



Andrew Scott Ltd.

PORT TALBOT HARBOURSIDE

Additional Gasholder Intrusive Investigation



Andrew Scott Ltd.

PORT TALBOT HARBOURSIDE

Additional Gasholder Intrusive Investigation

VERSION 1, CONFIDENTIAL

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1 INTRODUCTION

1.1 INSTRUCTION

WSP UK Ltd. (WSP) was instructed by Andrew Scott Ltd. (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 further assess ground conditions and potential contamination associated with the historical gasholder present on site. This report details the findings of the intrusive works. The site location is shown on **Figure 1** in **Appendix A**.

1.2 BACKGROUND

Several phases of ground investigation and assessment works have been completed at the site in order to permit future development. Remediation works have been identified as being required for parts of the site, however Natural Resources Wales (NRW) also indicated a requirement for further assessment associated with the historical gasholder located at the east of the site.

NRW correspondence (ref. CAS-116525-N2P7) stated the text below within their review of provided information as part of the pre-planning application process:

Previously we had suggested further monitoring especially of the areas impacted by hydrocarbons to ensure that these specific areas were not acting as sumps. We require an explanation of the poor coverage of the East of the site covering the gas holder. We note that only one sample was taken from a trial pit in 2017. As this area is within the red line planning boundary, we cannot agree that this area of the site has been adequately characterised. Bearing its former use and the potential for the groundwater in this area to contain hazardous substances, we ask that further investigation to be undertaken in this area to give more data, in order to understand this risk.

1.3 OBJECTIVES

The main objectives of this assessment were to:

- i Summarise existing information pertinent to the investigation;
- i Confirm ground conditions at the gasholder location to the east of the site;
- i 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:

- i Opus Phase I Desk Study Report, Ref: V-C8602.01-OIC-00-XX-RP-01, Dated July 2017;
- i 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;
- i WSP UK Ltd, Port Talbot Harbourside Generic Quantitative Risk Assessment, Supplementary Site Investigation Report, Ref 62253048-001, Dated September 2019; and
- i WSP UK Ltd, Port Talbot Harbourside Controlled Waters Detailed Quantitative Risk Assessment, Ref 62253048-002, Dated February 2020.
- i WSP UK Ltd, Port Talbot Harbourside Additional Product Investigation, Ref 62253048-003, Dated March 2020.



i WSP UK Ltd, Port Talbot Harbourside Remediation Strategy, Ref 62253048-004, Dated June 2020.

1.5 LIMITATIONS

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

i Andrew Scott Ltd.

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 which is 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.

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.

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.

2.4 EXISTING INFORMATION IN THE AREA OF THE GASHOLDER

NRW requested additional information be provided associated with the eastern area of the site, where a historical gasholder is present. Below is a summary of pertinent information from the identified area from historical investigations.

2007

A ground investigation completed by Structural Soils in 2007, completed the below exploratory locations within and in close proximity to the gasholder, locations of these can be found in **Figure 2, Appendix A**).

Table 2-1 – 2007 Ground Conditions Summary

Location ID	Depth (m bgl)	Ground Conditions	Visual / Olfactory Evidence of Contamination
TPC65	3.5	Made Ground comprising sandy gravels and cobbles of anthropogenic material to base. Groundwater ingress at 1.3m bgl.	Sheen on groundwater ingress at 1.3m bgl. Slight to moderate hydrocarbon sheen and odour (phenolic) on arisings 1.35 – 3.5m bgl.
TPC78	1.6	Made ground comprising sandy gravel of slag and concrete to 1.5m. Sandy organic clay beneath. Groundwater ingress at 1.5m bgl.	Strong hydrocarbon odour from 1.5 – 1.6m bgl.
TPC79	1.6	Made Ground comprising sandy gravels and cobbles of anthropogenic material to base. Groundwater ingress at 1.2m bgl.	Slight hydrocarbon odour 0.0 – 0.6m bgl. Moderate hydrocarbon odour 0.6 – 1.6m bgl. Moderate hydrocarbon odour and slight sheen on groundwater.
TPC80	2.9	Made Ground comprising sandy gravels and cobbles of anthropogenic material to 1.3m bgl. Gravelly clay 1.3 – 2.1m bgl. Gravel and cobbles of sandstone 1.3 – 2.9m bgl. Groundwater ingress at 1.1m bgl.	None identified.
TPC81	4.0	Made Ground comprising sandy gravels and cobbles of anthropogenic material to 1.5m bgl. Possible Made Ground comprising sandy silt/clay 1.5 – 2.5m bgl, and gravel/cobbles 2.5 – 4.0m bgl. Groundwater ingress at 0.8 bgl.	None identified.
TPC92	3.6	Made Ground comprising sandy gravels and cobbles of anthropogenic material to 2.3m bgl. Possible Made Ground comprising sand 2.3 – 2.6m bgl, clay 2.6 – 3.4m bgl, and gravel/cobbles 3.4 – 3.6m bgl. Groundwater ingress at 1.5 bgl.	None identified.
TPC93	4.6	Made Ground comprising sandy gravels and cobbles of anthropogenic material to 2.0m bgl. Possible Made Ground comprising silt 2.0 – 2.5m bgl, and gravel/cobbles 2.5 – 4.6m bgl. Groundwater ingress at 1.3 bgl.	None identified.
BHC4	15.0	Made Ground comprising sandy gravels and cobbles of anthropogenic material to 1.2m bgl. Sands and Gravels 1.2 – 15.0m bgl - Groundwater ingress at 1.2 bgl.	None identified.

Ground conditions were typically consistent across the site, comprising Made Ground of anthropogenic material including concrete, bricks, slag and metal; underlain by a more cohesive material (silts and clays), with sands and gravel beneath.

Evidence of hydrocarbon contamination was encountered in TPC65, TPC 78 and TPC 79 comprising odours and sheens on soils/groundwater; with a creosote odour noted in TPC94

potentially associated with timber encountered at similar depths. These locations are present to the west of the gasholder.

Table 2-2 – 2007 Laboratory Analysis Summary

Location ID	Depth (m bgl)	Test	Concentration (mg/kg)
TPC65	1.4	TPH C6-C40 PAH Total	<10 <10
TPC78	1.5	TPH C6-C40 PAH Total	26 44
TPC79	1.0	TPH C6-C40 PAH Total	49 26
TPC81	1.0	TPH C6-C40 PAH Total	120 33
TPC92	0.5	TPH C6-C40 PAH Total	130 <10
TPC93	0.8	TPH C6-C40 PAH Total	200 <10
BHC4	2.0	TPH C6-C40 PAH Total	<10 <10

Note: TPH – Total Petroleum Hydrocarbons, PAH – Polyaromatic Hydrocarbons

The soil concentrations were considered limited, and indicative of a general absence of gross hydrocarbon contamination; with all TPH concentrations below 500mg/kg.

2017

A supplementary ground investigation by Opus (now WSP) in 2017, included an exploratory location beneath the former gasholder, the location of which can be found in **Figure 2, Appendix A**).

Table 2-3 – 2017 Ground Conditions Summary

Location ID	Depth (m bgl)	Ground Conditions	Visual / Olfactory Evidence of Contamination
TPH10	2.2	Made Ground comprising sandy gravels and cobbles of anthropogenic material to 1.2m bgl. Sandy gravelly clay from 1.2 – 1.8m bgl. Sandy gravel from 1.8 – 2.2m bgl. Groundwater ingress from 1.4m bgl.	None identified.

Table 2-4 – 2017 Laboratory Analysis Summary

Location ID	Depth (m bgl)	Test	Concentration (mg/kg)
TPH10	0.5	TPH C5-C35 MTBE & BTEX Naphthalene	36 <1 0.12
	2.0	TPH C5-C35 MTBE & BTEX	<10 <1

Note: MTBE – Methyl tertiary butyl ether; BTEX – benzene, toluene, ethylbenzene & xylenes

3 WSP 2020 INVESTIGATION

3.1 SCOPE OF WORKS

Over and above the existing data from the Eastern area of the site summarised in Section 2, WSP completed a further supplementary intrusive investigation in response to the NRW statement.

WSP were present on 5th and 7th October 2020 to supervise the excavation of 5No. Trial pits which were completed by Andrew Scott (TP101 -105). Trial pits were excavated using a JCB 3CX including the use of a hydraulic breaker to progress through any layers of hardstanding / obstructions.

The following exploratory locations were completed as part of this investigation, with locations presented on **Figure 3, Appendix A** and summarised below in Table 3-1:

Table 3-1 – Trial Pit Locations

Location ID	Eastings	Northings	Level (mAOD)
TP101	276653.235	189489.370	6.550
TP102	276644.092	189472.876	6.600
TP103	276631.484	189469.222	6.690
TP104	276622.322	189463.388	6.571
TP105	276636.296	189503.462	6.624

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

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.

As part of Andrew Scott's works at the site, they undertook further excavation works to understand the extent of obstructions and buried features around the gasholder. Following the identification of limited areas of visual hydrocarbon impact, Andrew Scott collected two additional samples for analysis (labelled as TP106 and TP107) which were scheduled for chemical analysis. WSP were not present during the excavations of these locations but were provided with brief descriptions. The locations of these is included in **Figure 3 Appendix A**.

3.2 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 C**.

3.3 LABORATORY ANALYSIS

Chemical testing was undertaken on selected soil samples as indicated in **Table 3-2**.

Table 3-2 –Analytical Suite

Laboratory Test	No of Soil Samples Analysed	No of Leachate Samples Analysed
Asbestos Identification	6	-
Asbestos Quantification	1	-
Cyanide (Total)	14	-
Phenol	12	-
Hexavalent Chromium	12	-
Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG)	14	2
Polycyclic Aromatic Hydrocarbons (PAH)	14	2
Methyl tertiary butyl ether (MTBE)	14	2
Benzene, toluene, ethylbenzene, xylenes	14	2

4 GROUND INVESTIGATION – SUMMARY OF FINDINGS

4.1 GEOLOGY

Made Ground was encountered to the base of all trial pits to a maximum depth of 1.8m bgl (TP105). The Made Ground was relatively consistent across all of the locations, comprising brick, concrete and asphalt fragments. Trial pit logs are provided in **Appendix C** and a photolog in **Appendix E**.

All trial pits were advanced until groundwater ingress flooded the base of the pit.

4.2 GROUNDWATER STRIKES

Groundwater was encountered in all pits, striking visible groundwater inflows between 1.6m and 1.8m bgl, and following relatively rapid ingress, resting between 1.2m and 1.5m bgl.

Each pit was left open for 20 minutes following the groundwater strike to monitor the level and allow the levels to stabilise. There was no evidence of hydrocarbon sheen or odours from the groundwater.

4.3 VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

There was no visual and olfactory evidence of contamination in soils or groundwater in TP101 – 105. However, Andrew Scott reported visual and olfactory evidence of hydrocarbon impact in soils from TP106 and 107 as below:

- i TP106 – hydrocarbon sheen and slight hydrocarbon odour on soil arisings at 0.7m bgl;
- i TP107 – black staining and slight hydrocarbon odour on soil arisings at 0.7m bgl.

4.4 LABORATORY RESULTS

SOILS

A total of 12 soil samples were collected from the five trial pits (TP101 – TP105), plus two additional samples associated with TP106 and TP107; were submitted for laboratory analysis at ALS Laboratories. The analytical results are summarised in **Table 4-1**, and the laboratory testing certificates are provided in full in **Appendix D**.

Table 4-1 – Summary of Soil Concentrations

Determinand	Laboratory result (mg/kg)	Comments
Asbestos Identification	2x positive ID	Asbestos was identified in two samples: i TP104, 0.2m bgl – fibre bundles of chrysotile, quantified at <0.001% i TP105, 0.8m bgl – trace detections of loose fibres of chrysotile.
Cyanide (Total)	<1 (LOD)	Cyanide was not recorded above laboratory limit of detection (LOD) in any sample.
Phenol	<0.01 – 0.0115	Trace detections of phenol were encountered in three samples
Hexavalent Chromium	<0.6 – 0.78	Hexavalent chromium was identified above LOD in one sample, TP103 0.9m bgl.
Total Petroleum Hydrocarbons Criteria	<10 - 663	TPH was recorded below LOD in one sample, and below 100mg/kg in a total of nine samples.

Determinand	Laboratory result (mg/kg)	Comments
Working Group (TPH CWG)		The maximum concentration was recorded in TP104, with concentrations of 663mg/kg (0.2m bgl) and 388mg/kg (0.4m bgl); this decreased with depth to 44.8mg/kg (1.7m bgl). Concentrations primarily comprised heavy range (C21-C35) aromatic fractions; with light range (C5-C8) typically recorded below LOD or at trace concentrations.
Polyaromatic Hydrocarbons (PAH)	1.52 – 195 (Total)	All the samples recorded only very low / trace recorded total PAH concentrations (<30mg/kg and with the majority below 10mg/kg). The only exception to this observation was for shallow samples at TP104, with samples at 0.2m bgl and 0.4m bgl recording concentrations of 195mg/kg and 85.9mg/kg. A deeper sample at 1.7m bgl recorded 5.58mg/kg. The elevated concentrations in the shallow soils at BH104 are consistent with the more elevated TPH CWG. PAH concentrations in the shallow samples from TP primarily comprised fluoranthene and pyrene.
Methyl tertiary butyl ether (MTBE)	<LOD	MTBE was recorded below LOD in all samples analysed.
Benzene, toluene, ethylbenzene, xylenes	<LOD – 1.52	Toluene, ethylbenzene and xylenes were recorded below LOD in all samples. Benzene was recorded above LOD in one sample (TP107, 0.7m bgl) with a concentration of 1.52mg/kg.

LEACHATE

Leachate analysis was scheduled for two samples, TP103 (0.9m bgl) and TP105 (0.8m bgl).

i TP103 – 0.9m bgl

- TPH CWG recorded below LOD;
- MTBE and BTEX recorded below LOD; and
- Trace concentrations of PAH determinands, with a total PAH concentration of 0.000265mg/l, comprised of a range of PAH determinands.

i TP105 – 0.8m bgl

- TPH CWG recorded at 0.173mg/l, comprised entirely of mid to heavy range (C12-C35) aromatic hydrocarbons;
- MTBE and BTEX recorded below LOD; and
- Total PAH concentration of 0.0874mg/l, comprised predominantly of phenanthrene, fluoranthene and pyrene.

4.5 ASSESSMENT

The key risk drivers associated with the protection of controlled waters, as identified in the DQRA (WSP, 2020) are presented in Table 4-2 where remediation criteria have been compared to concentrations observed during the gasholder investigation works.

Table 4-2 – Soil Screening against Derived Criteria

Determinand	Remediation Criteria (mg/kg)	Gasholder Max. Concentration (mg/kg)	No. of Exceedances
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Hexavalent Chromium	1.2	0.78	0
Benzene	1.0	1.52	1 (TP107, 0.7m)
Toluene	0.557	<LOD	0
Ethylbenzene	0.450	<LOD	0
Total Xylenes	1.0	<LOD	0
Naphthalene	0.4	0.672	1 (TP106, 0.7m)
Phenol	2.9	0.0115	0

Based on the remediation criteria generated from the DQRA, a single marginal benzene exceedance and a single marginal naphthalene exceedance was identified. These samples were taken from areas noted to have visual/olfactory evidence of hydrocarbon impact by the contractors; The concentrations observed within these samples are both only marginally outside the criteria and are isolated and not repeated in any of the other data collected across the study area.

Given the isolated nature of the exceedances and the relatively shallow nature of the impact, the concentrations observed are not considered to present a significant source that have not adversely impacted groundwater concentrations more widely across the site.

5 SUMMARY OF FINDINGS

5.1 GASHOLDER INVESTIGATION LOCATIONS

Throughout several phases of ground investigation, numerous trial pits have been excavated in the eastern area of the site both beneath and in close proximity to the location of the former primary gasholder.

These historical investigations from 2007 and 2017 have indicated the presence of some limited and discrete areas of potentially contaminated soil and groundwater, consistent with the overall condition of the wider site.

In response to NRW comments, a series of supplementary trial pits have been excavated and soils sampled by WSP in 2020. The additional ground condition data further highlights the consistent subsurface condition in this eastern portion of the site with evidence for some limited hydrocarbon impact within the shallow ground. The limited maximum concentrations recorded were from shallow soils (TP104, 0.2-0.4m bgl) above the groundwater smear zone (~1.5m bgl), consistent with the absence of any evidence for notable contamination of the shallow groundwater.

No LNAPL was identified during historical or recent ground investigations beneath or in proximity to the former gasholder.

5.2 WIDER SITE SETTING

Several monitoring wells are located between the gasholder and identified receptors, based on inferred groundwater flow to the west towards the River Afan, and to the south towards Port Talbot Dock. The location of monitoring wells at the site is presented in **Figure 4, Appendix A**.

Monitoring wells BHH05 and MW1 to the south, and BHH04 to the north have recorded no detectable concentrations of TPH (TPH CWG <LOD) in all previous monitoring rounds.

Dissolved phase concentrations of hydrocarbons have been identified in groundwater from BH105_2019 to the north west of the gasholder (5 – 6mg/l), however this monitoring well is situated within a separate potential source area associated with historical tanks. Based on the conditions observed during trial pitting works, and the separation distance from former gasholder and BH105, the source of the impact in groundwater is not considered to be from the area beneath or immediately around the former gasholder.

The supplementary investigation is considered to confirm that the area associated with the former gasholder located in the east of the site is unlikely to represent a significant source of ongoing contamination to wider groundwater quality at the site. Whilst localised and discrete areas of ground impact may exist, these are considered to be present; however, this is consistent with other areas of the site, and do not pose an ongoing unacceptable risk to the identified controlled waters receptors.

The DQRA (WSP, 2020) has identified that dissolved phase concentrations in groundwater at the site do not pose an unacceptable risk to the identified receptors. The presence of LNAPL within other areas of the site away from the former holder is acknowledged and will require removal as part of future remediation works.

6 CONCLUSIONS

Following feedback from NRW, WSP oversaw a ground investigation comprising the excavation of trial pits and sampling of arisings to assess ground conditions within the location of a former gasholder at Port Talbot Harbourside to supplement the existing data set.

A total of five trial pits were excavated, arisings logged and sampled for laboratory analysis. A further two samples were collected and submitted for analysis from shallow pits by the contractor following visual identification of hydrocarbon impact as part of separate excavation works.

Ground conditions were consistent with the existing site data, comprising Made Ground at each exploratory location, to the base of each excavation. No visual/olfactory evidence of contamination was identified in the soil arisings or from groundwater ingress recorded into the five trial pits (TP101 – TP105). Field evidence of some hydrocarbon impact was identified within locations TP106 and TP107 (both visual and olfactory).

Soil samples scheduled for laboratory analysis did not indicate the presence of gross hydrocarbon impact at any of the exploratory locations consistent with the field data.

Given both the soils field and laboratory data and the field evidence from observed groundwater inflows, there is not considered to be any significant source of contamination in close proximity to the gasholder capable of adversely affecting groundwater quality at the site.

Groundwater wells located surrounding the gasholder show typically low concentrations of potential contaminants of concern, and the findings of the DQRA (WSP, 2020) remain valid:

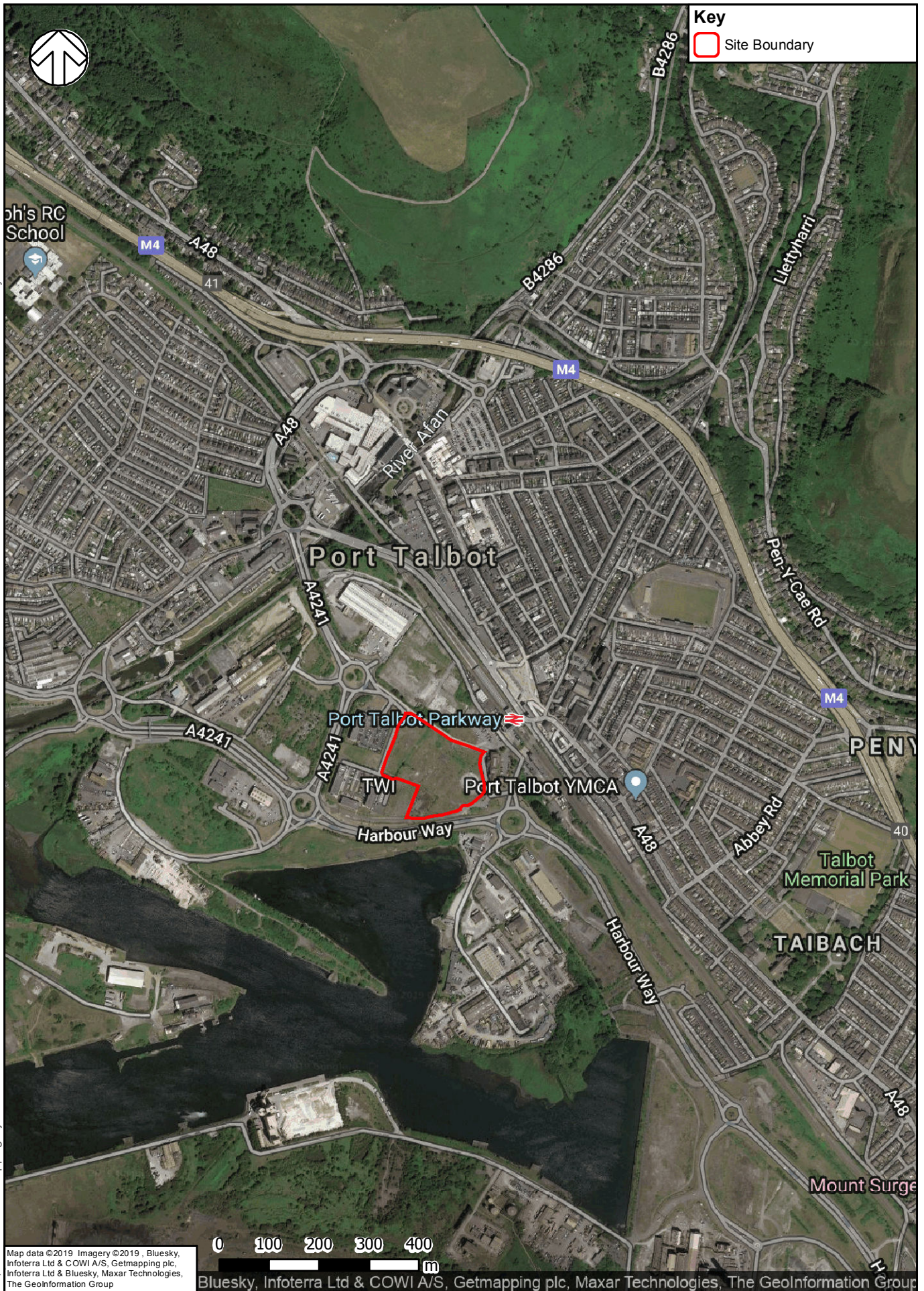
As is stated above, acknowledged and planned remediation works at the site comprise the removal of LNAPL from identified areas, as presented in the Remediation Strategy (WSP, 2020).

It is also noted that enabling works across the wider site will include removal of underground structures to facilitate future development and will include the removal of any shallow Made Ground not suitable to facilitate future development. This made ground removal will result in further betterment to ground conditions across the site, including in the area associated with the former gasholder.

Appendix A

FIGURES







- KEY**
- SITE BOUNDARY
 - WSP MONITORING LOCATION
 - POTENTIAL HISTORICAL SOURCE AREAS
 - 2007 EXPLORATORY LOCATIONS
 - 2017 EXPLORATORY LOCATIONS

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Client:
NEATH PORT TALBOT COUNTY BOROUGH COUNCIL

Project:
PORT TALBOT HARBOURSIDE

Title:
**EXPLORATORY HOLE LOCATION PLAN
HISTORICAL GASHOLDER**

Drawn: NB		Checked: RE		
Designed: RE		Approved:		
Date: 05/11/2020	Scale: 1:1000	A3	Sheet:	
Project Number:		Drawing Number:		Revision:
70057278		FIGURE 2		
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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
- 2020 GASHOLDER TRIAL PITS

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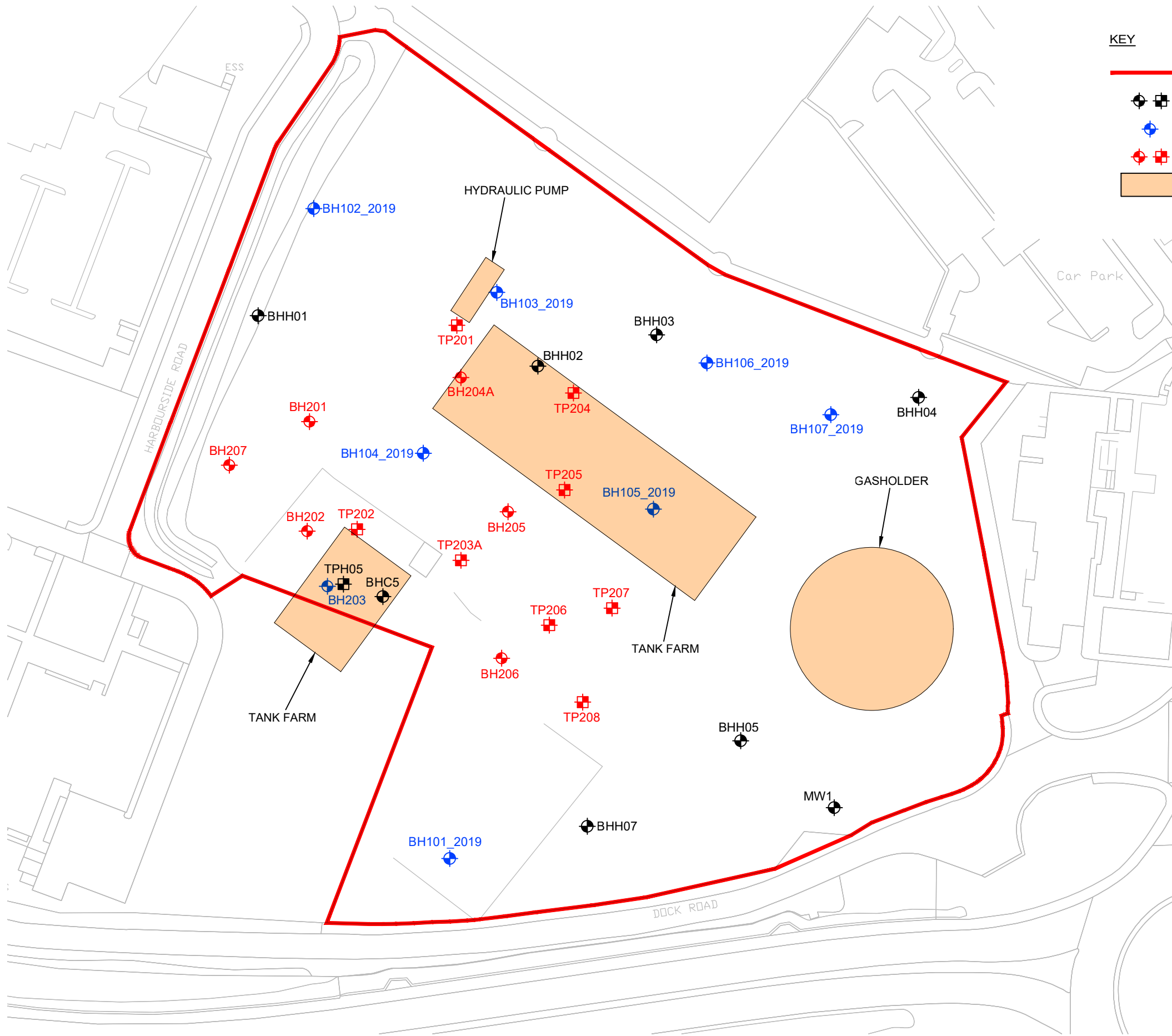
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Client:
NEATH PORT TALBOT COUNTY BOROUGH COUNCIL

Project:
PORT TALBOT HARBOURSIDE

Title:
GASHOLDER EXPLORATORY HOLE LOCATION PLAN WSP 2020

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70057278		FIGURE 3	
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- KEY
- SITE BOUNDARY
- PHASE 1 - HISTORIC MONITORING LOCATION
- PHASE 2 - WSP EXPLORATORY HOLE (AUGUST 2019)
- PHASE 3 - WSP EXPLORATORY HOLE (DECEMBER 2019)
- POTENTIAL HISTORICAL SOURCE AREAS

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**NEATH PORT TALBOT COUNTY
BOROUGH COUNCIL**

Project:
PORT TALBOT HARBOURSIDE

Title:

**EXPLORATORY HOLE
LOCATION PLAN
WSP 2020 SITE WIDE**

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Date: 24/02/2020	Scale: 1:1000	A3	Sheet:
Project Number:		Drawing Number:	
62253048		FIGURE 4	
Revision:			
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Appendix B

LIMITATIONS



REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

GENERAL

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

PHASE 1 GEO ENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

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

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

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

INTRUSIVE INVESTIGATION REPORTS

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

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

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

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

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

EUROCODE 7: GEOTECHNICAL DESIGN

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

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIAL STRATEGY REPORTS

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

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

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

GEOTECHNICAL DESIGN REPORT (GDR)

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

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS)

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

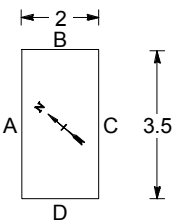
Appendix C

TRIAL PIT LOGS



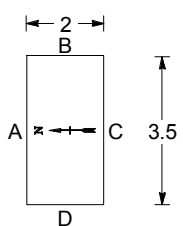
 WSP Cardiff 1 Tyndll Street Cardiff Telephone: 02920 769200 Fax:	TRIAL PIT LOG			Hole No. TP101	
	Project Port Talbot Harbourside			Sheet 1 of 1	
Job No 70057278		Client Andrew Scott Ltd.			Date 07-10-20 07-10-20
Contractor / Driller Andrew Scott		Method/Plant Used JCB	Logged By KP	Co-Ordinates (NGR) E -276653.24 N 189489.37	Ground Level (m AOD) 6.55

SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
						6.35	0.20	Concrete with rebar (CONCRETE)		CONC	
						5.85	0.70	Black and brown cobbly gravelly fine to coarse SAND. Cobbles and gravels are brick, concrete, asphalt and coal. (MADE GROUND)		MG	
						5.85	0.70	Dark brown cobbly sandy fine to coarse subrounded to angular GRAVEL. Cobbles and gravel are concrete, brick and asphalt. Frequent metal and wood. (MADE GROUND)		MG	
							(1.00)				
						4.85	1.70				

	Length	3.50m	Shoring/Support: None	Water Strikes <table border="1"> <tr> <th>Date</th> <th>Time</th> <th>Strike</th> <th>Minutes</th> <th>Standing</th> <th>Remarks</th> </tr> <tr> <td></td> <td></td> <td>1.70</td> <td>05</td> <td>1.20</td> <td></td> </tr> </table>						Date	Time	Strike	Minutes	Standing	Remarks			1.70	05	1.20	
	Date	Time		Strike	Minutes	Standing	Remarks														
			1.70	05	1.20																
Width	2.00m	Stability: Stable until water ingress	General Remarks Trial pit terminated at 1.7m bgl due to instability associated with groundwater ingress.																		
Orientation	50 degrees from north																				
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.																			

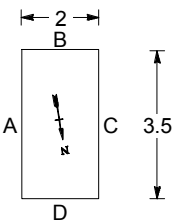
 WSP Cardiff 1 Tyndall Street Cardiff Telephone: 02920 769200 Fax:	TRIAL PIT LOG		Hole No. TP102	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 70057278	Client Andrew Scott Ltd.		Date 07-10-20 07-10-20	
Contractor / Driller Andrew Scott	Method/Plant Used JCB	Logged By KP	Co-Ordinates (NGR) E -276644.09 N 189472.88	Ground Level (m AOD) 6.60

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	0.20	Dark brown GRAVEL of limestone aggregate (MADE GROUND)		MG	
						6.10	(0.30) 0.50	Dark brown cobbly sandy fine to coarse subrounded to angular GRAVEL. Cobbles and gravel are concrete, brick and asphalt. Frequent plastic, glass and fabric fragments. (MADE GROUND)		MG	
						5.80	(0.30) 0.80	Concrete slab (CONCRETE)		CONC	
							(0.80)	Dark brown cobbly sandy fine to coarse subrounded to angular GRAVEL. Cobbles and gravel are concrete, brick and asphalt. Frequent wood and metal fragments. (MADE GROUND)		MG	
						5.00	1.60				

	Length	3.50m	Shoring/Support: None	<table border="1"> <tr> <th colspan="6">Water Strikes</th> </tr> <tr> <th>Date</th> <th>Time</th> <th>Strike</th> <th>Minutes</th> <th>Standing</th> <th>Remarks</th> </tr> <tr> <td></td> <td></td> <td>1.60</td> <td>15</td> <td>1.50</td> <td></td> </tr> </table>						Water Strikes						Date	Time	Strike	Minutes	Standing	Remarks			1.60	15	1.50	
	Water Strikes																										
	Date	Time	Strike	Minutes	Standing	Remarks																					
		1.60	15	1.50																							
Width	2.00m	Stability: Stable until water ingress	General Remarks Trial pit terminated at 1.6m bgl due to instability associated with groundwater ingress.																								
Orientation	90 degrees from north																										
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.																									

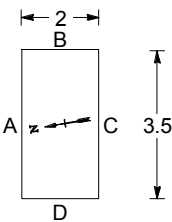
 WSP Cardiff 1 Tyndll Street Cardiff Telephone: 02920 769200 Fax:	TRIAL PIT LOG		Hole No. TP103	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 70057278	Client Andrew Scott Ltd.		Date 07-10-20 07-10-20	
Contractor / Driller Andrew Scott	Method/Plant Used JCB	Logged By KP	Co-Ordinates (NGR) E -276622.32 N 189463.39	Ground Level (m AOD) 6.57

SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
						6.37	0.20	Concrete with rebar (CONCRETE)		CONC	
						(0.40) 5.97	0.60	Black and brown cobbly, gravelly fine to coarse SAND with ash. Cobbles and gravels are brick, concrete, asphalt and coal. (MADE GROUND)		MG	
						(1.00)		Dark brown cobbly sandy fine to coarse subrounded to angular GRAVEL. Cobbles and gravel are concrete, brick and asphalt. Frequent metal and wood fragments. (MADE GROUND)		MG	
						4.87	1.70				

	Length	3.50m	Shoring/Support: None	Water Strikes						
	Width	2.00m		Date	Time	Strike	Minutes	Standing	Remarks	
	Orientation	190 degrees from north	Stability: Stable until water ingress			1.70	15	1.50		
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 Cardiff 1 Tyndll Street Cardiff Telephone: 02920 769200 Fax:	TRIAL PIT LOG		Hole No. TP105	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 70057278	Client Andrew Scott Ltd.		Date 05-10-20 05-10-20	
Contractor / Driller Andrew Scott	Method/Plant Used JCB	Logged By KP	Co-Ordinates (NGR) E -276636.30 N 189503.46	Ground Level (m AOD) 6.62

SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
						6.57	0.05	Grass over dark brown sandy SILT. (TOPSOIL)		TS	
						6.42	0.20	Dark brown silty gravelly fine to coarse SAND. Gravel is fine to coarse subrounded to angular brick, concrete and coal. (MADE GROUND)		GMG	
							(0.50)	ASPHALT.		GMG	
						5.92	0.70	Dark brown silty gravelly fine to coarse SAND with cobbles of concrete and asphalt. Gravel is fine to coarse subrounded to angular brick, concrete and coal. (MADE GROUND)		GMG	
							(1.10)	1.00 m bgl metal bar		GMG	
								1.30 m bgl sand is wet		GMG	
						4.82	1.80				

	Length	3.50m	Shoring/Support: None	<table border="1"> <tr> <th colspan="6">Water Strikes</th> </tr> <tr> <th>Date</th> <th>Time</th> <th>Strike</th> <th>Minutes</th> <th>Standing</th> <th>Remarks</th> </tr> <tr> <td></td> <td></td> <td>1.80</td> <td>15</td> <td>1.50</td> <td></td> </tr> </table>						Water Strikes						Date	Time	Strike	Minutes	Standing	Remarks			1.80	15	1.50	
	Water Strikes																										
	Date	Time	Strike	Minutes	Standing	Remarks																					
		1.80	15	1.50																							
Width	2.00m	Stability: Stable until water ingress	General Remarks Trial pit terminated at 1.7m bgl due to instability associated with groundwater ingress.																								
Orientation	100 degrees from north																										
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 D

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: Katherine Prosser

CERTIFICATE OF ANALYSIS

Date of report Generation: 24 October 2020
Customer: WSP PB BBC
Sample Delivery Group (SDG): 201008-93
Your Reference: 70057278
Location: Port Talbot Harbourside
Report No: 572467

This report has been revised and directly supersedes 571541 in its entirety.

We received 13 samples on Wednesday October 07, 2020 and 13 of these samples were scheduled for analysis which was completed on Saturday October 24, 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:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22990389	TP101	ES	0.30 - 0.30	07/10/2020
22990397	TP101	ES	1.50 - 1.50	07/10/2020
22990336	TP102	ES	0.30 - 0.30	07/10/2020
22990342	TP102	ES	1.50 - 1.50	07/10/2020
22990403	TP103	ES	0.20 - 0.20	07/10/2020
22990322	TP103	ES	0.90 - 0.90	07/10/2020
22990331	TP103	ES	1.60 - 1.60	07/10/2020
22990367	TP104	ES	0.20 - 0.20	05/10/2020
22990374	TP104	ES	0.40 - 0.40	05/10/2020
22990381	TP104	ES	1.70 - 1.70	05/10/2020
22990312	TP105	ES	0.10 - 0.10	05/10/2020
22990352	TP105	ES	0.80 - 0.80	05/10/2020
22990362	TP105	ES	1.30 - 1.30	05/10/2020

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

[illegible]

22990362	TP105	ES	1.30 - 1.30	60g VOC (ALE215)	S			X		
				250g Amber Jar (ALE210)	S	X				
				250g Amber Jar (ALE210)	S					
22990352	TP105	ES	0.80 - 0.80	1kg TUB with Handle (ALE260)	S					
				60g VOC (ALE215)	S			X		
				250g Amber Jar (ALE210)	S	X				
22990312	TP105	ES	0.10 - 0.10	1kg TUB with Handle (ALE260)	S					
				60g VOC (ALE215)	S					
				250g Amber Jar (ALE210)	S	X				
22990381	TP104	ES	1.70 - 1.70	1kg TUB with Handle (ALE260)	S					
				60g VOC (ALE215)	S			X		
				250g Amber Jar (ALE210)	S	X				
22990374	TP104	ES	0.40 - 0.40	60g VOC (ALE215)	S					
				250g Amber Jar (ALE210)	S	X		X		
				60g VOC (ALE215)	S					
22990367	TP104	ES	0.20 - 0.20	250g Amber Jar (ALE210)	S					
				60g VOC (ALE215)	S	X		X		
				60g VOC (ALE215)	S					



CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93 Client Reference: 70057278 Report Number: 572467
Location: Port Talbot Harbourside Order Number: 70057278-P01 Superseded Report: 571541

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
22990389	TP101	0.30 - 0.30	Dark Brown	Sand	Stones	None
22990397	TP101	1.50 - 1.50	Dark Brown	Sand	Stones	None
22990336	TP102	0.30 - 0.30	Dark Brown	Sandy Loam	Stones	None
22990342	TP102	1.50 - 1.50	Dark Brown	Sandy Loam	Stones	Vegetation
22990322	TP103	0.90 - 0.90	Dark Brown	Loamy Sand	Stones	None
22990331	TP103	1.60 - 1.60	Dark Brown	Loamy Sand	Stones	None
22990403	TP103	0.20 - 0.20	Dark Brown	Sand	Stones	Brick
22990367	TP104	0.20 - 0.20	Dark Brown	Sand	Stones	Vegetation
22990374	TP104	0.40 - 0.40	Dark Brown	Sandy Loam	Stones	None
22990381	TP104	1.70 - 1.70	Dark Brown	Loamy Sand	Stones	Vegetation
22990312	TP105	0.10 - 0.10	Dark Brown	Sandy Loam	Stones	Crushed Brick
22990352	TP105	0.80 - 0.80	Dark Brown	Sandy Loam	Stones	Crushed Brick
22990362	TP105	1.30 - 1.30	Dark Brown	Loamy Sand	Glass & 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:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

TPH CWG (S)

Results Legend			Customer Sample Ref.	TP103	TP104	TP104	TP104	TP105	TP105
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP103	TP104	TP104	TP104	TP105	TP105
GRO Surrogate % recovery**	%	TM089	1.60 - 1.60 Soil/Solid (S) 07/10/2020 07/10/2020 201008-93 22990331 ES	1.60 - 1.60 Soil/Solid (S) 05/10/2020 07/10/2020 201008-93 22990367 ES	0.20 - 0.20 Soil/Solid (S) 05/10/2020 07/10/2020 201008-93 22990374 ES	0.40 - 0.40 Soil/Solid (S) 05/10/2020 07/10/2020 201008-93 22990374 ES	1.70 - 1.70 Soil/Solid (S) 05/10/2020 07/10/2020 201008-93 22990381 ES	0.10 - 0.10 Soil/Solid (S) 05/10/2020 07/10/2020 201008-93 22990312 ES	1.30 - 1.30 Soil/Solid (S) 05/10/2020 07/10/2020 201008-93 22990362 ES
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	0.0125
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.0286	<0.01	0.0365
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.0678	<0.01	0.049
Aliphatics >C10-C12	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Aliphatics >C12-C16	<1 mg/kg	TM414		<1	<1	<1	<1	<1	<1
Aliphatics >C16-C21	<1 mg/kg	TM414		<1	<1	19	1.68	<1	2.6
Aliphatics >C21-C35	<1 mg/kg	TM414		6.9	11.1	40.3	16.6	6.28	18.6
Aliphatics >C35-C44	<1 mg/kg	TM414		<1	5.33	2.77	1.19	<1	3
Total Aliphatics >C10-C44	<5 mg/kg	TM414		8.37	16.7	62.4	19.5	6.58	24.9
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	TM414		21.3	663	388	44.6	130	277
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.069	<0.01	<0.01
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	0.0452	<0.01	0.0331
Aromatics > EC10-EC12	<1 mg/kg	TM414		<1	<1	<1	1.06	<1	<1
Aromatics > EC12-EC16	<1 mg/kg	TM414		<1	5	1.81	<1	<1	13
Aromatics > EC16-EC21	<1 mg/kg	TM414		<1	141	48.3	4.05	22.4	69.5
Aromatics > EC21-EC35	<1 mg/kg	TM414		10.9	433	223	17.4	88.8	154
Aromatics >EC35-EC44	<1 mg/kg	TM414		1.31	66.4	52.5	2.12	11.9	15.5
Aromatics > EC40-EC44	<1 mg/kg	TM414		<1	8.75	3.97	<1	<1	1.43
Total Aromatics > EC10-EC44	<5 mg/kg	TM414		13	646	326	25.1	124	252
Total Aliphatics & Aromatics >C5-C44	<10 mg/kg	TM414		21.3	663	388	44.8	130	277
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089		<0.05	<0.05	<0.05	0.0964	<0.05	0.098
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089		<0.05	<0.05	<0.05	0.114	<0.05	<0.05
GRO >C5-C10	<0.02 mg/kg	TM089		<0.02	<0.02	<0.02	0.211	<0.02	0.098



CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93 **Client Reference:** 70057278 **Report Number:** 572467
Location: Port Talbot Harbourside **Order Number:** 70057278-P01 **Superseded Report:** 571541

Asbestos Identification - Solid Samples

Results Legend

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

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP101ES 0.30 - 0.30 SOLID 07/10/2020 00:00:00 07/10/2020 05:00:00 201008-93 22990389 TM048	15/10/2020	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP102ES 0.30 - 0.30 SOLID 07/10/2020 00:00:00 07/10/2020 05:00:00 201008-93 22990336 TM048	14/10/20	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP103ES 0.20 - 0.20 SOLID 07/10/2020 00:00:00 07/10/2020 05:00:00 201008-93 22990403 TM048	15/10/20	Andrzej Fernecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP104ES 0.20 - 0.20 SOLID 05/10/2020 00:00:00 07/10/2020 05:00:00 201008-93 22990367 TM048	15/10/2020	Agnieszka Chelmonska	Fibre bundles	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP105ES 0.10 - 0.10 SOLID 05/10/2020 00:00:00 07/10/2020 05:00:00 201008-93 22990312 TM048	15/10/20	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP105ES 0.80 - 0.80 SOLID 05/10/2020 00:00:00 07/10/2020 05:00:00 201008-93 22990352 TM048	23/10/2020	Agnieszka Chelmonska	Loose fibres in soil	Not Detected (#)	Trace (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Asbestos Quantification - Full

Results Legend

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

		Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation	Asbestos Quantification - Total - %
Cust. Sample Ref.	TP104E5	None (#)	-	<0.001 (#)	<0.001 (#)	<0.001 (#)
Depth (m)	0.20 - 0.20					
Sample Type	SOLID					
Date Sampled	05/10/2020 00:00:00					
Date Received	07/10/2020 05:00:00					
SDG	201008-93					
Original Sample	22990367					
Method Number	TM304					



CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

Report Number: 572467
Superseded Report: 571541

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Port Talbot Harbourside
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)	21.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	82.2
Particle Size <4mm	>95%		

Case

SDG	201008-93
Lab Sample Number(s)	22990322
Sampled Date	07-Oct-2020
Customer Sample Ref.	TP103 ESZ
Depth (m)	0.90 - 0.90

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			

PAH Spec MS - Aqueous (W)

Naphthalene by GCMS	0.0000233	<0.00001	0.000233	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000394	<0.000005	0.000394	<0.00005	-	-	-
Anthracene by GCMS	0.0000059	<0.000005	0.000059	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000325	<0.000005	0.000325	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.0000261	<0.000005	0.000261	<0.00005	-	-	-
Pyrene by GCMS	0.000125	<0.000005	0.00125	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000127	<0.000005	0.000127	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000265	<0.000082	0.00265	<0.00082	-	-	-

TPH CWG (W)

Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Oct-2020
pH (pH Units)	10.55
Conductivity (µS/cm)	404.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.880

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

Report Number: 572467
Superseded Report: 571541

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Port Talbot Harbourside
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)	21.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	82.2
Particle Size <4mm	>95%		

Case

SDG 201008-93

Lab Sample Number(s) 22990322

Sampled Date 07-Oct-2020

Customer Sample Ref. TP103 ESZ

Depth (m) 0.90 - 0.90

Eluate Analysis

C ₂	Conc ⁿ in 10:1 eluate (mg/l)		A ₂	10:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection		Result	Limit of Detection

TPH CWG (W)

Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

VOC MS (W)

Benzene	<0.001	<0.001	<0.01	<0.01	-	-	-
Toluene	<0.001	<0.001	<0.01	<0.01	-	-	-
Ethylbenzene	<0.001	<0.001	<0.01	<0.01	-	-	-
p/m-Xylene	<0.001	<0.001	<0.01	<0.01	-	-	-
o-Xylene	<0.001	<0.001	<0.01	<0.01	-	-	-
Total Xylenes	<0.002	<0.002	<0.02	<0.02	-	-	-

Leach Test Information

Date Prepared	10-Oct-2020
pH (pH Units)	10.55
Conductivity (µS/cm)	404.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.880

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

Report Number: 572467
Superseded Report: 571541

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Port Talbot Harbourside
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	83.7
Particle Size <4mm	>95%		

Case

SDG 201008-93

Lab Sample Number(s) 22990352

Sampled Date 05-Oct-2020

Customer Sample Ref. TP105 ESZ

Depth (m) 0.80 - 0.80

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			

PAH Spec MS - Aqueous (W)

Naphthalene by GCMS	0.000185	<0.00001	0.00185	<0.0001	-	-	-
Acenaphthene by GCMS	0.00934	<0.000005	0.0934	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00932	<0.000005	0.0932	<0.00005	-	-	-
Fluoranthene by GCMS	0.0185	<0.000005	0.185	<0.00005	-	-	-
Anthracene by GCMS	0.00468	<0.000005	0.0468	<0.00005	-	-	-
Phenanthrene by GCMS	0.0154	<0.000005	0.154	<0.00005	-	-	-
Fluorene by GCMS	0.00929	<0.000005	0.0929	<0.00005	-	-	-
Chrysene by GCMS	0.0018	<0.000005	0.018	<0.00005	-	-	-
Pyrene by GCMS	0.0116	<0.000005	0.116	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.00223	<0.000005	0.0223	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00202	<0.000005	0.0202	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.000753	<0.000005	0.00753	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00102	<0.000002	0.0102	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.000213	<0.000005	0.00213	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.000489	<0.000005	0.00489	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000487	<0.000005	0.00487	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0874	<0.000082	0.874	<0.00082	-	-	-

TPH CWG (W)

Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	0.048	<0.01	0.48	<0.1	-	-	-
Aromatics >EC16-EC21	0.098	<0.01	0.98	<0.1	-	-	-
Aromatics >EC21-EC35	0.011	<0.01	0.11	<0.1	-	-	-

Leach Test Information

Date Prepared	12-Oct-2020
pH (pH Units)	10.01
Conductivity (µS/cm)	125.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.883

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

Validated

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Port Talbot Harbourside
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	83.7
Particle Size <4mm	>95%		

Case

SDG	201008-93
Lab Sample Number(s)	22990352
Sampled Date	05-Oct-2020
Customer Sample Ref.	TP105 ESZ
Depth (m)	0.80 - 0.80

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
TPH CWG (W)							
Total Aromatics >EC12-EC35	0.157	<0.01	1.57	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	0.173	<0.01	1.73	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
VOC MS (W)							
Benzene	<0.001	<0.001	<0.01	<0.01	-	-	-
Toluene	<0.001	<0.001	<0.01	<0.01	-	-	-
Ethylbenzene	<0.001	<0.001	<0.01	<0.01	-	-	-
p/m-Xylene	<0.001	<0.001	<0.01	<0.01	-	-	-
o-Xylene	<0.001	<0.001	<0.01	<0.01	-	-	-
Total Xylenes	<0.002	<0.002	<0.02	<0.02	-	-	-

Leach Test Information

Date Prepared	12-Oct-2020
pH (pH Units)	10.01
Conductivity (µS/cm)	125.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.883

Mcerts Certification does not apply to leachates

24/10/2020 09:13:13

09:12:29 24/10/2020



CERTIFICATE OF ANALYSIS

Validated

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93 Client Reference: 70057278 Report Number: 572467
Location: Port Talbot Harbourside Order Number: 70057278-P01 Superseded Report: 571541

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	22990389	22990397	22990336	22990342	22990322	22990331	22990403	22990367	22990374	22990381
	TP101	TP101	TP102	TP102	TP103	TP103	TP103	TP104	TP104	TP104
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
	0.30 - 0.30	1.50 - 1.50	0.30 - 0.30	1.50 - 1.50	0.90 - 0.90	1.60 - 1.60	0.20 - 0.20	0.20 - 0.20	0.40 - 0.40	1.70 - 1.70
	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	15-Oct-2020		14-Oct-2020				15-Oct-2020	15-Oct-2020		
Asbestos Quantification - Full								24-Oct-2020		
CEN 10:1 Leachate (1 Stage)					13-Oct-2020					
CEN Readings					15-Oct-2020					
Cyanide Comp/Free/Total/Thiocyanate	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020
EPH CWG (Aliphatic) Aqueous GC (W)					17-Oct-2020					
EPH CWG (Aromatic) Aqueous GC (W)					17-Oct-2020					
EPH CWG GC (S)	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	14-Oct-2020	14-Oct-2020	14-Oct-2020	14-Oct-2020	14-Oct-2020
GRO by GC-FID (S)	14-Oct-2020	13-Oct-2020	14-Oct-2020	14-Oct-2020	13-Oct-2020	13-Oct-2020	13-Oct-2020	14-Oct-2020	13-Oct-2020	13-Oct-2020
GRO by GC-FID (W)					15-Oct-2020					
Hexavalent Chromium (s)	15-Oct-2020	15-Oct-2020	15-Oct-2020	14-Oct-2020	15-Oct-2020	15-Oct-2020	14-Oct-2020	15-Oct-2020	15-Oct-2020	14-Oct-2020
Moisture at 105C					10-Oct-2020					
PAH by GCMS	16-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	16-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020
PAH Spec MS - Aqueous (W)					16-Oct-2020					
Phenols by HPLC (S)	14-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	14-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020
Sample description	12-Oct-2020	12-Oct-2020	13-Oct-2020	13-Oct-2020	12-Oct-2020	10-Oct-2020	10-Oct-2020	10-Oct-2020	10-Oct-2020	10-Oct-2020
TPH CWG (W)					17-Oct-2020					
TPH CWG GC (S)	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	15-Oct-2020	14-Oct-2020	14-Oct-2020	14-Oct-2020	14-Oct-2020	14-Oct-2020
VOC MS (S)	13-Oct-2020	13-Oct-2020	14-Oct-2020	14-Oct-2020	13-Oct-2020	13-Oct-2020	13-Oct-2020	14-Oct-2020	13-Oct-2020	13-Oct-2020
VOC MS (W)					15-Oct-2020					

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	22990312	22990352	22990362
	TP105	TP105	TP105
	ES	ES	ES
	0.10 - 0.10	0.80 - 0.80	1.30 - 1.30
	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	15-Oct-2020	23-Oct-2020	
CEN 10:1 Leachate (1 Stage)		13-Oct-2020	
CEN Readings		15-Oct-2020	
Cyanide Comp/Free/Total/Thiocyanate	15-Oct-2020		15-Oct-2020
EPH CWG (Aliphatic) Aqueous GC (W)		17-Oct-2020	
EPH CWG (Aromatic) Aqueous GC (W)		17-Oct-2020	
EPH CWG GC (S)	15-Oct-2020		15-Oct-2020
GRO by GC-FID (S)	14-Oct-2020		13-Oct-2020
GRO by GC-FID (W)		15-Oct-2020	
Hexavalent Chromium (s)	14-Oct-2020		15-Oct-2020
Moisture at 105C		12-Oct-2020	
PAH by GCMS	15-Oct-2020		15-Oct-2020
PAH Spec MS - Aqueous (W)		16-Oct-2020	
Phenols by HPLC (S)	15-Oct-2020		15-Oct-2020
Sample description	13-Oct-2020	13-Oct-2020	10-Oct-2020
TPH CWG (W)		17-Oct-2020	
TPH CWG GC (S)	15-Oct-2020		15-Oct-2020
VOC MS (S)	14-Oct-2020		13-Oct-2020
VOC MS (W)		15-Oct-2020	



CERTIFICATE OF ANALYSIS

Validated

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

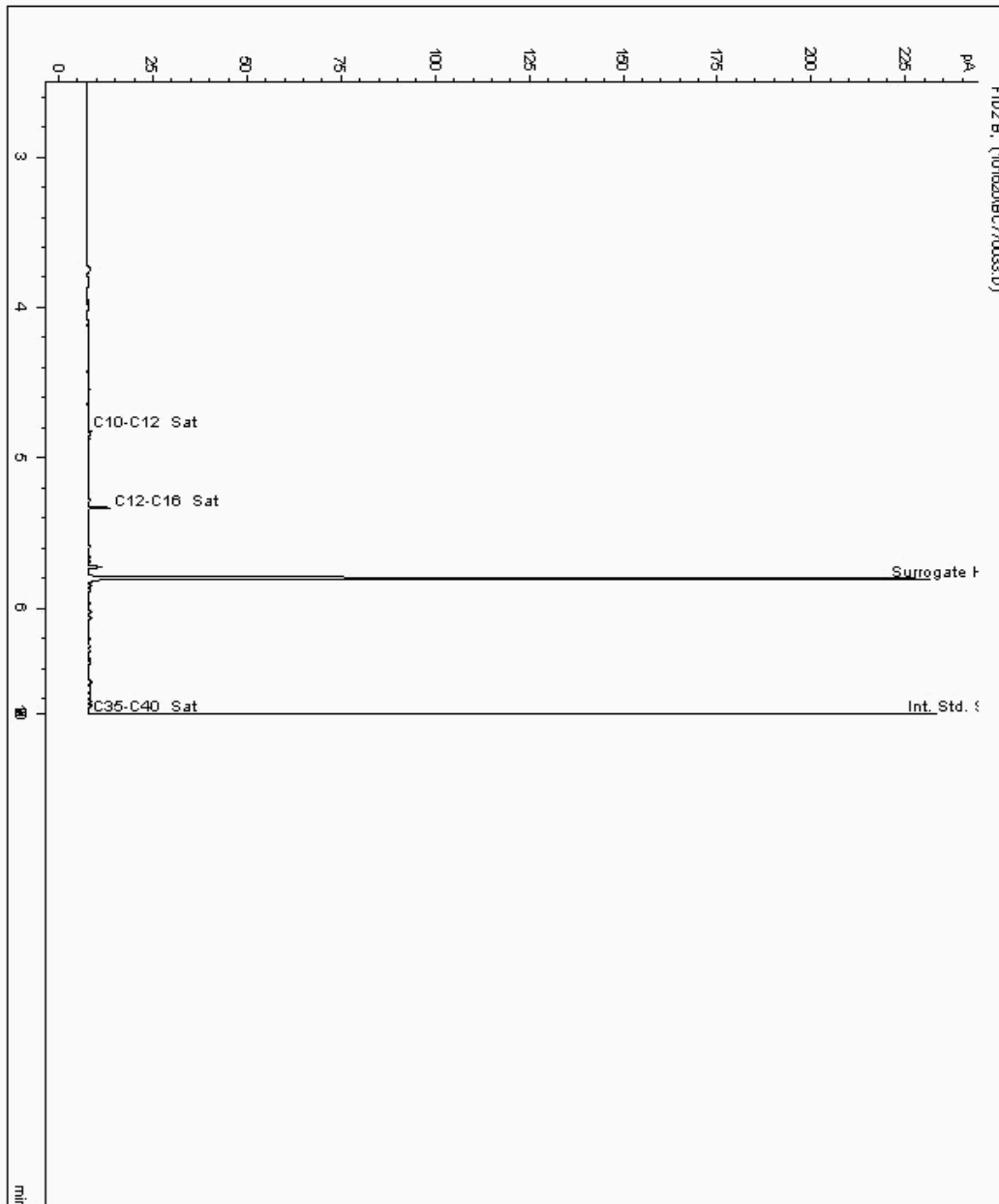
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 23038065
Sample ID : TP105

Depth : 0.80 - 0.80

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

Sample Identity: 21594437-
Date Acquired : 10/17/2020 9:17:42 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

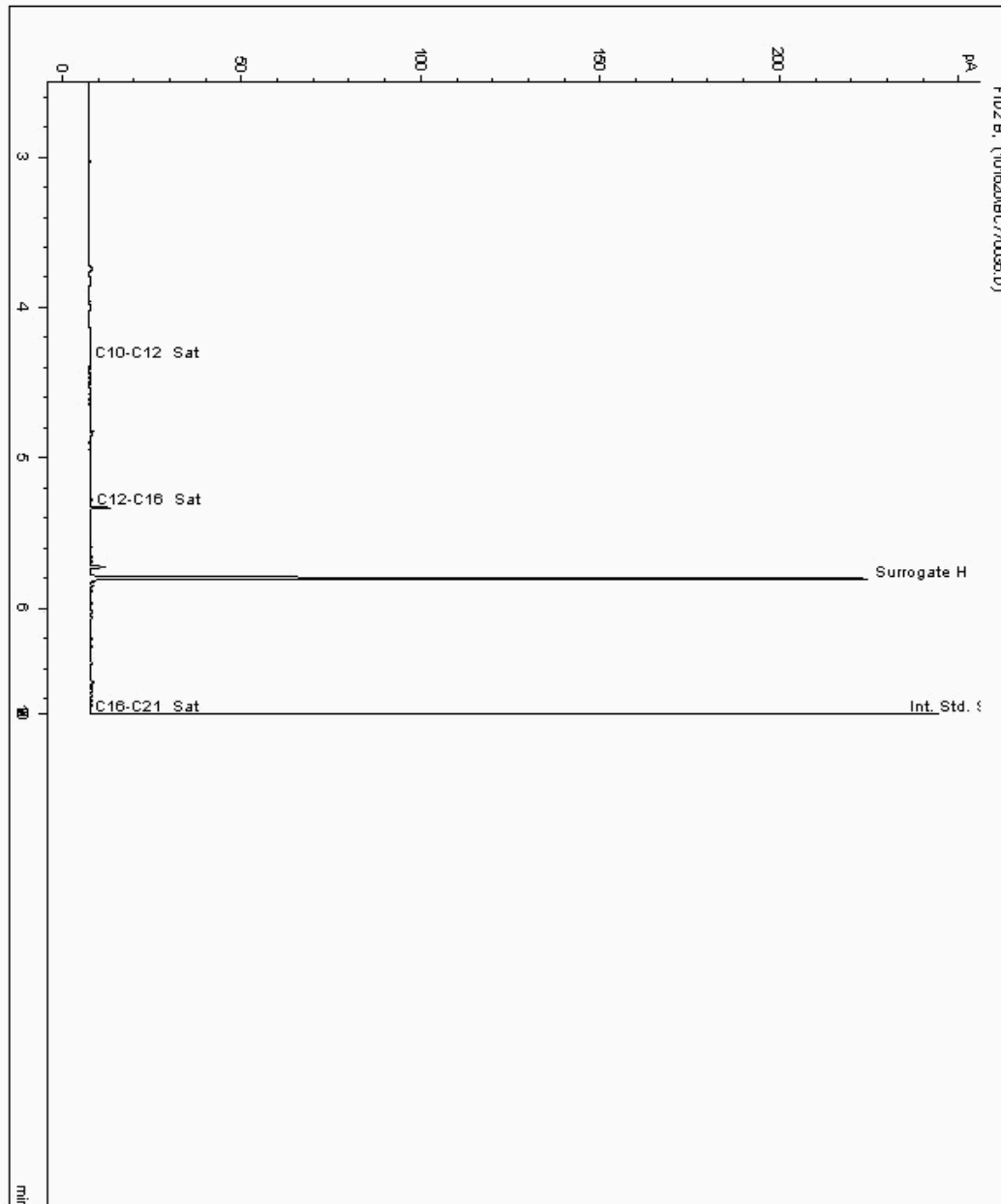
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 23039163
Sample ID : TP103

Depth : 0.90 - 0.90

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

Sample Identity: 21594429-
Date Acquired : 10/17/2020 10:28:15 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

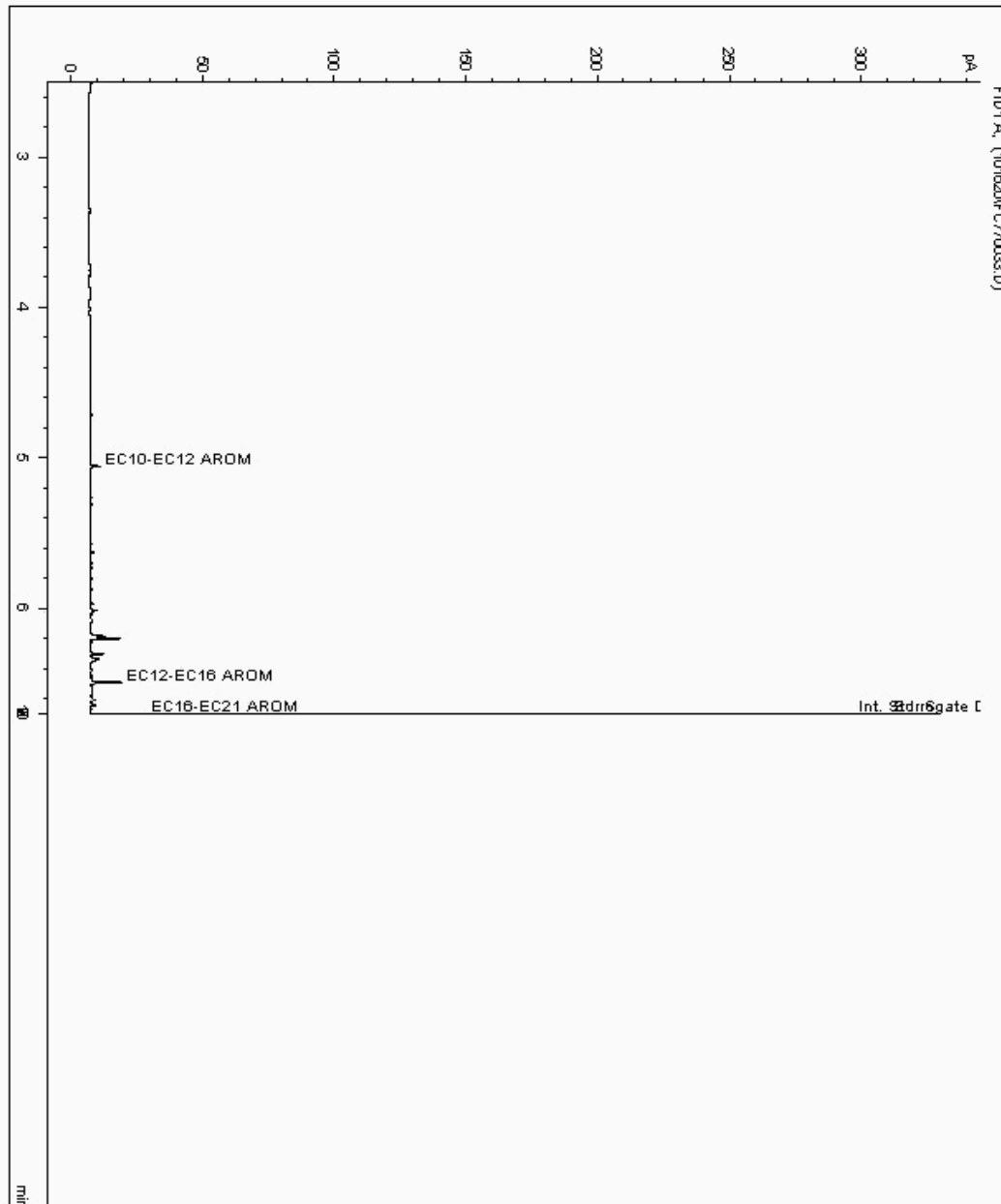
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 23038065
Sample ID : TP105

Depth : 0.80 - 0.80

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

Sample Identity: 21594438-
Date Acquired : 10/17/2020 9:17:42 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

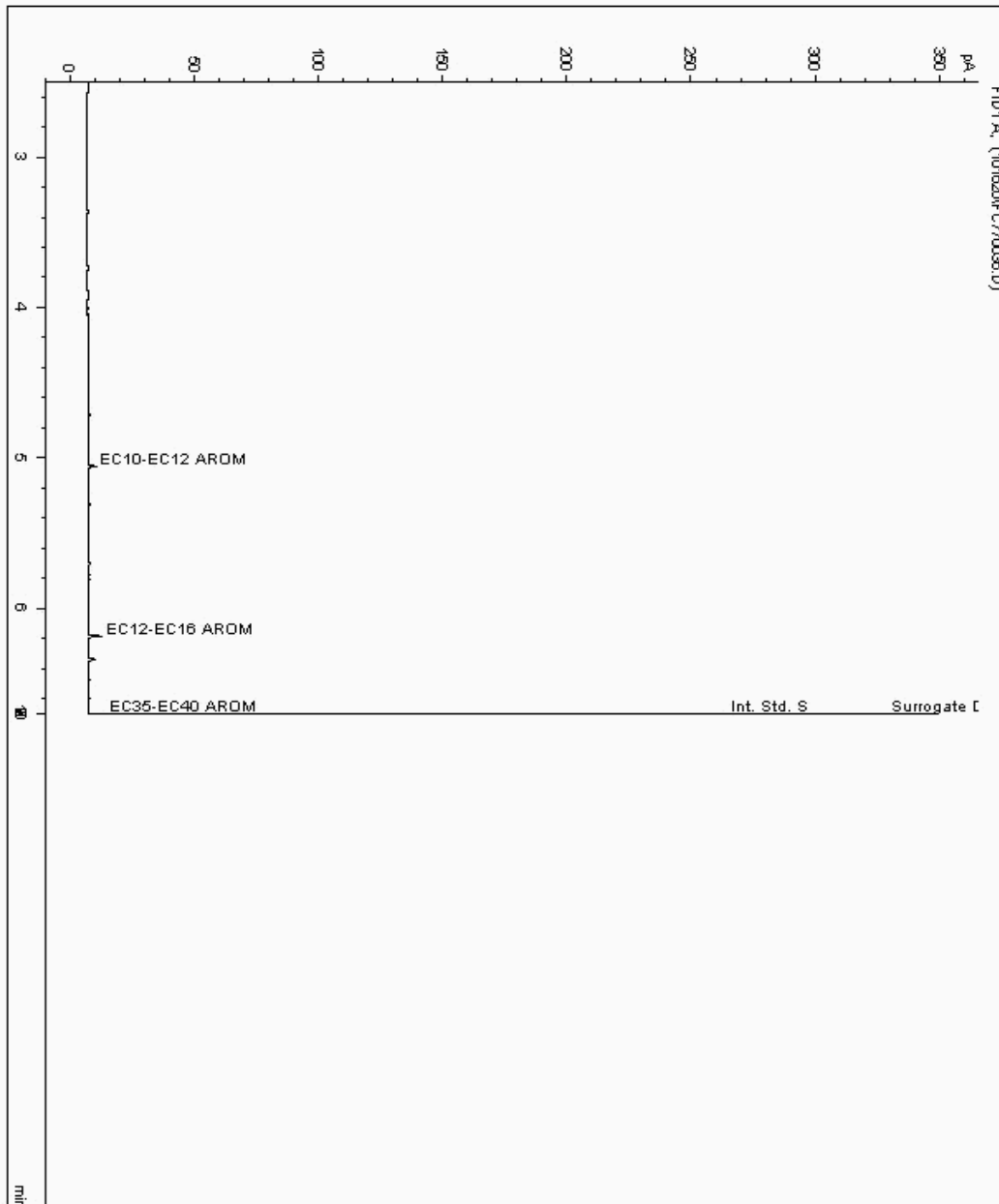
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 23039163
Sample ID : TP103

Depth : 0.90 - 0.90

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

Sample Identity: 21594430-
Date Acquired : 10/17/2020 10:28:15 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

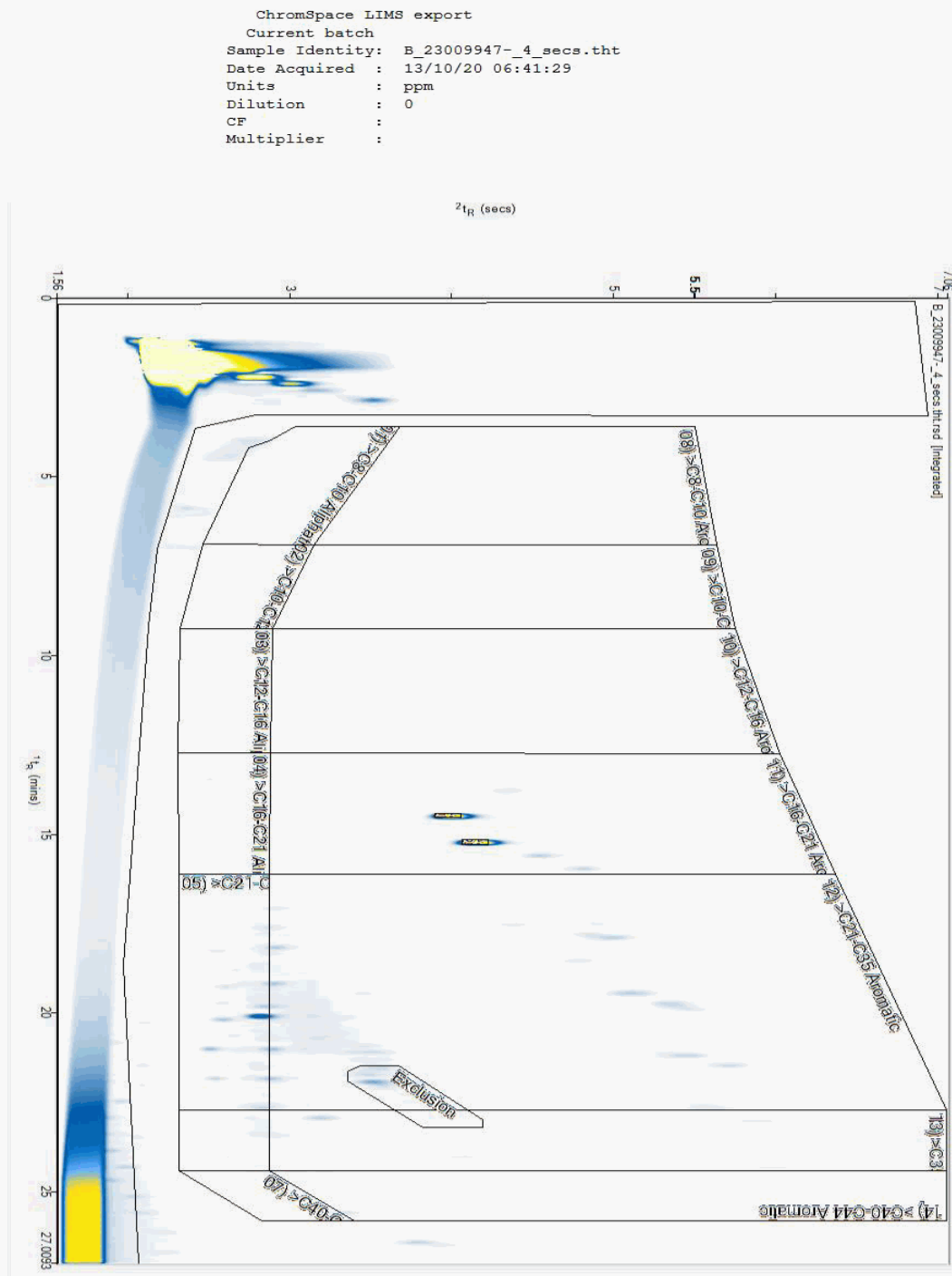
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23009947
Sample ID : TP103

Depth : 1.60 - 1.60





CERTIFICATE OF ANALYSIS

Validated

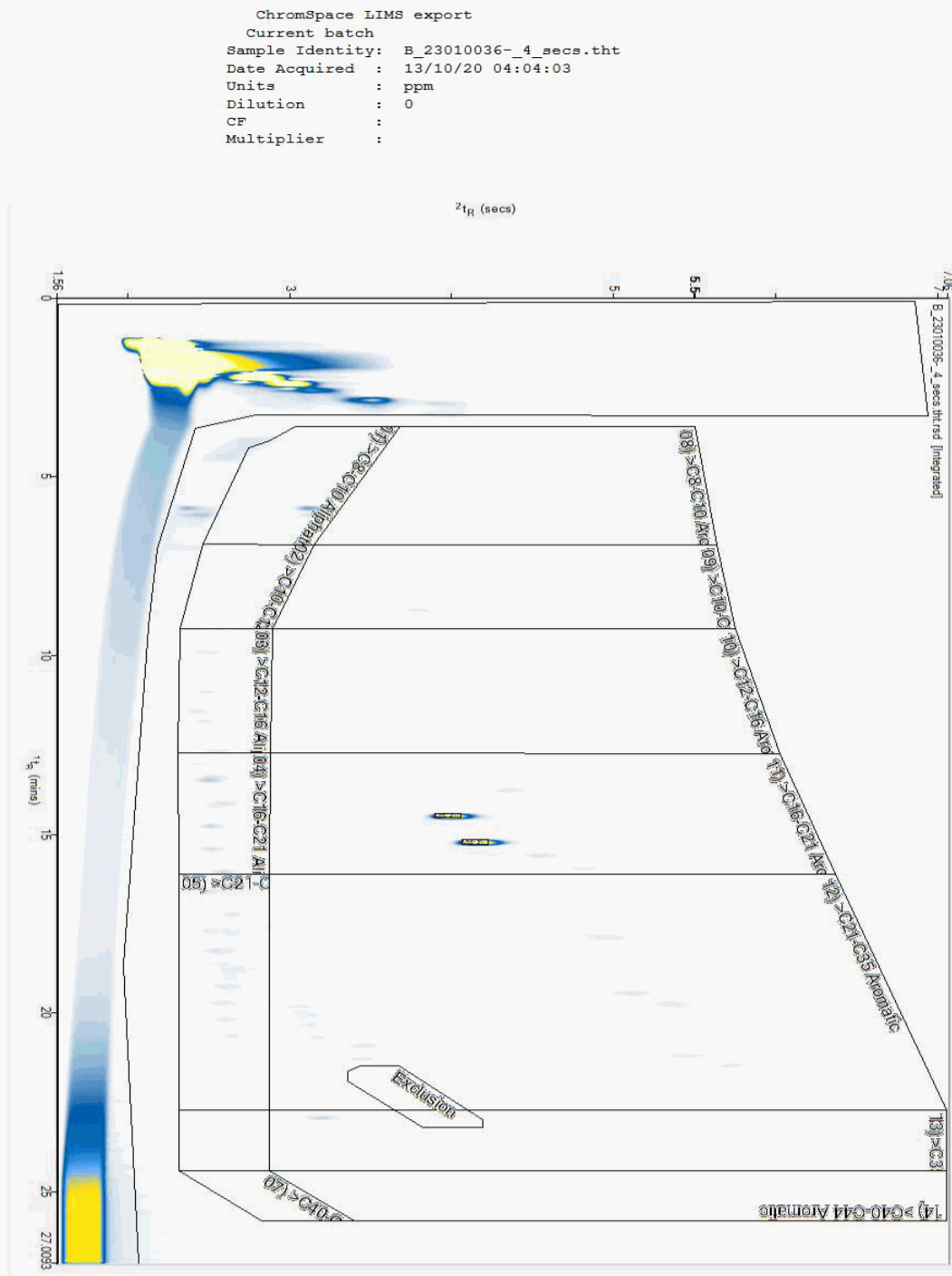
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23010036
Sample ID : TP103

Depth : 0.20 - 0.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

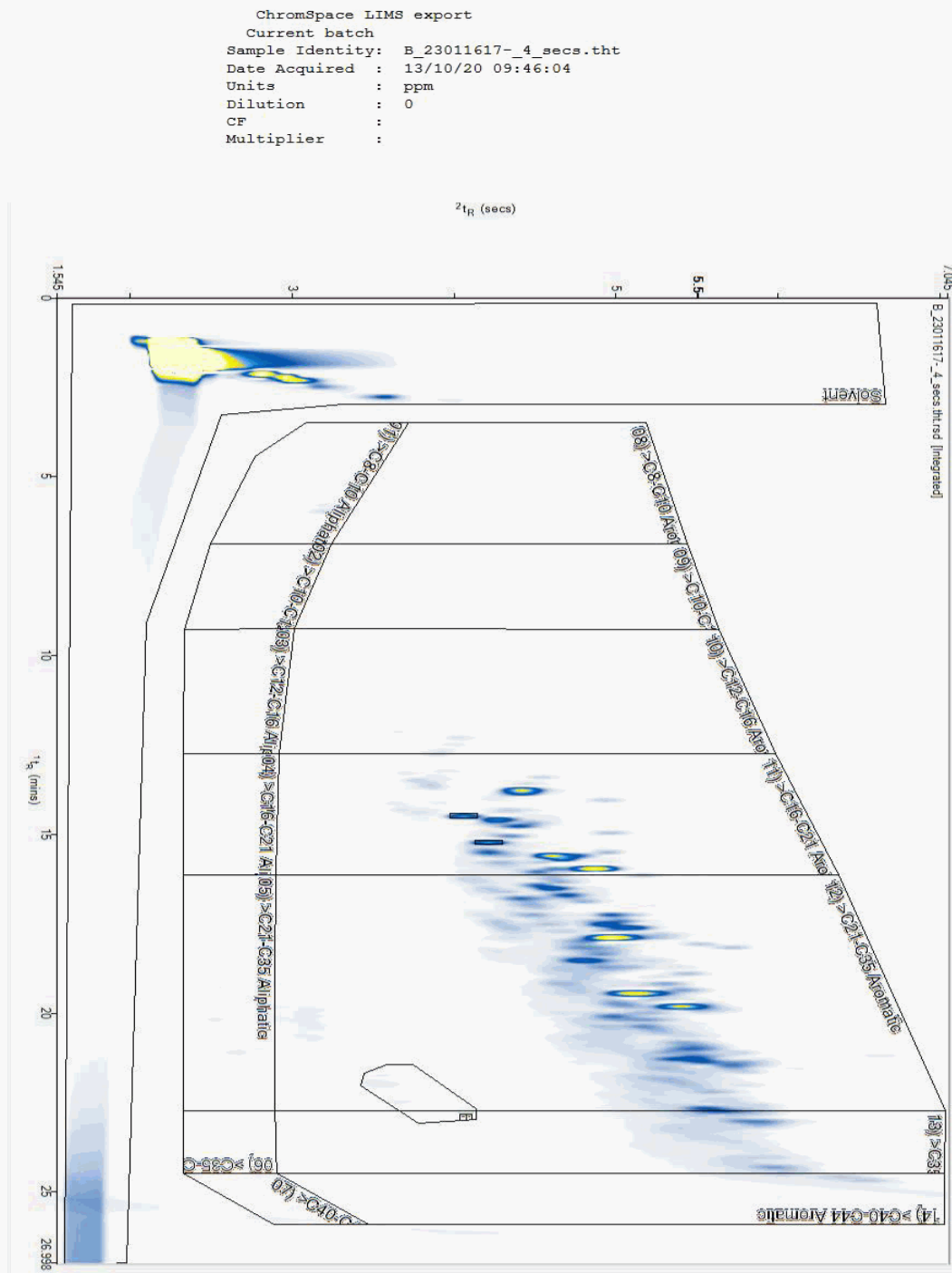
Report Number: 572467
Superseded Report: 571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23011617
Sample ID : TP104

Depth : 0.20 - 0.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

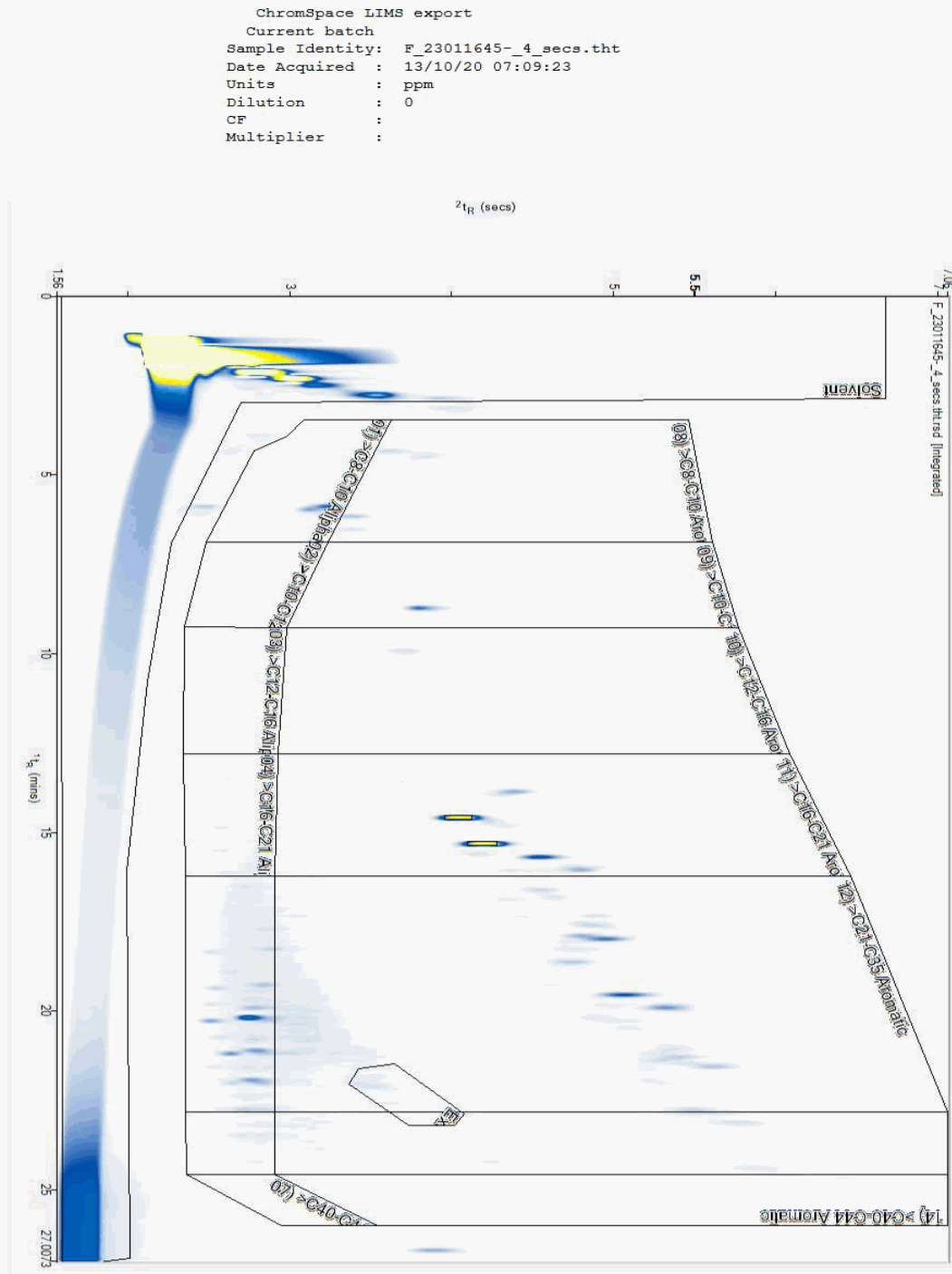
Report Number: 572467
Superseded Report: 571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23011645
Sample ID : TP104

Depth : 1.70 - 1.70





CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

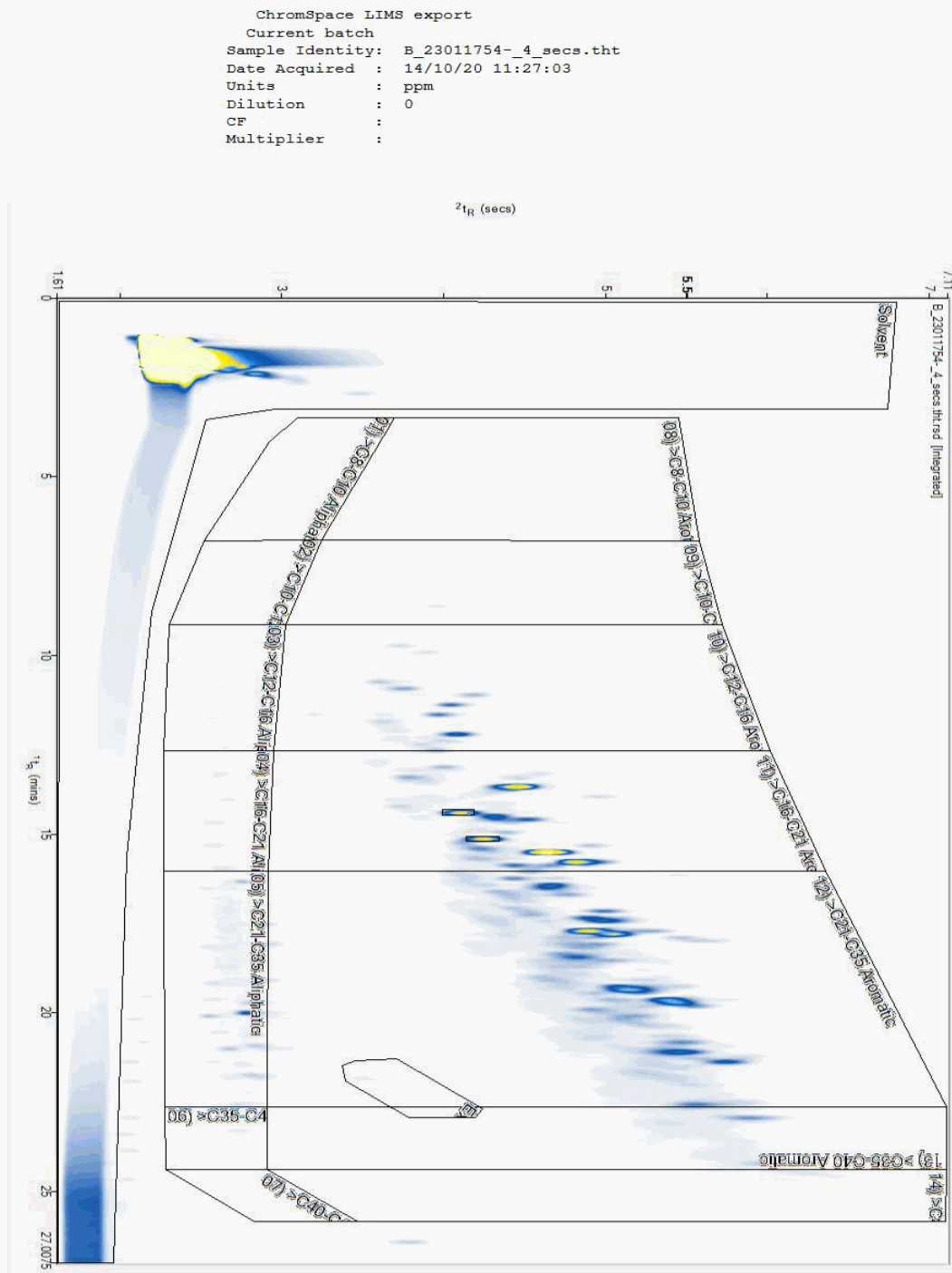
Report Number: 572467
Superseded Report: 571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23011754
Sample ID : TP105

Depth : 1.30 - 1.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

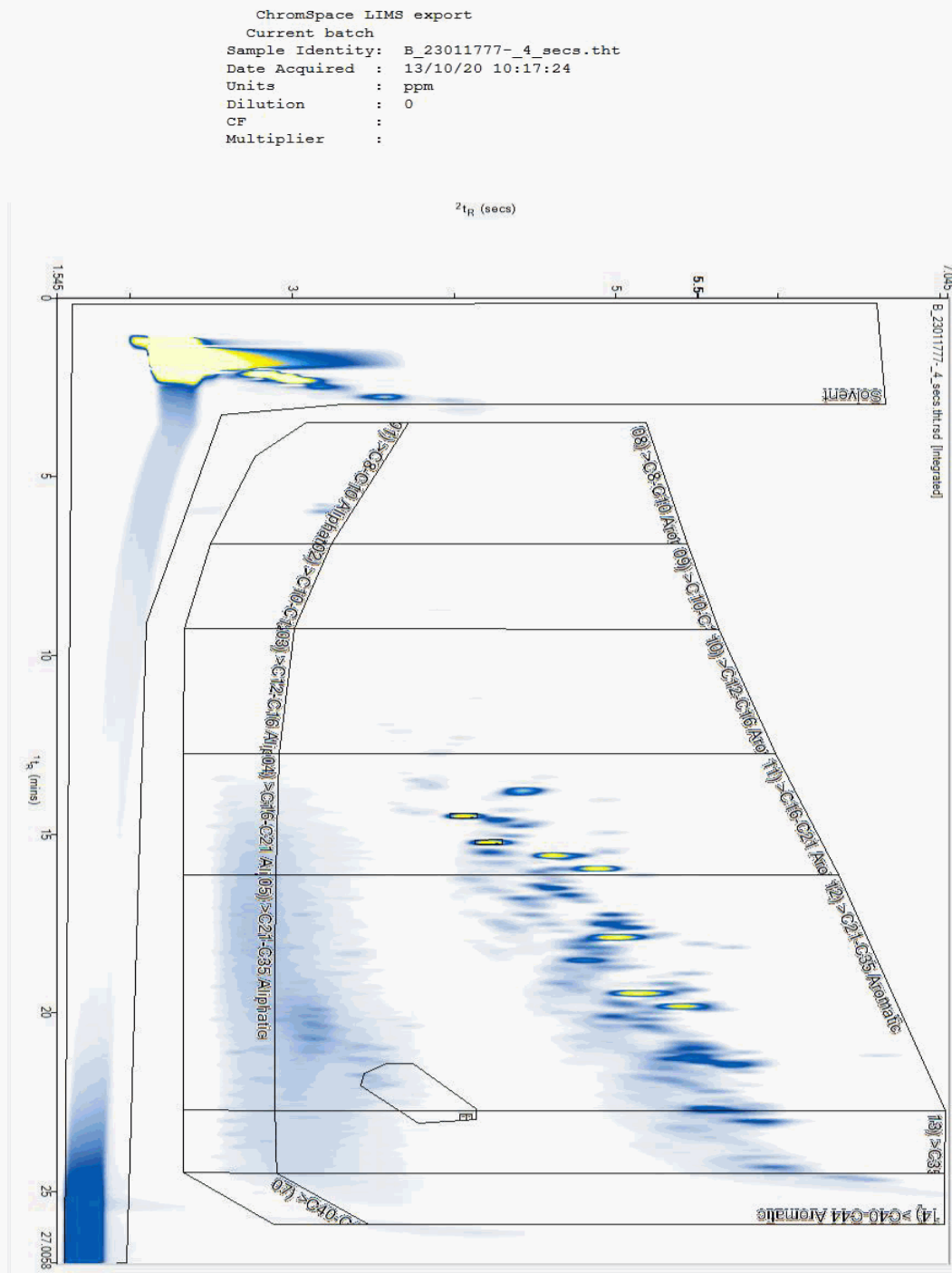
Report Number: 572467
Superseded Report: 571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23011777
Sample ID : TP104

Depth : 0.40 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

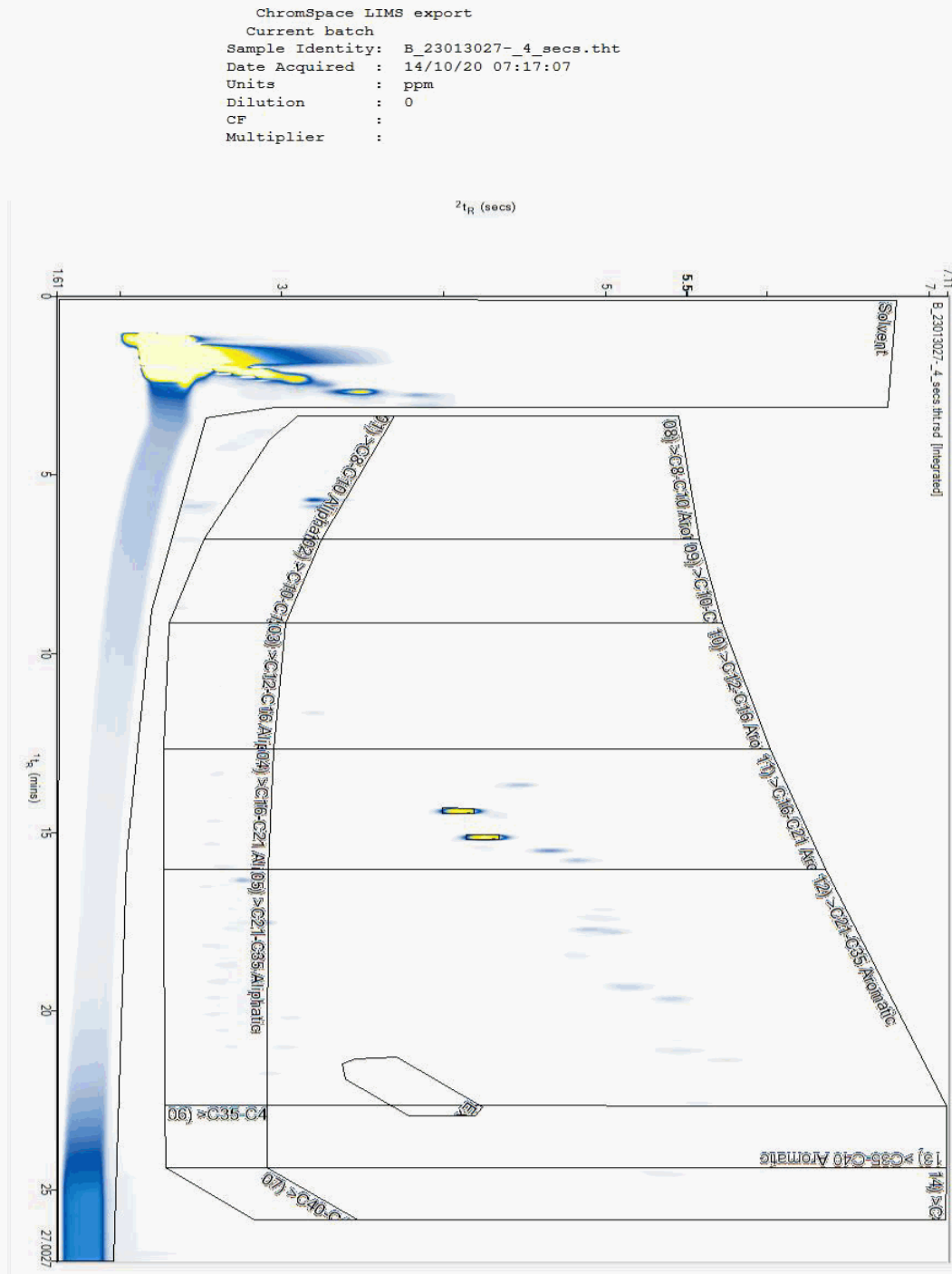
Report Number: 572467
Superseded Report: 571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23013027
Sample ID : TP101

Depth : 1.50 - 1.50





CERTIFICATE OF ANALYSIS

Validated

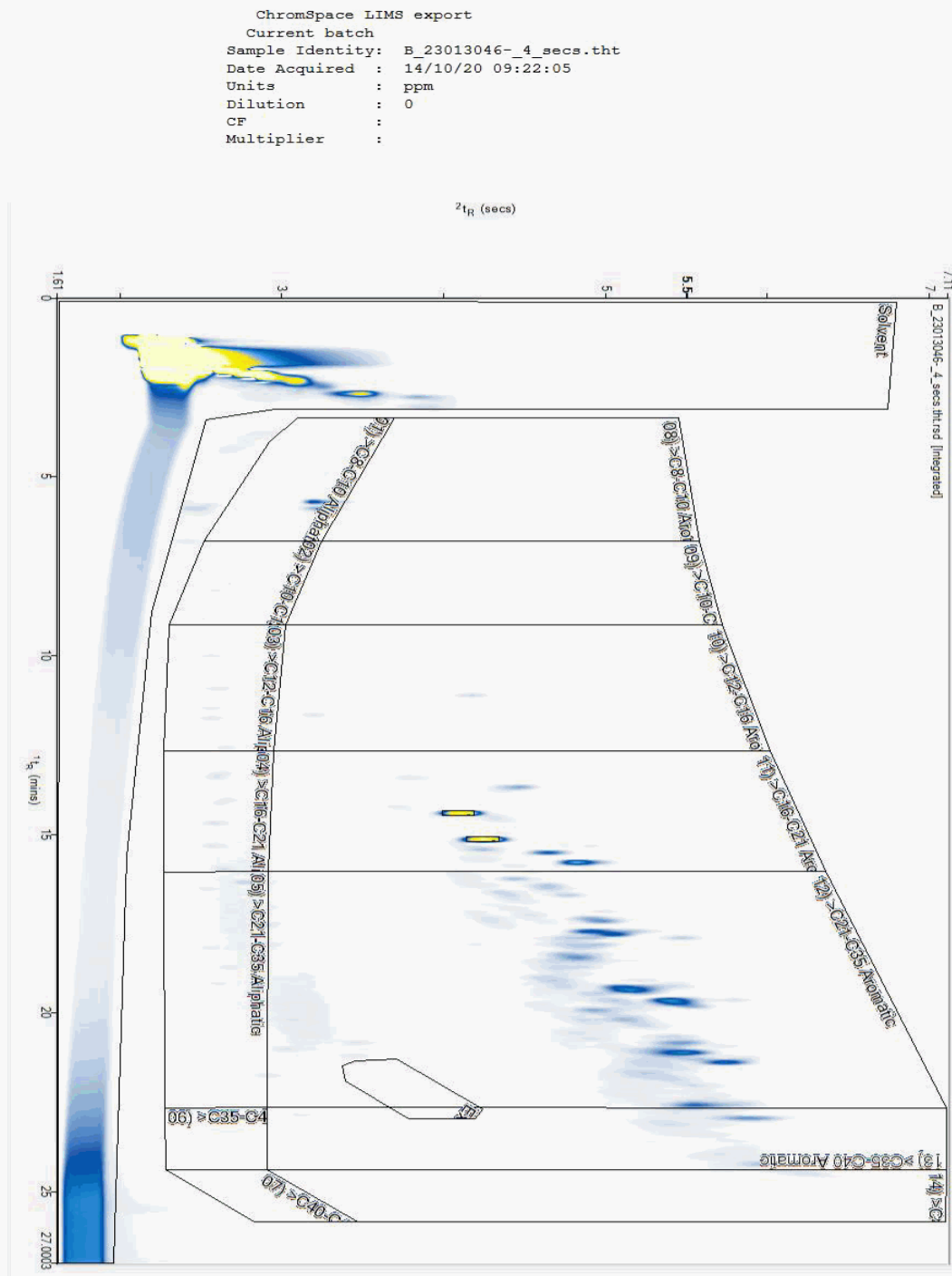
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23013046
Sample ID : TP103

Depth : 0.90 - 0.90





CERTIFICATE OF ANALYSIS

Validated

SDG: 201008-93
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

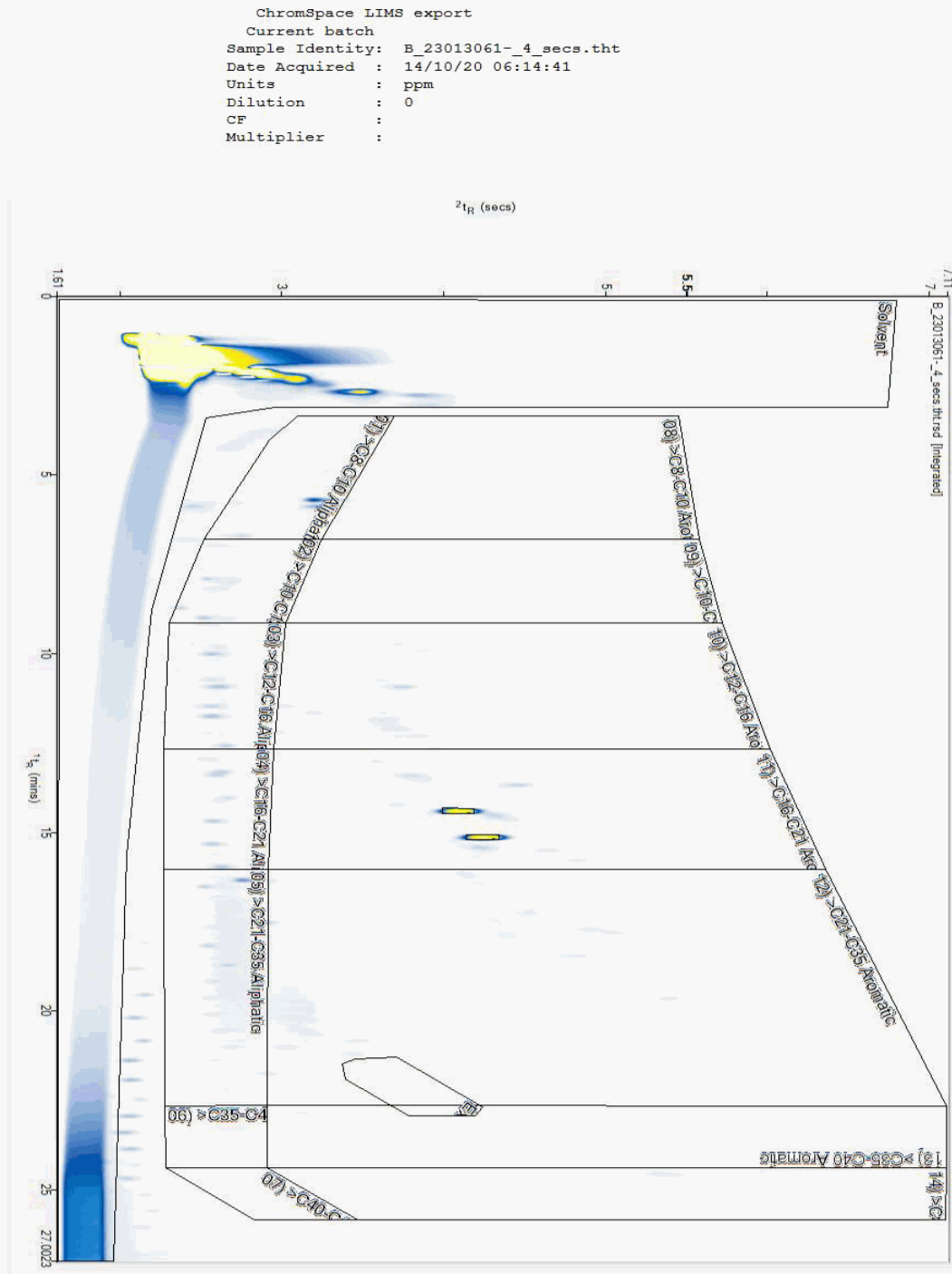
Report Number: 572467
Superseded Report: 571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23013061
Sample ID : TP101

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

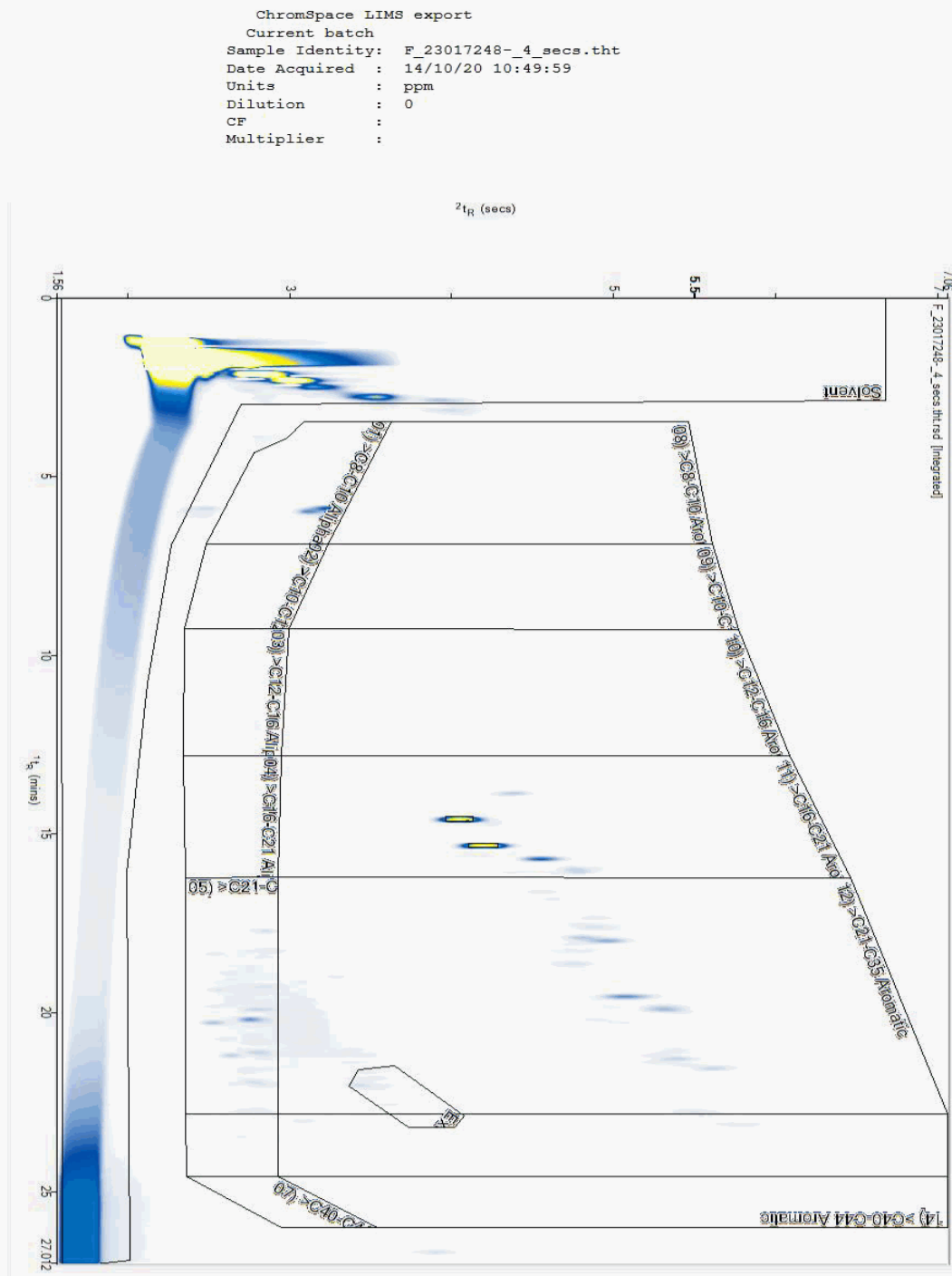
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23017248
Sample ID : TP102

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

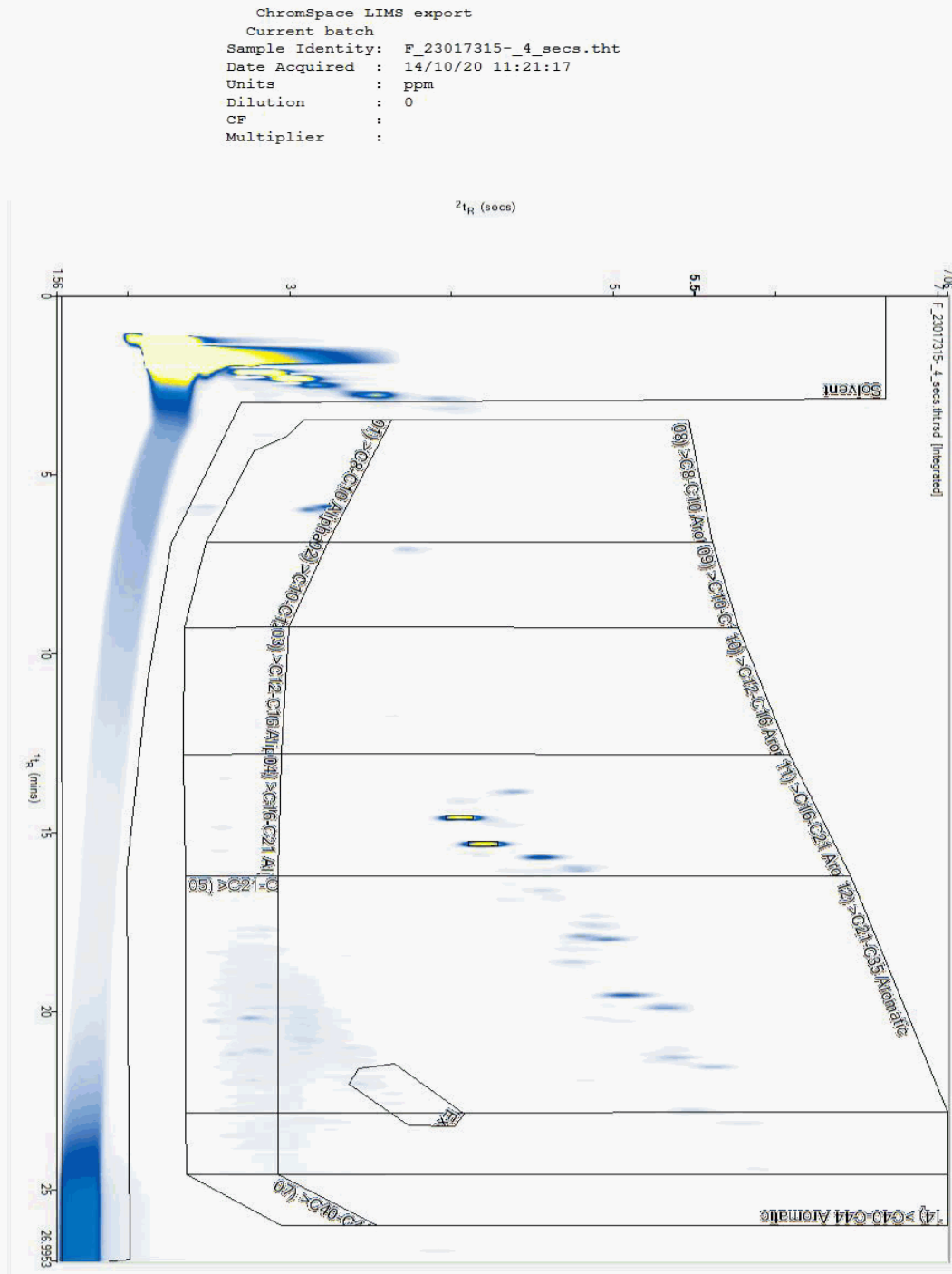
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23017315
Sample ID : TP102

Depth : 1.50 - 1.50





CERTIFICATE OF ANALYSIS

Validated

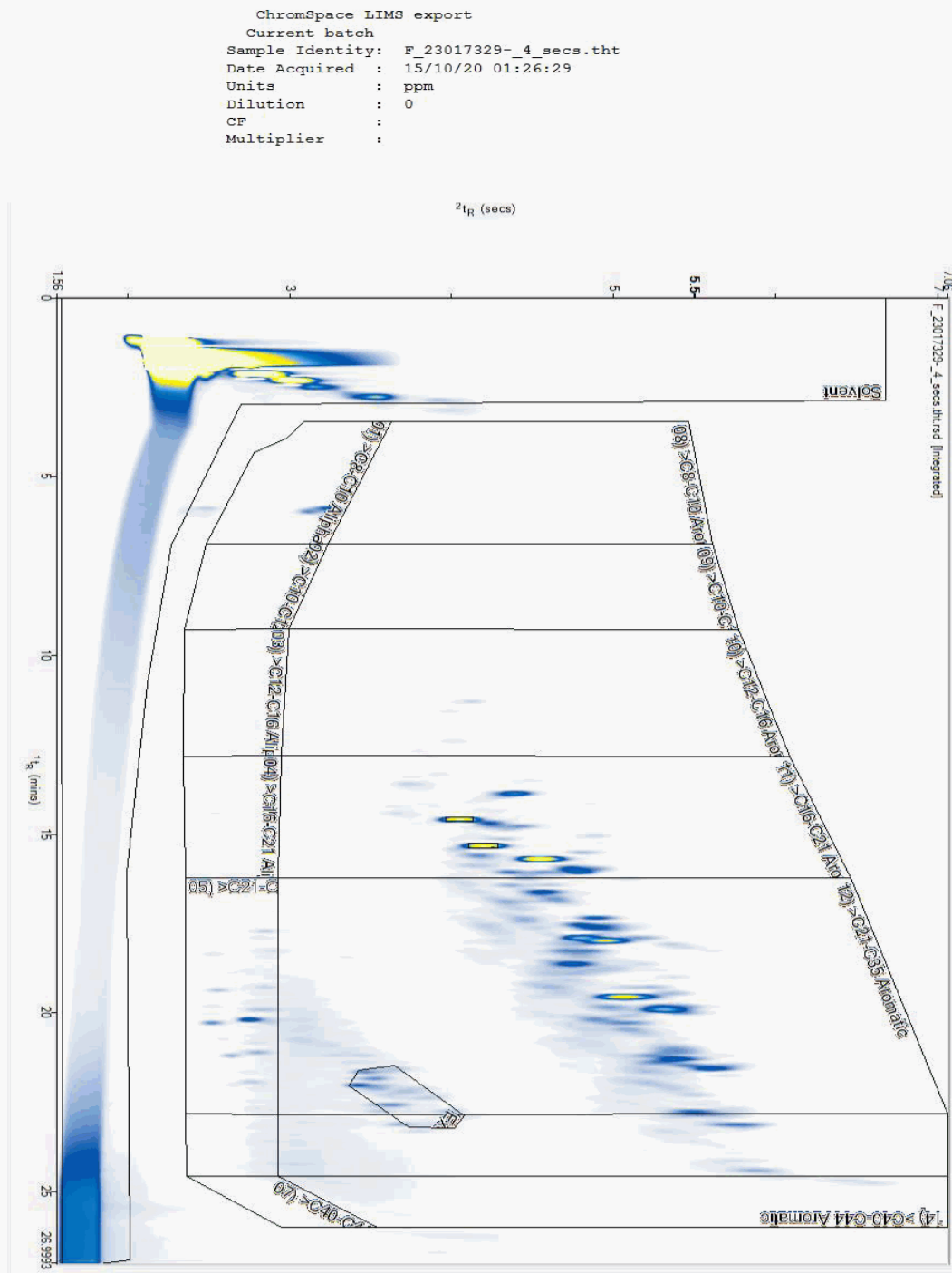
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23017329
Sample ID : TP105

Depth : 0.10 - 0.10





CERTIFICATE OF ANALYSIS

Validated

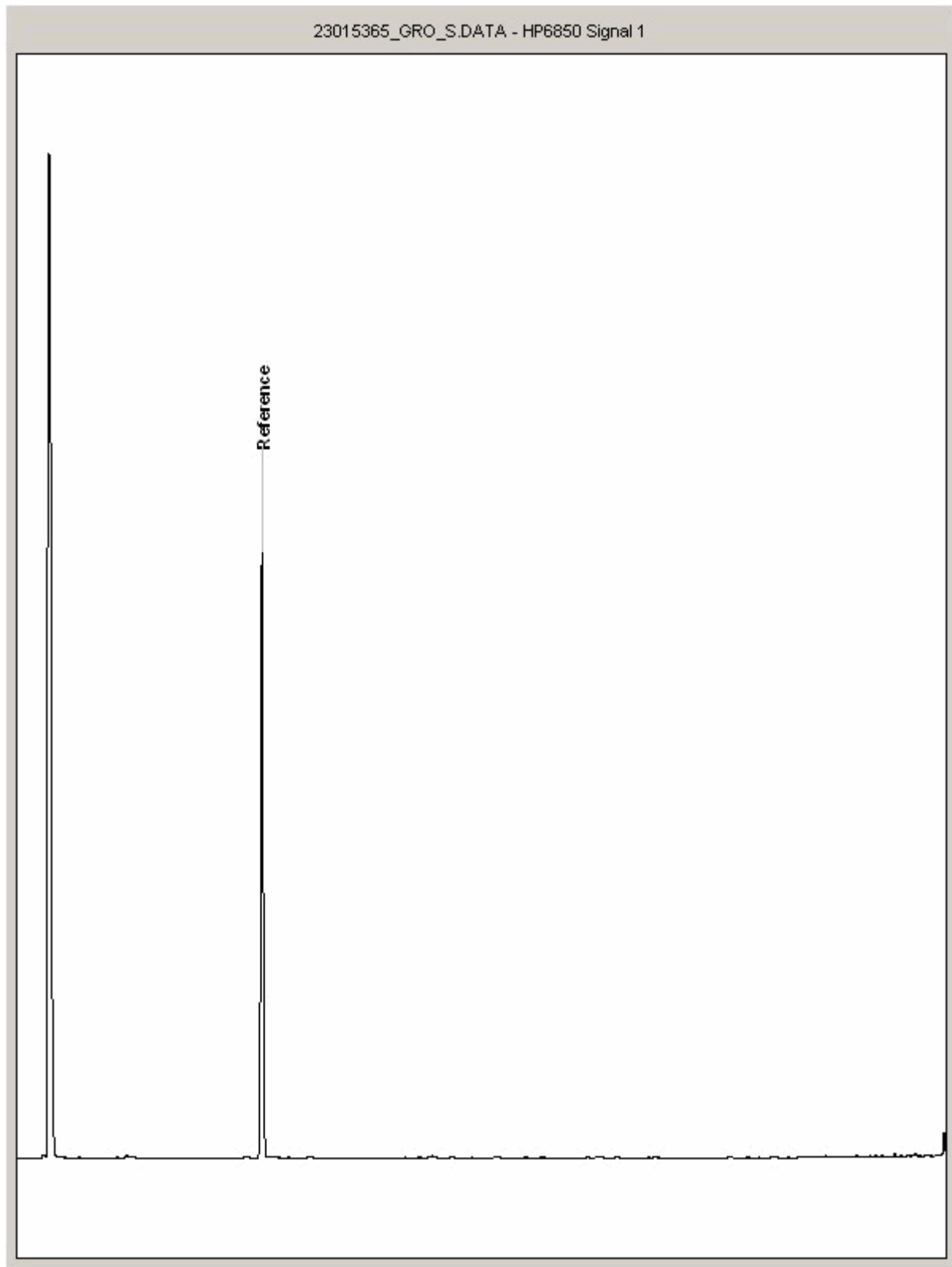
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23015365
Sample ID : TP104

Depth : 0.20 - 0.20





CERTIFICATE OF ANALYSIS

Validated

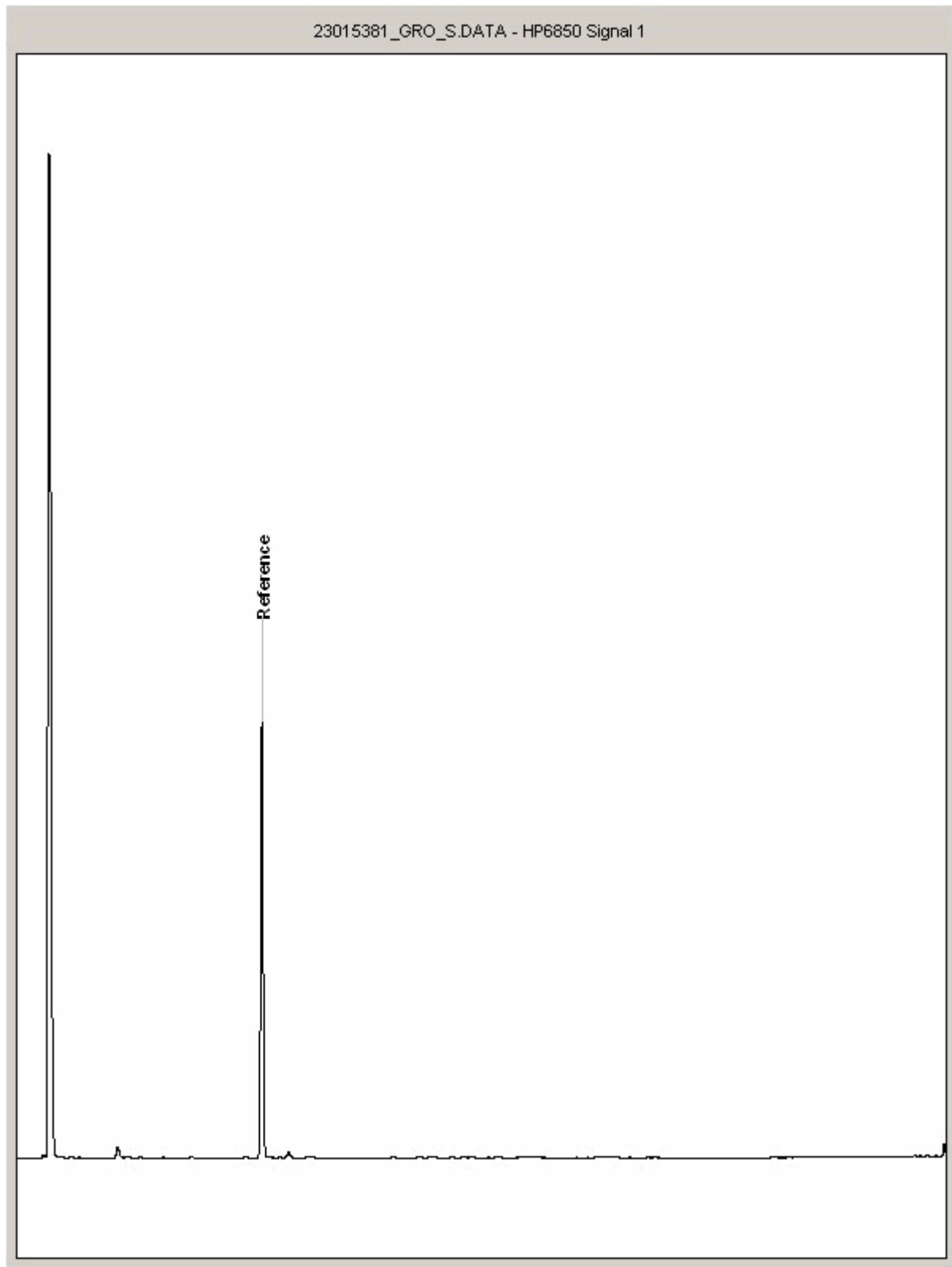
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23015381
Sample ID : TP104

Depth : 1.70 - 1.70





CERTIFICATE OF ANALYSIS

Validated

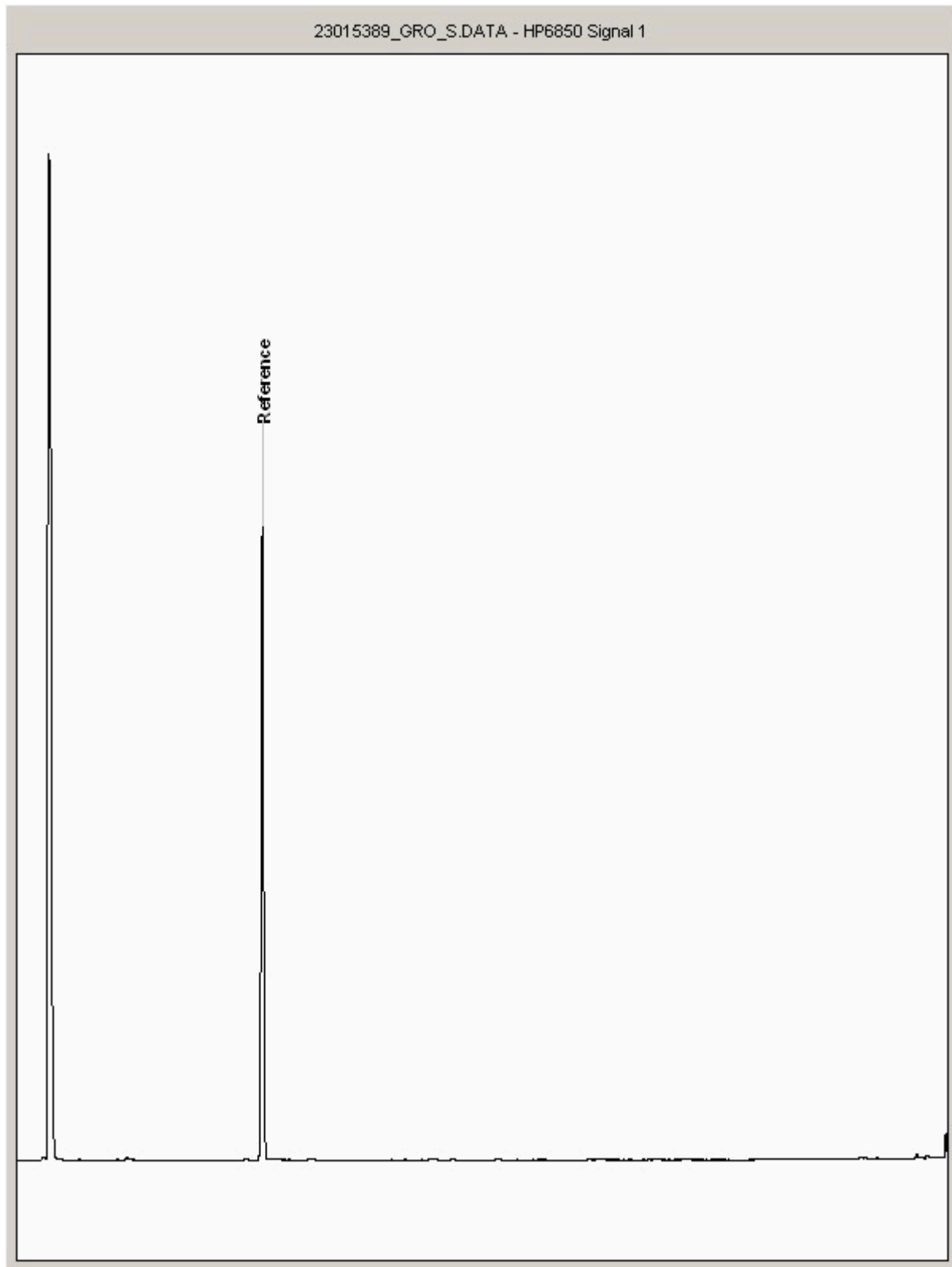
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23015389
Sample ID : TP103

Depth : 0.20 - 0.20





CERTIFICATE OF ANALYSIS

Validated

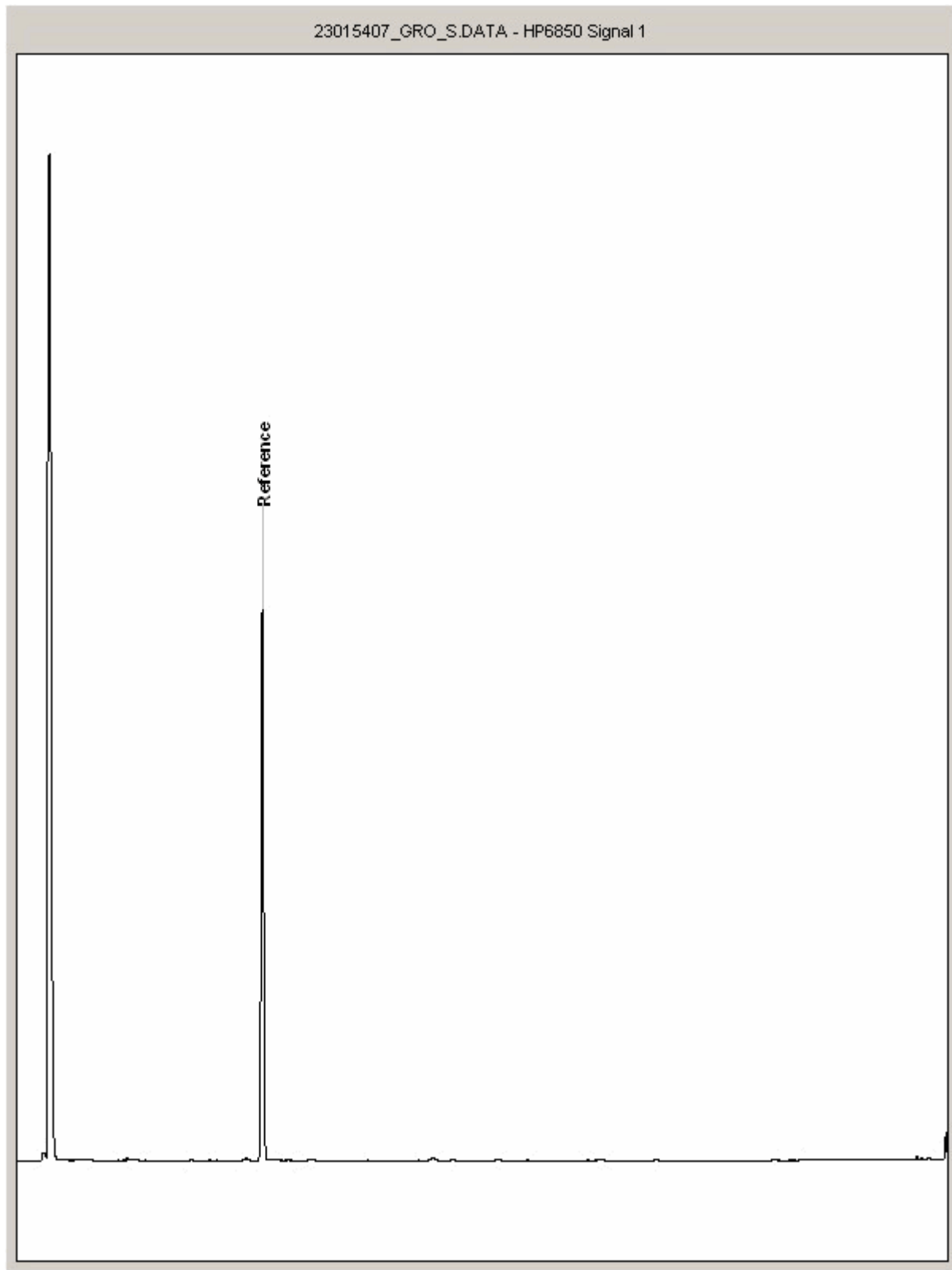
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23015407
Sample ID : TP103

Depth : 1.60 - 1.60





CERTIFICATE OF ANALYSIS

Validated

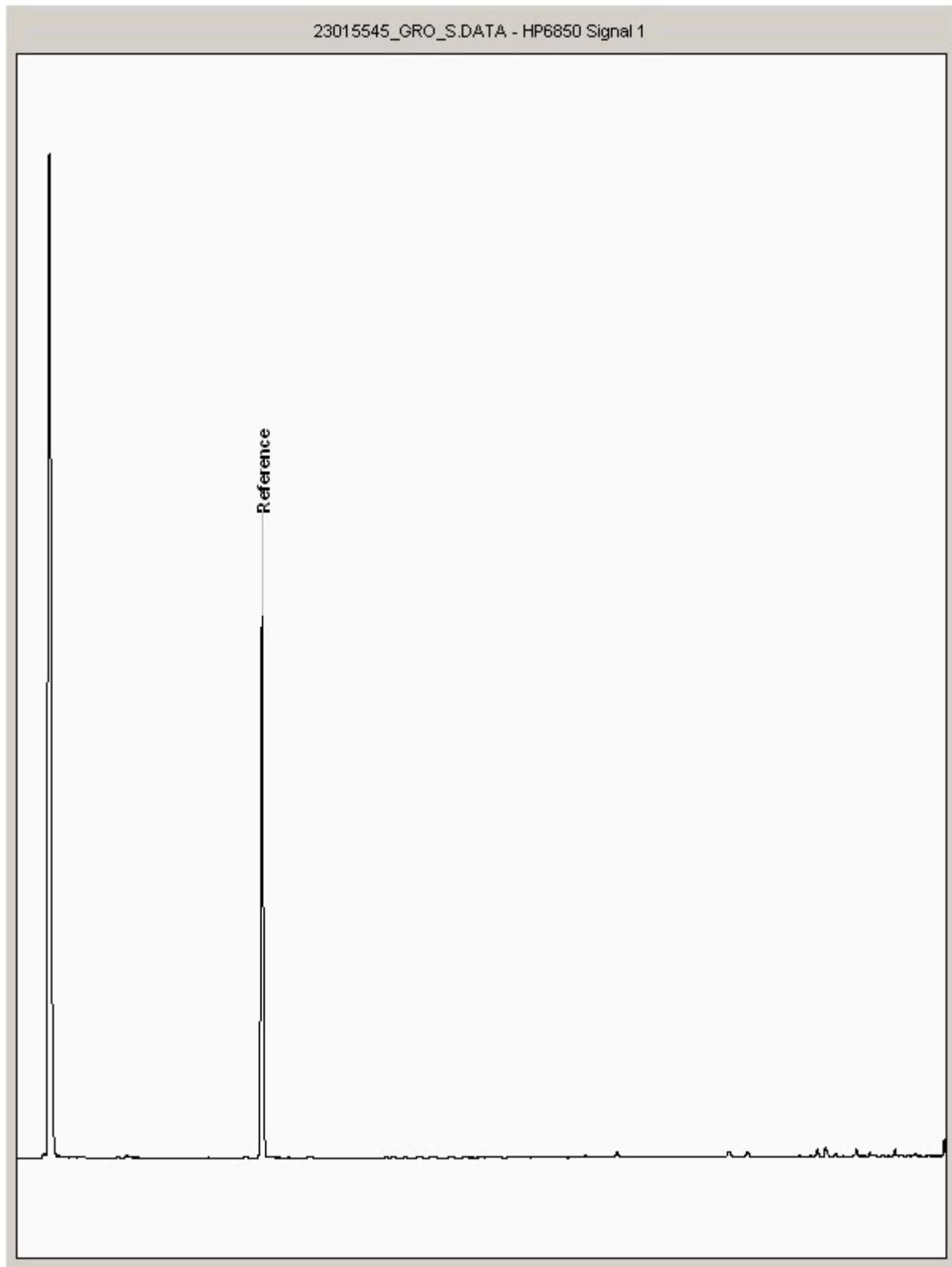
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23015545
Sample ID : TP105

Depth : 1.30 - 1.30





CERTIFICATE OF ANALYSIS

Validated

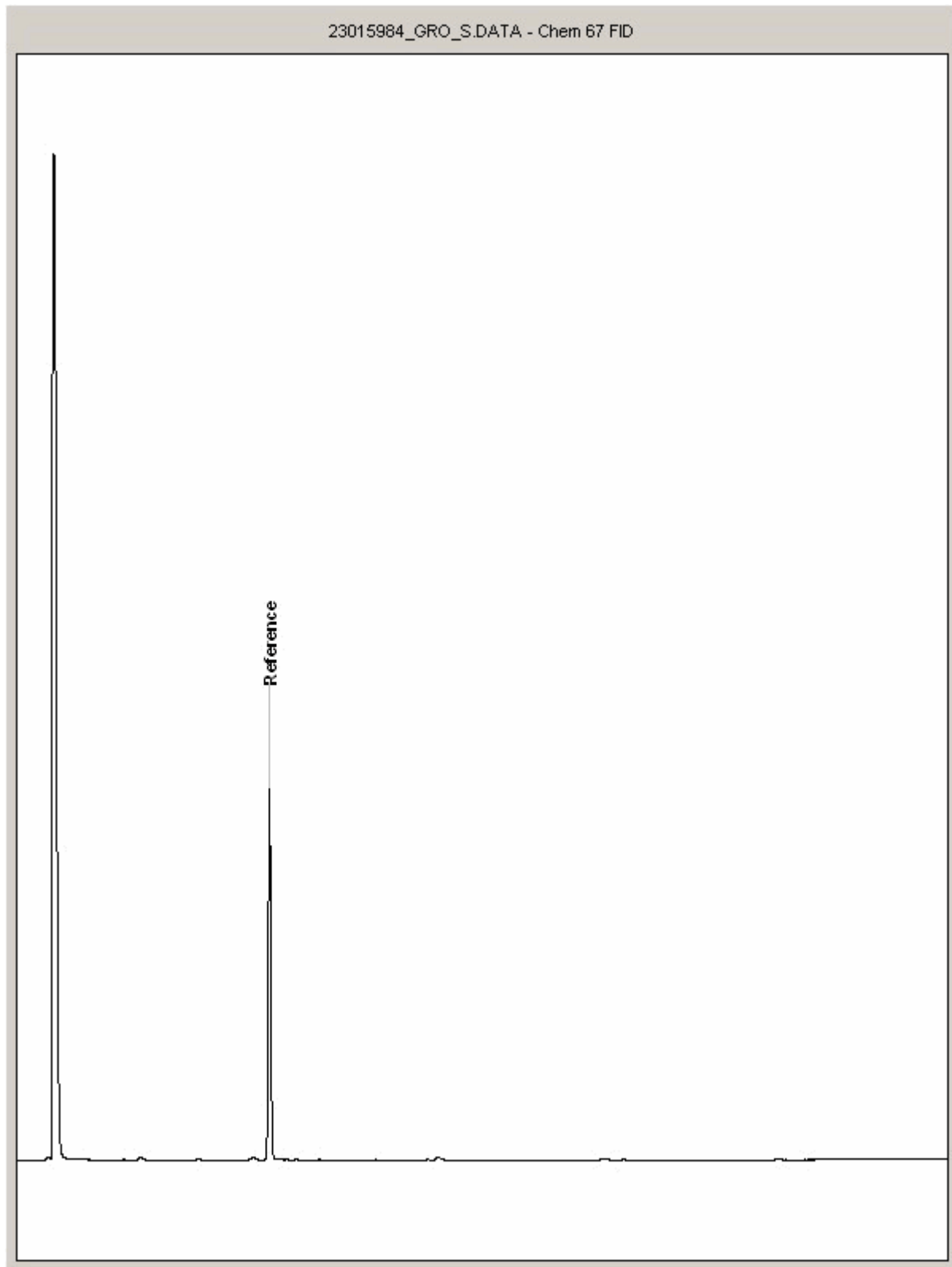
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23015984
Sample ID : TP103

Depth : 0.90 - 0.90





CERTIFICATE OF ANALYSIS

Validated

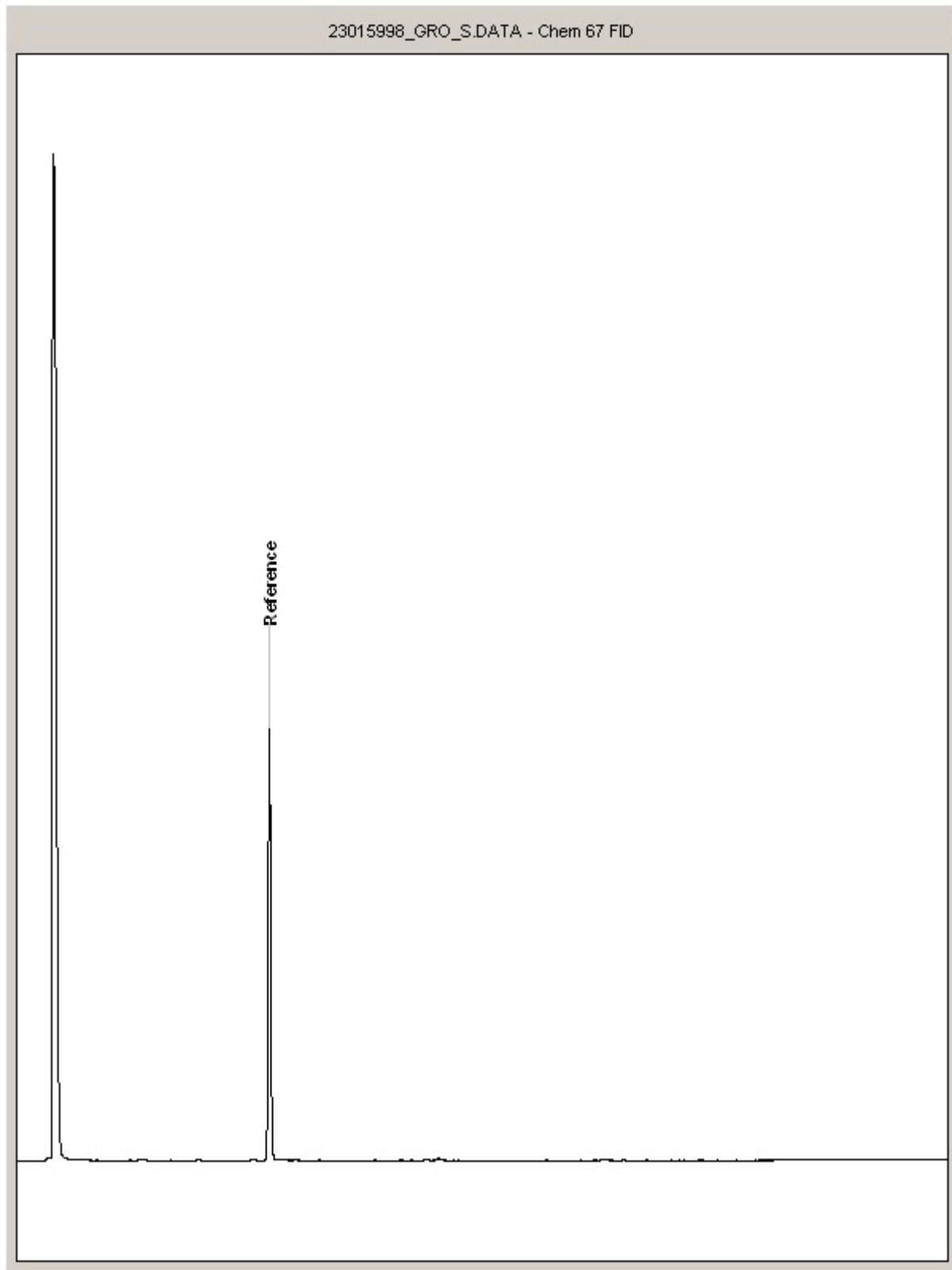
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23015998
Sample ID : TP101

Depth : 1.50 - 1.50





CERTIFICATE OF ANALYSIS

Validated

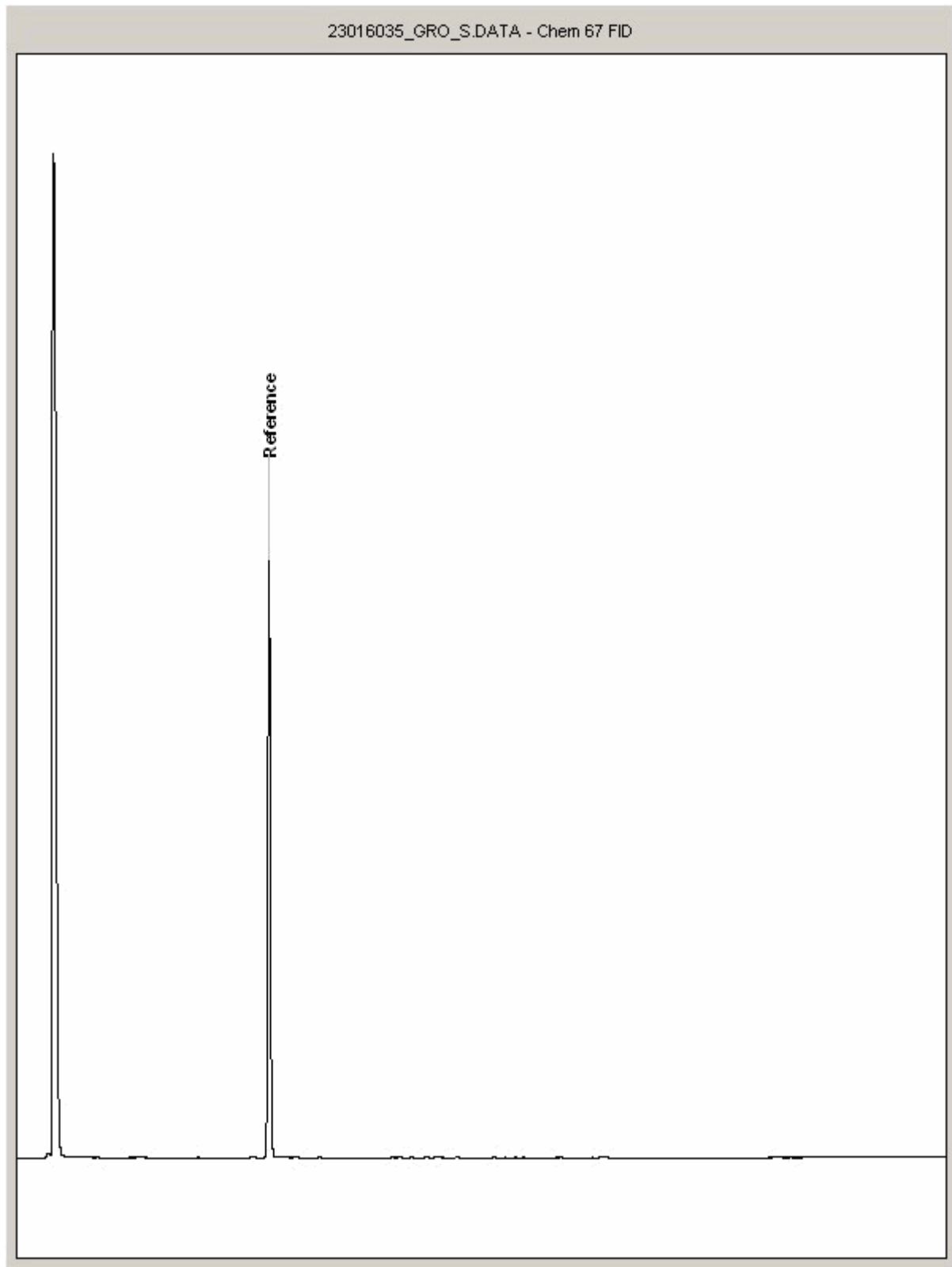
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23016035
Sample ID : TP102

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

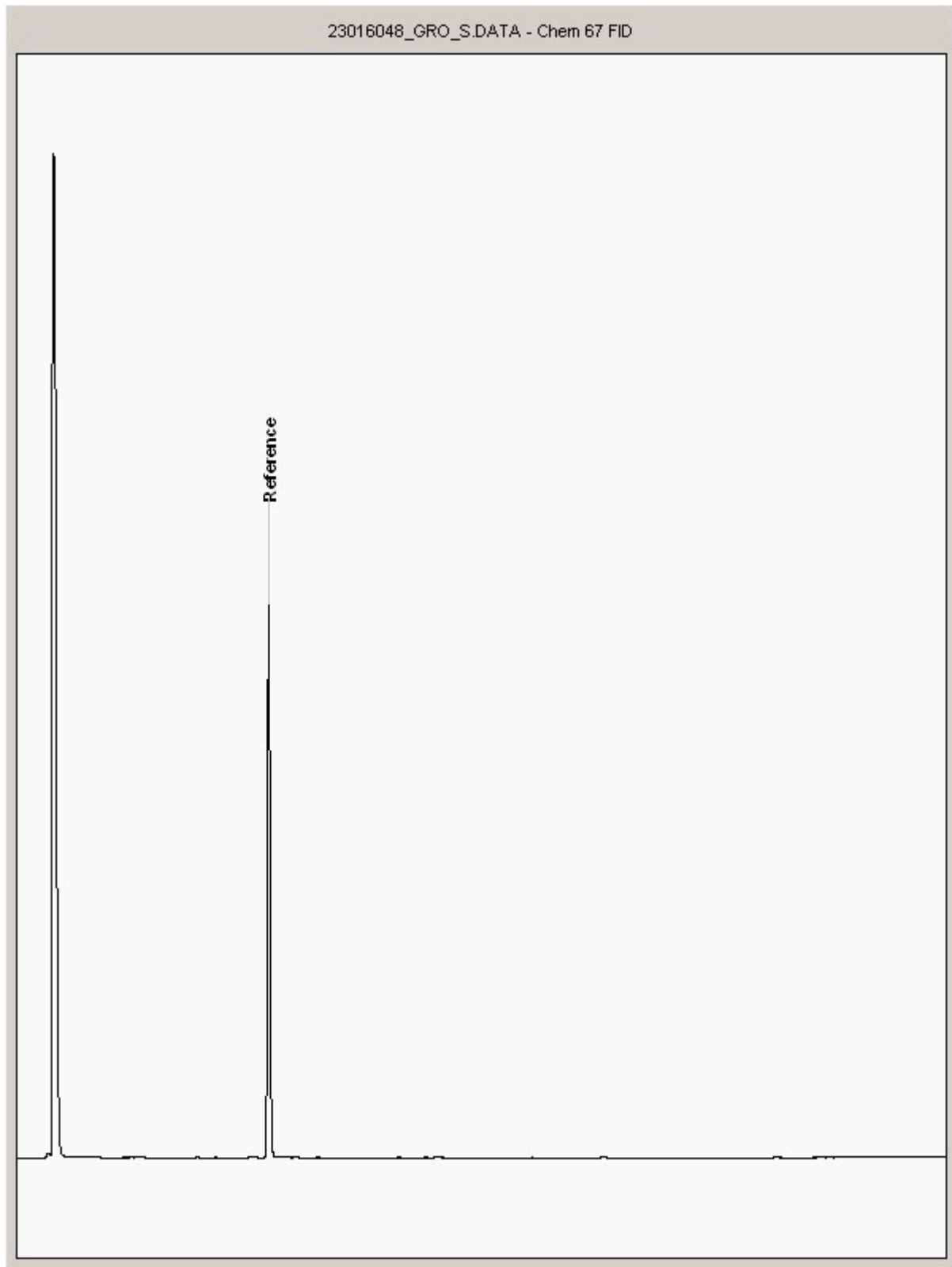
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23016048
Sample ID : TP105

Depth : 0.10 - 0.10





CERTIFICATE OF ANALYSIS

Validated

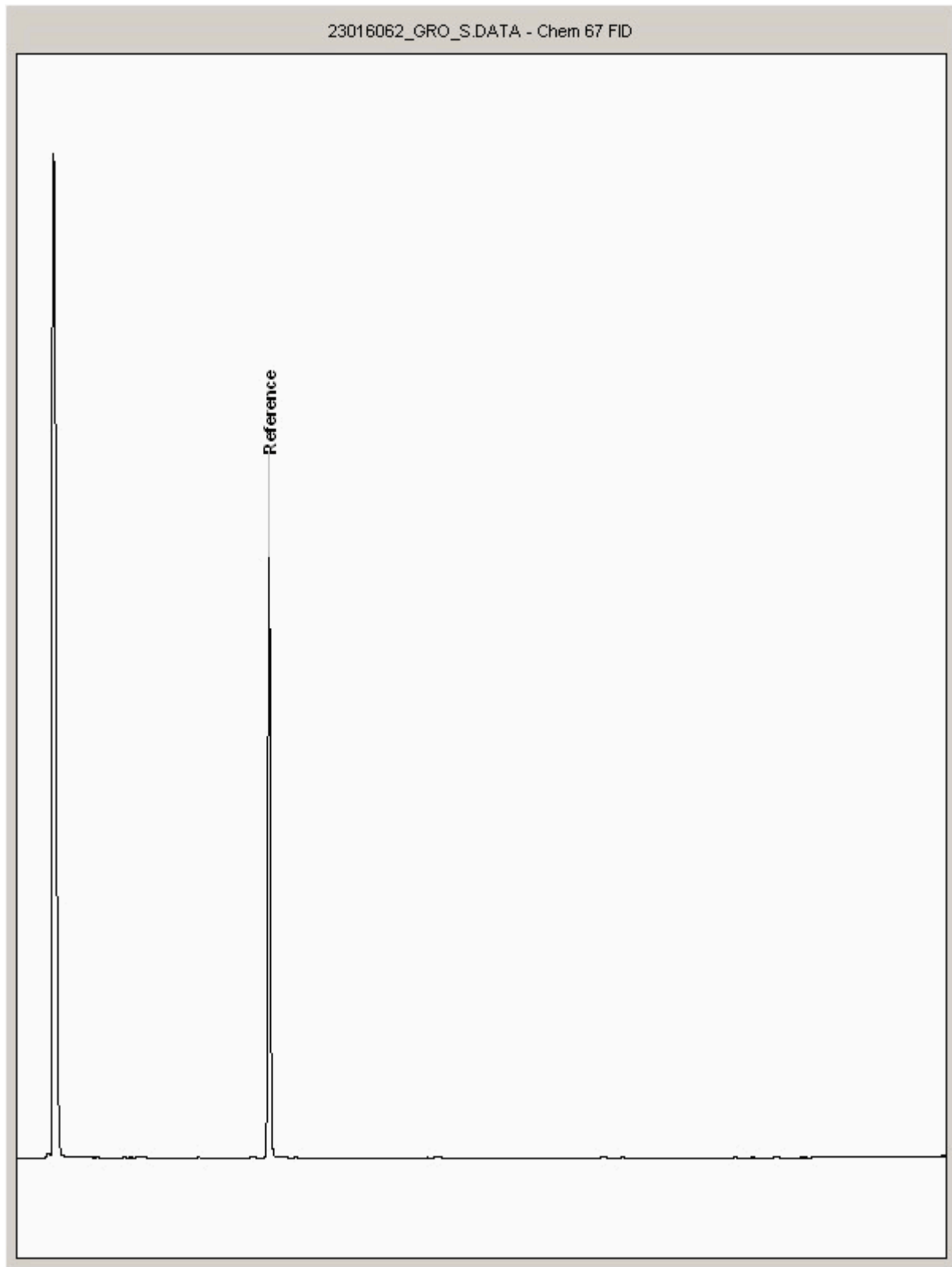
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23016062
Sample ID : TP104

Depth : 0.40 - 0.40





CERTIFICATE OF ANALYSIS

Validated

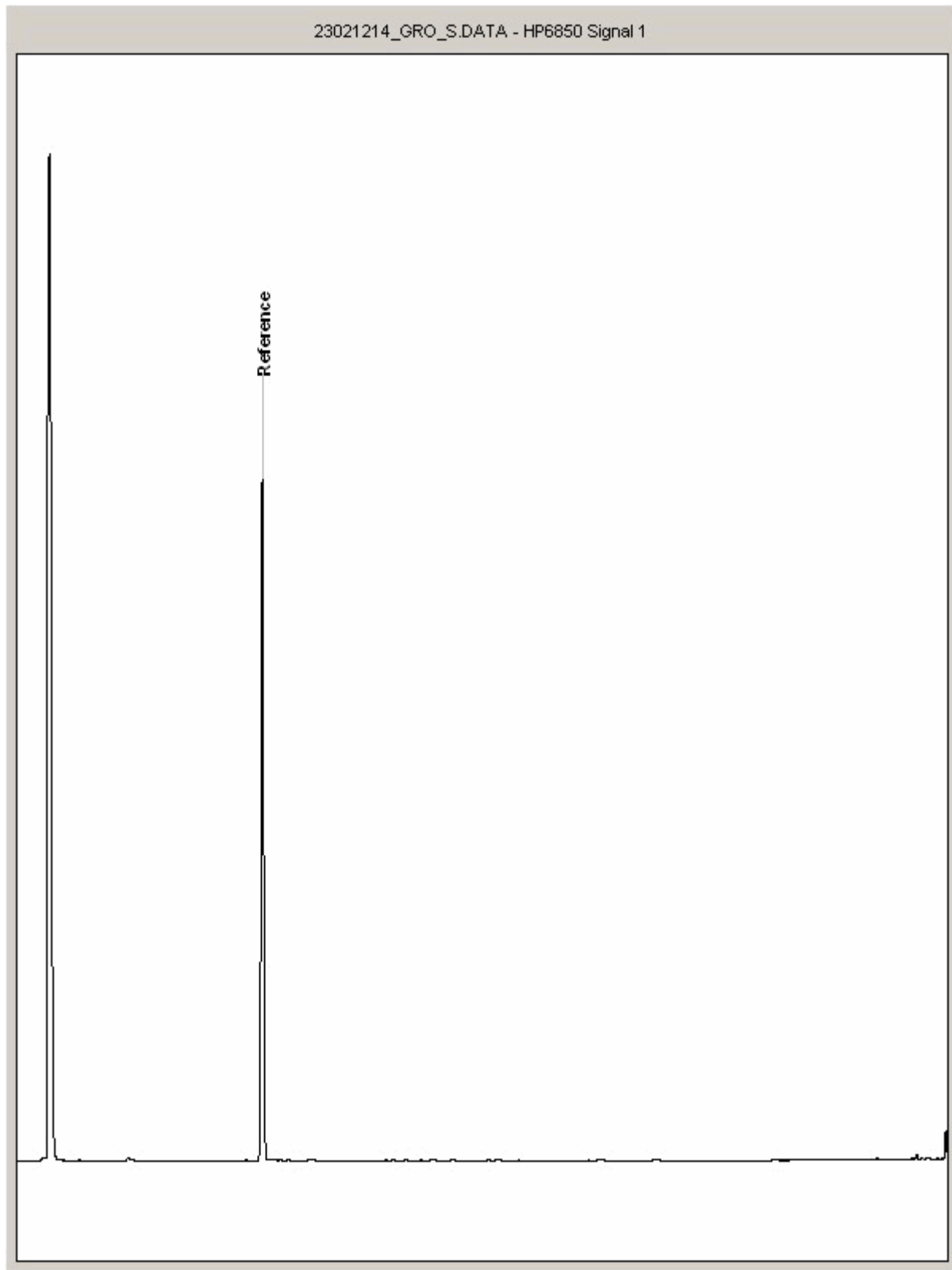
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23021214
Sample ID : TP102

Depth : 1.50 - 1.50





CERTIFICATE OF ANALYSIS

Validated

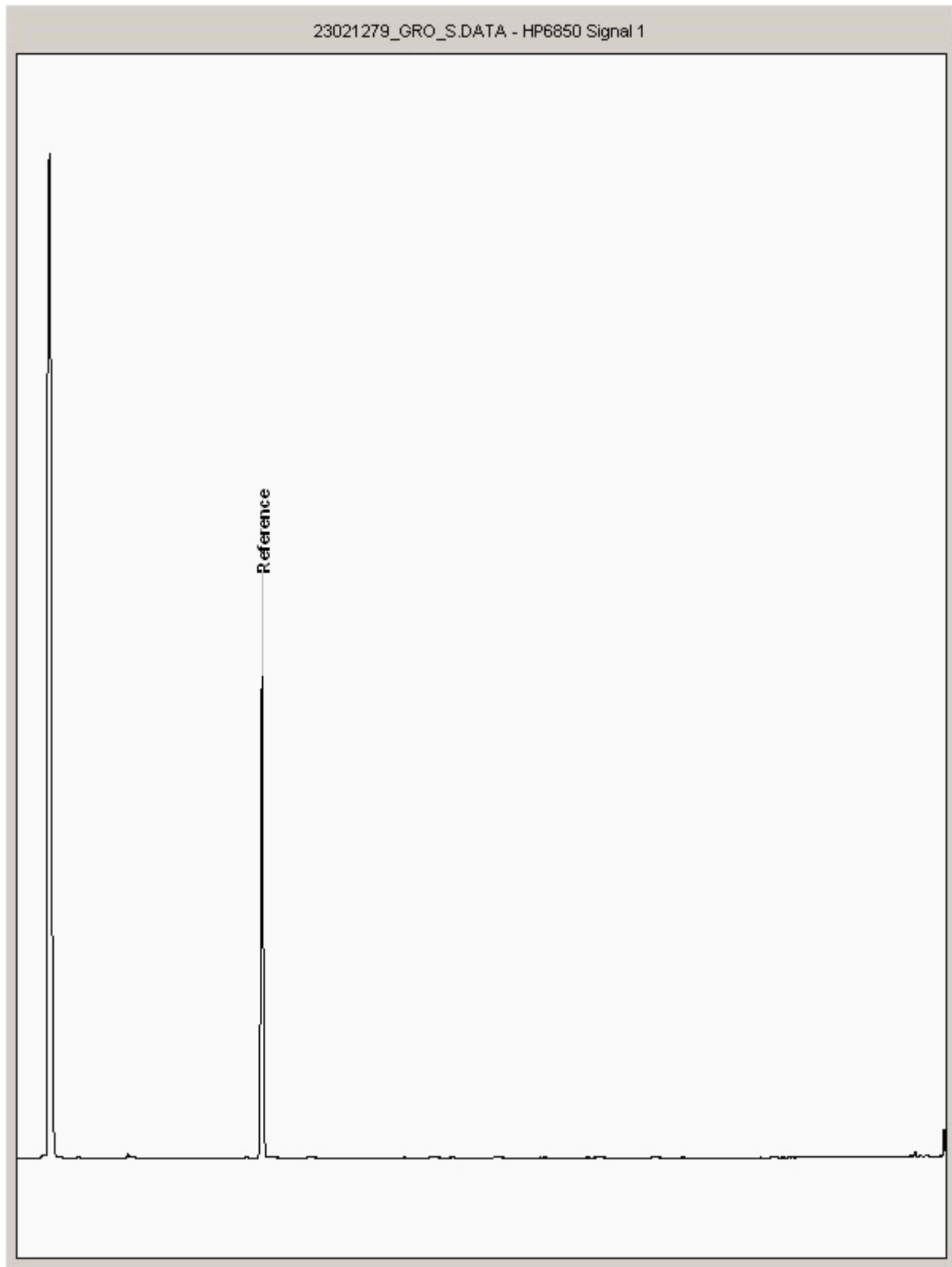
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23021279
Sample ID : TP101

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

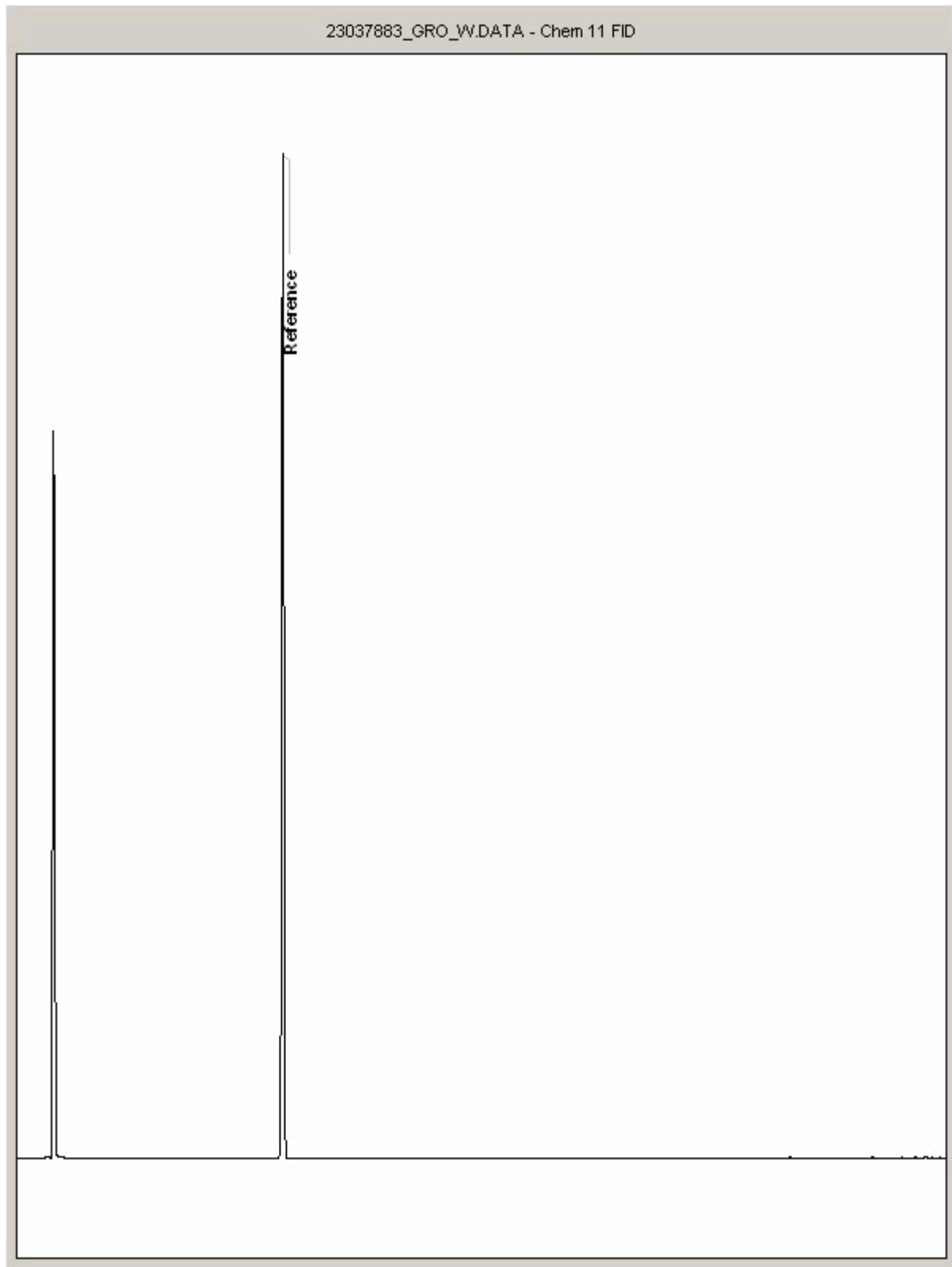
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 23037883
Sample ID : TP103

Depth : 0.90 - 0.90





CERTIFICATE OF ANALYSIS

Validated

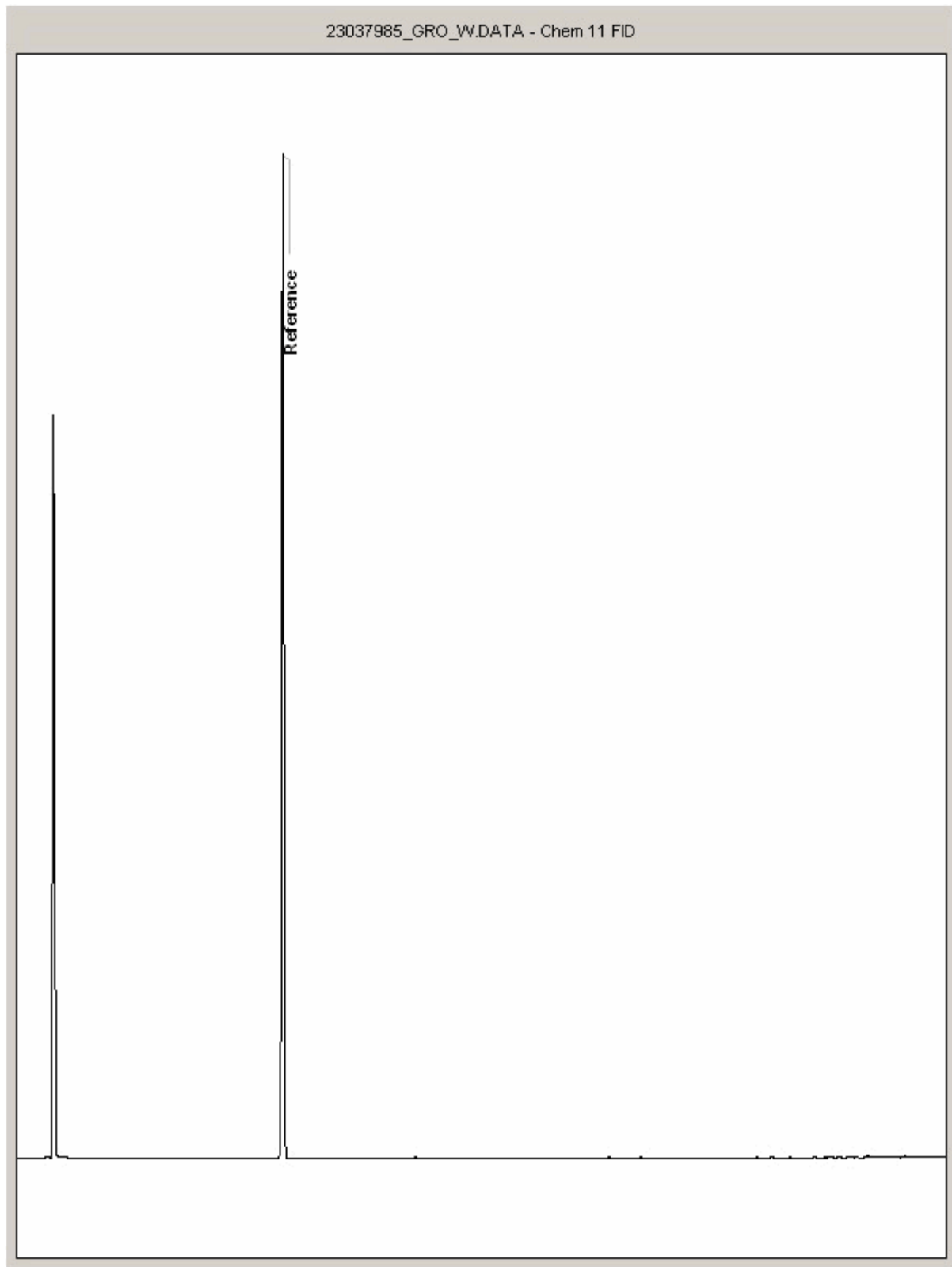
SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 23037985
Sample ID : TP105

Depth : 0.80 - 0.80





CERTIFICATE OF ANALYSIS

SDG:	201008-93	Client Reference:	70057278	Report Number:	572467
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	571541

Appendix

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

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

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



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

Attention: Katherine Prosser

CERTIFICATE OF ANALYSIS

Date of report Generation:	24 October 2020
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	201016-87
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	572480

We received 2 samples on Saturday October 10, 2020 and 2 of these samples were scheduled for analysis which was completed on Saturday October 24, 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:	201016-87	Client Reference:	70057278	Report Number:	572480
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23047245	TP106	ES	0.70 - 0.80	08/10/2020
23047253	TP107	ES	0.70 - 0.80	08/10/2020

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 201016-87 Client Reference: 70057278 Report Number: 572480
 Location: Port Talbot Harbourside Order Number: 70057278-P01 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)

23047245

23047253

Customer Sample Reference

TP106

TP107

AGS Reference

ES

ES

Depth (m)

0.70 - 0.80

0.70 - 0.80

Container

250g Amber Jar (ALE210)

60g VOC (ALE215)

250g Amber Jar (ALE210)

60g VOC (ALE215)

Sample Type

S

S

S

S

Cyanide Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 2

X

X

EPH CWG GC (S)

All

NDPs: 0
Tests: 2

X

X

GRO by GC-FID (S)

All

NDPs: 0
Tests: 2

X

X

PAH by GCMS

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: 201016-87 **Client Reference:** 70057278 **Report Number:** 572480
Location: Port Talbot Harbourside **Order Number:** 70057278-P01 **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
23047245	TP106	0.70 - 0.80	Dark Brown	Loamy Sand	Stones	Vegetation
23047253	TP107	0.70 - 0.80	Dark Brown	Sandy Loam	Vegetation	Stones

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:	201016-87	Client Reference:	70057278	Report Number:	572480
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	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
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by 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:	201016-87	Client Reference:	70057278	Report Number:	572480
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	23047245	23047253
Customer Sample Ref.	TP106	TP107
AGS Ref.	ES	ES
Depth	0.70 - 0.80	0.70 - 0.80
Type	Soil/Solid (S)	Soil/Solid (S)

Cyanide Comp/Free/Total/Thiocyanate	22-Oct-2020	22-Oct-2020
EPH CWG GC (S)	23-Oct-2020	23-Oct-2020
GRO by GC-FID (S)	22-Oct-2020	22-Oct-2020
PAH by GCMS	24-Oct-2020	24-Oct-2020
Sample description	21-Oct-2020	21-Oct-2020
TPH CWG GC (S)	23-Oct-2020	23-Oct-2020
VOC MS (S)	22-Oct-2020	22-Oct-2020



CERTIFICATE OF ANALYSIS

Validated

SDG: 201016-87
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

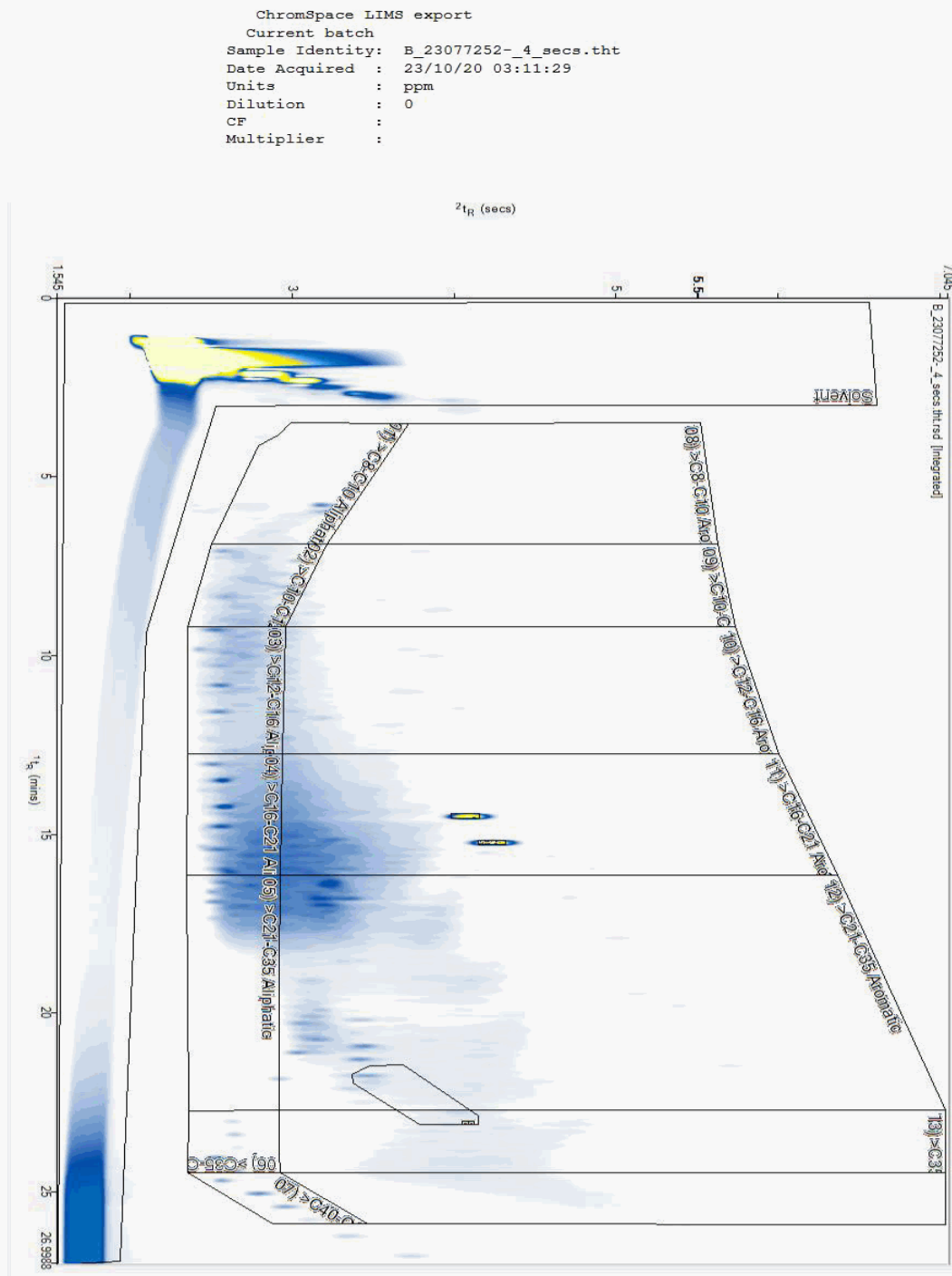
Report Number: 572480
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23077252
Sample ID : TP106

Depth : 0.70 - 0.80



SDG:	201016-87
<u>Location:</u>	Port Talbot Harbourside

Client Reference:	70057278
Order Number:	70057278-P01

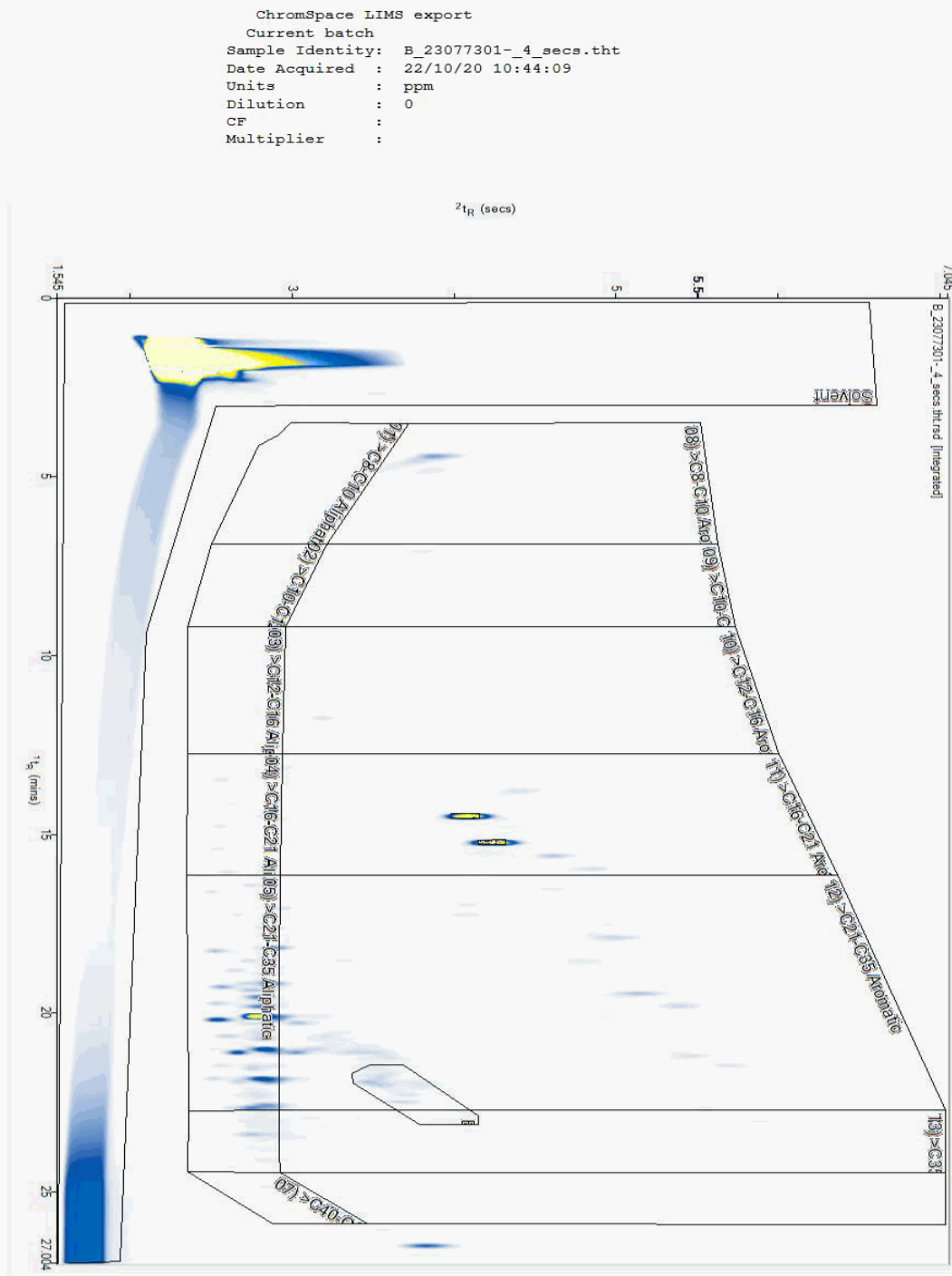
Report Number: 572480
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23077301
Sample ID : TP107

Depth : 0.70 - 0.80





CERTIFICATE OF ANALYSIS

Validated

SDG: 201016-87
Location: Port Talbot Harbourside

Client Reference: 70057278
Order Number: 70057278-P01

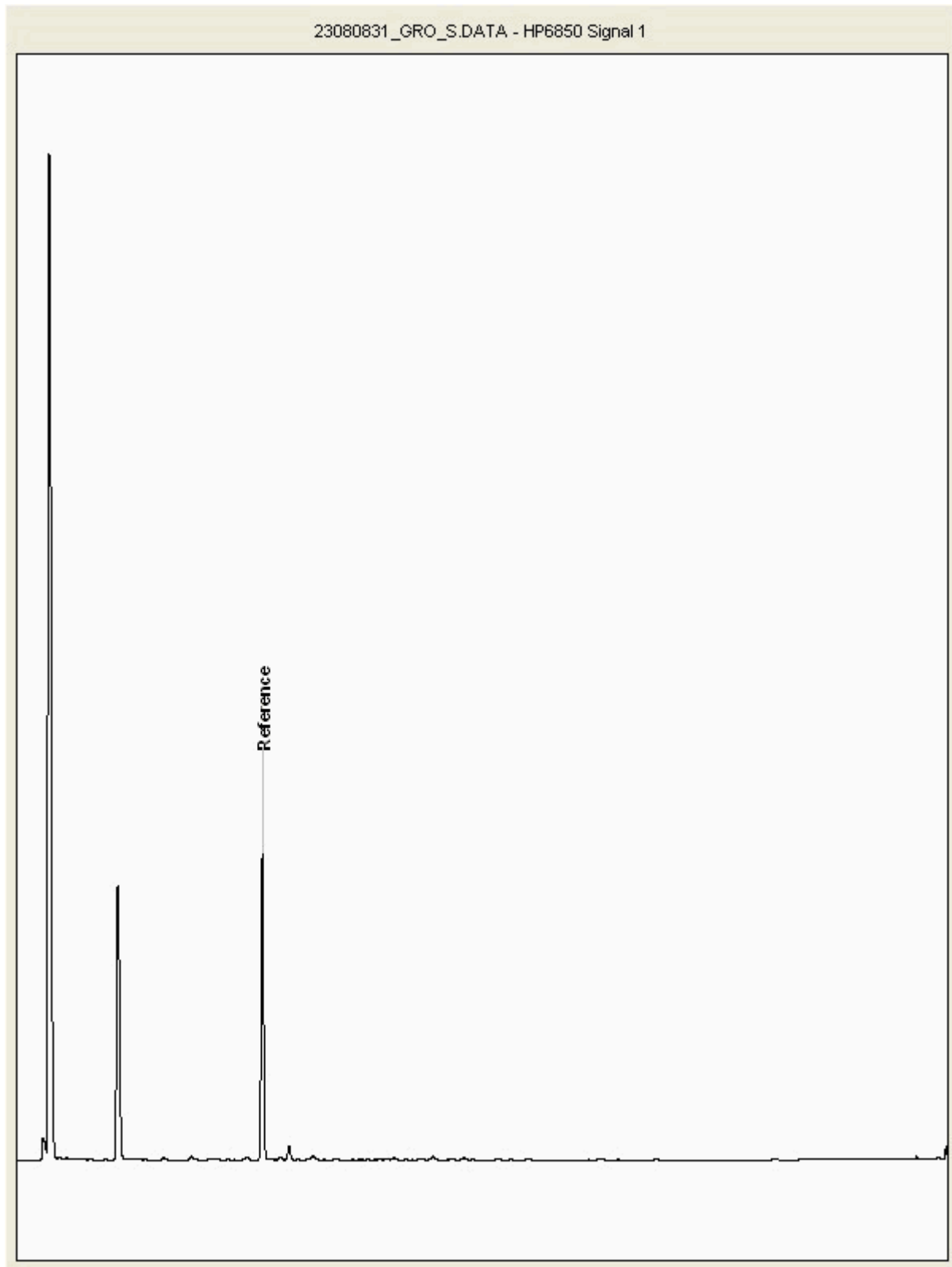
Report Number: 572480
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23080831
Sample ID : TP107

Depth : 0.70 - 0.80





CERTIFICATE OF ANALYSIS

Validated

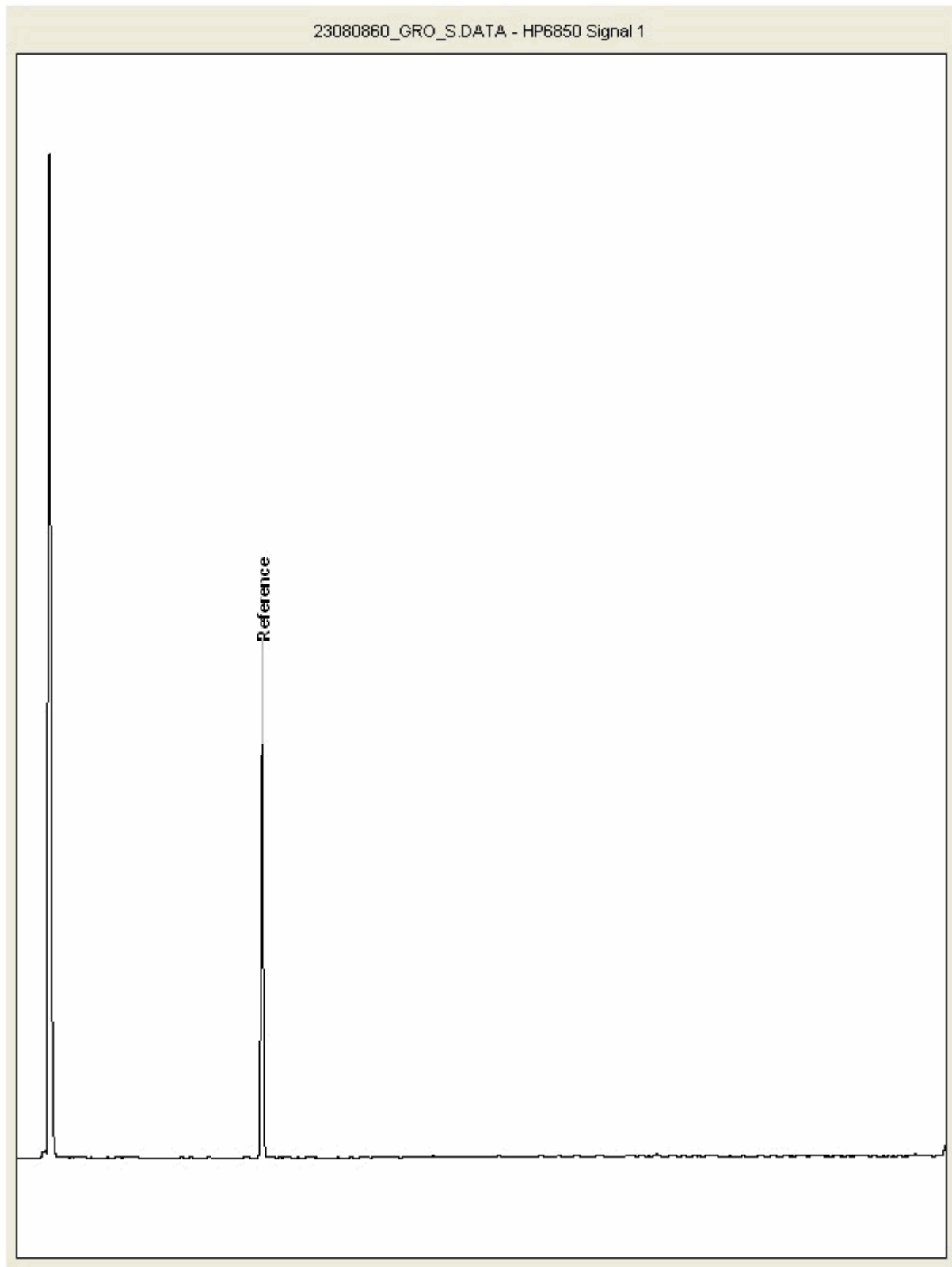
SDG:	201016-87	Client Reference:	70057278	Report Number:	572480
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23080860
Sample ID : TP106

Depth : 0.70 - 0.80





CERTIFICATE OF ANALYSIS

SDG:	201016-87	Client Reference:	70057278	Report Number:	572480
Location:	Port Talbot Harbourside	Order Number:	70057278-P01	Superseded Report:	

Appendix

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

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

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

Appendix E

PHOTOGRAPHIC LOG





Photo 1: The gas holder base, view to the east. (WSP, October 2020)

wsp



Photo 2: TP101 with groundwater resting at 1.5m bgl. (WSP, October 2020)

wsp



Photo 3: TP102. (WSP, October 2020)

WSP



Photo 4: TP103. (WSP, October 2020)

WSP



Photo 5: TP104. (WSP, October 2020)

WSP



Photo 6: TP105. (WSP, October 2020)

WSP



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