



Neath Port Talbot County Council

PORT TALBOT HARBOURSIDE

Factual Report - Additional Product Investigation





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Factual Report - Additional Product Investigation

CONFIDENTIAL

PROJECT NO. 62253048

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WSP

1 Capital Quarter

Tyndall Street

Cardiff

CF10 4BZ

Phone: +44 2920 769 200

WSP.com

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Signature	 Evans, Rhys pp for J Lott 2020.03.13 14:47:21 Z		
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Signature	 Digitally signed by Irlam, Anna (Anna.Irlam) DN: cn=Irlam, Anna (Anna.Irlam), ou=Cardiff (1 Capital Quarter), email=Anna.Irlam@wsp.com Reason: I have reviewed this document Date: 2020.03.13 15:21:05		
Authorised by	K Rawlins		
Signature	 Digitally signed by Rawlins, Katie DN: cn=Rawlins, Katie, ou=Bristol (Kings Orchard), email=Katie.Rawlins@wsp.com Reason: I am approving this document Date: 2020.03.13 15:55:56		
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1 INTRODUCTION

1.1 INSTRUCTION

WSP UK Ltd. (WSP) was instructed by Neath Port Talbot County Council (the Client) to undertake additional ground investigation works and laboratory testing at Port Talbot Harbourside (the 'site'), SA13 1RZ. The additional ground investigation works were undertaken to assess the extent of contamination found in the central and western areas of the site during previous a ground investigation conducted in August 2019. This report details the findings of the intrusive works. The site location is shown on **Figure 1** in **Appendix A**.

1.2 BACKGROUND

A previous ground investigation conducted by WSP in August 2019 encountered Non-Aqueous Phase Liquid (NAPL) and associated hydrocarbon contamination in the central and western areas of the site. However, due the limited coverage of monitoring wells in this area of the site, further investigation was deemed necessary to delineate the extent of the contamination plume prior to the proposal of a remediation strategy.

1.3 OBJECTIVES

The main objectives of this assessment were to:

- § Obtain additional soil and groundwater quality data in the central and western areas of the site;
- § Confirm the presence and extent of the NAPL on site; and
- § Assist with advising on the remediation strategy for the site.

1.4 PREVIOUS REPORTS

The following previous reports should be read in conjunction with this report. Data contained within these reports have been utilised in this assessment, where appropriate:

- § Opus Phase I Desk Study Report, Ref: V-C8602.01-OIC-00-XX-RP-01, Dated July 2017;
- § Opus International Consultants (UK) Ltd, NPT Harbourside Interpretative Geo-environmental Ground Investigation Report, Ref: V-C8602.01/OIC/00/XX/RP/02, Dated September 2017;
- § Opus International Consultants (UK) Ltd, NPT Harbourside – Addendum Ground Gas Letter Report, Ref: V-C8602.01-OIC-20171012-NPTCBC-01, dated October 2017;
- § WSP UK Ltd, Port Talbot Harbourside Generic Quantitative Risk Assessment, Supplementary Site Investigation Report, Ref 62253048-001, Dated September 2019; and
- § WSP UK Ltd, Port Talbot Harbourside Controlled Waters Detailed Quantitative Risk Assessment, Ref 62253048-002, Dated February 2020.

1.5 LIMITATIONS

This report is addressed to and may be relied upon by the following party:

- § Neath Port Talbot County Borough Council

The report shall not be relied upon or transferred to any other parties without the express written authorisation of WSP. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

Where this report summarises information provided from others, WSP cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon.

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

2 SITE DETAILS

2.1 LOCATION AND ACCESS

The site is located adjacent to the Cramic Way to Port Talbot Parkway Railway Station on the northern boundary and Old Dock Road and Harbour Way (A4241) on the southern boundary. The site comprises a roughly rectangular parcel of land which is approximately 2.8 Ha in area.

The location of the site is at an approximate National Grid Reference (NGR) 276570(E), 189509(N) as displayed on **Figure 1** in **Appendix A**.

The main access to the site is off Oakwood Road to the east of the site.

2.2 SITE DESCRIPTION

The site is generally flat, except for a raised embankment approximately 2m in height in the western area of the site. All buildings known to have been previously occupying the site have been demolished, but areas of concrete, macadam and hardstanding associated with these buildings remain.

To the north, the site boundary comprises a public footpath beyond which lies Port Talbot Parkway Railway Station and associated car parking. There is no fencing or other means of segregation to prevent public access to the site from this direction. To the east, the site is bound by Port Talbot Magistrates Court and associated parking but is open to public access. To the south, the site is fenced bound by Dock Road, beyond which lies Harbour Way. Earth bunds are present in the western portion of the site with site bound by newly developed commercial buildings.

2.3 PUBLISHED GEOLOGY

The geology of the area in its regional context is shown on British Geological Survey 1:50,000 scale plan Sheet 247, Swansea and in more detail on 1:10,560 scale sheet SS 78 NE. The site lies just within the southern outcrop of the South Wales Coalfield. For further site-specific detail of the geology encountered at the site refer to previous reports completed for the site.

2.3.1 SUPERFICIAL DEPOSITS

Maps indicate Estuarine Alluvium in the immediate area. Alluvial Fan deposits and Glacial Sand and Gravel are also indicated in close proximity to the site.

2.3.2 BEDROCK

Solid strata of the Llynfi Beds comprising sandstones with interbedded coal seams and minor siltstone and mudstone layers of the Lower Pennant Measures of Carboniferous age underlie the site.

3 GROUND INVESTIGATION METHODOLOGY

3.1 SCOPE OF WORKS

3.1.1 DESCRIPTION OF FIELDWORK

The ground investigation was undertaken between 2nd and 10th December 2019. The investigatory works were undertaken by Quantum Geotechnic Limited under the supervision and management of WSP engineers.

All works were conducted within safe working practices set out by WSPs Construction Phase Plan (CPP) including Risk Assessment and Method Statements. All exploratory hole locations were surveyed and cleared by utility clearance specialists from Midlands Surveys Limited prior to commencing intrusive works. Due to previously encountered ground conditions in the top 1.5 m on site, inspection pits were excavated using a JCB 3CX including the use of a hydraulic breaker to progress through any layers of hardstanding and backfilled before drilling commenced.

The following intrusive investigation works have been undertaken:

- § Five boreholes (BH201 – BH207) by cable percussive drilling to depths of 5.0 m, and two boreholes to 7.0 m below ground level (bgl);
- § Seven installation of 100mm diameter remediation wells within all seven boreholes using high density polyethylene (HDPE) well screen and washed filter gravel, with a hydrated bentonite seal and raised lockable cover; and
- § Eight machine excavated trial pits (TP201 – TP208) to variable depths (maximum depth of 3.0 m bgl).

Exploratory hole arisings were logged in general accordance to BS5930:2015, BS10175:2011+A2:2017 and Eurocodes. Borehole and trial pit logs are included in **Appendix D**.

Soil samples were collected for chemical laboratory testing by the WSP engineer on site. Samples were collected with a clean sampling trowel or by hand (using dedicated nitrile gloves for each sampling location). Samples were placed immediately into laboratory supplied containers, specific to the type of analyses required. All sample containers were sealed and labelled with a unique location identity, depth and date of sampling. The samples for chemical laboratory testing were sent to ALS Ltd, a UKAS and MCERTS accredited laboratory, for analysis.

3.2 EXPLORATORY HOLE LOCATIONS

The exploratory hole locations were set out by the WSP engineer in conjunction with a preliminary exploratory hole location plan. Once cleared of services, the utility clearance specialists surveyed the positions to ordnance survey datum.

An exploratory hole location plan is presented as **Figure 2 (Appendix A)**, which shows the different phases of ground investigation at the site.

- § Phase 1 references all historical exploratory hole locations pre 2019.
- § Phase 2 references the exploratory holes completed in the WSP GI in August 2019; and
- § Phase 3 references the exploratory holes completed in the WSP GI in December 2019.

There were two refusals on a concrete slab recorded, TP203 and BH204. At these exploratory hole locations, the holes were re-situated close to the original proposed locations. The exploratory hole

coordinates and levels are presented on the logs in **Appendix D**. Table 3-1 presents the National Grid Coordinates and Ordnance Datum for all exploratory holes.

Table 3-1 - Exploratory Hole Coordinates & Levels

Borehole ID	Eastings	Northings	Level (mAOD)
BH201	276508.226	189531.609	8.535
BH202	276507.670	189505.525	6.883
BH203	276512.494	189492.397	6.869
BH204A	276544.310	189542.114	6.607
BH205	276555.522	189510.153	6.891
BH206	276553.982	189475.275	6.644
BH207	276489.153	189521.246	8.551
TP201	276543.330	189554.522	6.497
TP202	276519.568	189505.962	6.884
TP203A	276544.310	189498.582	7.034
TP204	276571.097	189538.418	6.639
TP205	276568.982	189515.324	6.775
TP206	276565.341	189483.147	6.611
TP207	276580.299	189487.201	6.911
TP208	276573.294	189464.829	6.866

3.3 IN-SITU TESTING

A photoionisation detector (PID) fitted with a 10.6v lamp was used to undertake headspace testing to measure volatile organic compounds (VOCs) emitting from the various strata encountered. The readings are presented within the exploratory hole logs in **Appendix D**.

3.4 LABORATORY ANALYSIS

3.4.1 DESCRIPTION OF GEO-ENVIRONMENTAL TESTS

Chemical testing was undertaken on selected soil, groundwater and product samples as indicated in Table 3-2:

Table 3-2 – Laboratory Analysis

Determinand	No of Soil Samples Analysed	No of Groundwater Samples Analysed	No of Product Samples Analysed
Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG)	10	3	-
Methyl Tertiary Butyl Ether (MTBE)	10	3	-
Benzene, Toluene Ethylbenzene & Xylenes (BTEX)	10	3	-
Whole Oil Profile	-	-	1
Product Density	-	-	1
Viscosity	-	-	1
TPH CWG characterisation	-	-	1

Laboratory analytical certificates have been presented in **Appendix E**.

4 GROUND INVESTIGATION – SUMMARY OF FINDINGS

4.1 GEOLOGY

The ground conditions encountered were consistent with the published geological information and findings from previous ground investigations, generally comprising of hardstanding (locally) overlying Topsoil and/or Made Ground underlain by Alluvium. Exploratory hole logs are presented in **Appendix D**.

4.1.1 TOPSOIL

Topsoil of brownish grey sand was encountered from the surface in BH202 and BH203 (west corner of the site where some shrubs are present) and was approximately 100 mm thick.

4.1.2 MADE GROUND

Made Ground was encountered in all locations and varied in thickness from 1.5m to 2.5m in most locations, with the exception of BH201 and BH207 where Made Ground was greater than 4m thick (due to being on top of the embankment). The Made Ground comprised a sandy GRAVEL, the gravel consisting predominantly of slag clinker and brick, cobbles of the same composition were also common.

4.1.3 ALLUVIUM

Cohesive

Cohesive alluvium was encountered in seven of the fifteen exploratory holes (two boreholes and five trial pits) beneath the Made Ground on site. The cohesive alluvium was predominantly encountered as soft dark grey slightly gravelly SILT with occasional organic matter. The gravel is rounded fine to coarse of sandstone. The silt was encountered to a maximum proven depth of 4.5 m bgl (BH207) and had a maximum thickness of 0.8 m (TP207).

Granular

Granular alluvium was encountered in nine of the fifteen exploratory holes (all seven boreholes and two trial pits) beneath the alluvial silt or the Made Ground on site. The granular alluvium was predominantly encountered as dark greyish brown sandy subrounded to rounded fine to coarse GRAVEL of sandstone with medium cobble content. The granular alluvium was encountered to a maximum unproven depth of 7.0 m bgl (BH201 and BH207) and had a maximum unproven thickness of >3.55m (BH204A).

4.2 GROUNDWATER STRIKES

The cable percussive boreholes used water to assist with drilling, making water strikes difficult to accurately measure. However, based on drillers descriptions water strikes were observed typically between 1.5 m bgl (BH204A and BH206) and 3.1 m bgl (BH202). The groundwater strikes were typically observed at or near the top of the granular alluvium.

Water strikes in the trial pits were observed between 1.4 m bgl (TP204) and 2.9 m bgl (TP207). After 20 minutes, the groundwater level had typically risen between 0.1 m and 0.2 m.

4.3 VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of contamination encountered during the progression of exploratory locations is presented in Table 4-1 and the exploratory hole logs in **Appendix D**:

Table 4-1 – Visual and Olfactory Evidence of Contamination

Exploratory Location	Depth (m bgl)	Visual Evidence	Olfactory Evidence	Associated PID Readings (ppm)
TP202	0.7	Black staining	Bitumen odour	-
	1.1 – 1.3	Product on rootlets	-	170
TP203A	1.9	Hydrocarbon sheen on water ingress	Slight hydrocarbon odour	0.9
	2.1	Black staining on soil	Very strong hydrocarbon odour	4,069
	2.4	Brown/black hydrocarbon product on groundwater	Very strong hydrocarbon odour	>5,000
TP204	1.4 – 1.5	-	Slight hydrocarbon odour	12.4
BH202	3.0 – 3.8	Hydrocarbon sheen on gravel	Strong hydrocarbon odour	275
	3.8 – 4.5	-	Hydrocarbon odour	77.4
	4.5 – 5.0	-	Slight hydrocarbon odour	93.9
BH203	2.4 – 4.0	-	Strong hydrocarbon odour	1,225
	4.0 – 5.0	-	Hydrocarbon odour	1,554
BH204A	1.45 – 2.1	Black staining	Slight hydrocarbon odour	3.3
	2.1 – 3.5	Hydrocarbon sheen on gravel	Strong hydrocarbon odour	1,085
	3.5 – 4.5	-	Hydrocarbon odour	490
	4.5 – 5.0	-	Slight hydrocarbon odour	255
BH205	2.0 – 3.0	-	Slight hydrocarbon odour	26.8
BH206	1.5 – 1.7	Hydrocarbon sheen on groundwater	Hydrocarbon odour	229
	1.7 – 2.5	-	Slight hydrocarbon odour	14.3

4.4 POST-INVESTIGATION MONITORING

Following the completion of the intrusive works the monitoring well installations were developed using a battery powered pump. A single round of groundwater monitoring and sampling was completed on 9th January 2020. The monitoring wells were dipped using an oil/water interface probe and the depth to product (if present), depth to groundwater and base of the well was recorded. Data from this monitoring round is presented in Table 4-2. Data was collected from all Phase 2 (BH101-BH107) and Phase 3 (BH201-BH207) locations, along with available monitoring wells from older investigations (Phase 1).

4.5 GROUNDWATER AND PRODUCT SAMPLING

Groundwater samples were collected from monitoring wells BH202, BH203 and BH205 on 9th January 2020 using low flow technique and sent for laboratory analysis. Groundwater samples were recovered from three (out of the seven installed) monitoring wells considered most impacted. Water quality parameters were collected at three minute intervals until the readings were stable. This field data is presented in **Appendix F**.

A product sample was collected from BH204A and sent for laboratory analysis.

Laboratory certificates are presented in **Appendix E**.

4.6 BAILODOWN TESTING

Product recovery testing was undertaken on the two boreholes with identified product – BH104 and BH204A. Product was removed from above the water column using a peristaltic pump until the target volume had been removed, and then recovery (product recharge) measured using an oil/water interface probe. The baildown test for BH104 was undertaken for 240 minutes, and BH204A for 314 minutes.

Results of the test are included in **Appendix G**.

4.7 FURTHER WORKS

These most recent intrusive works has further delineated the hydrocarbon impact on the site. This additional information, including baildown test data will be interpreted, and previous assessments of soil and water quality data, will be used within the Remediation Strategy and inputted into the Earthworks Specification.

Table 4-2 - Ground Water and Product Monitoring Summary (9th January 2020)

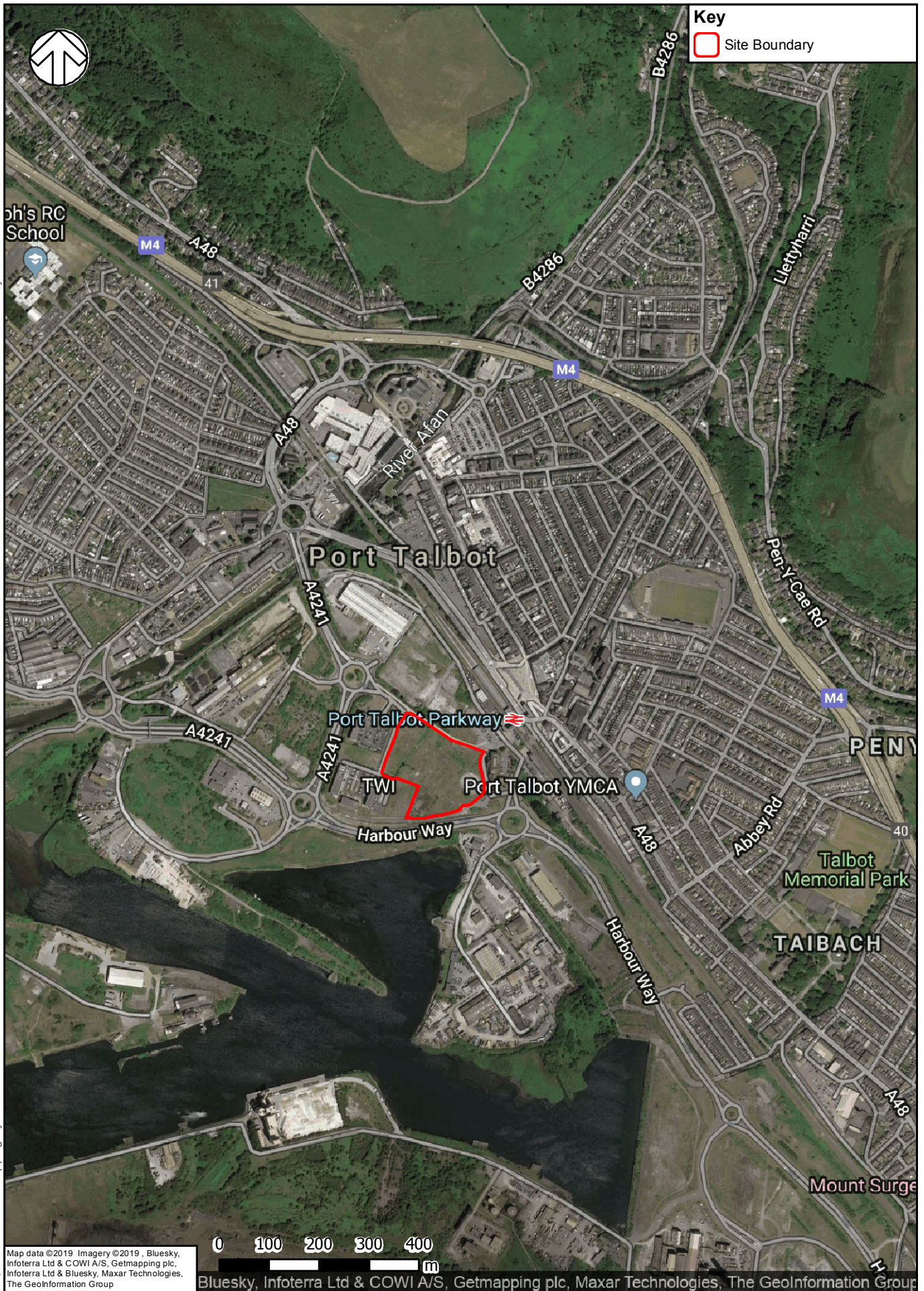
Borehole ID	Product Thickness	Depth to LNAPL	Depth to Water	Depth to Base
	Metres	m bcl*	m bcl	m bcl
BH201	-	-	3.72	7.36
BH202	-	-	2.01	5.11
BH203	-	-	2.10	5.43
BH204A	0.28	1.85	2.13	5.37
BH205	-	-	1.93	4.92
BH206	-	-	1.73	5.26
BH207	-	-	3.68	7.14
BH101	-	-	1.94	8.22
BH102	-	-	4.70	10.31
BH103	-	-	1.23	6.13
BH104	0.73	2.04	2.77	5.05
BH105A	-	-	1.64	8.07
BH106	-	-	1.26	8.22
BH107	-	-	0.98	6.28
BHH02 (S)	-	-	1.85	2.43
BHH02 (D)	-	-	1.89	8.82
BHH03	-	-	1.40	2.86
BHH05	-	-	1.69	2.58
BHH07 (S)	-	-	2.26	3.64
BHH07 (D)	-	-	2.26	8.92
BHC5	-	-	2.02	2.49

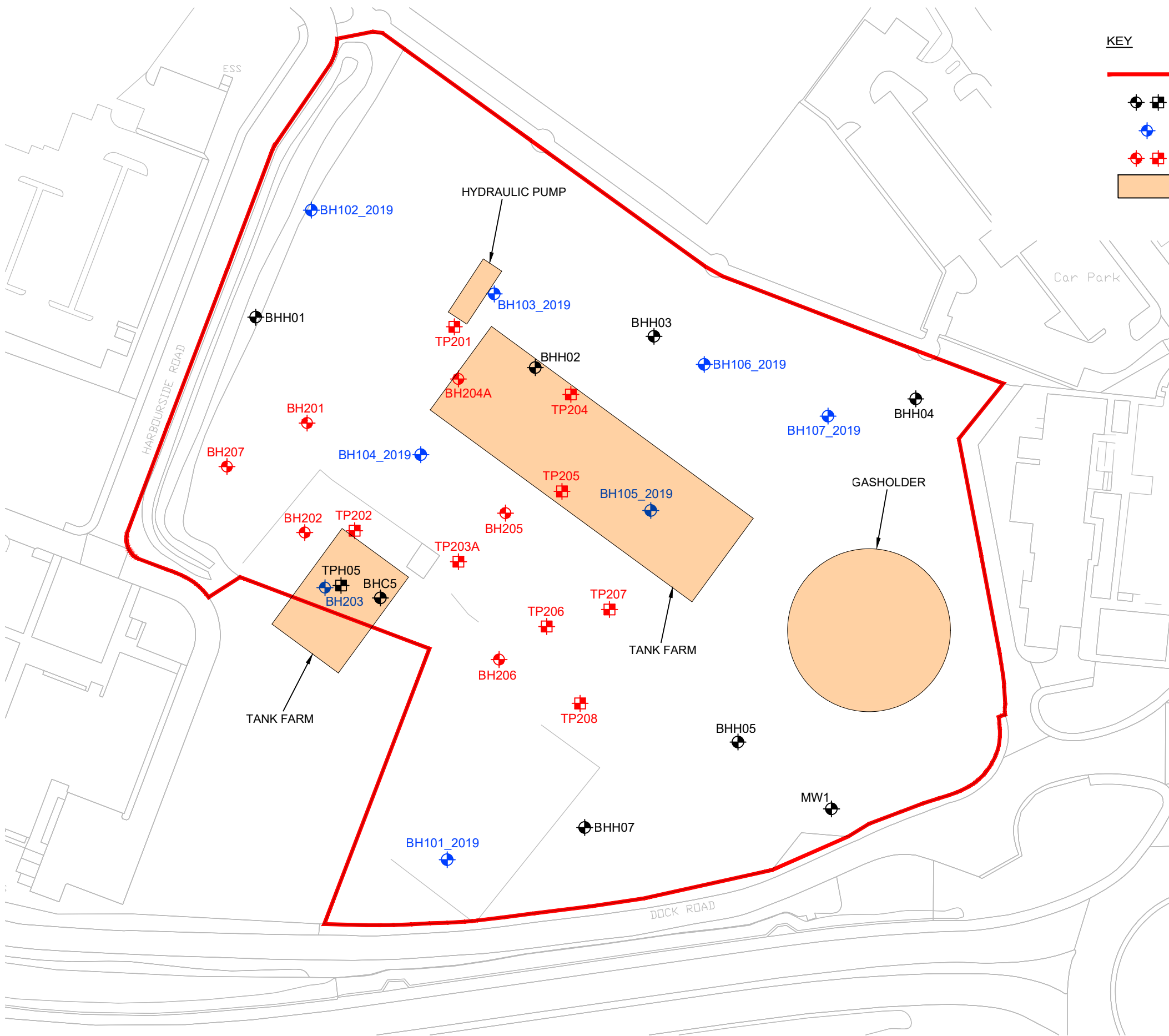
* m bcl – metres below cover level

Appendix A

FIGURES







- KEY**
- SITE BOUNDARY
 - PHASE 1 - HISTORIC OPUS EXPLORATORY HOLE
 - PHASE 2 - WSP EXPLORATORY HOLE (AUGUST 2019)
 - PHASE 3 - WSP EXPLORATORY HOLE (DECEMBER 2019)
 - POTENTIAL HISTORICAL SOURCE AREAS

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Kings Orchard
1 Queen Street
Bristol BS2 0HQ

Tel: 44-(0)1179-306200

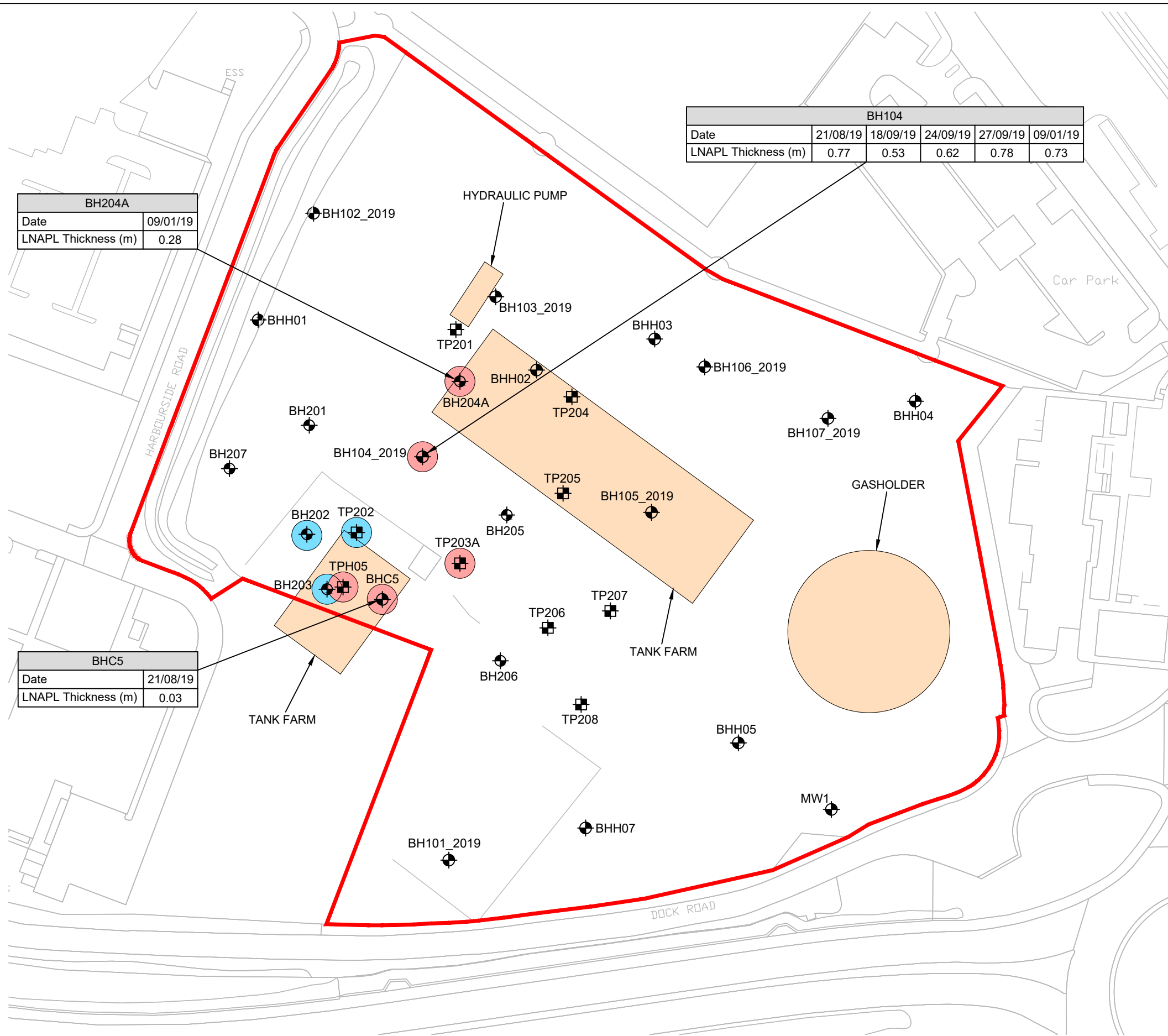
Client:
**NEATH PORT TALBOT COUNTY
BOROUGH COUNCIL**

Project:
PORT TALBOT HARBOURSIDE

Title:
**EXPLORATORY HOLE
LOCATION PLAN
ALL PHASES**

Drawn: CEW	Checked: RE
Designed: RE	Approved:
Date: 24/02/2020	Scale: 1:1000 A3 Sheet:
Project Number: 62253048	Drawing Number: FIGURE 2
Revision:	

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KEY

- SITE BOUNDARY
- BOREHOLE
- TRIAL PIT
- POTENTIAL HISTORICAL SOURCE AREAS
- FREE PHASE LNAPL
- HYDROCARBON IMPACTED SOILS

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Rev	Date	Description	By	Chk	App	Notes
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Kings Orchard
1 Queen Street
Bristol BS2 0HQ

Tel: 44-(0)1179-306200

Client:
NEATH PORT TALBOT COUNTY BOROUGH COUNCIL

Project:
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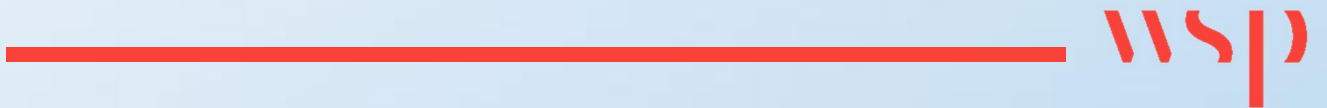
Title:
EXPLORATORY HOLE LOCATION PLAN WITH CONTAMINATION DISTRIBUTION

Drawn: CEW		Checked: RE	
Designed: RE		Approved:	
Date: 24/02/2020	Scale: 1:1000	A3	Sheet:
Project Number:		Drawing Number:	
62253048		FIGURE 3	
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Appendix B

REPORT 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 effects of any future changes or amendments to these values. Specific assumptions associated

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

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

PHOTOGRAPHIC RECORD



PHOTOGRAPHIC RECORD



Plate 1: Sidewall of TP202.
photo taken on 03/12/2019



Plate 2: Base of TP202.
photo taken on 03/12/2019

PHOTOGRAPHIC RECORD



*Plate 3: View of TP203A.
photo taken on 03/12/2019*



*Plate 4: Sidewall of TP203A.
photo taken on 03/12/2019*

PHOTOGRAPHIC RECORD



*Plate 5: TP203A with free phase
LNAPL contamination.
photo taken on 04/12/2019*



*Plate 6: Hydrocarbon impacted arisings from TP203A.
photo taken on 04/12/2019*

PHOTOGRAPHIC RECORD



*Plate 7: View of TP204.
photo taken on 03/12/2019*



*Plate 8: TP204 sidewall and arisings.
photo taken on 03/12/2019*

PHOTOGRAPHIC RECORD



*Plate 9: View of TP205.
photo taken on 03/12/2019*



*Plate 10: TP205 arisings.
photo taken on 03/12/2019*

PHOTOGRAPHIC RECORD



*Plate 11: View of TP206.
photo taken on 04/12/2019*



*Plate 12: TP206 arisings.
photo taken on 04/12/2019*

PHOTOGRAPHIC RECORD



*Plate 13: View of TP207.
photo taken on 03/12/2019*



*Plate 14: TP207 arisings.
photo taken on 03/12/2019*

PHOTOGRAPHIC RECORD



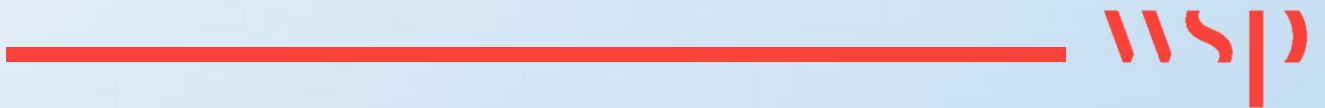
*Plate 15: View of TP208.
photo taken on 03/12/2019*



*Plate 16: TP208 sidewall and arisings.
photo taken on 03/12/2019*

Appendix D

EXPLORATORY HOLE LOGS



8.54

Elevation (m)	Stationing	Description	Soil Type	Notes
4.80	ES			
0.2		Dark brown slightly silty sandy angular to subrounded fine to coarse GRAVEL of brick, slag and clinker with occasional cobbles. Cobbles are subangular of brick and slag. (MADE GROUND)	GMG	
0.6		Light brown clayey sandy angular to subrounded fine to coarse GRAVEL of brick, slag, clinker and sandstone with frequent cobbles. Cobbles are subangular to subrounded of brick, slag and sandstone. (MADE GROUND)	GMG	
1.1				
1.5		Soft dark grey slightly gravelly SILT with occasional organic/plant matter. Gravel is rounded fine to coarse of sandstone. (ALLUVIUM)	ALV	
0.1		Dark grey and greyish brown sandy subrounded to rounded fine to coarse GRAVEL of sandstone with rare cobbles. Cobbles are subrounded of sandstone. (ALLUVIUM)	ALV	
0.5				
0.1				

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200		BOREHOLE LOG		Hole No. BH202	
Project Port Talbot Harbourside		Sheet 1 of 1			
Job No 62253048		Client Neath Port Talbot County Borough Council		Date 02-12-19 05-12-19	
Contractor / Driller Quantum		Method/Plant Used Dando 2000		Logged By HB/JL	
Co-Ordinates (NGR) E 276507.67 N 189505.53		Ground Level (m AOD) 6.88			

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. 100 mm
							6.78	0.10	Grass over pale greyish brown SAND. (TOPSOIL)		TS	
							6.58	0.30	Bluish grey sandy angular to subrounded fine to coarse GRAVEL of sandstone, limestone and brick. Sand is fine to coarse. (MADE GROUND)		MG	
			0.5					(1.70)	Dark brown very gravelly fine to coarse SAND with rare cobbles. Gravel is angular to subangular fine to coarse of slag. Cobbles are subangular of slag. (MADE GROUND)		MG	
			1.3				4.88	2.00	Very dark grey sandy angular to subangular fine to coarse GRAVEL of slag, clinker and brick with occasional cobbles. Cobbles are subangular of clinker and slag. (MADE GROUND)		GMG	
			275				4.28	2.60	Dark grey and light greyish brown slightly sandy subrounded to rounded fine to coarse GRAVEL of sandstone with occasional cobbles. Cobbles are subrounded of sandstone. (ALLUVIUM)		ALV	
			77.4					(2.40)	3.00 - 3.80 Strong hydrocarbon odour and sheen on gravel			
									3.80 - 4.50 Hydrocarbon odour			
			93.9				1.88	5.00	4.50 - 5.00 Slight hydrocarbon odour			

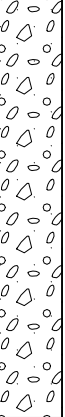
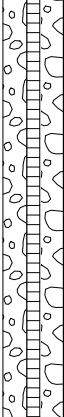
Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
02-12-19	08.00	0.00	0.00	127		02-12-19		1.60		2.90	3.00
02-12-19	17.00	1.60	0.00		1.60	05-12-19	00.20	3.10			
05-12-19	08.00	1.60	0.00		1.60						
05-12-19	17.00	5.00	5.00		3.10						
Chiselling				Water Added		General Remarks Hole terminated at 5.00m bgl on engineer's instruction.					
From	To	Hours	Tool	From	To						
				1.5	5						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200		BOREHOLE LOG		Hole No. BH203	
Project Port Talbot Harbourside		Sheet 1 of 1			
Job No 62253048		Client Neath Port Talbot County Borough Council		Date 02-12-19 02-12-19	
Contractor / Driller Quantum		Method/Plant Used Dando 2000		Logged By HB	
Co-Ordinates (NGR) E 276512.49 N 189492.40		Ground Level (m AOD) 6.87			

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. 100 mm
			0.8				6.84	0.03	Grass over brown SAND. (TOPSOIL)		TS	
								(2.37)	Greyish brown very gravelly fine and medium SAND with frequent cobbles. Gravel is fine to coarse of various lithologies including clinker and slag. Cobbles are subangular of clinker and slag. (MADE GROUND)		MG	
			1225				4.47	2.40	Dark grey sandy subrounded to rounded fine to coarse GRAVEL of sandstone with low cobble content. Sand is fine to coarse. Cobbles are subrounded to rounded of sandstone. (ALLUVIUM)			
			1554					(2.60)	2.40 - 4.00 m bgl Strong hydrocarbon odour		ALV	
			76.1						4.00 - 5.00 m bgl Hydrocarbon odour			
			9.9				1.87	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
02-12-19	08.00	0.00	0.00	127							
02-12-19	17.00	5.00	5.00		2.17						
Chiselling				Water Added		General Remarks Hole terminated at 5.00m bgl. Water added to assist drilling, post-fieldwork depth at 2.10m bgl.					
From	To	Hours	Tool	From	To						
				1.5	5						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200	BOREHOLE LOG		Hole No. BH204A
	Project Port Talbot Harbourside		Sheet 1 of 1
Job No 62253048	Client Neath Port Talbot County Borough Council		Date 04-12-19 09-12-19
Contractor / Driller Quantum	Method/Plant Used Dando 2000	Logged By JL	Co-Ordinates (NGR) E 276544.31 N 189542.11
		Ground Level (m AOD) 6.61	

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. 100 mm
2.20	ES		1.1			 	6.41	0.20	Very dark grey sandy angular fine to coarse GRAVEL of clinker, slag and brick. Sand is fine to coarse. (MADE GROUND)		GMG	
								(1.25)	Light grey sandy angular fine to coarse GRAVEL of clinker and slag with frequent cobbles. Sand is fine to coarse. Cobbles are subangular of clinker and slag. (MADE GROUND)			
							5.16	1.45	Very dark grey sandy rounded fine to coarse GRAVEL of sandstone with occasional cobbles. Sand is fine to coarse. Cobbles are subangular of sandstone. (ALLUVIUM)		ALV	
								(3.55)	1.45 - 2.10 Slight hydrocarbon odour and black staining 2.10 - 3.50 Strong hydrocarbon odour and sheen on gravel			
									3.50 - 4.50 Hydrocarbon odour			
			255						4.50 - 5.00 Slight hydrocarbon odour			
			16.1				1.61	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
04-12-19	08.00	0.00	0.00	127		04-12-19		1.50			
04-12-19	17.00	1.50	0.00		1.5	09-12-19	00.20	2.10		1.95	
09-12-19	08.00	1.50	0.00		1.50						
09-12-19	17.00	5.00	5.00		2.10						
Chiselling				Water Added		General Remarks Hole terminated at 5.00m bgl on engineer's instruction.					
From	To	Hours	Tool	From	To						
				1.5	5						
Scale 1:62.5		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 BH LOG 62253048 - PORT TALBOT HARBOURSIDE.GPJ WSPTEMPLATE7.00.GDT 21/2/20

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200		BOREHOLE LOG		Hole No. BH205	
Project Port Talbot Harbourside		Sheet 1 of 1			
Job No 62253048		Client Neath Port Talbot County Borough Council		Date 04-12-19 04-12-19	
Contractor / Driller Quantum		Method/Plant Used Dando 2000		Logged By JL	
Co-Ordinates (NGR) E 276555.52 N 189510.15		Ground Level (m AOD) 6.89			

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. 100 mm
2.10	ES		0.9				6.69	0.20	Dark brown silty gravelly fine to coarse SAND. Gravel is subangular fine and medium of limestone and brick. (MADE GROUND)		GMG	
							(0.60)		Very dark grey mottled black slightly sandy angular to subangular fine to coarse GRAVEL of slag, clinker, ash and brick with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are subangular of slag and clinker (up to 400mm diameter). (MADE GROUND)		GMG	
							6.09	0.80				
							(1.20)		Light brown gravelly fine to coarse SAND with occasional cobbles. Gravel is angular to subangular fine to coarse of slag, clinker and sandstone. Cobbles are subangular of slag and clinker. (MADE GROUND)		GMG	
							4.89	2.00				
			13.1						Dark grey and brownish grey sandy subrounded to rounded fine to coarse GRAVEL of sandstone with occasional cobbles. Sand is fine to coarse. Cobbles are subrounded to rounded of sandstone. (ALLUVIUM)		ALV	
									2.00 - 3.00 Slight hydrocarbon odour			
			26.8									
			9.3					(3.00)				
			2.5				1.89	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
04-12-19	08.00	0.00	0.00	127		10-12-19	00.20	2.00		1.80	
04-12-19	17.00	5.00	5.00		2.00						
Chiselling				Water Added		General Remarks Hole terminated at 5m bgl on engineer's instruction.					
From	To	Hours	Tool	From	To						
				1.5	5						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200		BOREHOLE LOG		Hole No. BH206	
Project Port Talbot Harbourside		Sheet 1 of 1			
Job No 62253048		Client Neath Port Talbot County Borough Council		Date 04-12-19 10-12-19	
Contractor / Driller Quantum		Method/Plant Used Dando 2000		Logged By JL	
Co-Ordinates (NGR) E 276553.98 N 189475.28		Ground Level (m AOD) 6.64			

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. 100 mm
3.00	ES		2.5				6.14	(0.50) 0.50	Dark brown sandy slightly silty angular to subangular fine to coarse GRAVEL of brick, slag and concrete. Sand is fine to coarse. (MADE GROUND)		GMG	
								(1.00)	Light greyish brown slightly gravelly fine to coarse SAND. Gravel is rounded fine to coarse of sandstone. (MADE GROUND)		GMG	
			229				5.14	1.50				
							4.94	1.70	Dark grey slightly gravelly fine to coarse SAND. Gravel is rounded fine to coarse of sandstone. (MADE GROUND)		GMG	
			75.2					(0.80)	1.50 - 1.70 Hydrocarbon odour and sheen on groundwater		GMG	
			14.3				4.14	2.50	Dark brownish grey sandy slightly silty angular to subangular fine to coarse GRAVEL of slag, clinker, brick and sandstone with occasional cobbles. Sand is fine to coarse. Cobbles are angular to subangular of slag, clinker and brick. (MADE GROUND)			
			1.3						1.70 - 2.50 m bgl Slight hydrocarbon odour			
								(2.50)	Brownish grey and dark grey sandy subrounded to rounded fine to coarse GRAVEL of sandstone with occasional cobbles. Sand is fine to coarse. Cobbles are subrounded of sandstone. (ALLUVIUM)		ALV	
			1.1									
			0.7				1.64	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
04-12-19	08.00	0.00	0.00	127		04-12-19	00.20	1.50		1.50	
04-12-19	17.00	1.50	0.00		1.5						
10-12-19	08.00	1.50	0.00		1.5						
10-12-19	17.00	5.00	5.00		2.15						
Chiselling				Water Added							
From	To	Hours	Tool	From	To	General Remarks Hole terminated at 5.00m bgl on engineer's instruction.					
				1.5	5						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200	BOREHOLE LOG		Hole No. BH207	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Neath Port Talbot County Borough Council		Date 04-12-19 06-12-19	
Contractor / Driller Quantum	Method/Plant Used Dando 2000	Logged By JL	Co-Ordinates (NGR) E 276489.15 N 189521.25	Ground Level (m AOD) 8.55

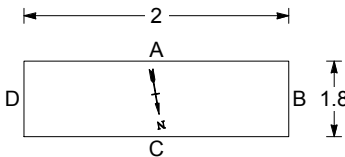
SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. 100 mm
4.60	ES		0.6				7.95	(0.60) 0.60	Dark brown sandy angular to subangular fine to coarse GRAVEL of brick, clinker and slag with frequent cobbles. Sand is fine to coarse. Cobbles are subangular of slag and brick. (MADE GROUND)		GMG	
								(1.40)	Soft light brown slightly sandy slightly gravelly SILT. Sand si fine to coarse. Gravel is angular to subrounded fine to coarse of brick, slag and sandstone. (MADE GROUND)		CMG	
							6.55	2.00				
								(2.00)	Dark greyish brown sandy silty angular to subangular fine to coarse GRAVEL of brick, slag, clinker and sandstone with occasional cobbles. Cobbles are subangular of slag and brick. (MADE GROUND)		GMG	
							4.55	4.00				
			0.2				4.05	(0.50) 4.50	Soft very dark grey slightly gravelly SILT with occasional plant material. Gravel is subrounded to rounded fine to coarse of sandstone. (ALLUVIUM)		ALV	
			0.2					(2.50)	Brownish grey sandy subrounded to rounded fine to coarse GRAVEL of sandstone with occasional cobbles. Sand is fine to coarse. Cobbles are rounded of sandstone. (ALLUVIUM)		ALV	
			0.1									
			0.1									
			0				1.55	7.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
04-12-19	08.00	0.00	0.00	127	3.85						
04-12-19	17.00	1.50	0.00								
06-12-19	08.00	1.50	0.00								
06-12-19	17.00	7.00	7.00								
Chiselling				Water Added		General Remarks Hole terminated at 7.00m bgl. Water added to assist drilling, post-fieldwork depth at 3.68m bgl. No visual or olfactory evidence of contamination.					
From	To	Hours	Tool	From	To						
				1.5	5						
Scale 1:62.5		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 BH LOG 62253048 - PORT TALBOT HARBOURSIDE.GPJ WSPTEMPLATE7.00.GDT 21/2/20

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200 Fax:	TRIAL PIT LOG			Hole No. TP201	
	Project Port Talbot Harbourside			Sheet 1 of 1	
Job No 62253048	Client Neath Port Talbot County Borough Council			Date 02-12-19 02-12-19	
Contractor / Driller Quantum	Method/Plant Used JCB-3CX	Logged By HB	Co-Ordinates (NGR) E 276543.33 N 189554.52	Ground Level (m AOD) 6.50	

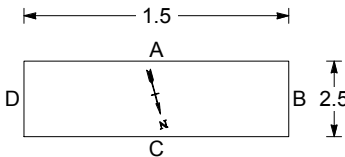
SAMPLES & TESTS						STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology
						6.40	0.10	ASPHALT. (MADE GROUND)		TARMAC
						(0.90)	0.50	Dark greyish brown very gravelly fine to coarse SAND with rare cobbles. Gravel is angular to subangular fine to coarse of slag, brick, concrete and sandstone. Cobbles are subangular of brick and concrete. (MADE GROUND) 0.50 Brick wall along southern and western pit sides		MG
						5.50	1.00			

	Length 2.00m	Shoring/Support: None	Water Strikes					
	Width 1.80m		Date	Time	Strike	Minutes	Standing	Remarks
	Orientation 10 degrees from north	Stability: Stable	General Remarks Hole terminated at 1.00m bgl due to concrete obstruction. No groundwater encountered. No visual or olfactory evidence of contamination.					

Scale 1:31.25 Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200 Fax:	TRIAL PIT LOG			Hole No. TP203A	
	Project Port Talbot Harbourside			Sheet 1 of 1	
Job No 62253048		Client Neath Port Talbot County Borough Council			Date 03-12-19 03-12-19
Contractor / Driller Quantum		Method/Plant Used JCB-3CX	Logged By JL	Co-Ordinates (NGR) E 276544.31 N 189498.58	Ground Level (m AOD) 7.03

SAMPLES & TESTS					STRATA						Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
						6.88	0.15	Light grey sandy angular to subangular fine and medium GRAVEL of limestone and concrete. Sand is fine to coarse. (MADE GROUND)		GMG	
1.00		0.9					(1.95)	Very dark grey mottled black and dark orangish brown sandy angular to subangular fine to coarse GRAVEL of slag, clinker and concete with frequent cobbles. Sand is fine to coarse. Cobbles are subangular of slag and clinker. (MADE GROUND)		GMG	
2.10	ES	4069				4.93	2.10	Soft dark grey mottled black slightly gravelly SILT. Gravel is rounded fine and medium of sandstone. (ALLUVIUM)		ALV	
2.40		>5000				4.53	2.50	2.10 Very strong hydrocarbon odour and black staining on soil. 2.40 Very dark brown/black hydrocarbon product pooling on surface of groundwater.			

	Length 1.50m	Shoring/Support: None	Water Strikes							
	Width 2.50m		Date 03-12-19	Time	Strike 2.10	Minutes 20	Standing 1.90	Remarks Fast ingress		
	Orientation 15 degrees from north	Stability: Stable	General Remarks Hole terminated at 2.50m bgl on engineer's instruction.							
Scale 1:31.25		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.								

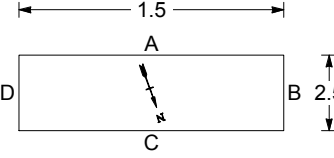
08 WSP TP LOG STANDARD 62253048 - PORT TALBOT HARBOURSIDE.GPJ WSPTEMPLATE1.03.GDT 21/2/20

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200 Fax:		TRIAL PIT LOG			Hole No. TP204				
					Sheet 1 of 1				
Job No 62253048		Client Neath Port Talbot County Borough Council			Date 03-12-19 03-12-19				
Contractor / Driller Quantum		Method/Plant Used JCB-3CX		Logged By JL		Co-Ordinates (NGR) E 276571.10 N 189538.42		Ground Level (m AOD) 6.64	

[illegible]

 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200 Fax:	TRIAL PIT LOG		Hole No. TP205	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Neath Port Talbot County Borough Council		Date 03-12-19 03-12-19	
Contractor / Driller Quantum	Method/Plant Used JCB-3CX	Logged By JL	Co-Ordinates (NGR) E 276568.98 N 189515.32	Ground Level (m AOD) 6.78

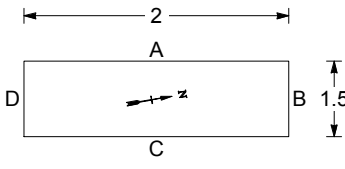
SAMPLES & TESTS						STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology
1.00	ES	0.5				6.48	(0.30)	Dark brown gravelly silty fine to coarse SAND. Gravel is subangular fine and medium of sandstone, brick and slag. (MADE GROUND)		GMG
							0.30			
								Very dark brownish grey sandy angular to subangular fine to coarse GRAVEL of slag, clinker, brick, tarmac and concrete with frequent cobbles. Sand is fine to coarse. Cobbles are subangular of clinker, slag and brick. (MADE GROUND)		GMG
							(1.50)			
2.00	ES	1.4				4.98	1.80			
						4.58	(0.40)	Soft very dark grey slightly gravelly SILT with occasional organic plant material. Gravel is rounded fine and medium of sandstone. (ALLUVIUM)		ALV
						4.48	2.30	Very dark grey sandy subrounded to rounded fine to coarse GRAVEL of sandstone. (ALLUVIUM)		ALV

	Length	1.50m	Shoring/Support:	Water Strikes						
	Width	2.50m		Stability:	Date	Time	Strike	Minutes	Standing	Remarks
	Orientation	20 degrees from north	Stable		03-12-19		1.50			
					03-12-19		1.80	20	1.60	
General Remarks Hole terminated at 2.30m bgl on engineer's instruction. No visual or olfactory evidence of contamination.										

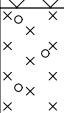
Scale 1:31.25 Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

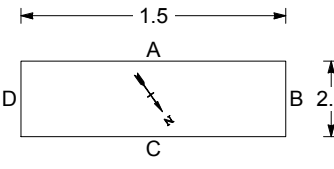
 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200 Fax:	TRIAL PIT LOG			Hole No. TP206	
	Project Port Talbot Harbourside			Sheet 1 of 1	
Job No 62253048		Client Neath Port Talbot County Borough Council			Date 03-12-19 03-12-19
Contractor / Driller Quantum		Method/Plant Used JCB-3CX	Logged By JL	Co-Ordinates (NGR) E 276565.34 N 189483.15	Ground Level (m AOD) 6.61

SAMPLES & TESTS						STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology
							(1.00)	Brown sandy silty subangular to subrounded fine to coarse GRAVEL of brick, concrete and slag with occasional cobbles. Sand is fine to coarse. Cobbles are subangular of brick. (MADE GROUND)		GMG
						5.61	1.00			
							(0.70)	Light brown mottled black slightly gravelly fine to coarse SAND with frequent pockets of peat. Gravel is rounded fine to coarse of sandstone. (MADE GROUND)		GMG
1.50	ES	4.5				4.91	1.70			
						4.81	1.80	Soft dark grey mottled greenish grey and black slightly gravelly SILT with occasional pockets of peat. Gravel is subrounded fine to coarse of sandstone. (ALLUVIUM)	x o x	ALV
1.80		24.1								

	Length	2.00m	Shoring/Support: None	Water Strikes					
	Width	1.50m		Stability: Stable	Date	Time	Strike	Minutes	Standing
	Orientation	100 degrees from north	03-12-19			1.50	20	1.30	
	Scale 1:31.25		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.						

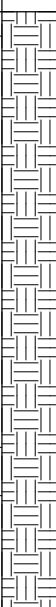
 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200 Fax:		TRIAL PIT LOG		Hole No. TP207	
Project Port Talbot Harbourside		Sheet 1 of 1			
Job No 62253048		Client Neath Port Talbot County Borough Council		Date 03-12-19 03-12-19	
Contractor / Driller Quantum		Method/Plant Used JCB-3CX		Logged By JL	
Co-Ordinates (NGR) E 276580.30 N 189487.20		Ground Level (m AOD) 6.91			

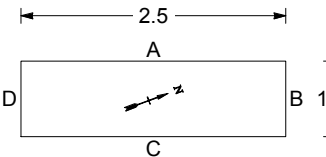
SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.00		0.5				6.81	0.10	Dark brown gravelly silty fine to coarse SAND. Gravel is subangular fine and medium of sandstone, brick and slag. (MADE GROUND)		GMG	
								Very dark brownish grey sandy angular to subangular fine to coarse GRAVEL of slag, clinker, brick, tarmac and concrete with frequent cobbles. Sand is fine to coarse. Cobbles are subangular of clinker, slag and brick. (MADE GROUND)			
							(1.60)			GMG	
2.00		0.4				5.21	1.70	Soft very dark grey slightly gravelly SILT with occasional organic plant material. Gravel is rounded fine and medium of sandstone. (ALLUVIUM)		ALV	
							(0.80)				
3.00	ES	0.2			 	4.41	2.50	Soft light brownish grey mottled light grey gravelly CLAY. Gravel is rounded fine to coarse of sandstone. (ALLUVIUM)		ALV	
							(0.50)				
						3.91	3.00				

	Length	1.50m	Shoring/Support: None	Water Strikes						
	Width	2.50m		Stability: Stable	Date	Time	Strike	Minutes	Standing	Remarks
	Orientation	35 degrees from north	03-12-19			2.90	20	2.40		
	Scale 1:31.25				Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.					

General Remarks
 Hole terminated at 3.0m bgl on engineer's instruction. No visual or olfactory evidence of contamination.

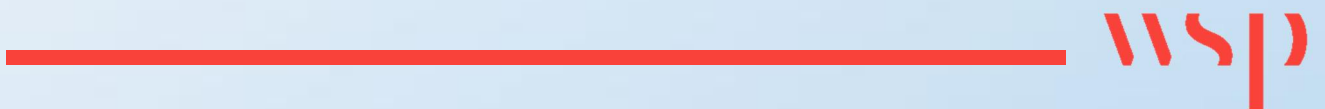
 WSP 1 Capital Quarter, Tyndall Street, Cardiff CF10 4BZ Telephone: 02920 769 200 Fax:	TRIAL PIT LOG		Hole No. TP208	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Neath Port Talbot County Borough Council		Date 04-12-19 04-12-19	
Contractor / Driller Quantum	Method/Plant Used JCB-3CX	Logged By JL	Co-Ordinates (NGR) E 276573.29 N 189464.83	Ground Level (m AOD) 6.87

SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.00	ES	0.7				6.77	0.10	Brown sandy slightly silty angular to subangular fine and medium GRAVEL of concrete, slag and brick. Sand is fine to coarse. (MADE GROUND)		GMG	
								Very dark grey and black sandy angular to subangular fine to coarse GRAVEL of clinker, slag and ash with frequent cobbles. Sand is fine to coarse. Cobbles are subangular of clinker and slag. (MADE GROUND)			
						(1.70)				GMG	
						5.07	1.80				
1.90	ES	7.3				4.87	2.00	Soft dark grey slightly gravelly slightly organic SILT with occasional plant material. Gravel is rounded fine to coarse of sandstone. (ALLUVIUM)		ALV	
							(0.50)	Dark grey and light greyish brown slightly sandy rounded fine to coarse GRAVEL of sandstone with frequent cobbles. Sand is fine to coarse. Cobbles are rounded of sandstone. (ALLUVIUM)		ALV	
2.50		1.2				4.37	2.50				

	Length	2.50m	Shoring/Support:	Water Strikes					
	Width	1.50m		Stability:	Date	Time	Strike	Minutes	Standing
	Orientation	110 degrees from north	Stable		04-12-19		1.70	20	1.60
Scale 1:31.25		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.							

Appendix E

LABORATORY CERTIFICATES





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 BBC
3rd Floor, Kings Orchard,
1 Queen Street
Bristol
Gloucestershire
BS2 0HQ

Attention: Jack Lott

CERTIFICATE OF ANALYSIS

Date of report Generation:	14 December 2019
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	191206-159
Your Reference:	62253048
Location:	Port Talbot Harbourside
Report No:	534077

We received 3 samples on Friday December 06, 2019 and 2 of these samples were scheduled for analysis which was completed on Saturday December 14, 2019. 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: 191206-159 **Client Reference:** 62253048 **Report Number:** 534077
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21307954	BH203	ES	2.40	04/12/2019
21307947	TP202	ES	1.60 - 1.70	04/12/2019
21307959	TP203A	ES	2.10	04/12/2019

Maximum Sample/Coolbox Temperature (°C) : 1.8

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-159
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

Report Number: 534077
Superseded Report:

Results Legend

- X** Test
N 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)		21307947	21307969
	Customer Sample Reference		TP202	TP203A
	AGS Reference		ES	ES
	Depth (m)		1.60 - 1.70	2.10
	Container		250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	X	X
Sample description	All	NDPs: 0 Tests: 2	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
VOC MS (S)	All	NDPs: 0 Tests: 2	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-159
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

Report Number: 534077
Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
------------------	----------	-------------	-----------------	---------------	-------------	---------------	------------	--------------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21307947	TP202	1.60 - 1.70	Black	Sand	Stones	None
21307959	TP203A	2.10	Black	Silt Loam	Vegetation	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: 191206-159 **Client Reference:** 62253048 **Report Number:** 534077
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
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
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:	191206-159	Client Reference:	62253048	Report Number:	534077
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	21307947	21307959
Customer Sample Ref.	TP202	TP203A
AGS Ref.	ES	ES
Depth	1.60 - 1.70	2.10
Type	Soil/Solid (S)	Soil/Solid (S)
EPH CWG GC (S)	14-Dec-2019	14-Dec-2019
GRO by GC-FID (S)	10-Dec-2019	13-Dec-2019
Sample description	07-Dec-2019	07-Dec-2019
TPH CWG GC (S)	14-Dec-2019	14-Dec-2019
VOC MS (S)	11-Dec-2019	11-Dec-2019

SDG:	191206-159
Location:	Port Talbot Harbourside

Client Reference:	62253048
Order Number:	62253048-GI4

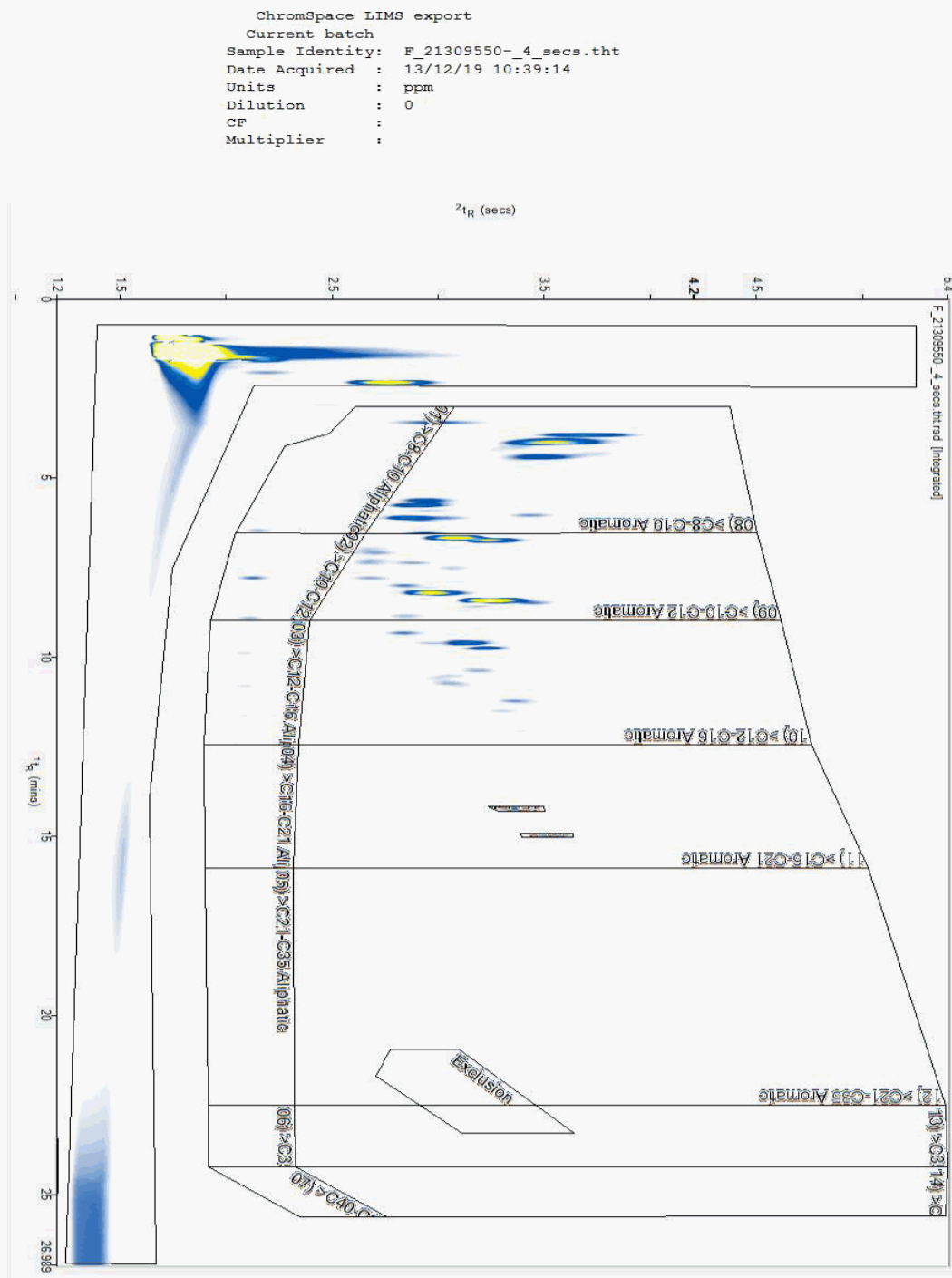
Report Number: 534077
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21309550
Sample ID : TP203A

Depth : 2.10





CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-159
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

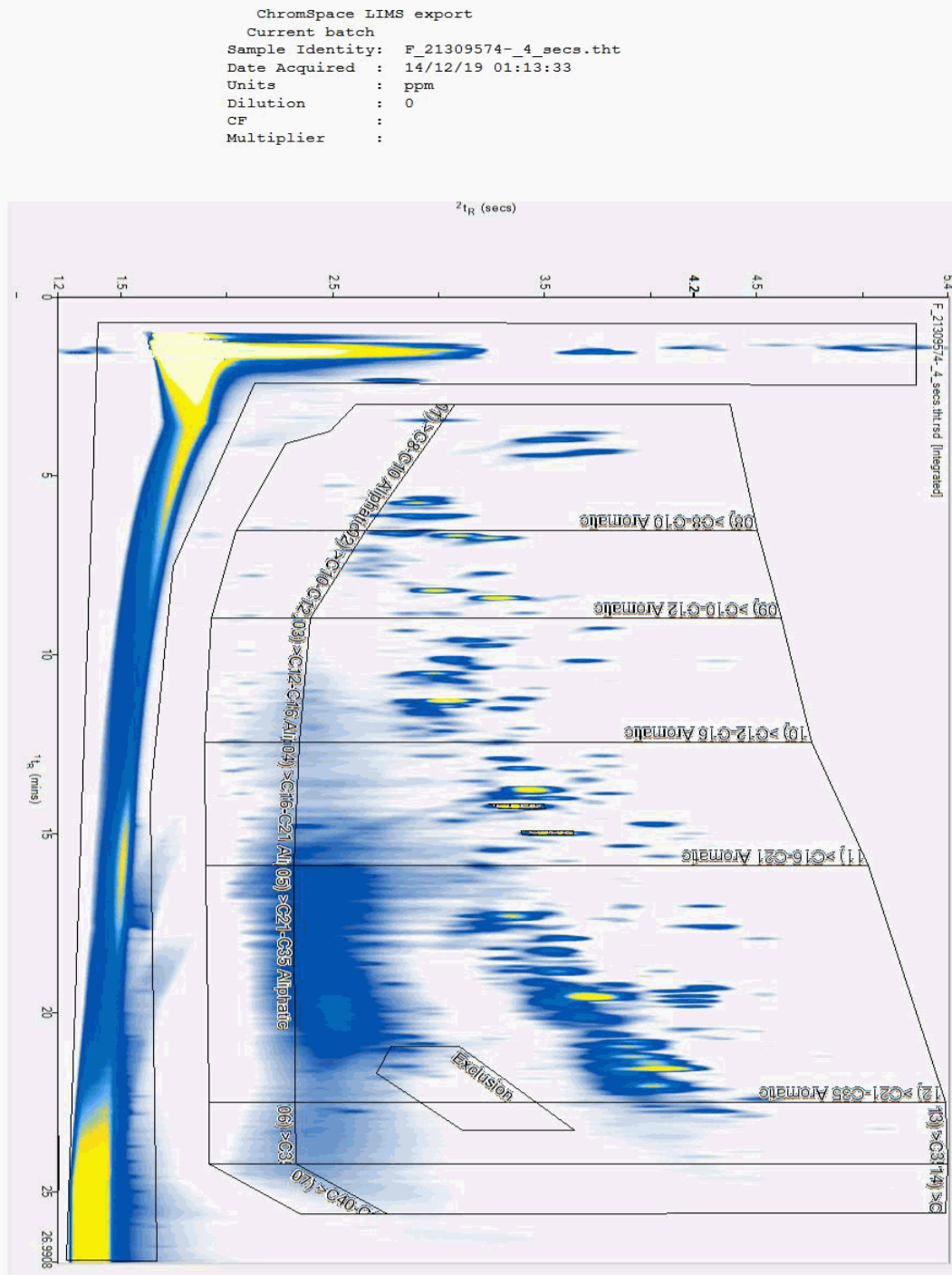
Report Number: 534077
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21309574
Sample ID : TP202

Depth : 1.60 - 1.70





CERTIFICATE OF ANALYSIS

Validated

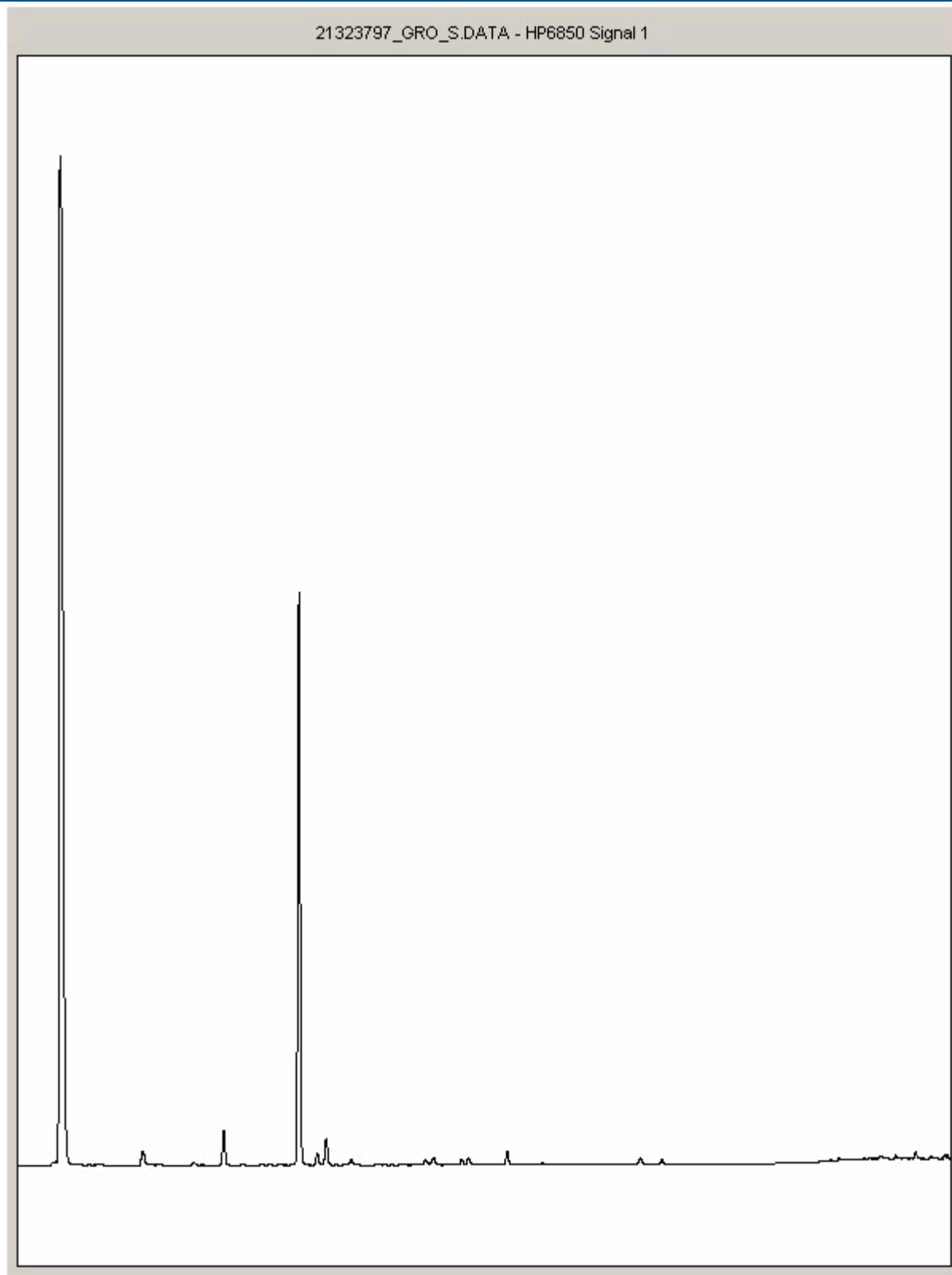
SDG:	191206-159	Client Reference:	62253048	Report Number:	534077
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21323797
Sample ID : TP202

Depth : 1.60 - 1.70





CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-159
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

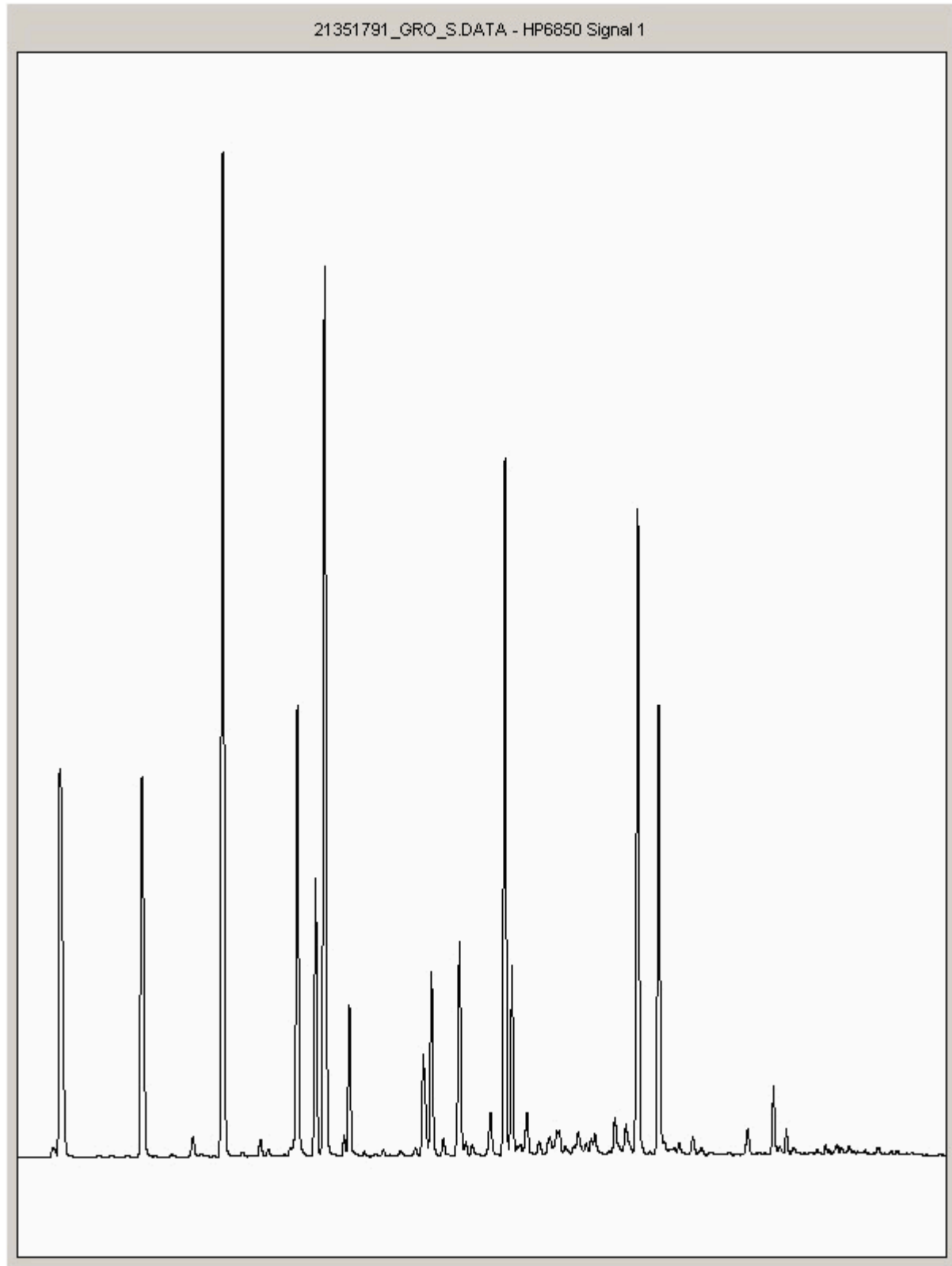
Report Number: 534077
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21351791
Sample ID : TP203A

Depth : 2.10





CERTIFICATE OF ANALYSIS

SDG:	191206-159	Client Reference:	62253048	Report Number:	534077
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Appendix

General

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.

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
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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

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* (2107).

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.



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 BBC
3rd Floor, Kings Orchard,
1 Queen Street
Bristol
Gloucestershire
BS2 0HQ

Attention: Jack Lott

CERTIFICATE OF ANALYSIS

Date of report Generation:	14 December 2019
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	191206-161
Your Reference:	62253048
Location:	Port Talbot Harbourside
Report No:	534079

We received 5 samples on Friday December 06, 2019 and 5 of these samples were scheduled for analysis which was completed on Saturday December 14, 2019. 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: 191206-161 **Client Reference:** 62253048 **Report Number:** 534079
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21307988	TP204	ES	1.40	04/12/2019
21307993	TP205	ES	2.00	04/12/2019
21308007	TP206	ES	1.50	04/12/2019
21308002	TP207	ES	3.00	04/12/2019
21308012	TP208	ES	1.90	04/12/2019

Maximum Sample/Coolbox Temperature (°C) : 1.4

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-161
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

Report Number: 534079
Superseded Report:

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

Results Legend	Lab Sample No(s)		21307988	21307993	21308007	21308002	21308012
	Customer Sample Reference		TP204	TP205	TP206	TP207	TP208
	AGS Reference		ES	ES	ES	ES	ES
	Depth (m)		1.40	2.00	1.50	3.00	1.90
	Container		250g Amber Jar (ALE210)	250g Amber Jar (ALE215)	250g Amber Jar (ALE210)	250g Amber Jar (ALE215)	250g Amber Jar (ALE215)
	Sample Type		S	S	S	S	S
			S	S	S	S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 5		X	X	X	X
Sample description	All	NDPs: 0 Tests: 5	X	X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG:	191206-161	Client Reference:	62253048	Report Number:	534079
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

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
21307988	TP204	1.40	Dark Brown	Sand	Stones	Vegetation
21307993	TP205	2.00	Black	Silt Loam	Stones	N/A
21308007	TP206	1.50	Light Brown	Sand	Stones	Vegetation
21308002	TP207	3.00	Light Brown	Silt Loam	Stones	Vegetation
21308012	TP208	1.90	Black	Sandy Silt Loam	Stones	Vegetation

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: 191206-161 **Client Reference:** 62253048 **Report Number:** 534079
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
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
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: 191206-161 **Client Reference:** 62253048 **Report Number:** 534079
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	21307988	21307993	21308007	21308002	21308012
Customer Sample Ref.	TP204	TP205	TP206	TP207	TP208
AGS Ref.	ES	ES	ES	ES	ES
Depth	1.40	2.00	1.50	3.00	1.90
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)

EPH CWG GC (S)	14-Dec-2019	14-Dec-2019	14-Dec-2019	14-Dec-2019	14-Dec-2019
GRO by GC-FID (S)	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019
Sample description	07-Dec-2019	07-Dec-2019	07-Dec-2019	07-Dec-2019	07-Dec-2019
TPH CWG GC (S)	14-Dec-2019	14-Dec-2019	14-Dec-2019	14-Dec-2019	14-Dec-2019
VOC MS (S)	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019

SDG:	191206-161
Location:	Port Talbot Harbourside

Client Reference:	62253048
Order Number:	62253048-GI4

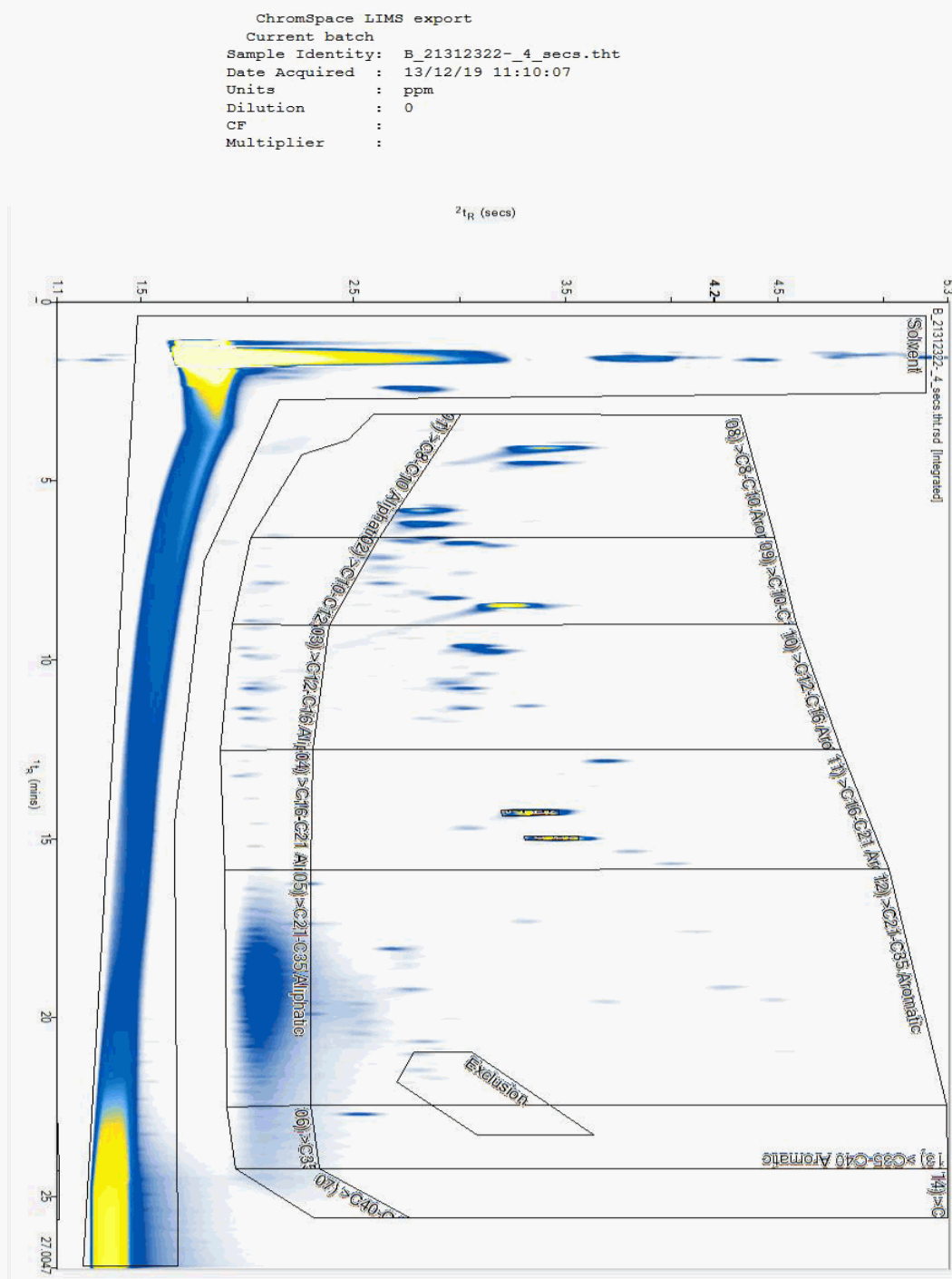
Report Number: 534079
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21312322
Sample ID : TP204

Depth : 1.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-161
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

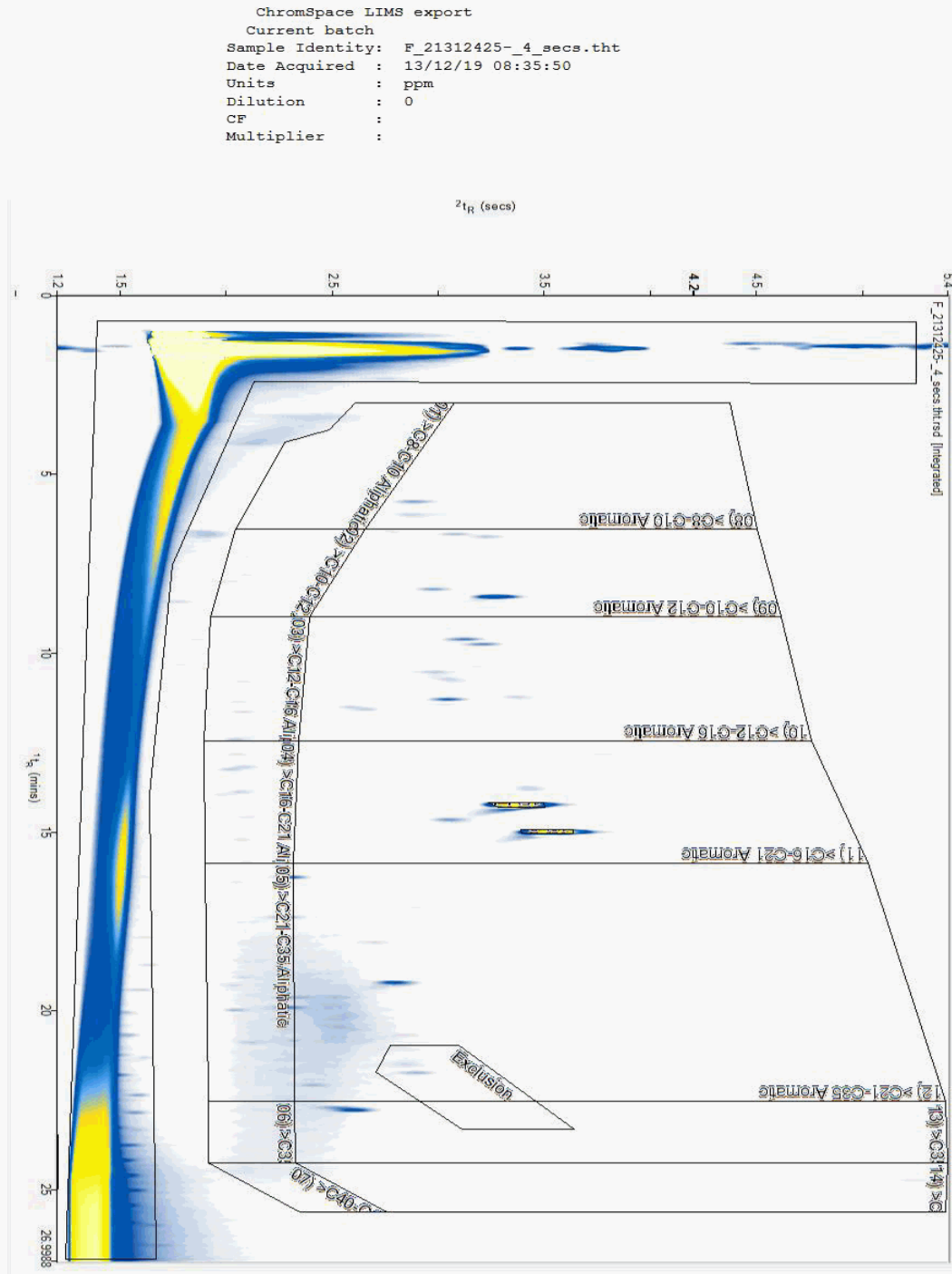
Report Number: 534079
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21312425
Sample ID : TP206

Depth : 1.50



SDG:	191206-161
<u>Location:</u>	Port Talbot Harbourside

Client Reference:	62253048
Order Number:	62253048-GI4

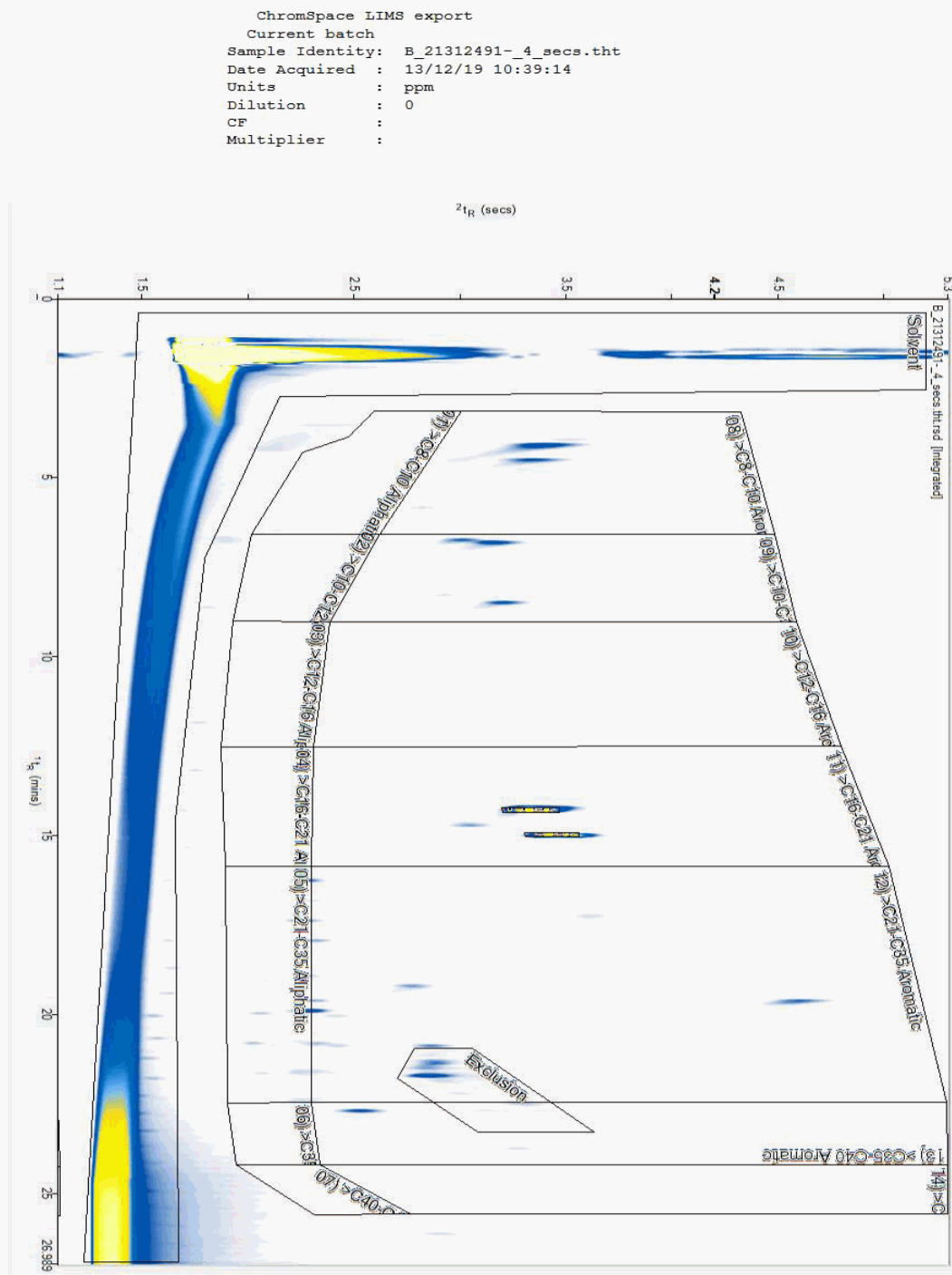
Report Number: 534079
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21312491
Sample ID : TP205

Depth : 2.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-161
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

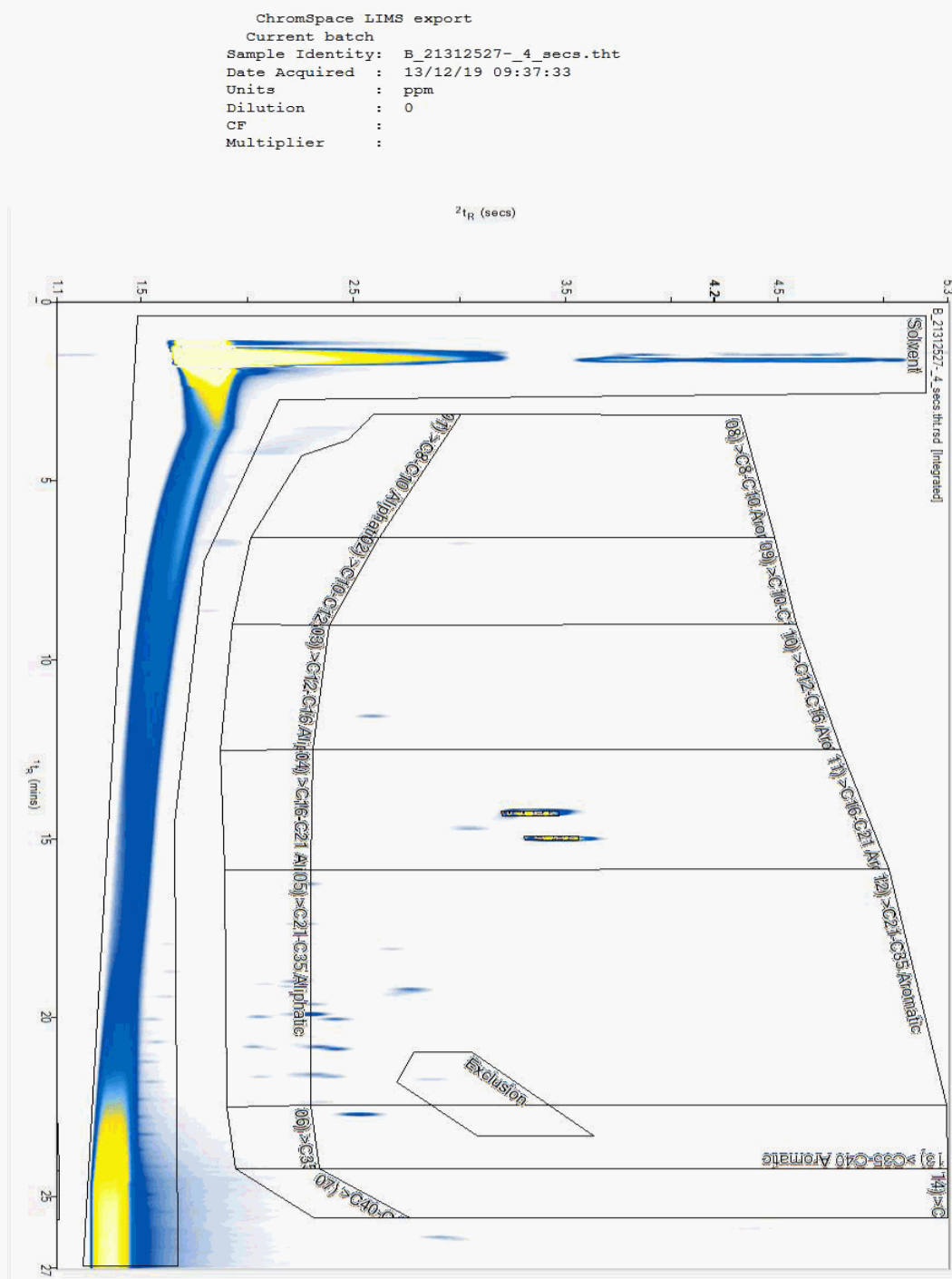
Report Number: 534079
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21312527
Sample ID : TP207

Depth : 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 191206-161
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

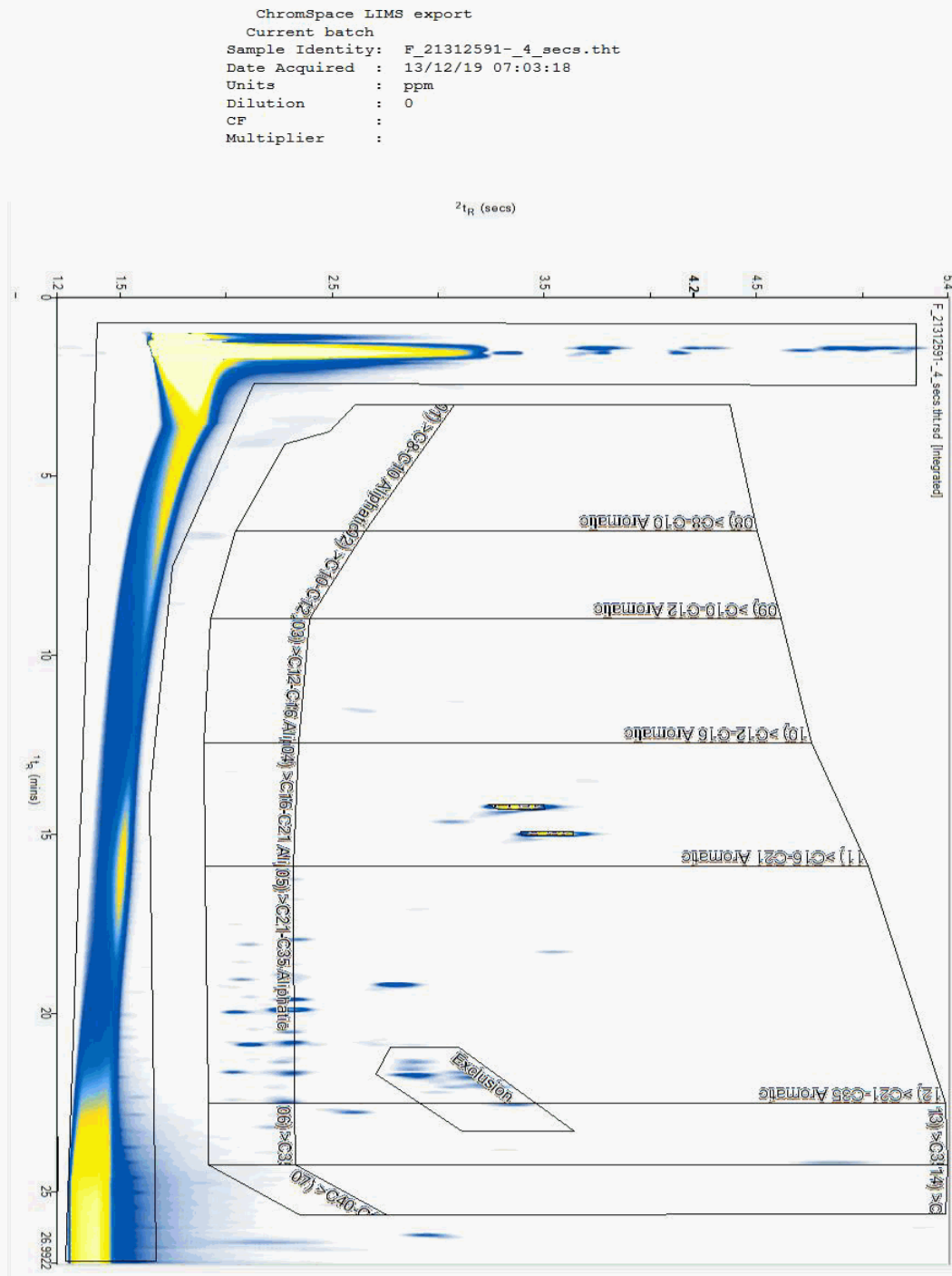
Report Number: 534079
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21312591
Sample ID : TP208

Depth : 1.90





CERTIFICATE OF ANALYSIS

Validated

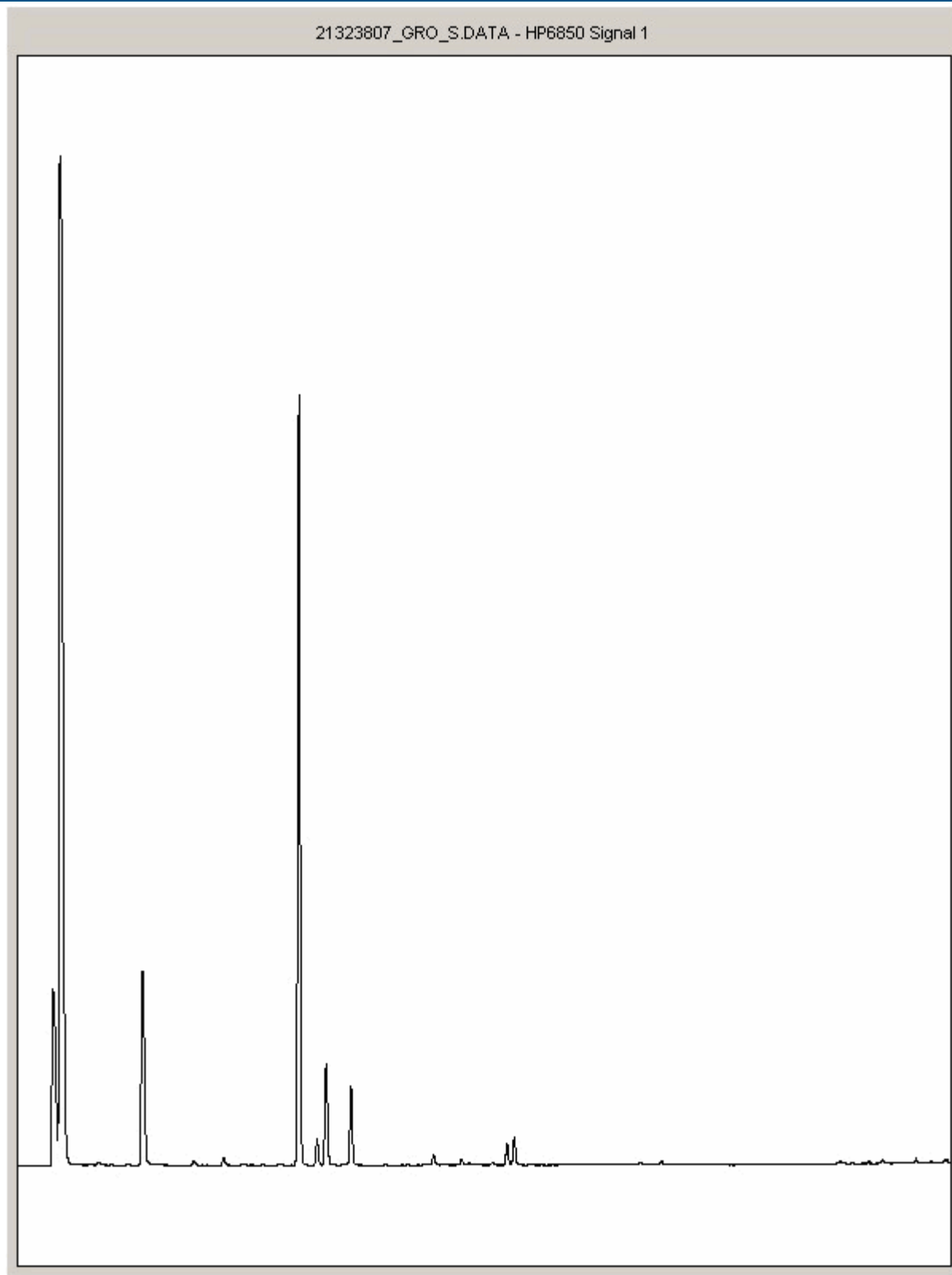
SDG:	191206-161	Client Reference:	62253048	Report Number:	534079
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21323807
Sample ID : TP205

Depth : 2.00





CERTIFICATE OF ANALYSIS

Validated

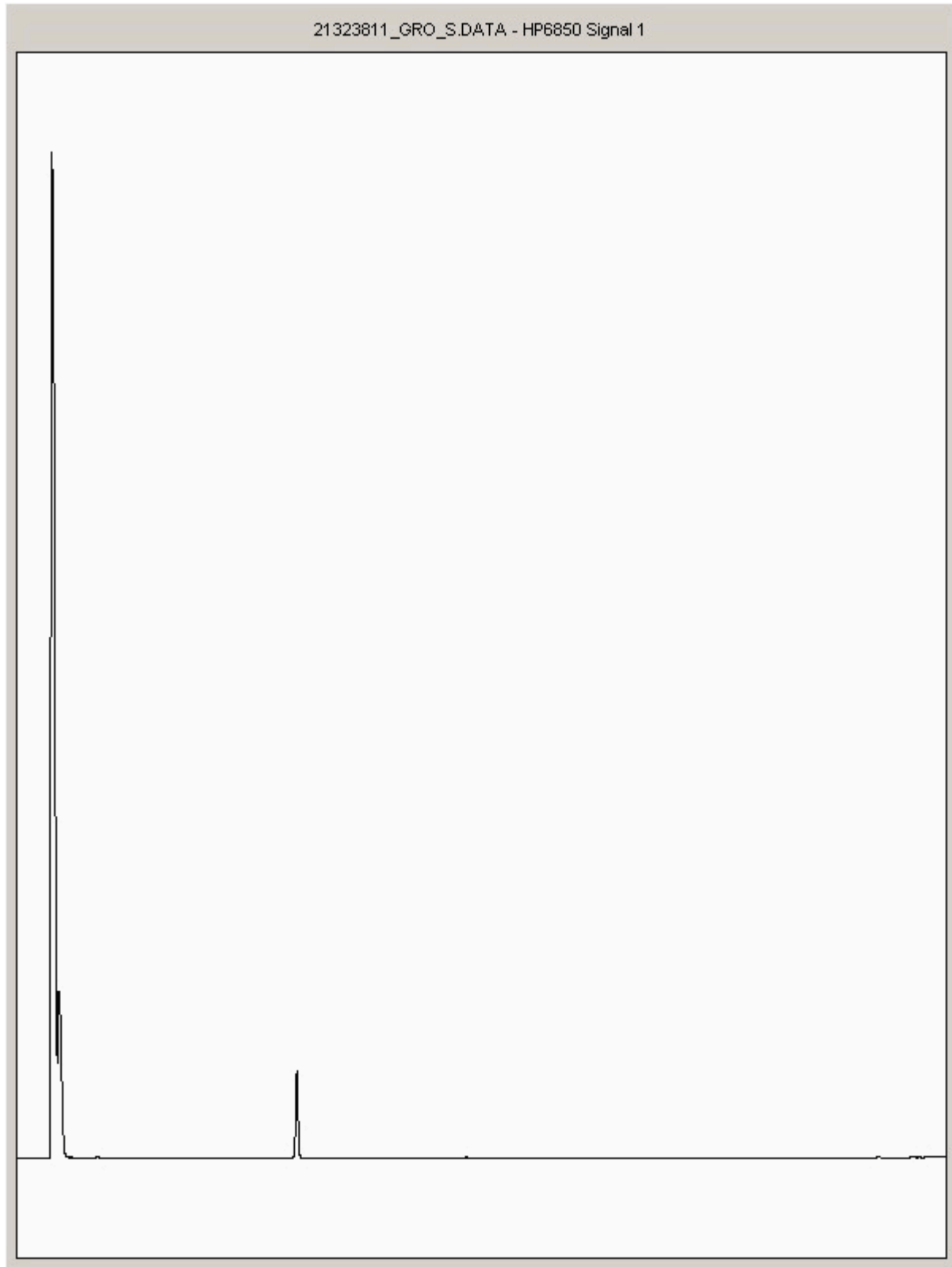
SDG:	191206-161	Client Reference:	62253048	Report Number:	534079
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21323811
Sample ID : TP208

Depth : 1.90





CERTIFICATE OF ANALYSIS

Validated

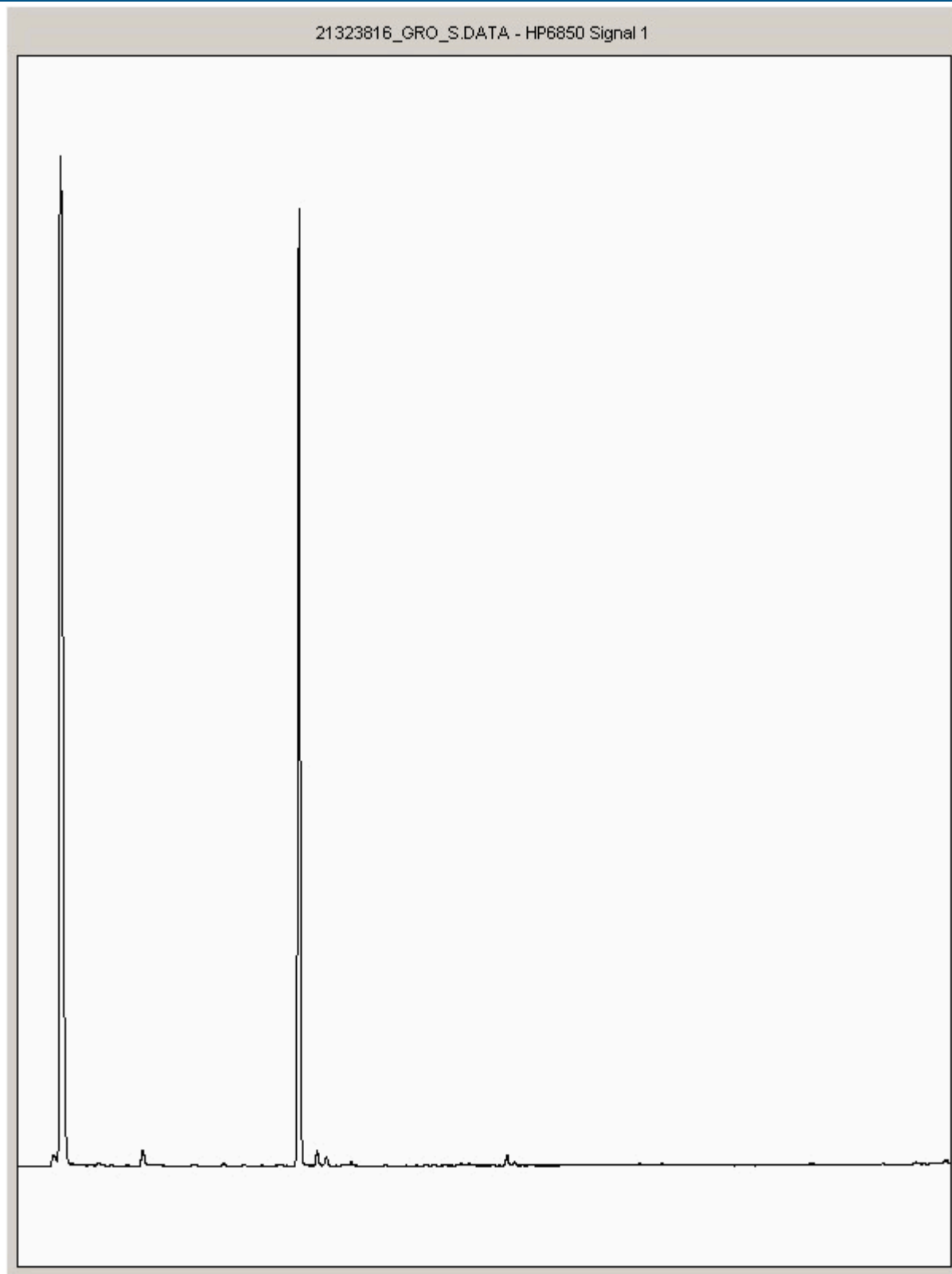
SDG:	191206-161	Client Reference:	62253048	Report Number:	534079
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21323816
Sample ID : TP207

Depth : 3.00





CERTIFICATE OF ANALYSIS

Validated

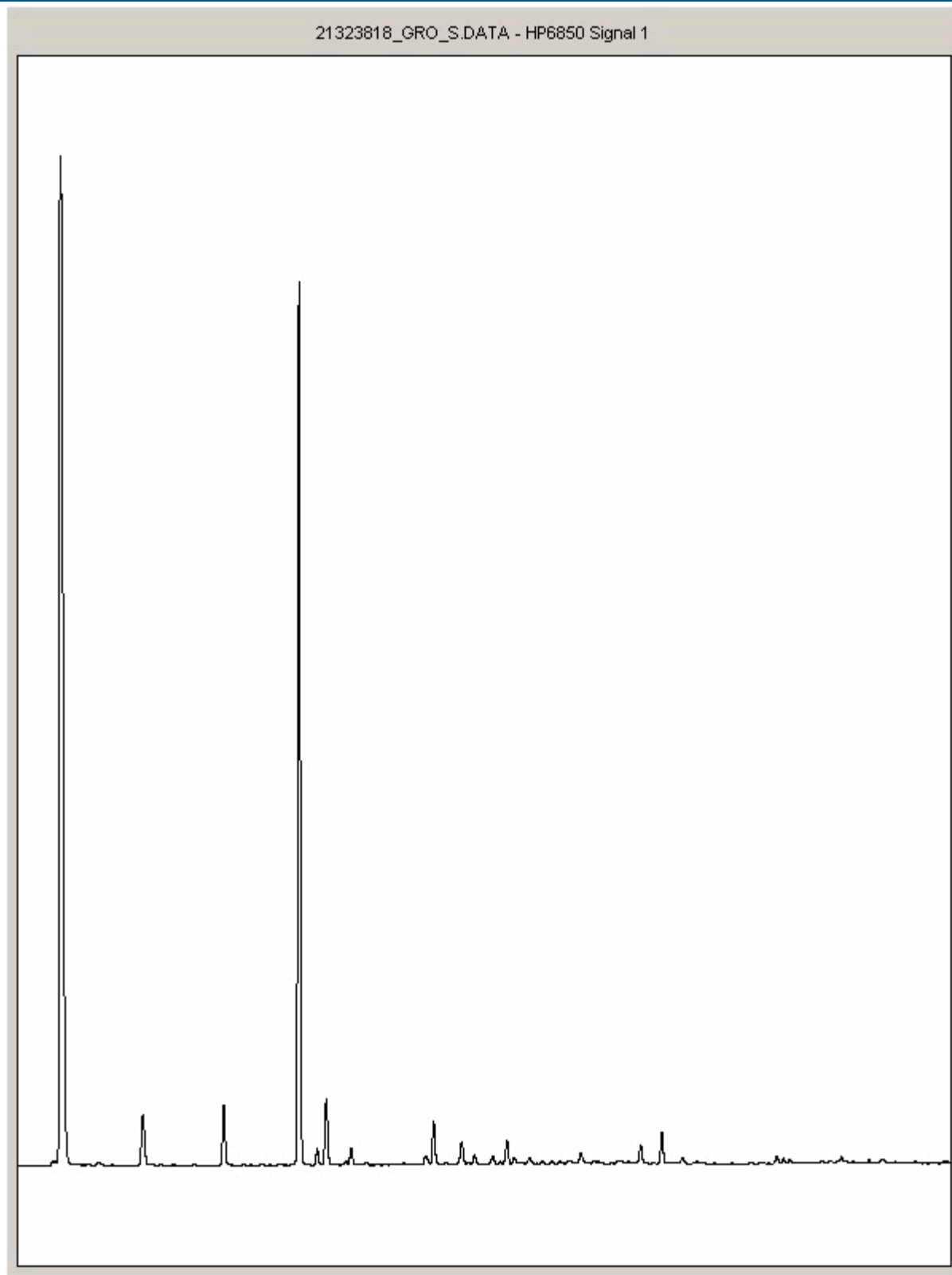
SDG:	191206-161	Client Reference:	62253048	Report Number:	534079
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21323818
Sample ID : TP204

Depth : 1.40





CERTIFICATE OF ANALYSIS

Validated

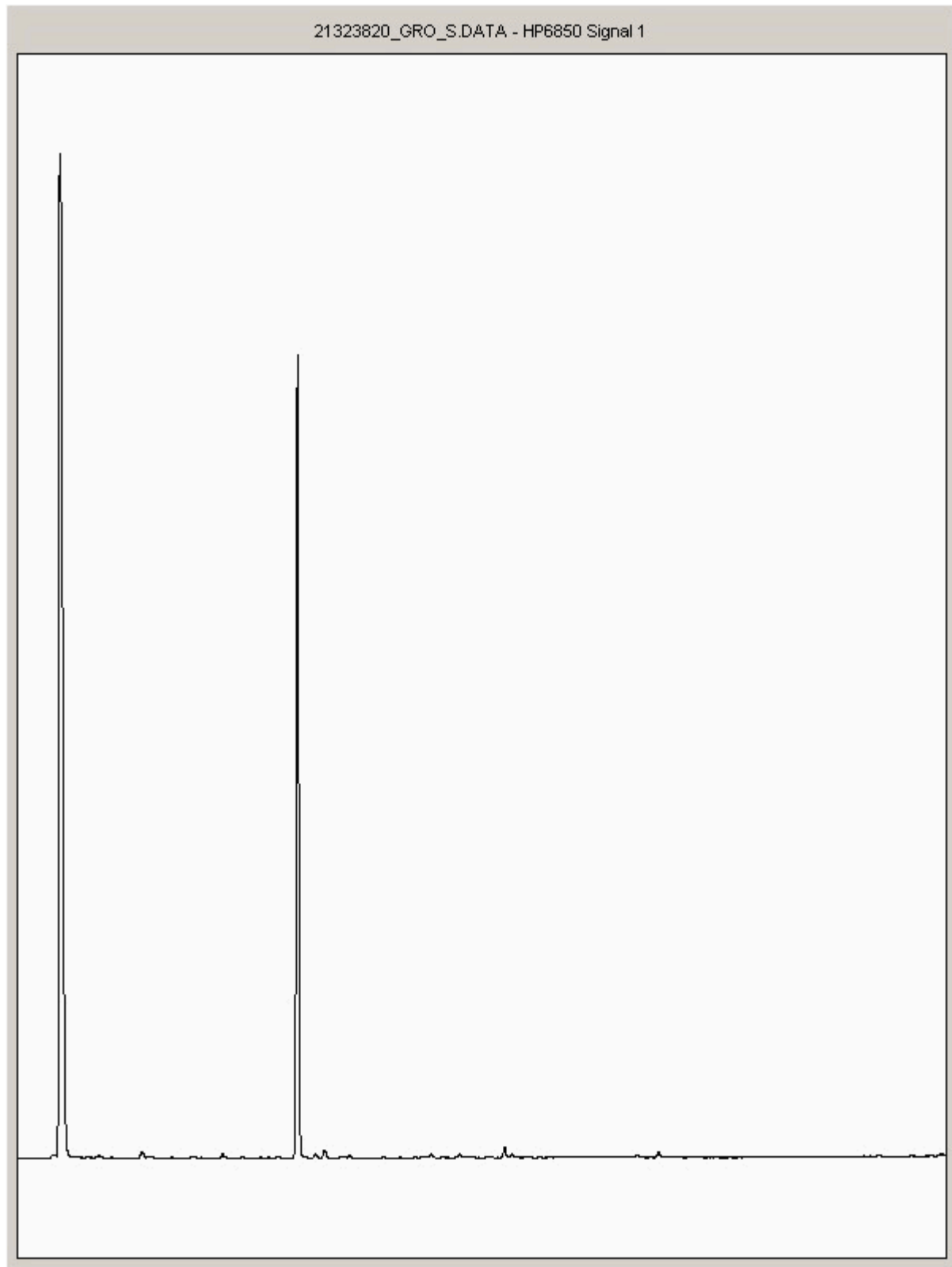
SDG:	191206-161	Client Reference:	62253048	Report Number:	534079
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21323820
Sample ID : TP206

Depth : 1.50





CERTIFICATE OF ANALYSIS

SDG:	191206-161	Client Reference:	62253048	Report Number:	534079
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Appendix

General

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.

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
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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

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* (2107).

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.



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 BBC
3rd Floor, Kings Orchard,
1 Queen Street
Bristol
Gloucestershire
BS2 0HQ

Attention: Jack Lott

CERTIFICATE OF ANALYSIS

Date of report Generation:	20 December 2019
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	191209-42
Your Reference:	62253048
Location:	Port Talbot Harbourside
Report No:	534893

We received 3 samples on Monday December 09, 2019 and 1 of these samples were scheduled for analysis which was completed on Friday December 20, 2019. 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:	191209-42	Client Reference:	62253048	Report Number:	534893
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21323534	BH201	ES	4.80	05/12/2019
21323529	BH202	ES	3.00	05/12/2019
21323539	BH207	ES	4.60	05/12/2019

Maximum Sample/Coolbox Temperature (°C) : 6.8

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191209-42
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

Report Number: 534893
Superseded Report:

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)

21323534

Customer
Sample Reference

BH201

AGS Reference

ES

Depth (m)

4.80

Container

250g Amber Jar
(ALE210)

60g VOC
(ALE215)

Sample Type

S

S

EPH CWG GC (S)

All

NDPs: 0
Tests: 1

X

GRO by GC-FID (S)

All

NDPs: 0
Tests: 1

X

Sample description

All

NDPs: 0
Tests: 1

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 1

X

VOC MS (S)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 191209-42 **Client Reference:** 62253048 **Report Number:** 534893
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
Lab Sample No(s)	Customer Sample Ref.		Depth (m)	Colour	Description	Inclusions	Inclusions 2		
21323534	BH201		4.80	Dark Brown	Sandy Loam	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: 191209-42
Location: Port Talbot HarboursideClient Reference: 62253048
Order Number: 62253048-GI4Report Number: 534893
Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample Ref.	BH201				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	4.80				
M	mCERIS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		05/12/2019				
diss.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		09/12/2019				
*	Subcontracted - refer to subcontractor report for accreditation status.		191209-42				
**	% 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		21323534				
(F)	Trigger breach confirmed		ES				
1-3+5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM089	99				
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01				
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01				
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01				
Aliphatics >C10-C12	<1 mg/kg	TM414	<1				
Aliphatics >C12-C16	<1 mg/kg	TM414	<1				
Aliphatics >C16-C35	<1 mg/kg	TM414	<1				
Aliphatics >C35-C44	<1 mg/kg	TM414	<1				
Total Aliphatics >C10-C44	<5 mg/kg	TM414	<5				
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	TM414	<10				
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01				
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01				
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01				
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1				
Aromatics > EC12-EC16	<1 mg/kg	TM414	<1				
Aromatics > EC16-EC21	<1 mg/kg	TM414	<1				
Aromatics > EC16-EC35	<1 mg/kg	TM414	<1				
Aromatics > EC21-EC35	<1 mg/kg	TM414	<1				
Aromatics >EC35-EC44	<1 mg/kg	TM414	<1				
Aromatics > EC40-EC44	<1 mg/kg	TM414	<1				
Total Aromatics > EC10-EC44	<5 mg/kg	TM414	<5				
Total Aliphatics & Aromatics >C5-C44	<10 mg/kg	TM414	<10				
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089	<0.05				
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089	<0.05				
GRO >C5-C10	<0.02 mg/kg	TM089	<0.02				



CERTIFICATE OF ANALYSIS

Validated

SDG: 191209-42 **Client Reference:** 62253048 **Report Number:** 534893
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
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
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:	191209-42	Client Reference:	62253048	Report Number:	534893
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	21323534
Customer Sample Ref.	BH201
AGS Ref.	ES
Depth	4.80
Type	Soil/Solid (S)

EPH CWG GC (S)	20-Dec-2019
GRO by GC-FID (S)	16-Dec-2019
Sample description	12-Dec-2019
TPH CWG GC (S)	20-Dec-2019
VOC MS (S)	13-Dec-2019

SDG:	191209-42
Location:	Port Talbot Harbourside

Client Reference:	62253048
Order Number:	62253048-GI4

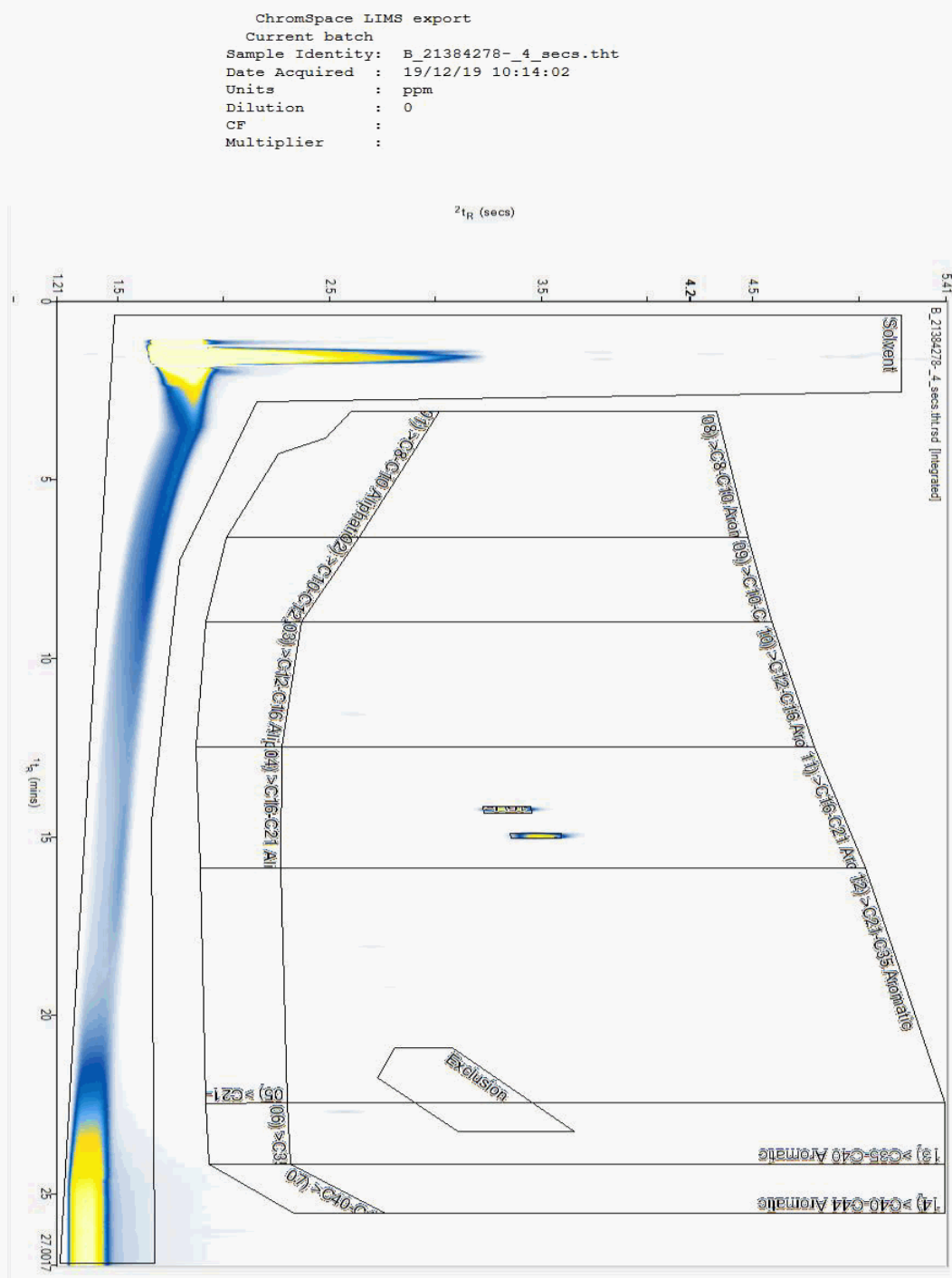
Report Number: 534893
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21384278
Sample ID : BH201

Depth : 4.80





CERTIFICATE OF ANALYSIS

Validated

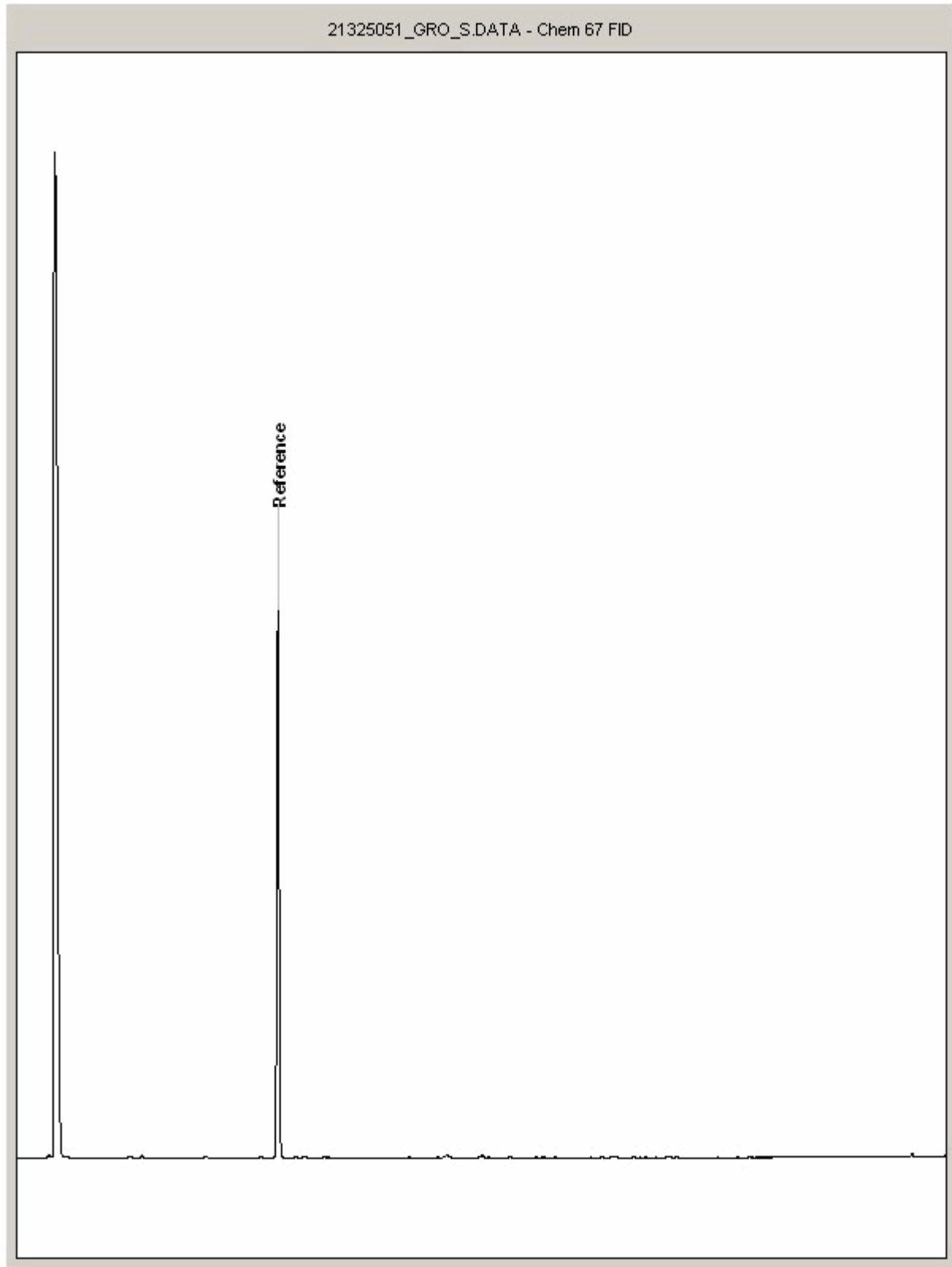
SDG:	191209-42	Client Reference:	62253048	Report Number:	534893
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21325051
Sample ID : BH201

Depth : 4.80





CERTIFICATE OF ANALYSIS

SDG:	191209-42	Client Reference:	62253048	Report Number:	534893
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Appendix

General

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.

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
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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

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* (2107).

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.



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 BBC
3rd Floor, Kings Orchard,
1 Queen Street
Bristol
Gloucestershire
BS2 0HQ

Attention: Jack Lott

CERTIFICATE OF ANALYSIS

Date of report Generation:	21 December 2019
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	191214-63
Your Reference:	62253048
Location:	Port Talbot Harbourside
Report No:	535090

We received 2 samples on Saturday December 14, 2019 and 1 of these samples were scheduled for analysis which was completed on Saturday December 21, 2019. 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:	191214-63	Client Reference:	62253048	Report Number:	535090
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21367139	BH205	ES	2.10	13/12/2019
21367130	BH204A	ES	2.20	13/12/2019

Maximum Sample/Coolbox Temperature (°C) : 6.0

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-63 Client Reference: 62253048 Report Number: 535090
Location: Port Talbot Harbourside Order Number: 62253048-GI4 Superseded Report:

Results Legend

X Test
N 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)

21367130

Customer Sample Reference

BH204A

AGS Reference

ES

Depth (m)

2.20

Container

250g Amber Jar (ALE210)

60g VOC (ALE215)

Sample Type

S

S

EPH CWG GC (S)

All

NDPs: 0
Tests: 1

X

GRO by GC-FID (S)

All

NDPs: 0
Tests: 1

X

Sample description

All

NDPs: 0
Tests: 1

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 1

X

VOC MS (S)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-63 **Client Reference:** 62253048 **Report Number:** 535090
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
Lab Sample No(s)	Customer Sample Ref.			Depth (m)	Colour	Description	Inclusions	Inclusions 2	
21367130	BH204A			2.20	Black	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:	191214-63	Client Reference:	62253048	Report Number:	535090
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Results Legend		Customer Sample Ref.	BH204A				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		13/12/2019				
diss.filt	Dissolved / filtered sample.		-				
tot.unfilt	Total / unfiltered sample.		14/12/2019				
*	Subcontracted - refer to subcontractor report for accreditation status.		191214-63				
**	% 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		21367130				
(F)	Trigger breach confirmed		ES				
1-3+5@	Sample deviation (see appendix)						
Component	LOD/Units		Method				
Moisture Content Ratio (% of as received sample)	%	PM024	2.4				



CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-63 **Client Reference:** 62253048 **Report Number:** 535090
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
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
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: 191214-63
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

Report Number: 535090
Superseded Report:

Test Completion Dates

Lab Sample No(s)	21367130
Customer Sample Ref.	BH204A
AGS Ref.	ES
Depth	2.20
Type	Soil/Solid (S)

EPH CWG GC (S)	21-Dec-2019
GRO by GC-FID (S)	18-Dec-2019
Sample description	15-Dec-2019
TPH CWG GC (S)	21-Dec-2019
VOC MS (S)	18-Dec-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-63
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

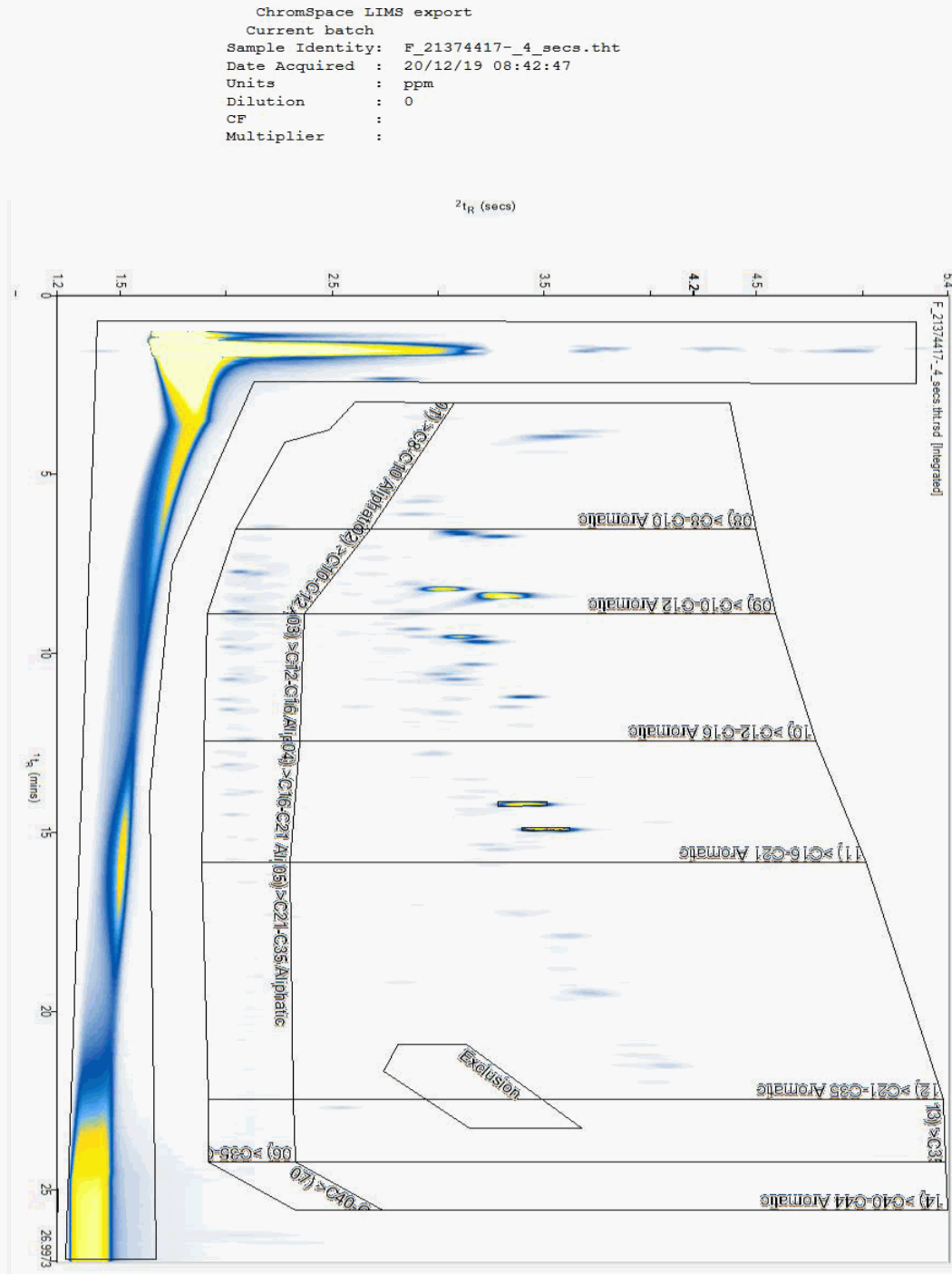
Report Number: 535090
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21374417
Sample ID : BH204A

Depth : 2.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-63
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 62253048-GI4

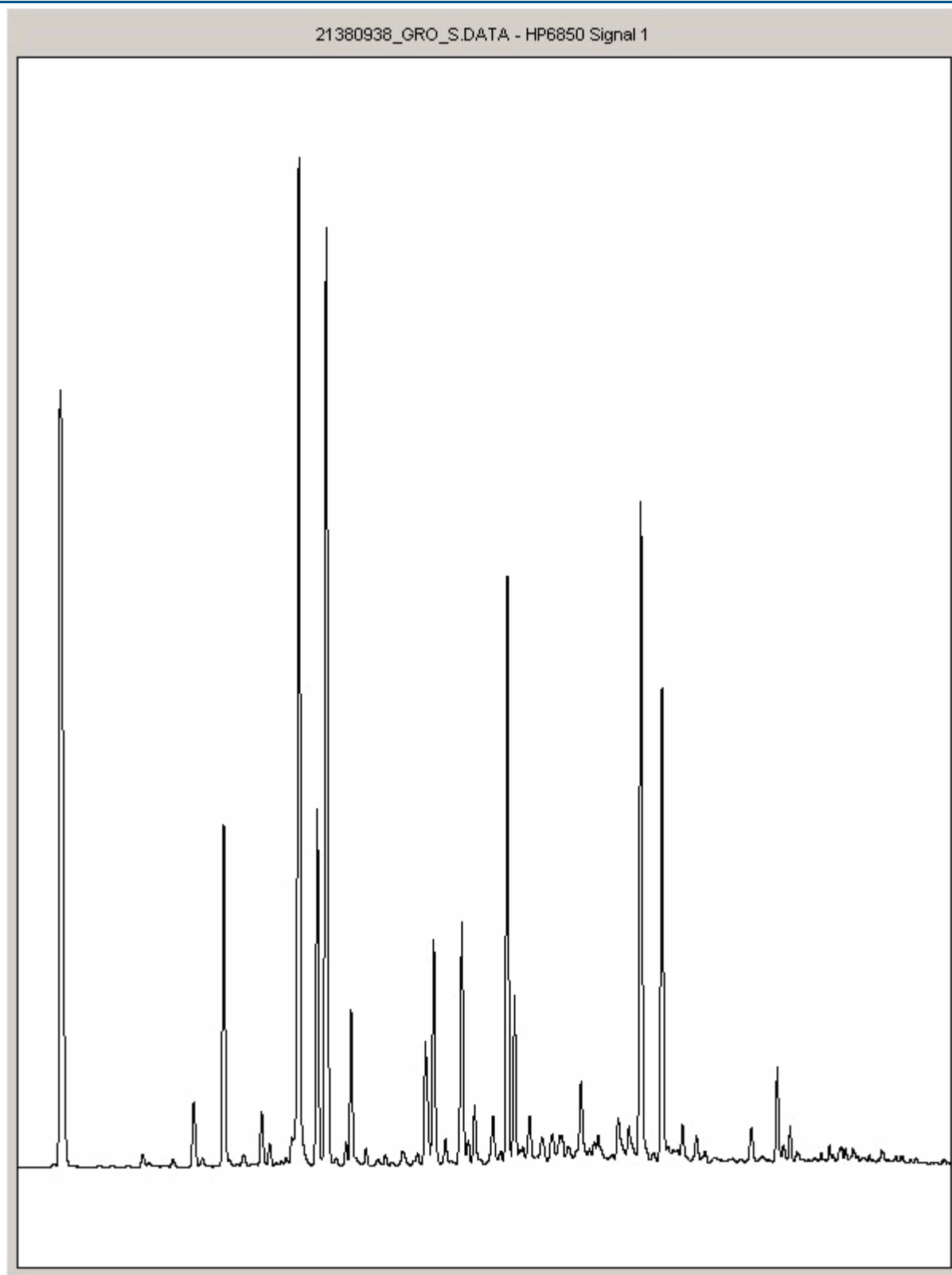
Report Number: 535090
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21380938
Sample ID : BH204A

Depth : 2.20





CERTIFICATE OF ANALYSIS

SDG:	191214-63	Client Reference:	62253048	Report Number:	535090
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	

Appendix

General

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.

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
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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

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* (2107).

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.



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 BBC
3rd Floor, Kings Orchard,
1 Queen Street
Bristol
Gloucestershire
BS2 0HQ

Attention: Jack Lott

CERTIFICATE OF ANALYSIS

Date of report Generation:	19 December 2019
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	191214-28
Your Reference:	62253048
Location:	Port Talbot Harbourside
Report No:	534688

We received 1 sample on Saturday December 14, 2019 and 1 of these samples were scheduled for analysis which was completed on Thursday December 19, 2019. 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:	191214-28	Client Reference:	62253048	Report Number:	534688
Location:	Port Talbot Harbourside	Order Number:	600253048-GI4	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21364673	BH206	ES	3.00	13/12/2019

Maximum Sample/Coolbox Temperature (°C) : 4.2

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-28 Client Reference: 62253048 Report Number: 534688
Location: Port Talbot Harbourside Order Number: 600253048-GI4 Superseded Report:

Results Legend

X Test
N 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)

21364673

Customer Sample Reference

BH206

AGS Reference

ES

Depth (m)

3.00

Container

250g Amber Jar (ALE210)

60g VOC (ALE215)

Sample Type

S

S

EPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1		X
Sample description	All	NDPs: 0 Tests: 1	X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
VOC MS (S)	All	NDPs: 0 Tests: 1		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-28 **Client Reference:** 62253048 **Report Number:** 534688
Location: Port Talbot Harbourside **Order Number:** 600253048-GI4 **Superseded Report:**

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
------------------	----------	-------------	-----------------	---------------	-------------	---------------	------------	--------------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21364673	BH206	3.00	Black	Sandy Loam	Stones	N/A

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: 191214-28 **Client Reference:** 62253048 **Report Number:** 534688
Location: Port Talbot Harbourside **Order Number:** 600253048-GI4 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
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
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:	191214-28	Client Reference:	62253048	Report Number:	534688
Location:	Port Talbot Harbourside	Order Number:	600253048-GI4	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	21364673
Customer Sample Ref.	BH206
AGS Ref.	ES
Depth	3.00
Type	Soil/Solid (S)

EPH CWG GC (S)	19-Dec-2019
GRO by GC-FID (S)	17-Dec-2019
Sample description	14-Dec-2019
TPH CWG GC (S)	19-Dec-2019
VOC MS (S)	17-Dec-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 191214-28
Location: Port Talbot Harbourside

Client Reference: 62253048
Order Number: 600253048-GI4

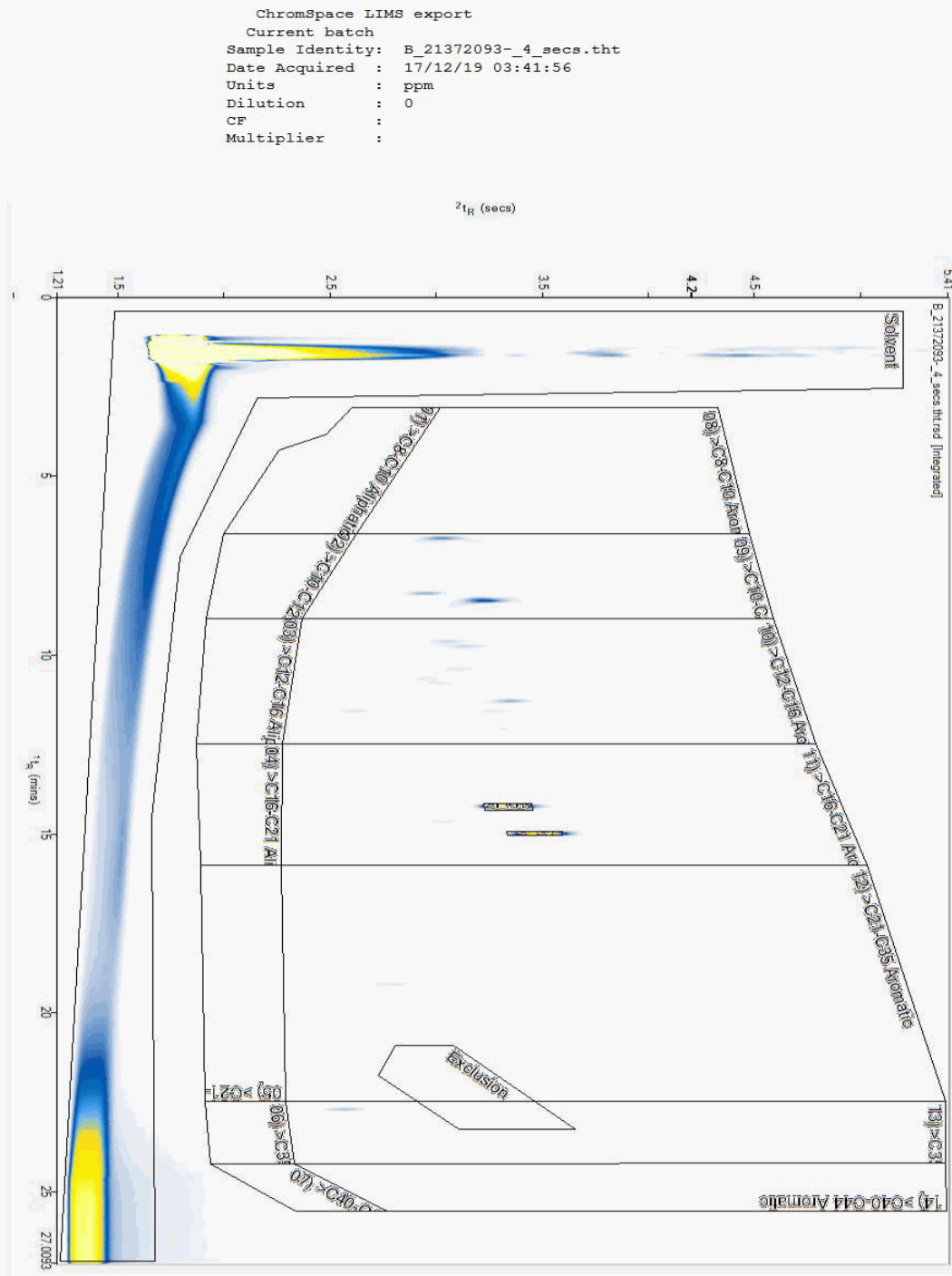
Report Number: 534688
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21372093
Sample ID : BH206

Depth : 3.00





CERTIFICATE OF ANALYSIS

Validated

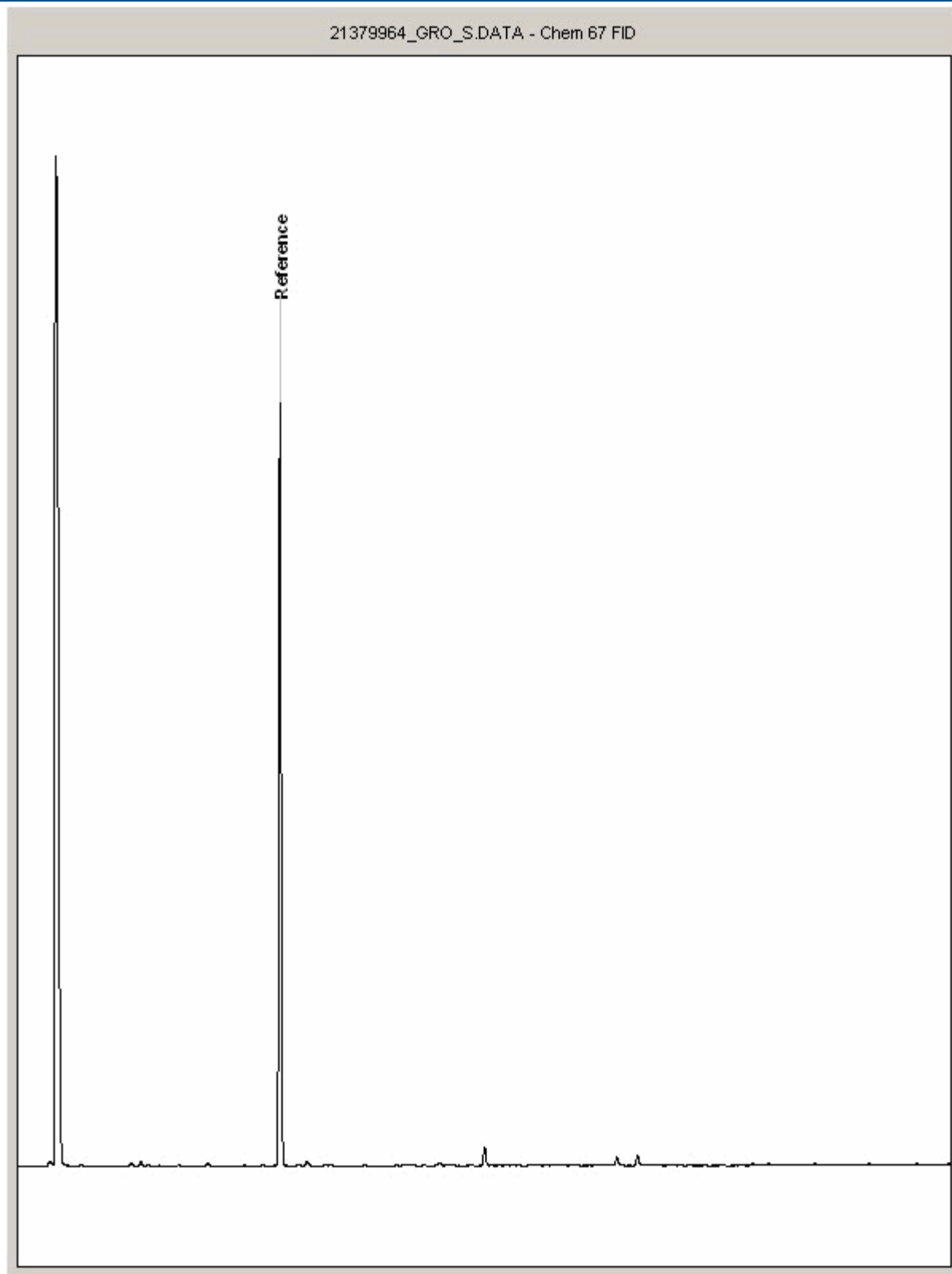
SDG:	191214-28	Client Reference:	62253048	Report Number:	534688
Location:	Port Talbot Harbourside	Order Number:	600253048-GI4	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21379964
Sample ID : BH206

Depth : 3.00





CERTIFICATE OF ANALYSIS

SDG:	191214-28	Client Reference:	62253048	Report Number:	534688
Location:	Port Talbot Harbourside	Order Number:	600253048-GI4	Superseded Report:	

Appendix

General

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.

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
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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

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* (2107).

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.



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 BBC
3rd Floor, Kings Orchard,
1 Queen Street
Bristol
Gloucestershire
BS2 0HQ

Attention: Jack Lott

CERTIFICATE OF ANALYSIS

Date of report Generation:	31 January 2020
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	200114-98
Your Reference:	62253048
Location:	Port Talbot Harbourside
Report No:	539240

This report has been revised and directly supersedes 538360 in its entirety.

We received 7 samples on Tuesday January 14, 2020 and 6 of these samples were scheduled for analysis which was completed on Friday January 31, 2020. 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:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21485736	BH104	EW	0.00 - 0.00	09/01/2020
21485716	BH202	EW	0.00 - 0.00	09/01/2020
21485728	BH203	EW	0.00 - 0.00	09/01/2020
21485720	BH205	EW	0.00 - 0.00	09/01/2020
21485733	BH204A	EW	0.00 - 0.00	09/01/2020
21485724	SW1 (DOCK)	EW	0.00 - 0.00	09/01/2020
21485726	SW2 (FEEDER)	EW	0.00 - 0.00	09/01/2020

Maximum Sample/Coolbox Temperature (°C) : 6.8

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200114-98
Location: Port Talbot Harbourside**Client Reference:** 62253048
Order Number: 62253048-GI4**Report Number:** 539240
Superseded Report: 538360

TPH CWG (W)

Results Legend			Customer Sample Ref.	BH202	BH203	BH205	SW1 (DOCK)	SW2 (FEEDER)	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference							
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								
1-3+5@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
GRO Surrogate % recovery**	%	TM245	104	113	110	111	106		
GRO >C5-C12	<50 µg/l	TM245	<50 #	<50 #	<50 #	<50 @ #	<50 @ #		
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3	<3 @ #	<3 @ #		
Benzene	<7 µg/l	TM245	<7	<7	<7	<7 @ #	<7 @ #		
Toluene	<4 µg/l	TM245	<4	<4	<4	<4 @ #	<4 @ #		
Ethylbenzene	<5 µg/l	TM245	<5	<5	<5	<5 @ #	<5 @ #		
m,p-Xylene	<8 µg/l	TM245	<8	<8	<8	<8 @ #	<8 @ #		
o-Xylene	<3 µg/l	TM245	<3	<3	<3	<3 @ #	<3 @ #		
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11	<11	<11 @	<11 @		
Sum of detected BTEX	<28 µg/l	TM245	<28	<28	<28	<28 @	<28 @		
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174				<10	<10		
Aliphatics >C12-C16 (diss.filt)	<10 µg/l	TM174	<10	<10	<10				
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174				<10	<10		
Aliphatics >C16-C21 (diss.filt)	<10 µg/l	TM174	<10	<10	<10				
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174				<10	<10		
Aliphatics >C21-C35 (diss.filt)	<10 µg/l	TM174	<10	<10	<10				
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174				<10	<10		
Total Aliphatics >C12-C35 (diss.filt)	<10 µg/l	TM174	<10	<10	<10				
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10	<10 @	<10 @		
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174				<10	<10		
Aromatics >EC12-EC16 (diss.filt)	<10 µg/l	TM174	<10	<10	<10				
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174				<10	<10		
Aromatics >EC16-EC21 (diss.filt)	<10 µg/l	TM174	<10	<10	<10				
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174				<10	<10		
Aromatics >EC21-EC35 (diss.filt)	<10 µg/l	TM174	<10	<10	<10				



CERTIFICATE OF ANALYSIS

Validated

SDG: 200114-98 **Client Reference:** 62253048 **Report Number:** 539240
Location: Port Talbot Harbourside **Order Number:** 62253048-GI4 **Superseded Report:** 538360

Table of Results - Appendix

Method No	Reference	Description
TM059	In - house Method	Determination of whole oil by gas chromatography (C4-C40)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
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
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
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter

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: 200114-98 Client Reference: 62253048 Report Number: 539240
Location: Port Talbot Harbourside Order Number: 62253048-GI4 Superseded Report: 538360

Test Completion Dates

Lab Sample No(s)	21485716	21485728	21485720	21485733	21485724	21485726
Customer Sample Ref.	BH202	BH203	BH205	BH204A	SW1 (DOCK)	SW2 (FEEDER)
AGS Ref.	EW	EW	EW	EW	EW	EW
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Product (P)	Surface Water	Surface Water
Character of hydrocarbon samples				21-Jan-2020		
Dissolved Metals by ICP-MS					20-Jan-2020	20-Jan-2020
Dissolved Organic/Inorganic Carbon					20-Jan-2020	20-Jan-2020
EPH CWG (Aliphatic) Aqueous GC (W)					31-Jan-2020	31-Jan-2020
EPH CWG (Aliphatic) Filtered GC (W)	21-Jan-2020	21-Jan-2020	21-Jan-2020			
EPH CWG (Aromatic) Aqueous GC (W)					31-Jan-2020	31-Jan-2020
EPH CWG (Aromatic) Filtered GC (W)	21-Jan-2020	21-Jan-2020	21-Jan-2020			
GRO by GC-FID (W)	15-Jan-2020	15-Jan-2020	15-Jan-2020		28-Jan-2020	28-Jan-2020
Mercury Dissolved					24-Jan-2020	24-Jan-2020
pH Value of Filtered Water					21-Jan-2020	21-Jan-2020
TPH CWG (W)					31-Jan-2020	31-Jan-2020
TPH CWG Filtered (W)	21-Jan-2020	21-Jan-2020	21-Jan-2020			



CERTIFICATE OF ANALYSIS

Validated

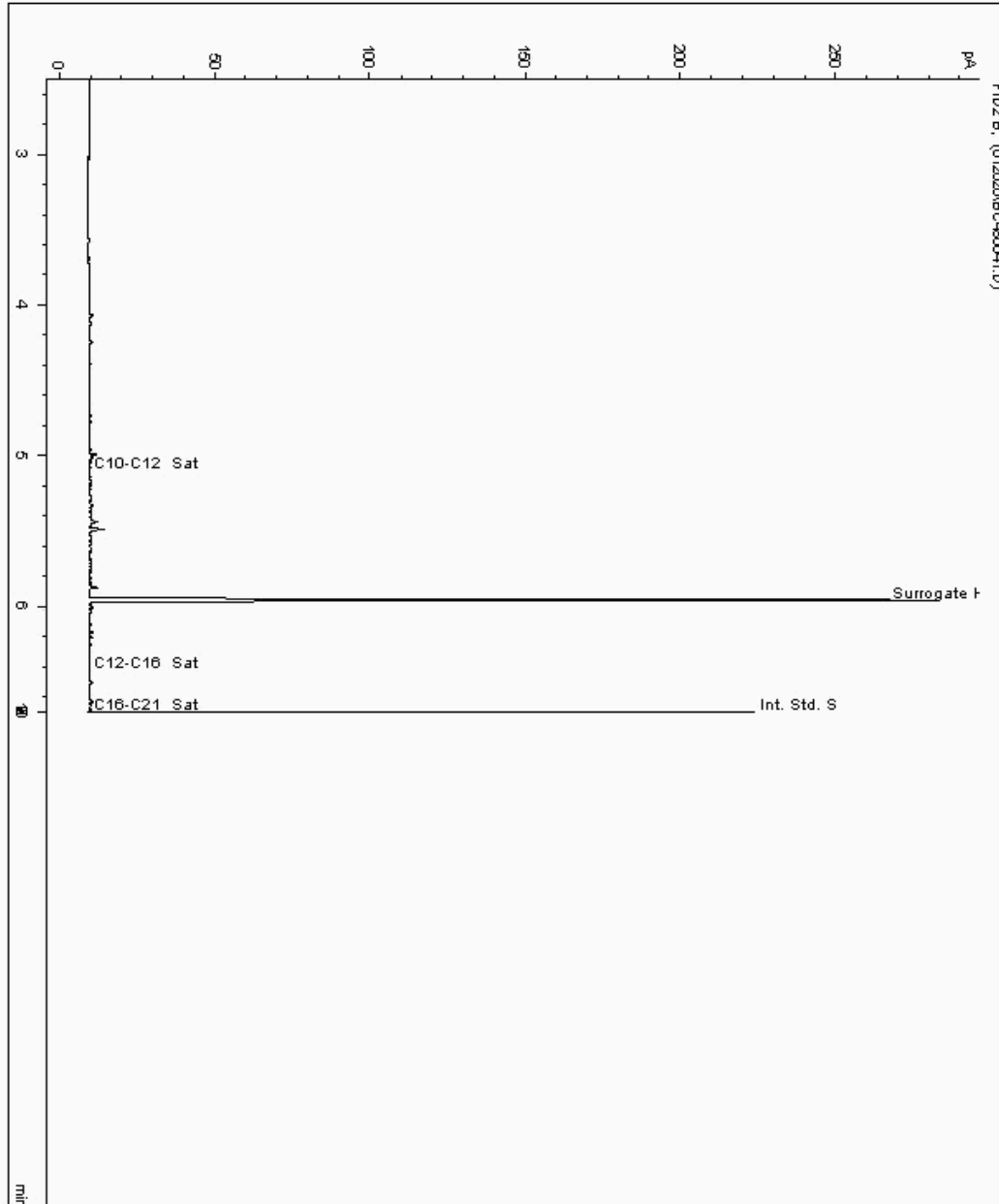
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis:	EPH CWG (Aliphatic) Filtered GC (W)	Sample No :	21510319	Depth :	0.00 - 0.00
		Sample ID :	BH205		

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

Sample Identity: 20176376-
Date Acquired : 21/01/2020 11:30:52 PM
Units : ppb
Dilution : SE BH205[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

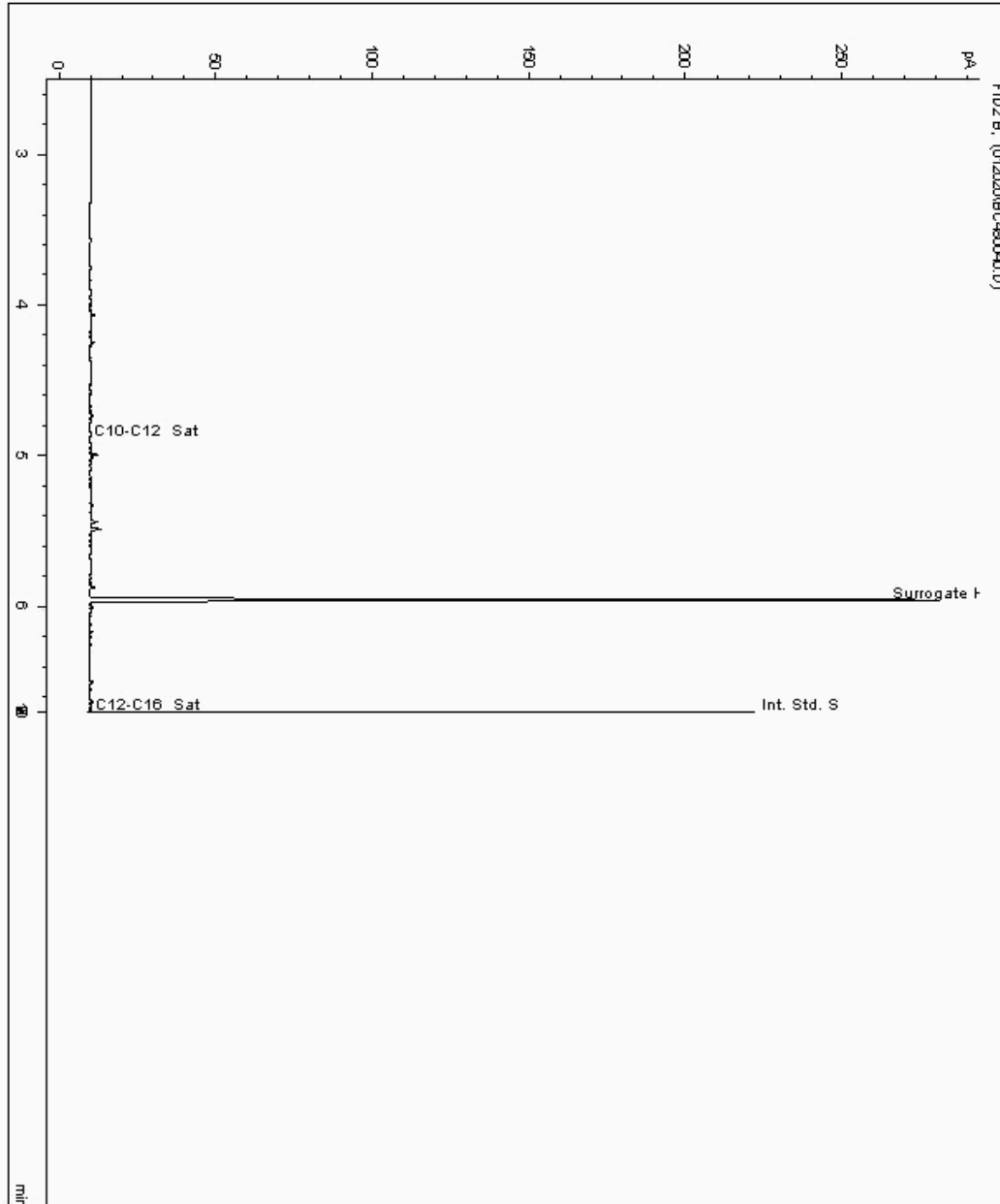
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: EPH CWG (Aliphatic) Filtered GC (W) Sample No : 21510320 Depth : 0.00 - 0.00
Sample ID : BH202

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

Sample Identity: 20176371-
Date Acquired : 21/01/2020 11:08:43 PM
Units : ppb
Dilution : SE BH202[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

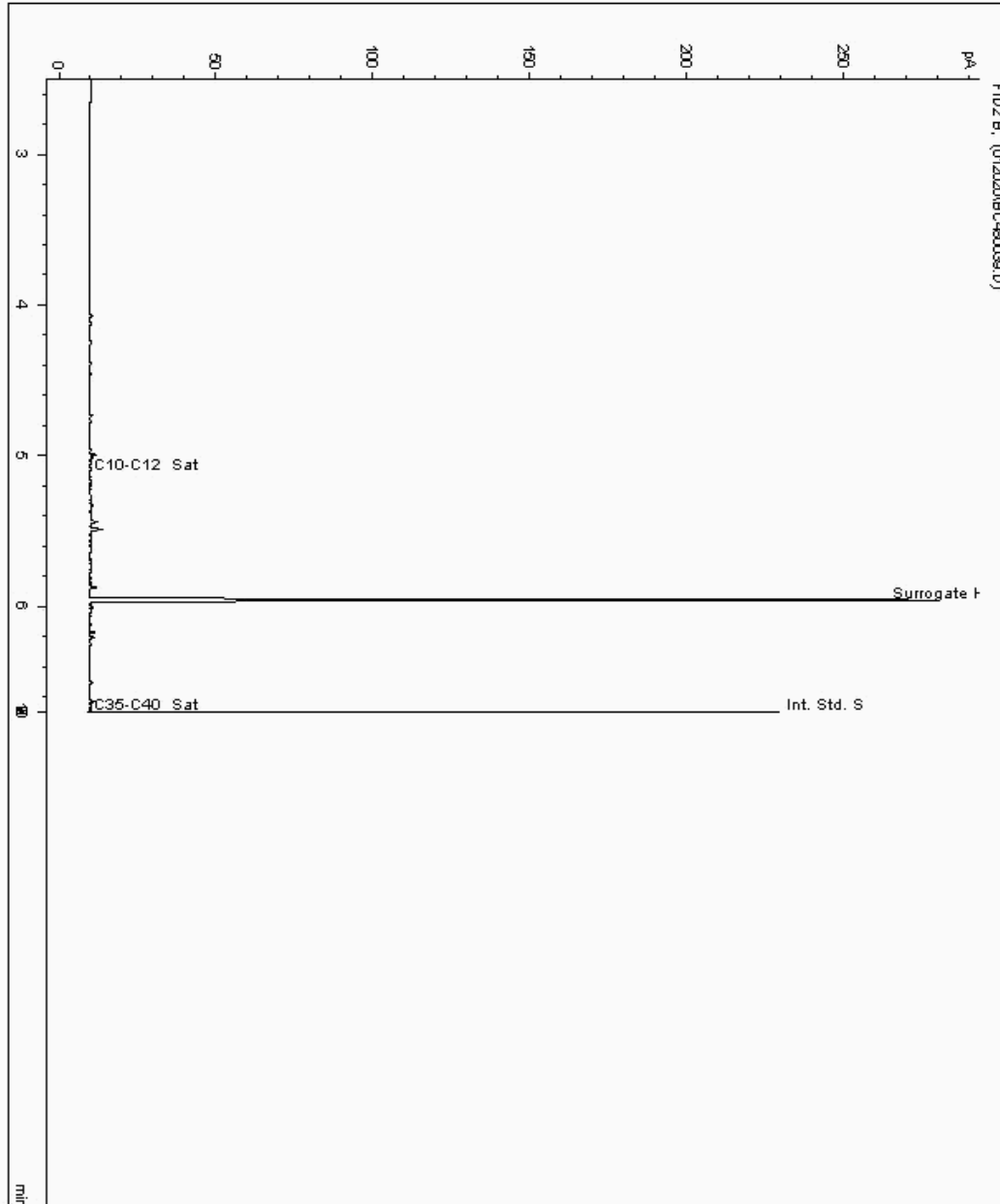
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis:	EPH CWG (Aliphatic) Filtered GC (W)	Sample No :	21510323	Depth :	0.00 - 0.00
		Sample ID :	BH203		

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

Sample Identity: 20176391-
Date Acquired : 21/01/2020 10:46:34 PM
Units : ppb
Dilution : SE BH203[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

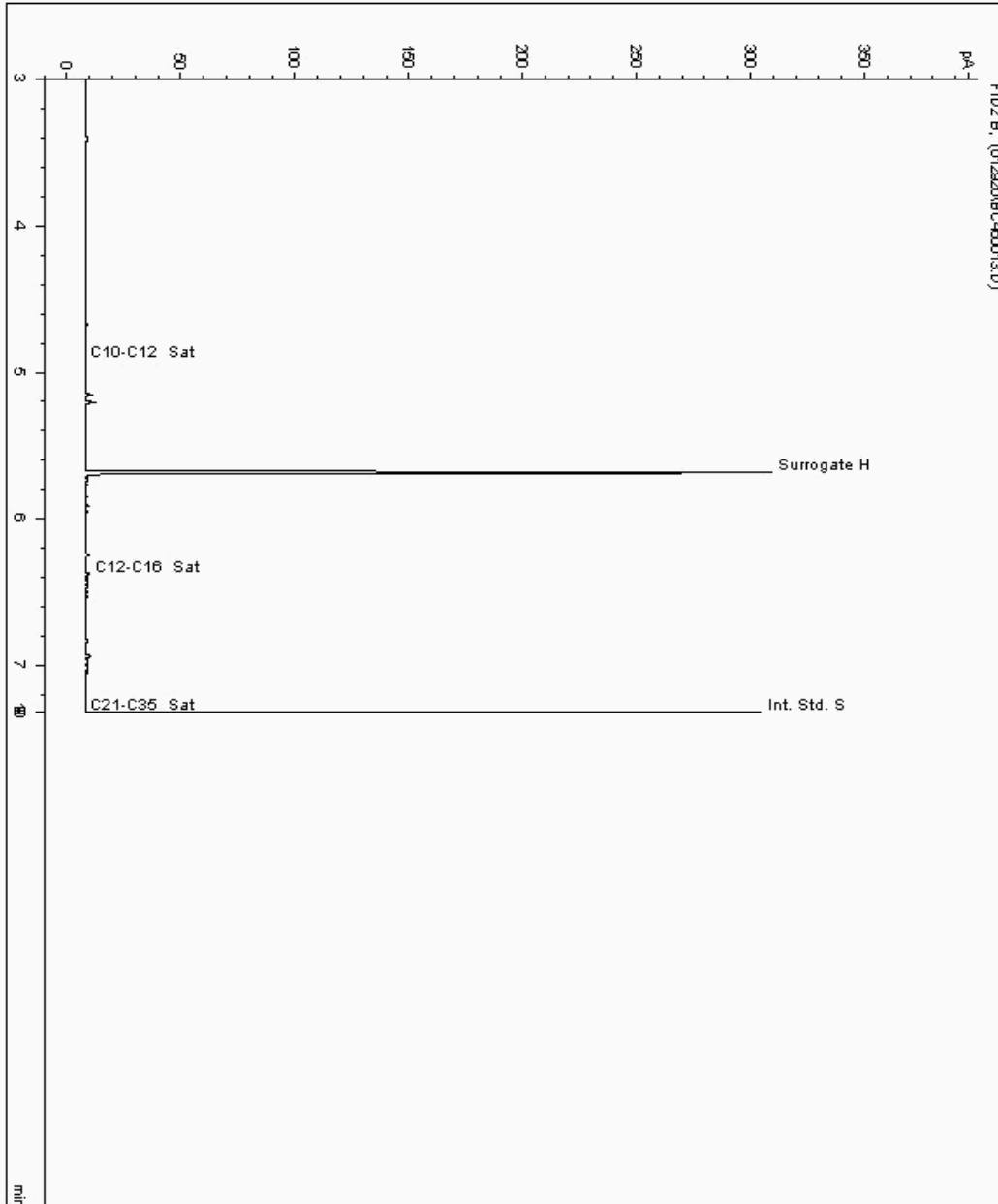
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 21561776
Sample ID : SW1 (DOCK)

Depth : 0.00 - 0.00

Speciated TPH - SATS (C12 - C40)

Sample Identity: 20247428-
Date Acquired : 30/01/2020 12:17:37 PM
Units : ppb
Dilution:





CERTIFICATE OF ANALYSIS

Validated

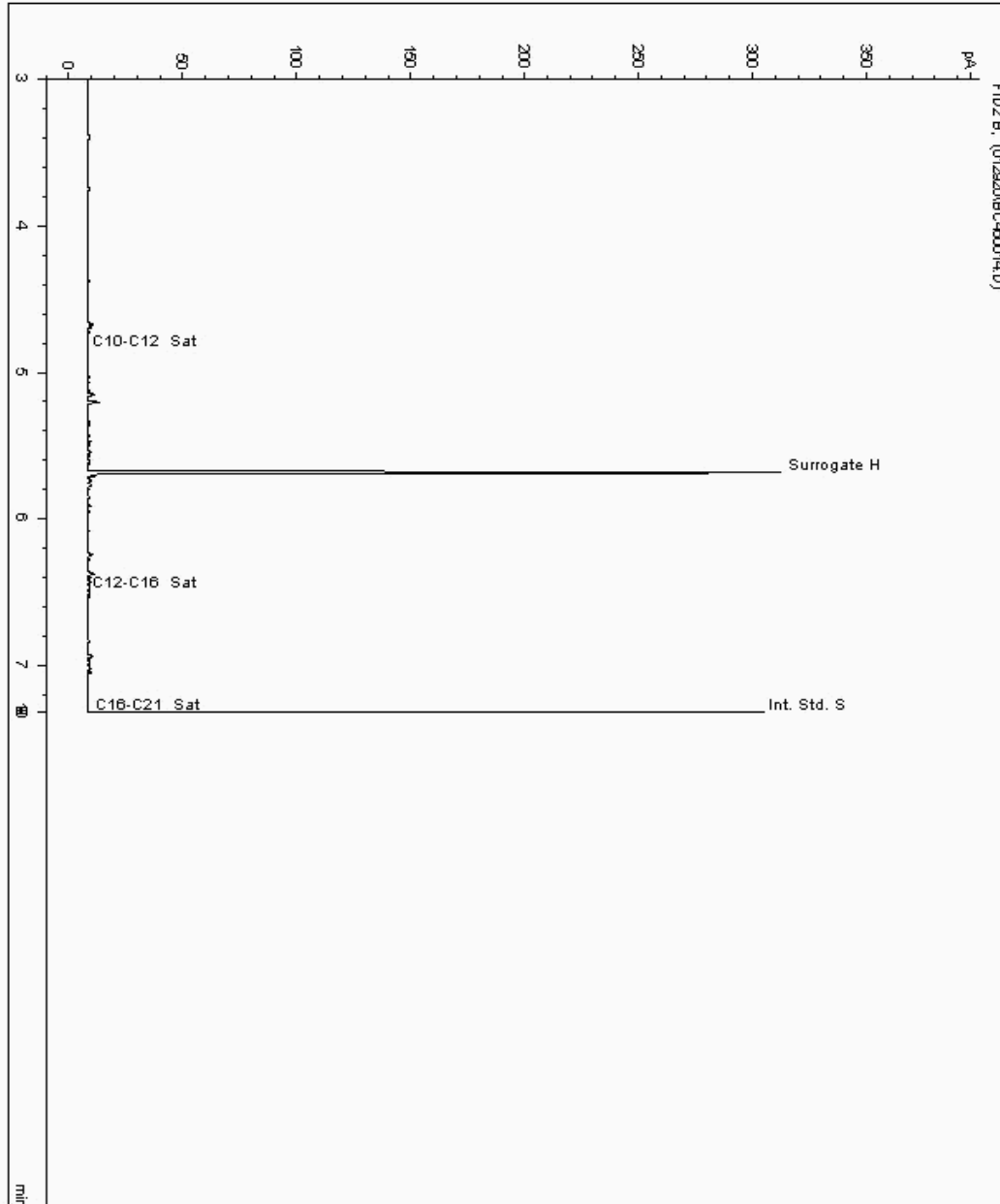
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : 21561777 Depth : 0.00 - 0.00
Sample ID : SW2 (FEEDER)

Speciated TPH - SATS (C12 - C40)

Sample Identity: 20247433-
Date Acquired : 30/01/2020 12:41:09 PM
Units : ppb
Dilution:





CERTIFICATE OF ANALYSIS

Validated

SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

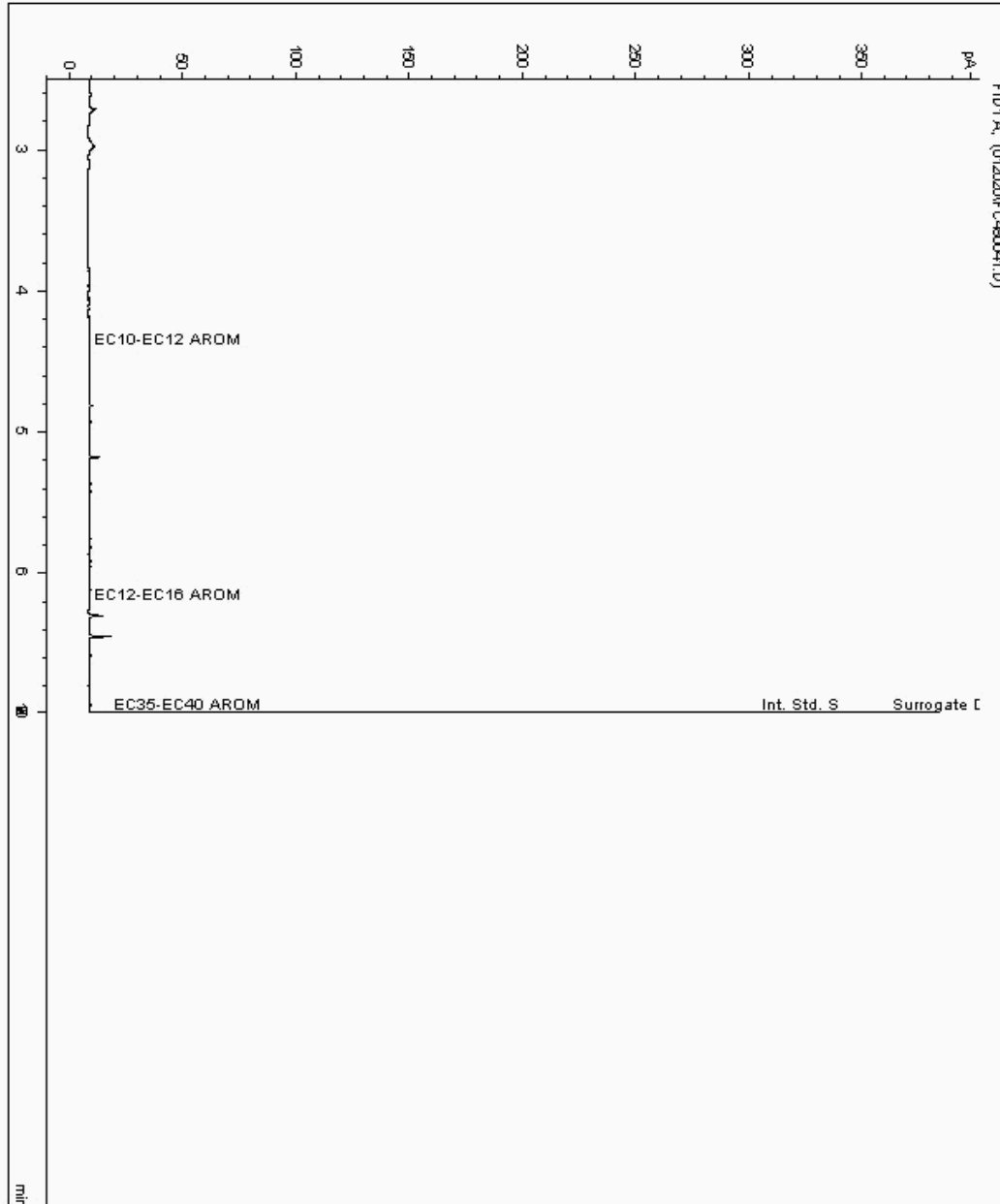
Analysis: EPH CWG (Aromatic) Filtered GC (W)

Sample No : 21510319
Sample ID : BH205

Depth : 0.00 - 0.00

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

Sample Identity: 20176377-
Date Acquired : 21/01/2020 11:30:52 PM
Units : ppb
Dilution : SE BH205[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

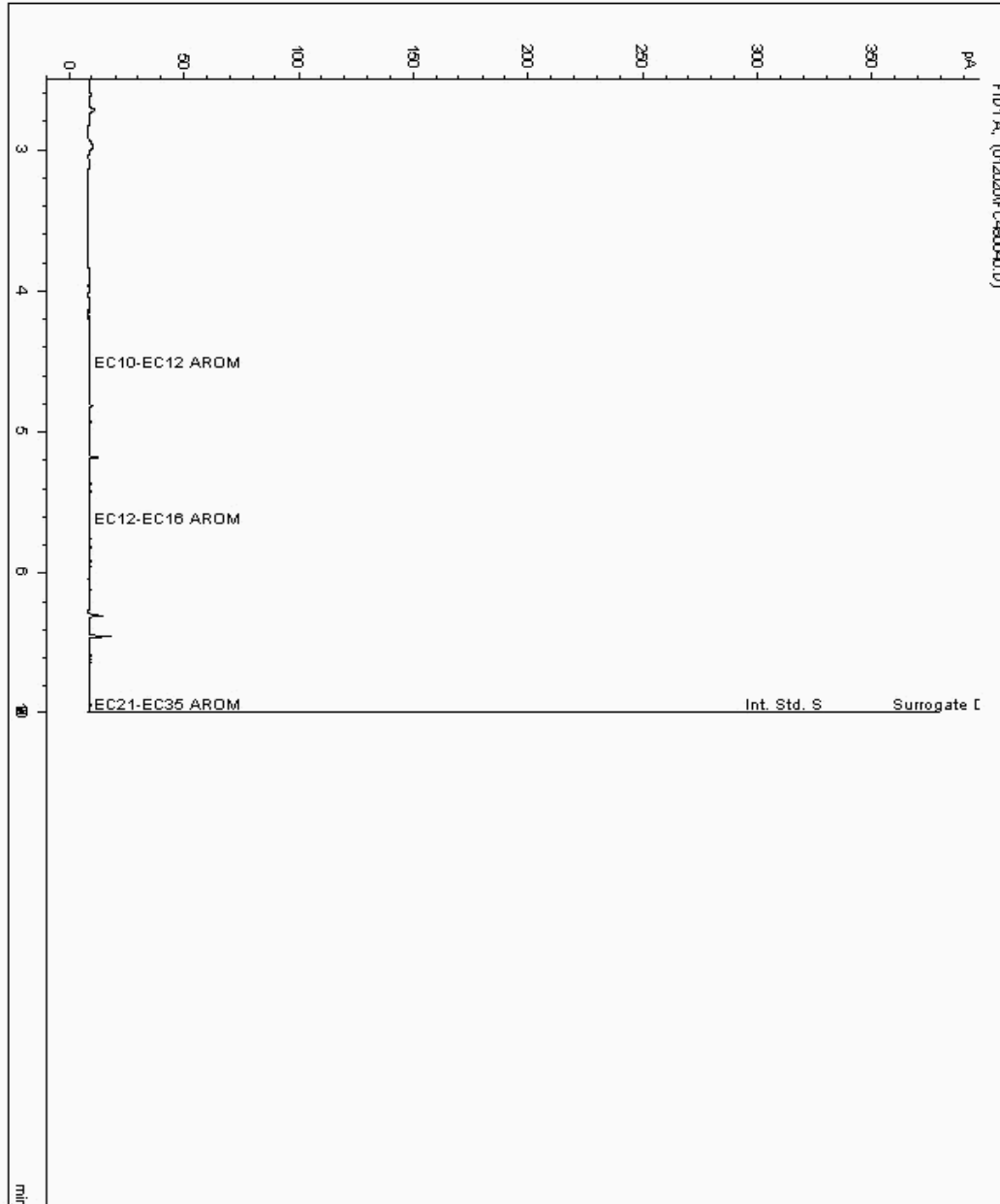
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: EPH CWG (Aromatic) Filtered GC (W) Sample No : 21510320 Depth : 0.00 - 0.00
Sample ID : BH202

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

Sample Identity: 20176372-
Date Acquired : 21/01/2020 11:08:43 PM
Units : ppb
Dilution : SE BH202[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

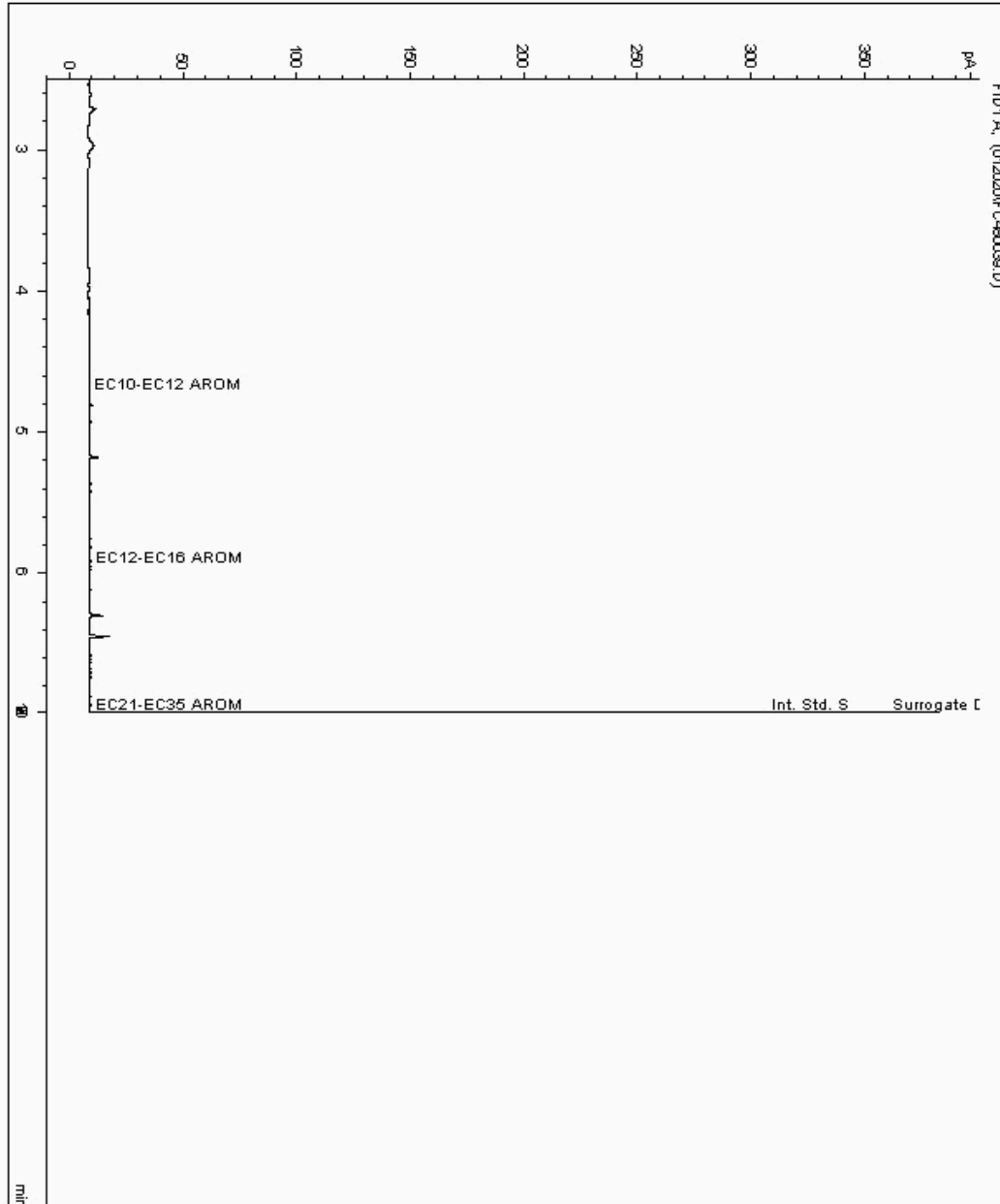
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: EPH CWG (Aromatic) Filtered GC (W) Sample No : 21510323 Depth : 0.00 - 0.00
Sample ID : BH203

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

Sample Identity: 20176392-
Date Acquired : 21/01/2020 10:46:35 PM
Units : ppb
Dilution : SE BH203[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

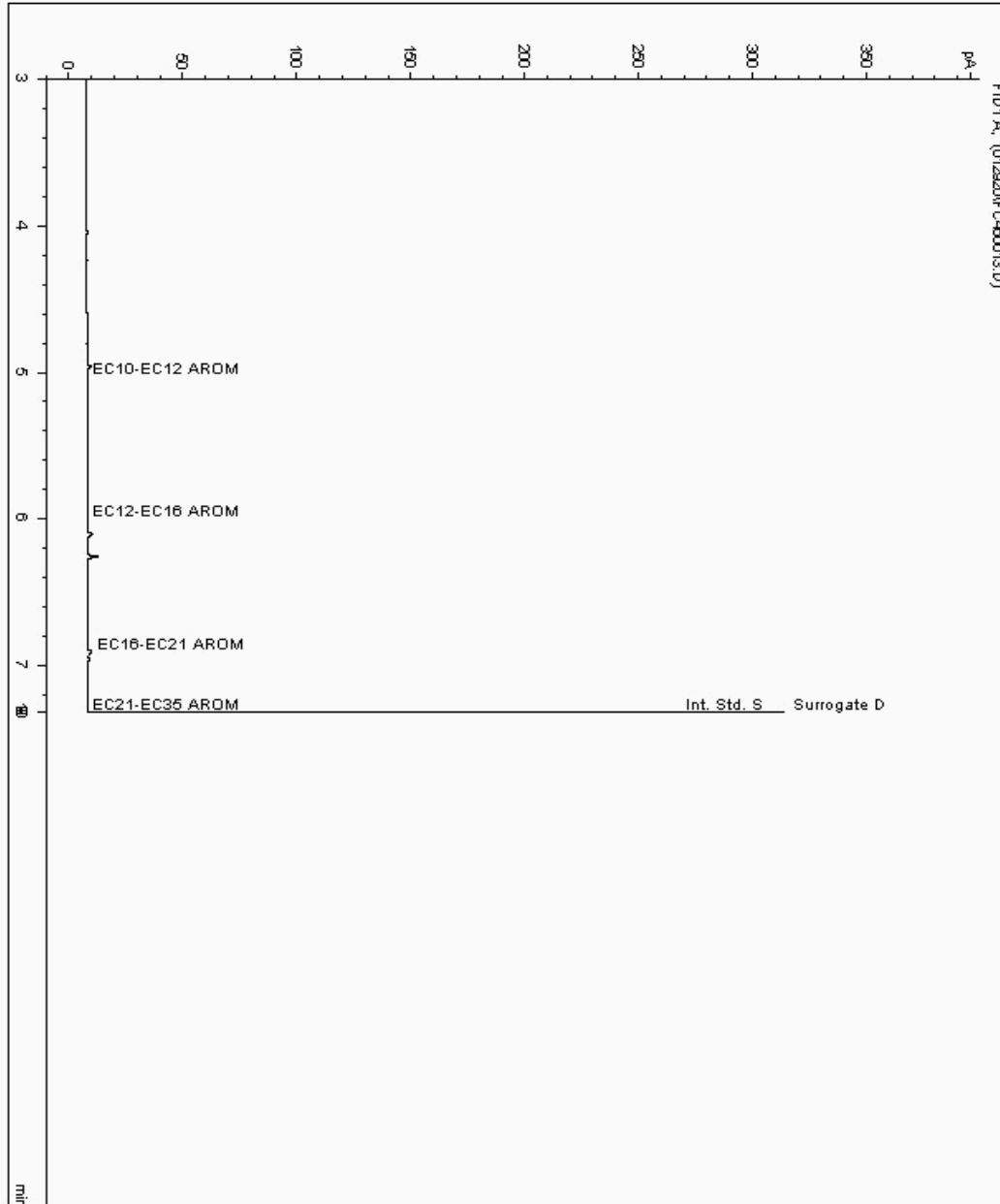
Validated

SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : 21561776 Depth : 0.00 - 0.00
Sample ID : SW1 (DOCK)

Speciated TPH - SATS (C12 - C40)
Sample Identity: 20247429-
Date Acquired : 30/01/2020 12:17:37 PM
Units : ppb
Dilution:





CERTIFICATE OF ANALYSIS

Validated

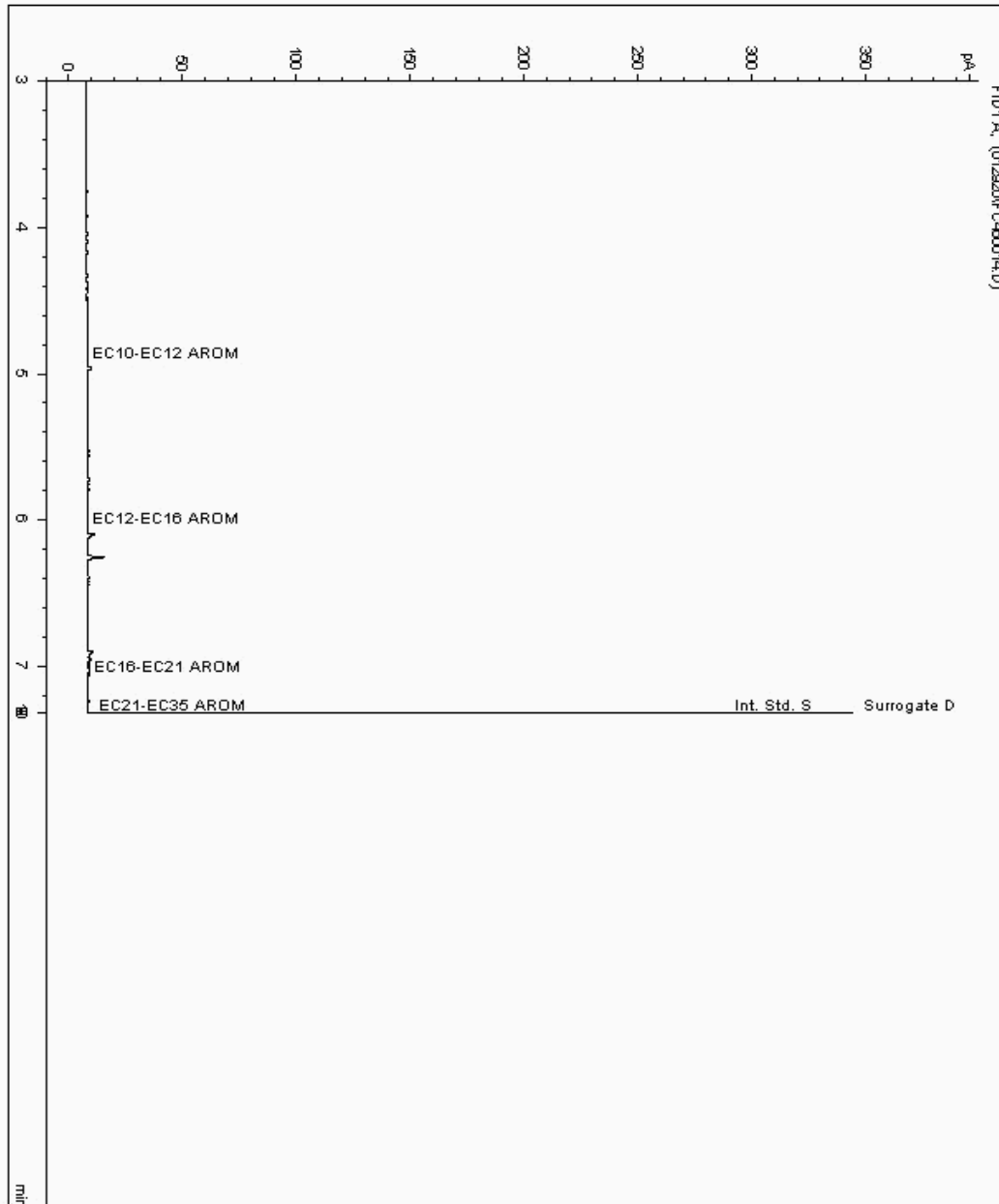
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : 21561777 Depth : 0.00 - 0.00
Sample ID : SW2 (FEEDER)

Speciated TPH - SATS (C12 - C40)

Sample Identity: 20247434-
Date Acquired : 30/01/2020 12:41:10 PM
Units : ppb
Dilution:





CERTIFICATE OF ANALYSIS

Validated

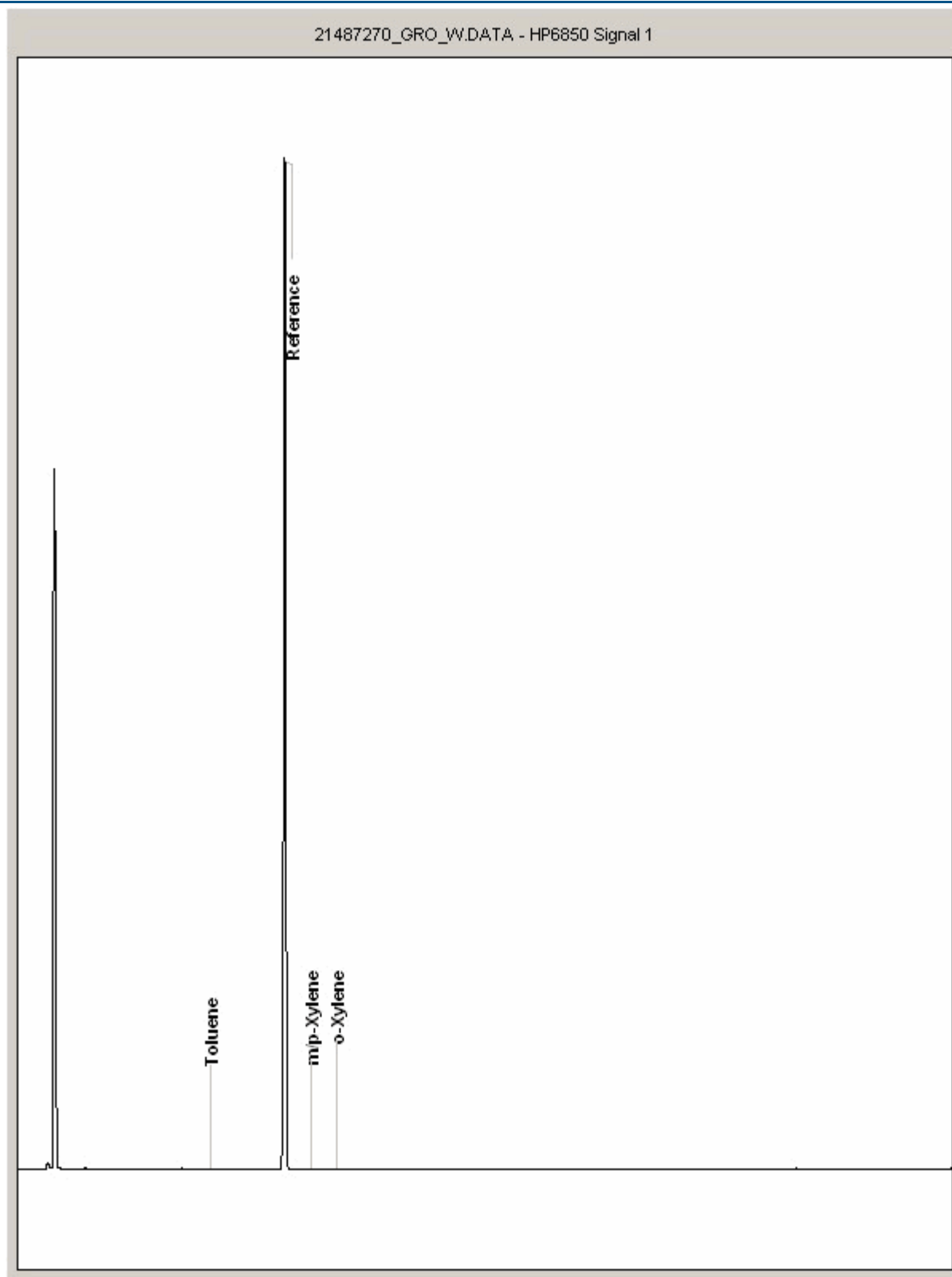
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21487270
Sample ID : BH205

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

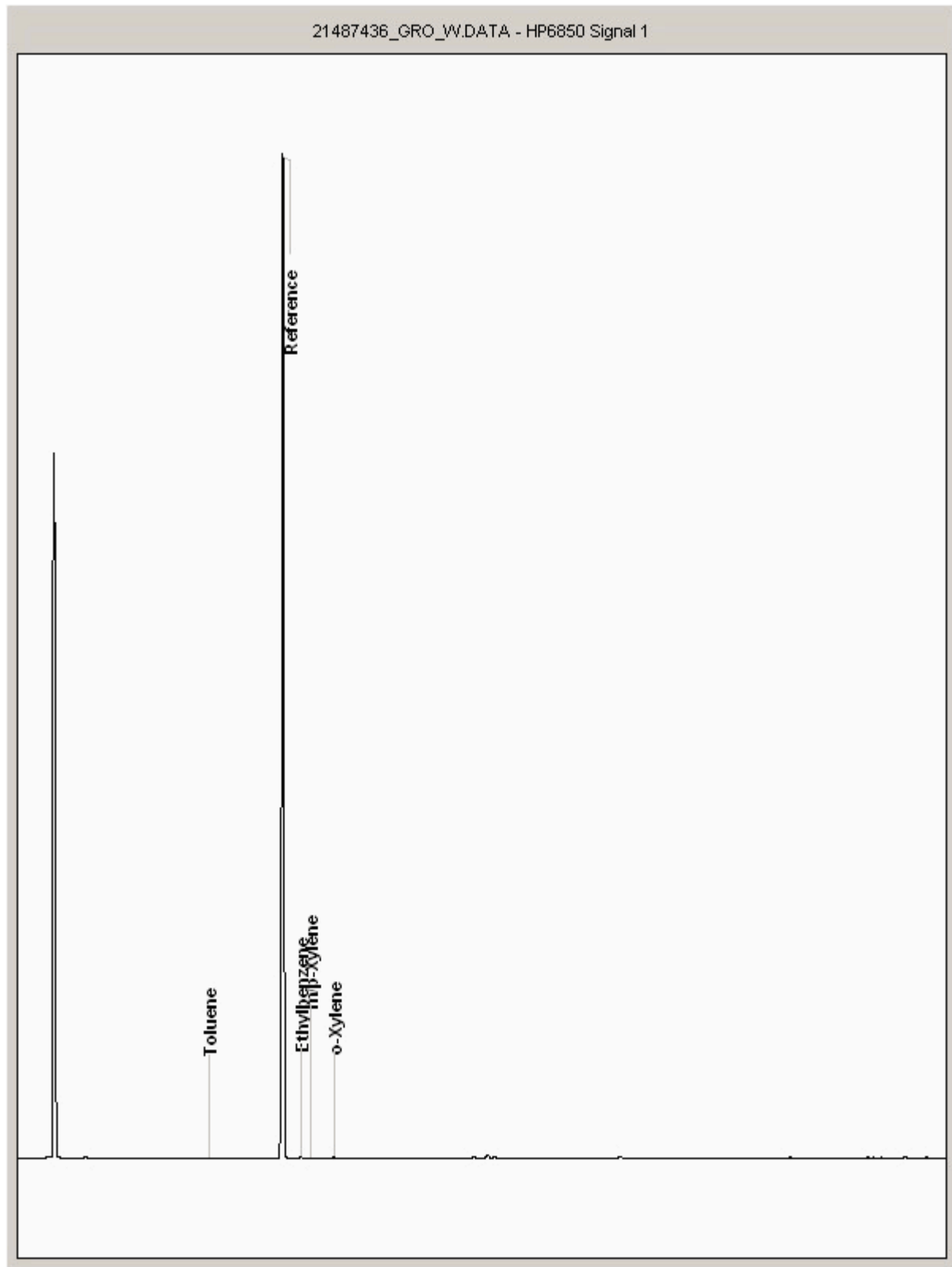
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21487436
Sample ID : BH202

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

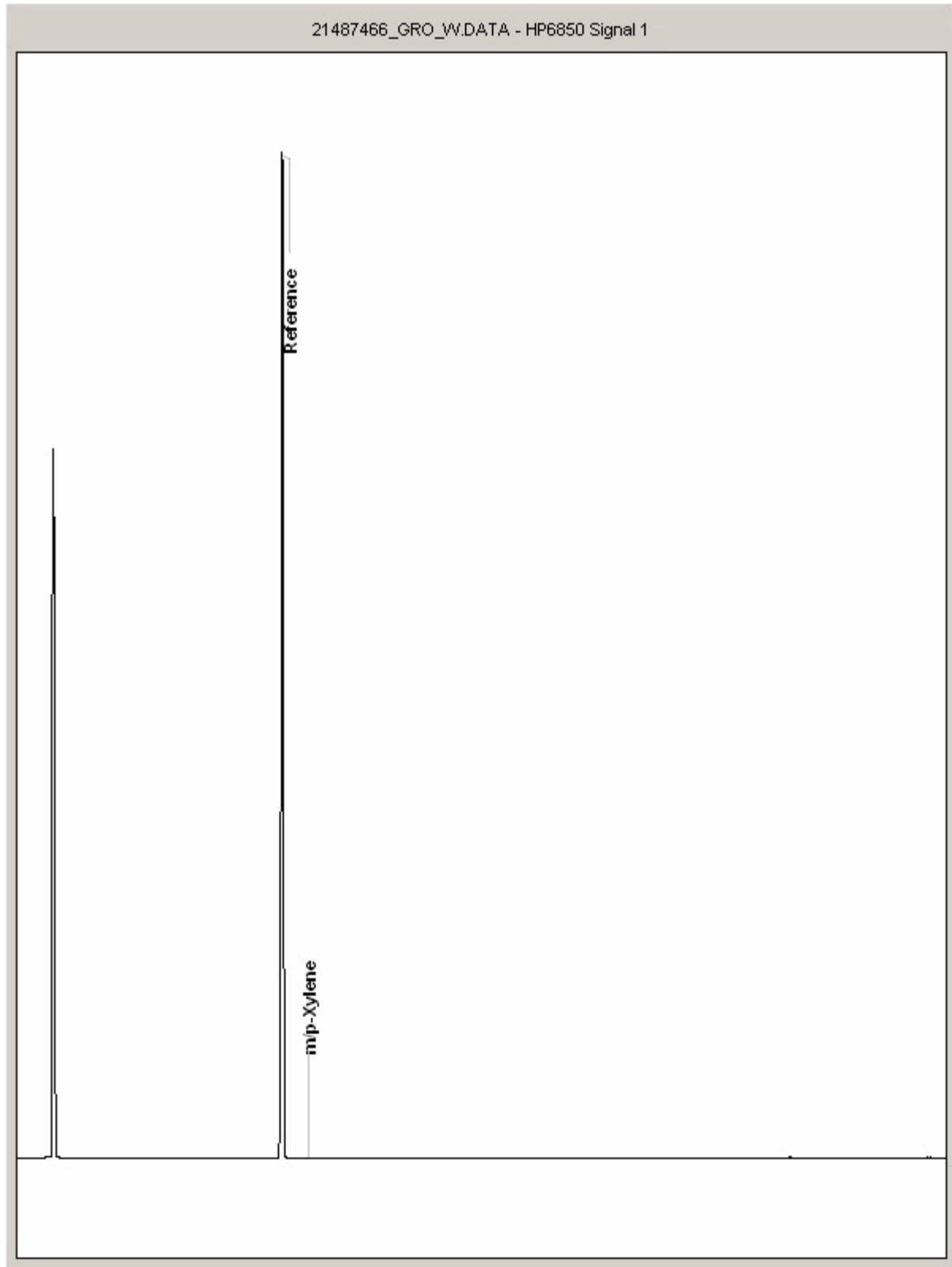
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21487466
Sample ID : BH203

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

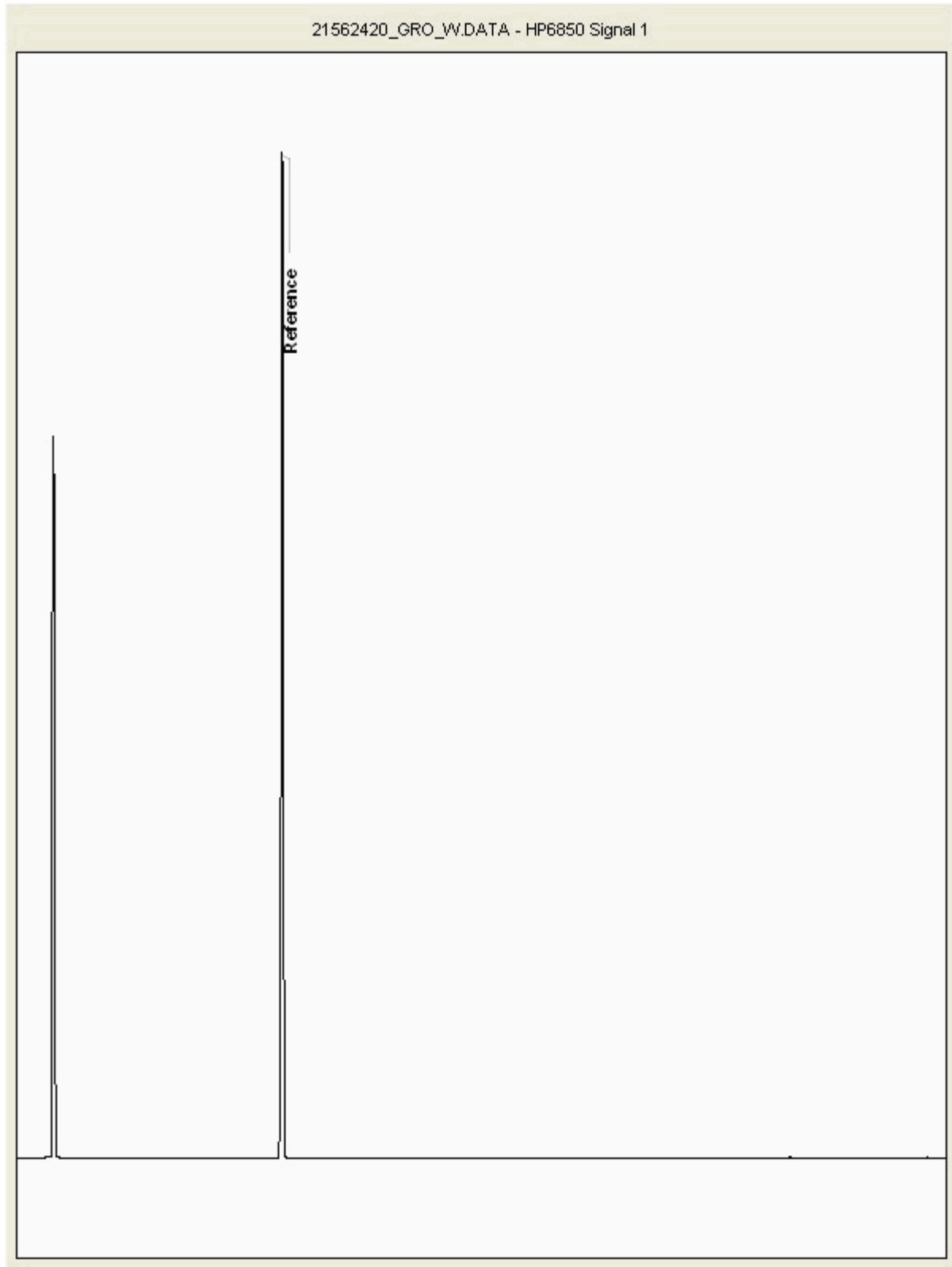
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21562420
Sample ID : SW1 (DOCK)

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

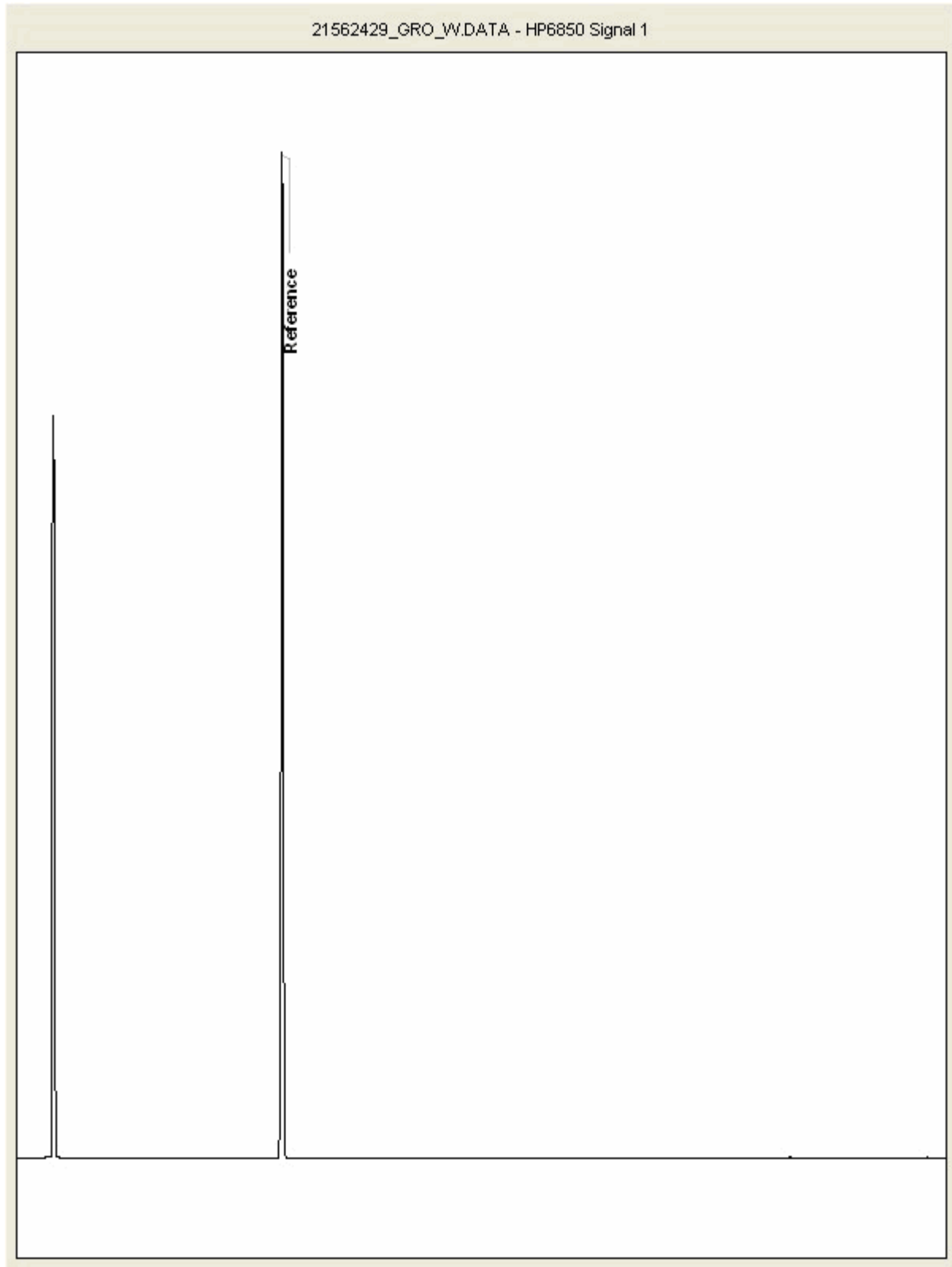
SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21562429
Sample ID : SW2 (FEEDER)

Depth : 0.00 - 0.00



Chemical Oil Fingerprint

Client: H_WSP_BRI

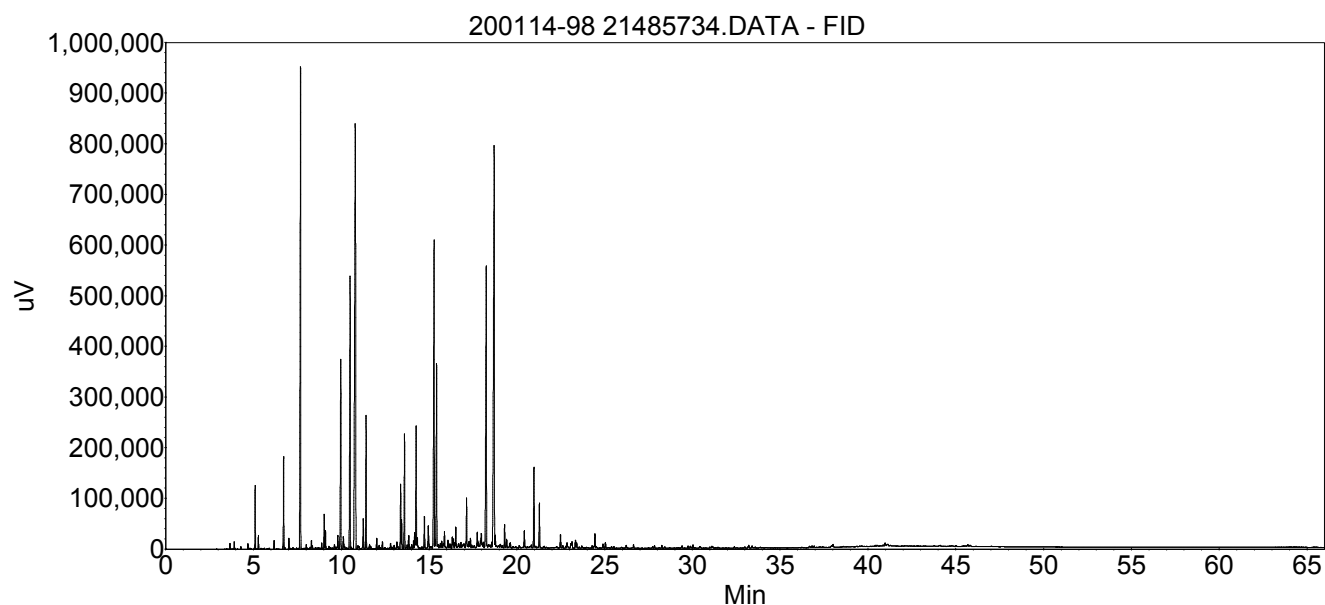
Job number: 200114-98 21485734

Identity: BH204A

Description: Dark Product

Carbon Range: C6 - C15
Boiling Point Range: 69 - 271°C

Fingerprint: Possible Petrol /Kerosene Range Hydrocarbons
Comments: N/A



ALS Hawarden**Forensic Chemical Fingerprint Summary Report**

Client : H_WSP_BRI
Job Number : 200114-98
Location: Port Talbot Harbourside

Sample Number	Sample Identity	Visual Interpretation	Carbon Range	Boiling point Range °C	Age*
21485734	BH204A	Dark Product	C6 - C15	69 - 271	>10 Years

* (Kaplan et al. 1997) It must be noted that this calculation is only really applicable to a gasoline layer on water.
The age must be used as a guidance figure only as there could be several other factors that could affect the ageing process such as environment, climatic conditions etc.



CERTIFICATE OF ANALYSIS

SDG:	200114-98	Client Reference:	62253048	Report Number:	539240
Location:	Port Talbot Harbourside	Order Number:	62253048-GI4	Superseded Report:	538360

Appendix

General

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.

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
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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

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* (2107).

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.



To:

WSP PB BBC

3rd Floor, Kings Orchard,

1 Queens St,

Bristol

BS2 0HQ

Non-routine Analysis Report

10 MARCH 2020

Our Reference:	SDG: 200114-98
Your Reference:	n/a
Location:	Port Talbot Harbourside

1 product sample was received with a request to carry out whole oil analysis with CWG fractionation.

We are pleased to enclose our non-routine analysis report.

SIGNED:

GERAINT PUMFORD

LABORATORY SECTION MANAGER



Contents

1. Introduction.....	3
2. Results	4
Table 1: Sample References	3
Table 2: Results in percentages	4



1. Introduction

One product sample was received for whole oil analysis with CWG fractionation. The whole oil was carried out routinely, however a large proportion of the samples were in the C6-C12 range, which is not suitable for routine fractionation.

The sample was prepared by carrying out a solvent dilution and running for both GRO and EPHCWG.

Client Sample ID	SDG	Sample Event Number
BH204A	200114-98	21485733

Table 1: Sample References

All analyses within this report are outside our accreditation status and were conducted on the 'As Received' sample.



2. Results

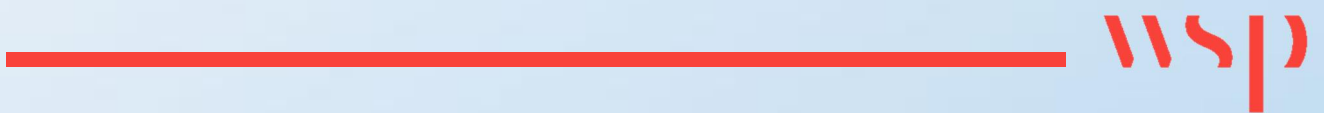
The sample was analysed using gas chromatography with flame ionisation detection for the EPHCWG portion and by headspace gas chromatography with flame ionisation detection for the GRO portion. The results in % form from the analysed sample is reported in Table 2.

	BH204A
Aliphatic >C6-C8	1.49
Aliphatic >C8-C10	22.44
Aliphatic >C10-C12	23.51
Aliphatic >C12-C16	11.77
Aliphatic >C16-C21	3.77
Aliphatic >C21-C35	0
Aliphatic >C35-C40	0
Aromatic >EC6-EC8	1.01
Aromatic >EC8-EC10	14.88
Aromatic >EC10-EC12	12.55
Aromatic >EC12-EC16	7.09
Aromatic >EC16-EC21	1.49
Aromatic >EC21-EC35	0
Aromatic >EC35-EC40	0

Table 2: Results in %

Appendix F

GROUNDWATER MONITORING DATA



Low-Flow Test Report:

Test Date / Time: 09/01/2020 13:32:57
Project: Port Talbot (2)
Operator Name:

Location Name: BH202	Flow Cell Volume: 90 ml	Instrument Used: SmartROLL MP Serial Number: 595881
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
09/01/2020 13:32	00:00	7.22 pH	10.75 °C	713.75 µS/cm	1.70 mg/L		33.1 mV	
09/01/2020 13:35	03:00	7.17 pH	11.00 °C	708.82 µS/cm	1.38 mg/L		13.1 mV	
09/01/2020 13:38	06:00	7.17 pH	11.04 °C	712.45 µS/cm	1.26 mg/L		-1.1 mV	
09/01/2020 13:41	09:00	7.18 pH	11.03 °C	712.15 µS/cm	1.19 mg/L		-4.5 mV	
09/01/2020 13:44	12:00	7.19 pH	11.02 °C	712.75 µS/cm	1.13 mg/L		-8.1 mV	
09/01/2020 13:47	15:00	7.20 pH	11.01 °C	713.31 µS/cm	1.12 mg/L		-9.2 mV	
09/01/2020 13:50	18:00	7.21 pH	11.01 °C	713.26 µS/cm	1.11 mg/L		-10.6 mV	

Samples

Sample ID:	Description:
------------	--------------

Low-Flow Test Report:

Test Date / Time: 09/01/2020 12:02:44
Project: Port Talbot
Operator Name:

Location Name: BH203 Latitude: 0 Longitude: 0	Flow Cell Volume: 90 ml	Instrument Used: SmartROLL MP Serial Number: 595881
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
09/01/2020 12:02	00:00	7.01 pH	12.35 °C	490.48 µS/cm	1.29 mg/L		126.7 mV	
09/01/2020 12:05	03:00	7.26 pH	11.52 °C	499.83 µS/cm	1.25 mg/L		102.4 mV	2.09 cm
09/01/2020 12:08	06:00	7.36 pH	11.31 °C	502.32 µS/cm	1.21 mg/L		90.1 mV	2.09 cm
09/01/2020 12:11	09:00	7.41 pH	11.21 °C	503.01 µS/cm	1.19 mg/L		81.4 mV	2.09 cm
09/01/2020 12:14	12:00	7.43 pH	11.15 °C	503.80 µS/cm	1.17 mg/L		74.8 mV	2.09 cm
09/01/2020 12:17	15:00	7.45 pH	11.10 °C	505.10 µS/cm	1.16 mg/L		69.2 mV	2.09 cm
09/01/2020 12:20	18:00	7.46 pH	11.09 °C	505.56 µS/cm	1.15 mg/L		64.8 mV	2.09 cm
09/01/2020 12:23	21:00	7.47 pH	11.06 °C	507.79 µS/cm	1.15 mg/L		61.8 mV	2.09 cm

Samples

Sample ID:	Description:
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Low-Flow Test Report:

Test Date / Time: 09/01/2020 14:01:45
Project: Port Talbot (3)
Operator Name:

Location Name: BH205	Flow Cell Volume: 90 ml	Instrument Used: SmartROLL MP Serial Number: 595881
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
09/01/2020 14:01	00:00	8.44 pH	10.49 °C	372.04 µS/cm	2.32 mg/L		7.1 mV	
09/01/2020 14:04	03:00	8.60 pH	10.84 °C	367.36 µS/cm	1.73 mg/L		36.0 mV	
09/01/2020 14:07	06:00	8.63 pH	10.84 °C	366.00 µS/cm	1.70 mg/L		46.5 mV	
09/01/2020 14:10	09:00	8.63 pH	10.73 °C	364.90 µS/cm	1.74 mg/L		54.5 mV	
09/01/2020 14:13	12:00	8.64 pH	10.66 °C	364.88 µS/cm	1.72 mg/L		59.6 mV	
09/01/2020 14:16	15:00	8.64 pH	10.61 °C	364.13 µS/cm	1.76 mg/L		63.4 mV	
09/01/2020 14:19	18:00	8.64 pH	10.55 °C	365.80 µS/cm	1.69 mg/L		66.4 mV	
09/01/2020 14:29	28:11	8.46 pH	9.42 °C	0.65 µS/cm	10.30 mg/L		85.8 mV	

Samples

Sample ID:	Description:
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Appendix G

PRODUCT RECOVERY TESTS



BAILDOWN TEST FORM

Site:	Port Talbot Harbourside	Project No.:	62253048
Well ID:	BH104	Sampler(s):	JL & JT
Method: (i.e. peristaltic pump, bailer)	Peri Pump		

Static corrected water table depth (m) (optional)		Well pipe diameter (mm)	50
Specific gravity of LNAPL (g/cm3) (optional)		Borehole diameter (mm)	200
Static depth to water (m)	2.76		
Static depth to product (m)	2.03	Well casing specific volume (L/m) (optional)	
Well depth (m)	4.80	Apparent LNAPL thickness (pre-test) (m)	0.73
Depth to top of screen (m)	2.00	Volume of Water removed (L)	1
Depth to base of screen (m)	4.80	Volume of LNAPL removed (L)	3.33

Clock Time	Elapsed Time (min)	DTW (m)	DTP (m)	Thickness (m)	Comments
11.21	0	2.15	2.09	0.06	
11.22	1	2.16	2.09	0.07	
11.24	3	2.19	2.09	0.1	
11.26	5	2.20	2.09	0.11	
11.31	10	2.24	2.09	0.15	
11.36	15	2.26	2.09	0.17	
11.51	30	2.30	2.09	0.21	
12.21	60	2.37	2.09	0.28	
13.21	120	2.505	2.085	0.42	
14.21	180	2.625	2.065	0.56	
15.21	240	2.635	2.055	0.58	

BAILDOWN TEST FORM

Site:	Port Talbot Harbourside	Project No.:	62253048
Well ID:	BH204A	Sampler(s):	JL & JT
Method: (i.e. peristaltic pump, bailer)	Peri Pump		

Static corrected water table depth (m) (optional)		Well pipe diameter (mm)	50
Specific gravity of LNAPL (g/cm3) (optional)		Borehole diameter (mm)	200
Static depth to water (m)	2.13		
Static depth to product (m)	1.85	Well casing specific volume (L/m) (optional)	
Well depth (m)	5.13	Apparent LNAPL thickness (pre-test) (m)	0.28
Depth to top of screen (m)	1.50	Volume of Water removed (L)	4
Depth to base of screen (m)	5.13	Volume of LNAPL removed (L)	1.5

Clock Time	Elapsed Time (min)	DTW (m)	DTP (m)	Thickness (m)	Comments
10.07	1	1.91	1.865	0.045	
10.12	5	1.91	1.865	0.045	
10.15	8	1.915	1.865	0.05	
10.18	11	1.915	1.865	0.05	
10.21	16	1.915	1.865	0.05	
10.27	20	1.915	1.865	0.05	
10.37	30	1.915	1.865	0.05	
11.07	60	1.915	1.865	0.05	
12.21	134	1.915	1.865	0.05	
13.21	194	1.925	1.865	0.06	
14.21	254	1.93	1.865	0.065	
15.21	314	1.93	1.865	0.065	



1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

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