	ug/l	1.00 - 10.0				< 10	< 10	< 1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Halogenated Hydrocarbons

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,2-Dibromo-3-Chloropropane	ug/l	1.00	WHO 2017	1.00		<1	<1	<1
1,2-Dibromoethane	ug/l	1.00	WHO 2017	0.40		<1	<1	<1
Bromobenzene	ug/l	1.00				<1	<1	<1
Bromochloromethane	ug/l	1.00				<1	<1	<1
Bromodichloromethane	ug/l	1.00				<1	<1	<1
Bromoform	ug/l	1.00				<1	<1	<1
Bromomethane	ug/l	1.00				<1	<1	<1
Dibromochloromethane	ug/l	1.00	WHO 2017	100		<1	<1	<1
Dibromomethane	ug/l	1.00				<1	<1	<1
Dichlorodifluoromethane	ug/l	1.00				<1	<1	<1
Trichlorofluoromethane	ug/l	1.00				<1	<1	<1



WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Ketones

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Isophorone	ug/l	1.00 - 10.0				< 10	< 10	< 1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

MetalsAquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Arsenic	ug/l	0.50	UK DWS	10.0		1.41		1.14
Boron	ug/l	10.0	UK DWS	1,000		47.3		45.2
Cadmium	ug/l	0.080	UK DWS	5.00		<0.08		<0.08
Chromium	ug/l	1.00	UK DWS	50.0		<1		<1
Copper	ug/l	0.30	UK DWS	2,000		1.1		2.48
Hexavalent Chromium	ug/l	30.0				<30	<30	<30
Lead	ug/l	0.20	UK DWS	10.0		0.95		1.18
Mercury	ug/l	0.010	UK DWS	1.00		<0.01		<0.01
Nickel	ug/l	0.40	UK DWS	20.0		2.24		7
Selenium	ug/l	1.00	UK DWS	10.0		<1		24.7
Vanadium	ug/l	1.00				<1		<1
Zinc	ug/l	1.00				17.9		17.1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Other

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2-Chloronaphthalene	ug/l	1.00 - 10.0				<10	<10	<1
4-Bromophenylphenyl ether	ug/l	1.00 - 10.0				<10	<10	<1
4-Chloroaniline	ug/l	1.00 - 10.0				<10	<10	<1
4-Chlorophenyl phenyl ether	ug/l	1.00 - 10.0				<10	<10	<1
Azobenzene	ug/l	1.00 - 10.0				<10	<10	<1
Bis (2-chloroethoxy) methane	ug/l	1.00 - 10.0				<10	<10	<1
Bis (2-chloroethyl) ether	ug/l	1.00 - 10.0				<10	<10	<1
Carbazole	ug/l	1.00 - 10.0				<10	<10	<1
Carbon Disulphide	ug/l	1.00				<1	<1	<1
Nitrobenzene	ug/l	1.00 - 10.0				<10	<10	<1
n-Nitrosodi-n-Propylamine	ug/l	1.00 - 10.0				<10	<10	<1
Styrene	ug/l	1.00	WHO 2017	20.0		<1	<1	<1

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

PAHsAquifer: No aquifer entered

Result > Assessment Criteria

Limit of detection > Assessment Criteria

Analyte	Units	LOD	Reference	GAC	PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
2-Methylnaphthalene	ug/l	1.00 - 10.0				<10	<10	<1
Acenaphthene	ug/l	0.005				<0.005	0.106	0.00881
Acenaphthylene	ug/l	0.005				0.833	0.201	0.00733
Anthracene	ug/l	0.005				<0.005	0.33	0.0349
Benzo (a) anthracene	ug/l	0.005				<0.005	1.31	0.0993
Benzo (a) pyrene	ug/l	0.002	UK DWS	0.010		0.312	2.37	0.283
Benzo (b) fluoranthene	ug/l	0.005				0.373	4.5	0.905
Benzo (ghi) perylene	ug/l	0.005				0.183	2.54	0.632
Benzo (k) fluoranthene	ug/l	0.005				0.0857	1.57	0.224
Chrysene	ug/l	0.005				<0.005	1.91	0.22
Dibenzo (ah) anthracene	ug/l	0.005				0.0445	0.454	0.0834
Fluoranthene	ug/l	0.005				<0.005	2.7	0.202
Fluorene	ug/l	0.005				<0.005	0.104	0.0134
Indeno (1,2,3-cd) pyrene	ug/l	0.005				0.118	2.41	0.418
Naphthalene	ug/l	0.010				0.0342	0.0929	0.017
PAH (Total)	ug/l	0.082				3.42	24.2	3.41
Phenanthrene	ug/l	0.005				<0.005	0.938	0.0824
Pyrene	ug/l	0.005				1.44	2.69	0.181

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Pesticides, Herbicides and Insecticides

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Hexachlorocyclopentadiene	ug/l	1.00 - 10.0				< 10	< 10	< 1
Pentachlorophenol	ug/l	1.00 - 10.0	WHO 2017	9.00		< 10	< 10	< 1



WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Pharmaceuticals

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2-Nitroaniline	ug/l	1.00 - 10.0				< 10	< 10	< 1



WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

PhenolsAquifer: No aquifer entered

Result > Assessment Criteria

Limit of detection > Assessment Criteria

					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2,4-Dimethylphenol	ug/l	1.00 - 10.0				<10	<10	<1
2-Methylphenol (o-Cresol)	ug/l	1.00 - 10.0				<10	<10	<1
2-Nitrophenol	ug/l	1.00 - 10.0				<10	<10	<1
4-Methylphenol	ug/l	1.00 - 10.0				<10	<10	<1
4-Nitrophenol	ug/l	1.00 - 10.0				<10	<10	<1
Cresols	ug/l	6.00				<6	<6	<6
Methylphenols Total (Summed)	ug/l	-999				10	10	1
Phenol	ug/l	1.00 - 2.00				<2	<2	<1
Phenol (Monohydric)	ug/l	16.0				<16	<16	<16
Xylenols	ug/l	8.00				<8	<8	<8

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

Phthalates

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Bis (2-ethylhexyl) phthalate	ug/l	2.00 - 20.0	WHO 2017	8.00	<20	<20	<2	
Butyl benzyl phthalate	ug/l	1.00 - 10.0			<10	<10	<1	
Diethyl phthalate	ug/l	1.00 - 10.0			<10	<10	<1	
Dimethyl phthalate	ug/l	1.00 - 10.0			<10	<10	<1	
Di-n-butyl phthalate	ug/l	1.00 - 10.0			<10	<10	<1	
Di-n-octyl phthalate	ug/l	5.00 - 50.0			<50	<50	<5	

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

QA Standard

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
4-Bromofluorobenzene	%					96.8	98.2	99.5
Dibromofluoromethane	%					124	120	118
Toluene-d8 Surrogate	%					99.4	99.9	101

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

TPH/EPH

Aquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
GRO Surrogate	%					101	101	105
PRO (C5-C12)	ug/l	50.0				127	<50	<50

WATER

Site Area(s) selected: N/A, Whole site
Event selected: All events, N/A, Round 2

VOCsAquifer: No aquifer entered

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
4-Isopropyltoluene	ug/l	1.00				<1	<1	<1
iso-Propylbenzene	ug/l	1.00				<1	<1	<1
n-Butylbenzene	ug/l	1.00				<1	<1	<1
n-Propylbenzene	ug/l	1.00				<1	<1	<1
Sec-Butylbenzene	ug/l	1.00				<1	<1	<1
Tert-Butylbenzene	ug/l	1.00				<1	<1	<1

Region	Wales and England	Hardness	0-50 mg/l
Water Body	Surface water	Recieving surface water status	Good (or below)
Water Body Type	Inland		
Surface Water Type	River or Stream	Altitude	< 80m Elevation



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Aliphatics and Aromatics

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Aliphatic C05-C06	ug/l	10.0				< 10	< 10	< 10
Aliphatic C06-C08	ug/l	10.0				17	< 10	< 10
Aliphatic C08-C10	ug/l	10.0				16	< 10	< 10
Aliphatic C10-C12	ug/l	10.0				44	< 10	< 10
Aliphatic C12-C16	ug/l	10.0 - 20.0				7980	< 10	< 10
Aliphatic C16-C21	ug/l	10.0 - 20.0				8240	77	< 10
Aliphatic C16-C35	ug/l	10.0 - 20.0				12100	518	< 10
Aliphatic C21-C35	ug/l	10.0 - 20.0				3900	441	< 10
Aliphatics C12-C35	ug/l	10.0 - 20.0				20100	518	< 10
Aromatic C06-C07	ug/l	10.0	CL:AIRE 2017	10.0		< 10	< 10	< 10
Aromatic C07-C08	ug/l	10.0	CL:AIRE 2017	74.0		< 10	< 10	< 10
Aromatic C08-C10	ug/l	10.0	CL:AIRE 2017	20.0		11	< 10	< 10
Aromatic C10-C12	ug/l	10.0	CL:AIRE 2017	2.00		30	< 10	< 10
Aromatic C12-C16	ug/l	10.0	CL:AIRE 2017	2.00		695	< 10	< 10
Aromatic C12-C35	ug/l	10.0				6450	312	< 10
Aromatic C16-C21	ug/l	10.0	CL:AIRE 2017	0.10		3030	40	< 10
Aromatic C16-C35	ug/l	10.0				5760	312	< 10
Aromatic C21-C35	ug/l	10.0	CL:AIRE 2017	0.0002		2730	272	< 10
Total Aliphatics and Aromatics (C5-C35)	ug/l	10.0				26700	830	< 10

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Alkali and Alkaline Earth Metals

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1.5 - 5
					Sample Date	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC			
Barium	ug/l	0.20				35.1	33
Beryllium	ug/l	0.10				<0.1	<0.1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

BTEX and Fuel Additives

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,2,4-Trimethylbenzene	ug/l	1.00				<1	<1	<1
1,3,5-Trimethylbenzene	ug/l	1.00				<1	<1	<1
Benzene	ug/l	1.00	EQS 2015	10.0		<1	<1	<1
Ethylbenzene	ug/l	1.00	Proposed EQS	20.0		<1	<1	<1
Methyl t-butylether (MTBE)	ug/l	1.00				<1	<1	<1
Tertiary Amyl Methyl Ether (TAME)	ug/l	1.00				<1	<1	<1
Toluene	ug/l	1.00	EQS 2015	74.0		<1	<1	<1
Xylene	ug/l	2.00	CL:AIRE 2017	30.0		<2	<2	<2
Xylene - Total (Summed)	ug/l	-999				1	1	1
Xylene-m & p	ug/l	1.00				<1	<1	<1
Xylene-o	ug/l	1.00				<1	<1	<1

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Chlorinated Aliphatics

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,1,1,2-Tetrachloroethane	ug/l	1.00				<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	1.00				<1	<1	<1
1,1-Dichloroethane	ug/l	1.00				<1	<1	<1
1,1-Dichloroethene	ug/l	1.00				<1	<1	<1
1,1-Dichloropropene	ug/l	1.00				<1	<1	<1
1,2,3-Trichloropropane	ug/l	1.00				<1	<1	<1
1,2-Dichloroethane	ug/l	1.00	EQS 2015	10.0		<1	<1	<1
1,2-Dichloropropane	ug/l	1.00				<1	<1	<1
1,3-Dichloropropane	ug/l	1.00				<1	<1	<1
2,2-Dichloropropane	ug/l	1.00				<1	<1	<1
Carbon tetrachloride	ug/l	1.00	EQS 2015	12.0		<1	<1	<1
Chloroethane	ug/l	1.00				<1	<1	<1
Chloroform	ug/l	1.00	EQS 2015	2.50		<1	<1	<1
Chloromethane	ug/l	1.00				<1	<1	<1
Cis 1,2-Dichloroethene	ug/l	1.00				<1	<1	<1
Cis 1,3-Dichloropropene	ug/l	1.00				<1	<1	<1
Dichloromethane	ug/l	3.00	EQS 2015	20.0		<3	<3	<3
Hexachlorobutadiene	ug/l	1.00	EQS 2015 MAC	0.60		<1	<1	<1
Hexachloroethane	ug/l	1.00 - 10.0				<10	<10	<1

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Chlorinated Aliphatics

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Tetrachloroethene (PCE)	ug/l	1.00	EQS 2015	10.0		<1	<1	<1
Trans-1,2-Dichloroethene	ug/l	1.00				<1	<1	<1
Trans-1,3-Dichloropropene	ug/l	1.00				<1	<1	<1
Trichloroethene (TCE)	ug/l	1.00	EQS 2015	10.0		<1	<1	<1
Vinyl chloride	ug/l	1.00				<1	<1	<1

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Chlorinated Aromatics

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,2,3-Trichlorobenzene	ug/l	1.00				<1	<1	<1
1,2,4-Trichlorobenzene	ug/l	1.00				<1	<1	<1
1,2-Dichlorobenzene	ug/l	1.00				<1	<1	<1
1,3,5-Trichlorobenzene	ug/l	1.00				<1	<1	<1
1,3-Dichlorobenzene	ug/l	1.00				<1	<1	<1
1,4-Dichlorobenzene	ug/l	1.00				<1	<1	<1
2-Chlorotoluene	ug/l	1.00				<1	<1	<1
4-Chlorotoluene	ug/l	1.00				<1	<1	<1
Chlorobenzene	ug/l	1.00				<1	<1	<1
Hexachlorobenzene	ug/l	1.00 - 10.0	EQS 2015 MAC	0.050		<10	<10	<1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Chlorinated Phenols

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2,4,5-Trichlorophenol	ug/l	1.00 - 10.0			< 10	< 10	< 1	
2,4,6-Trichlorophenol	ug/l	1.00 - 10.0			< 10	< 10	< 1	
2,4-Dichlorophenol	ug/l	1.00 - 10.0	EQS 2015	4.20	< 10	< 10	< 1	
Chlorophenols - Total (Summed Isomers)	ug/l	-999			10	10	1	



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Dioxins and Furans

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Dibenzofuran	ug/l	1.00 - 10.0				< 10	< 10	< 1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Dyes

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
3-Nitroaniline	ug/l	1.00 - 10.0				< 10	< 10	< 1
4-Nitroaniline	ug/l	1.00 - 10.0				< 10	< 10	< 1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Explosives

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2,4-Dinitrotoluene	ug/l	1.00 - 10.0				< 10	< 10	< 1
2,6-Dinitrotoluene	ug/l	1.00 - 10.0				< 10	< 10	< 1

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Halogenated Hydrocarbons

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
1,2-Dibromo-3-Chloropropane	ug/l	1.00				<1	<1	<1
1,2-Dibromoethane	ug/l	1.00				<1	<1	<1
Bromobenzene	ug/l	1.00				<1	<1	<1
Bromochloromethane	ug/l	1.00				<1	<1	<1
Bromodichloromethane	ug/l	1.00				<1	<1	<1
Bromoform	ug/l	1.00				<1	<1	<1
Bromomethane	ug/l	1.00				<1	<1	<1
Dibromochloromethane	ug/l	1.00				<1	<1	<1
Dibromomethane	ug/l	1.00				<1	<1	<1
Dichlorodifluoromethane	ug/l	1.00				<1	<1	<1
Trichlorofluoromethane	ug/l	1.00				<1	<1	<1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Ketones

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Isophorone	ug/l	1.00 - 10.0				< 10	< 10	< 1

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Metals

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Arsenic	ug/l	0.50	EQS 2015	50.0		1.41		1.14
Cadmium	ug/l	0.080	EQS 2015	0.080		<0.08		<0.08
Chromium	ug/l	1.00	EQS 2015	4.70		<1		<1
Copper	ug/l	0.30	EQS 2015 - Bioavailable	1.00		1.1		2.48
Hexavalent Chromium	ug/l	30.0	EQS 2015	3.40		<30	<30	<30
Lead	ug/l	0.20	EQS 2015 - Bioavailable	1.20		0.95		1.18
Mercury	ug/l	0.010	EQS 2015 MAC	0.070		<0.01		<0.01
Nickel	ug/l	0.40	EQS 2015 - Bioavailable	4.00		2.24		7
Selenium	ug/l	1.00				<1		24.7
Zinc	ug/l	1.00	EQS 2015 - Bioavailable	10.9		17.9		17.1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Other

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2-Chloronaphthalene	ug/l	1.00 - 10.0				<10	<10	<1
4-Bromophenylphenyl ether	ug/l	1.00 - 10.0				<10	<10	<1
4-Chloroaniline	ug/l	1.00 - 10.0				<10	<10	<1
4-Chlorophenyl phenyl ether	ug/l	1.00 - 10.0				<10	<10	<1
Azobenzene	ug/l	1.00 - 10.0				<10	<10	<1
Bis (2-chloroethoxy) methane	ug/l	1.00 - 10.0				<10	<10	<1
Bis (2-chloroethyl) ether	ug/l	1.00 - 10.0				<10	<10	<1
Carbazole	ug/l	1.00 - 10.0				<10	<10	<1
Carbon Disulphide	ug/l	1.00				<1	<1	<1
Nitrobenzene	ug/l	1.00 - 10.0				<10	<10	<1
n-Nitrosodi-n-Propylamine	ug/l	1.00 - 10.0				<10	<10	<1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

PAHs Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2-Methylnaphthalene	ug/l	1.00 - 10.0				<10	<10	<1
Acenaphthene	ug/l	0.005				<0.005	0.106	0.00881
Acenaphthylene	ug/l	0.005				0.833	0.201	0.00733
Anthracene	ug/l	0.005	EQS 2015	0.10		<0.005	0.33	0.0349
Benzo (a) anthracene	ug/l	0.005				<0.005	1.31	0.0993
Benzo (a) pyrene	ug/l	0.002	EQS 2015	0.0002		0.312	2.37	0.283
Benzo (b) fluoranthene	ug/l	0.005				0.373	4.5	0.905
Benzo (ghi) perylene	ug/l	0.005				0.183	2.54	0.632
Benzo (k) fluoranthene	ug/l	0.005				0.0857	1.57	0.224
Chrysene	ug/l	0.005				<0.005	1.91	0.22
Dibenzo (ah) anthracene	ug/l	0.005				0.0445	0.454	0.0834
Fluoranthene	ug/l	0.005	EQS 2015	0.006		<0.005	2.7	0.202
Fluorene	ug/l	0.005				<0.005	0.104	0.0134
Indeno (1,2,3-cd) pyrene	ug/l	0.005				0.118	2.41	0.418
Naphthalene	ug/l	0.010	EQS 2015	2.00		0.0342	0.0929	0.017
PAH (Total)	ug/l	0.082				3.42	24.2	3.41
Phenanthrene	ug/l	0.005				<0.005	0.938	0.0824
Pyrene	ug/l	0.005				1.44	2.69	0.181

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Pesticides, Herbicides and Insecticides

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Hexachlorocyclopentadiene	ug/l	1.00 - 10.0				< 10	< 10	< 1
Pentachlorophenol	ug/l	1.00 - 10.0	EQS 2015	0.40		< 10	< 10	< 1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Pharmaceuticals

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2-Nitroaniline	ug/l	1.00 - 10.0				< 10	< 10	< 1



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Phenols

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
2,4-Dimethylphenol	ug/l	1.00 - 10.0				<10	<10	<1
2-Methylphenol (o-Cresol)	ug/l	1.00 - 10.0				<10	<10	<1
2-Nitrophenol	ug/l	1.00 - 10.0				<10	<10	<1
4-Methylphenol	ug/l	1.00 - 10.0				<10	<10	<1
4-Nitrophenol	ug/l	1.00 - 10.0				<10	<10	<1
Methylphenols Total (Summed)	ug/l	-999				10	10	1
Phenol	ug/l	1.00 - 2.00	EQS 2015	7.70		<2	<2	<1
Phenol (Monohydric)	ug/l	16.0				<16	<16	<16
Xylenols	ug/l	8.00				<8	<8	<8

WATER

Site Area(s) selected: Whole site
Event selected: Round 2

Phthalates

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
Bis (2-ethylhexyl) phthalate	ug/l	2.00 - 20.0	EQS 2015	1.30	<20	<20	<2	
Butyl benzyl phthalate	ug/l	1.00 - 10.0	EQS 2015	7.50	<10	<10	<1	
Di-n-butyl phthalate	ug/l	1.00 - 10.0			<10	<10	<1	



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

QA Standard

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
4-Bromofluorobenzene	%					96.8	98.2	99.5
Dibromofluoromethane	%					124	120	118
Toluene-d8 Surrogate	%					99.4	99.9	101



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

TPH/EPH

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
GRO Surrogate	%					101	101	105
PRO (C5-C12)	ug/l	50.0				127	<50	<50



WATER

Site Area(s) selected: Whole site
Event selected: Round 2

VOCs

Aquifer: No aquifer entered

Current event: Round 2

Result > Assessment Criteria Limit of detection > Assessment Criteria					PointID	WS05	WS06	WS07
					Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
					Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	Reference	GAC				
4-Isopropyltoluene	ug/l	1.00				<1	<1	<1
iso-Propylbenzene	ug/l	1.00				<1	<1	<1
n-Butylbenzene	ug/l	1.00				<1	<1	<1
n-Propylbenzene	ug/l	1.00				<1	<1	<1
Sec-Butylbenzene	ug/l	1.00				<1	<1	<1
Tert-Butylbenzene	ug/l	1.00				<1	<1	<1

Aliphatics and Aromatics

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
				Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
				Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
Aliphatic C05-C06	ug/l	10.0	GAC > Sol		<10	<10	<10
Aliphatic C06-C08	ug/l	10.0	GAC > Sol		17	<10	<10
Aliphatic C08-C10	ug/l	10.0	GAC > Sol		16	<10	<10
Aliphatic C10-C12	ug/l	10.0	GAC > Sol		44	<10	<10
Aliphatic C12-C16	ug/l	10.0 - 20.0	GAC > Sol		7980	<10	<10
Aromatic C07-C08	ug/l	10.0	GAC > Sol		<10	<10	<10
Aromatic C08-C10	ug/l	10.0	GAC > Sol		11	<10	<10
Aromatic C10-C12	ug/l	10.0	GAC > Sol		30	<10	<10
Aromatic C12-C16	ug/l	10.0	GAC > Sol		695	<10	<10

BTEX and Fuel Additives

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
Response Zone Depth (m bgl)					1 - 2.3	1 - 2.5	1.5 - 5
Sample Date					31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
1,2,4-Trimethylbenzene	ug/l	1.00	104,900		<1	<1	<1
1,3,5-Trimethylbenzene	ug/l	1.00	104,900		<1	<1	<1
Benzene	ug/l	1.00	57,540		<1	<1	<1
Ethylbenzene	ug/l	1.00	GAC > Sol		<1	<1	<1
Methyl t-butylether (MTBE)	ug/l	1.00	22,530,700		<1	<1	<1
Toluene	ug/l	1.00	GAC > Sol		<1	<1	<1
Xylene - Total (Summed)	ug/l	-999	GAC > Sol		1	1	1

Chlorinated Aliphatics

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
				Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
				Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
1,1,1,2-Tetrachloroethane	ug/l	1.00	65,181		<1	<1	<1
1,1,1-Trichloroethane	ug/l	1.00	GAC > Sol		<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/l	1.00	431,837		<1	<1	<1
1,1,2-Trichloroethane	ug/l	1.00	140,883		<1	<1	<1
1,1-Dichloroethene	ug/l	1.00	44,826		<1	<1	<1
1,2-Dichloroethane	ug/l	1.00	2,410		<1	<1	<1
1,2-Dichloropropane	ug/l	1.00	7,545		<1	<1	<1
Carbon tetrachloride	ug/l	1.00	24,520		<1	<1	<1
Chloroethane	ug/l	1.00	2,808,414		<1	<1	<1
Chloromethane	ug/l	1.00	3,796		<1	<1	<1
Dichloromethane	ug/l	3.00	1,022,884		<3	<3	<3
Hexachlorobutadiene	ug/l	1.00	745		<1	<1	<1
Tetrachloroethene (PCE)	ug/l	1.00	13,800		<1	<1	<1
Trans-1,2-Dichloroethene	ug/l	1.00	44,769		<1	<1	<1
Trichloroethene (TCE)	ug/l	1.00	1,540		<1	<1	<1
Vinyl chloride	ug/l	1.00	171		<1	<1	<1

Chlorinated Aromatics

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
Response Zone				Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
Sample Date					31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
1,2,3-Trichlorobenzene	ug/l	1.00	9,411		<1	<1	<1
1,2,4-Trichlorobenzene	ug/l	1.00	27,714		<1	<1	<1
1,2-Dichlorobenzene	ug/l	1.00	GAC > Sol		<1	<1	<1
1,3,5-Trichlorobenzene	ug/l	1.00	2,014		<1	<1	<1
1,3-Dichlorobenzene	ug/l	1.00	8,303		<1	<1	<1
1,4-Dichlorobenzene	ug/l	1.00	GAC > Sol		<1	<1	<1
Chlorobenzene	ug/l	1.00	46,835		<1	<1	<1

Halogenated Hydrocarbons

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
Response Zone				Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
Sample Date					31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
Bromobenzene	ug/l	1.00	58,325		<1	<1	<1

Other

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
Response Zone Depth (m bgl)					1 - 2.3	1 - 2.5	1.5 - 5
Sample Date					31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
2-Chloronaphthalene	ug/l	1.00 - 10.0	GAC > Sol		<10	<10	<1
Carbon Disulphide	ug/l	1.00	15,370		<1	<1	<1
Styrene	ug/l	1.00	GAC > Sol		<1	<1	<1

PAHs

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
				Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
				Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
Naphthalene	ug/l	0.010	GAC > Sol		0.0342	0.0929	0.017

VOCs

Result > Assessment Criteria Limit of detection > Assessment Criteria				PointID	WS05	WS06	WS07
				Response Zone Depth (m bgl)	1 - 2.3	1 - 2.5	1.5 - 5
				Sample Date	31/03/21	31/03/21	31/03/21
Analyte	Units	LOD	GAC				
iso-Propylbenzene	ug/l	1.00	GAC > Sol		<1	<1	<1
n-Propylbenzene	ug/l	1.00	GAC > Sol		<1	<1	<1



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