



Andrew Scott Ltd

PORT TALBOT HARBOURSIDE

Remediation Verification Report





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Remediation Verification Report

VERSION 1 – CONFIDENTIAL

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EXECUTIVE SUMMARY

WSP UK Ltd. (WSP) were commissioned by Andrew Scott Ltd (ASL). to provide remediation stewardship and verification of remedial works at the Port Talbot Harbourside site. The remediation works were part of an enabling and site preparation package of works for Neath Port Talbot County Borough Council, completed under planning permission P2020/0294.

The remediation works were completed by ASL in general accordance with the approved remediation strategy and included the removal of 618m³ hydrocarbon impacted soils, skimming and removal of 21,160L LNAPL from open excavations and installation of a 600mm capping layer across the site surface. LNAPL source removal works were validated through the installation of groundwater monitoring wells, which were monitored on a weekly basis for three months. No LNAPL was identified in any location.

Elevated concentrations of hydrocarbons remain in the area subject to LNAPL removal, however significant betterment has been achieved through the source removal works, and natural attenuation will allow for the improvement in groundwater conditions.

There are no unacceptable risks identified following completion of the remedial activities to the identified receptors based on current site condition (vacant land). However, during future development, consideration should be given to the following:

- Maintaining appropriate capping layer to prevent pathways between underlying contaminated soils and future site users (commercial development);
- Appropriate work control procedures during future excavation works;
- The use of appropriate construction materials in future developments including buried structures and utility infrastructure with consideration to the elevated concentrations of hydrocarbons observed at the Site including sealing ducting to prevent the creation of vapour pathways into future buildings.

This report is deemed suitable to discharge Planning Condition 6 (remediation verification) of planning application P2020/0294 and should be included in the projects Health and Safety File to ensure potential risks are identified during future development works.

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1 INTRODUCTION

1.1 AUTHORISATION

This document presents the verification for the remediation works completed by Andrew Scott Ltd (ASL) (the Client) at the Port Talbot Harbourside, Cramic Way, Port Talbot, SA13 1RZ (hereafter referred to as 'the Site'). The remediation works were part of a wider construction project at the Site, completed by ASL to allow future commercial development.

WSP UK Ltd (WSP) was instructed by ASL to provide stewardship, advice, part time supervision and validation during the remediation works at the Site.

A Verification Report is required to support the proposed redevelopment of the Site, through planning permission, application reference P/2020/0294. The remediation to enable the redevelopment was completed by ASL. WSP provided part time attendance during the remediation works to verify the completion of the works in accordance with the agreed strategy. This report has been produced using information and site records provided by ASL along with information gathered by WSP during site visits.

1.2 INTRODUCTION AND SITE CONTEXT

The Site is located between Old Dock Road and Harbour Way (A4241) on the southern boundary and Cramic Way to Port Talbot Parkway Railway Station on the northern boundary. The Site comprises a approximately rectangular parcel of land which is approximately 2.8 ha in area. The site location is provided as Figure 1, presented in Appendix A.

A planning application was submitted by Neath Port Talbot County Borough Council (NPTCBC), reference P2020/0294, for the proposed works which covered enabling and remediation works at the Site. A plan indicating the proposed development layout is included as Figure 2 (Appendix A).

Several conditions were imposed on the application (refer to Appendix B), of which Condition 5 related to the management of potential land contamination. WSP produced a remediation strategy on behalf of NPTCBC (prior to the commission by ASL) which formed part of the planning conditions associated with the planning application for the new development as follows:

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

This report details the remediation works that have been completed in line with the Remediation Strategy and Verification Plan contained therein.

1.3 OBJECTIVES

In line with the Remediation Strategy, the objective of the remediation works were:

- To render the site suitable for proposed future commercial development use; and,
- Mitigate identified risks to controlled waters receptors associated with the presence of LNAPL.

To fulfil the objectives, the Remediation Strategy proposed the following:

- Removal of identified hydrocarbon impacted soils and groundwater (including the presence of Light Non-Aqueous Phase Liquid (LNAPL); and,
- Installation of a capping layer across the site surface.

1.4 OUTLINE SCOPE OF PROJECT

NPTCBC commissioned ASL following a competitive tender process to complete the scope of works presented below (see Figure 2, Appendix A), completed in accordance with the conditions imposed under planning application P2020/0294 (included as Appendix B).

- Site clearance;
- Removal of underground structures to 1.5m bgl;
- Completion of remediation works (detailed in Section 1.5);
- Flood mitigation works including the construction of a culvert leading to Port Talbot Docks and raising of site levels to 7.5 m AOD across the Site;
- Construction of a carriageway through the centre of the Site;
- Ecological improvement works;
- Car parking improvement works at the adjacent train station; and,
- Upgrade of adjacent Cramic Way.

1.5 OUTLINE SCOPE OF REMEDIATION WORKS

To achieve the remediation objectives, the remediation works completed by ASL included the following key activities, described in more detail in Section 3 of this report:

- Removal of hardstanding from the site surface;
- Removal of obstructions / sub-surface structures where identified;
- Removal of licensed and non-licensed asbestos;
- Excavation of hydrocarbon impacted soil in the areas previously identified as containing LNAPL;
- LNAPL removal from open excavations, where identified;
- Disposal of unsuitable material;
- Reuse of site won material involving crushing of concrete to 6F2;
- Reinstatement of excavations; and,
- Installation of a capping layer across the finished site surface.

1.6 DETAILS OF PROJECT RELATED PERSONNEL

The details of project related personnel involved with project delivery are included in Table 1-1.

Table 1-1 – Project Related Personnel

Project Responsibility	Name	Company
NPTCBC (Landowner) Project Manager	Ken Stacey	Neath Port Talbot County Borough Council
Client Project Manager	William Pugh	Andrew Scott Ltd

Project Responsibility	Name	Company
Contaminated Land Officer	Mohammed Muttakir	Neath Port Talbot County Borough Council
Site Manager	Mark Reece	Andrew Scott Ltd
Contractor Environmental Support	Rhys Evans	WSP

1.7 LIMITATIONS

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

- 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 reviewed.

General limitations of the assessment are included in Appendix C.

1.8 ADDITIONAL REPORTS

This report should be supplemented, where appropriate, by the below reports:

- WSP UK Ltd, Port Talbot Harbourside – Materials Management Plan Validation Report, Ref. 70057278-MMP, Dated April 2022; and
- WSP UK Ltd, Port Talbot Harbourside – Geotechnical Validation Report, Ref. 70057278-GEO, Dated May 2022.

2 BACKGROUND INFORMATION

This section presents a high-level overview of background information pertaining to the Site and the remediation works. Information has been taken from previous site investigations and the Remediation Strategy completed by WSP (see Section 2.1).

2.1 PREVIOUS REPORTS

- Opus Phase I Desk Study Report, Ref: V-C8602.01-OIC-00-XX-RP-01, Dated July 2017;
- Opus International Consultants (UK) Ltd, NPT Harbourside Interpretative Geo-environmental Ground Investigation Report, Ref: V-C8602.01/OIC/00/XX/RP/02, Dated September 2017;
- Opus International Consultants (UK) Ltd, NPT Harbourside – Addendum Ground Gas Letter Report, Ref: V-C8602.01-OIC-20171012-NPTCBC-01, dated October 2017;
- WSP UK Ltd, Port Talbot Harbourside Generic Quantitative Risk Assessment, Supplementary Site Investigation Report, Ref 62253048-001, Dated March 2020;
- WSP UK Ltd, Port Talbot Harbourside Controlled Waters Detailed Quantitative Risk Assessment, Ref 62253048-002, Dated February 2020;
- WSP UK Ltd, Port Talbot Harbourside, Factual Report – Additional Product Investigation, Ref. 62253048-003, dated March 2020; and,
- WSP UK Ltd, Port Talbot Harbourside, Remediation Strategy, Ref. 62253048-004, dated June 2020.

2.2 SITE LOCATION AND DESCRIPTION

The Site is located between Old Dock Road and Harbour Way (A4241) on the southern boundary and Cramic Way to Port Talbot Parkway Railway Station on the northern boundary. The Site comprises a approximately rectangular parcel of land which is approximately 2.8 ha in area. The western portion of the Site is bound with earth bunds whilst the northern and eastern boundaries are open. The southern boundary is fenced.

The Site is located on a section of land which, in general, is relatively flat except for a raised earth bund, approximately 2.0 m in height, in the western area of the Site. The Site boundary is confined by large boulders and fencing along its eastern and southern boundaries and soil bunds along the western boundary. The northern site boundary is open onto a public footpath.

All buildings previously occupying the Site associated with the site's historical use as a Steel and Chemical Works have been demolished but areas of concrete slab, asphalt/tarmacadam surfacing and hardstanding associated with these buildings remain amongst surface vegetation.

2.3 SITE HISTORY

Prior to 1876 the Site predominantly consisted of marshes and agricultural land. Post 1876 the Site was developed to include buildings and tanks, which included a gas holder on its eastern side. By 1921 the Site was part of the Port Talbot Steel Works which included railway lines to the north and south. From 1964 the Site had been further developed and renamed as a Chemical Works, whilst the railway lines and gas holder had been removed new above ground tanks had been added. These

above ground tanks were no longer present on Site by 1991, and the Site became part of the wider industrial estate. Between 1997 and 2007 all buildings had been demolished.

2.4 GEOLOGY

Geological information has been collated from the previous site investigations, in addition to information obtained from the British geological Society (BGS).

2.4.1 MADE GROUND

The Made Ground encountered across the Site is predominantly granular and coarse in nature, comprising a mixture of ash, slag, brick, concrete and stone with various inclusions of deleterious material including metal, glass and wood. The thickness of the Made Ground ranges from 1.0 m to 3.5 m below ground level (bgl), with an average thickness of 2.0 m. Several concrete slabs are noted across the Site, both at surface level and encountered at shallow depth.

2.4.2 SUPERFICIAL DEPOSITS

As detailed in the BGS maps, the Site is fully underlain by the Tidal Flat Deposits (clay, silt and sands).

In most of the exploratory holes that encountered natural strata, variable granular and cohesive superficial deposits were encountered beneath the Made Ground.

Alluvial Silt is present in the majority of exploratory hole locations and was encountered directly underlying the Made Ground. The Alluvial Silts were encountered between 1.60 m and 4.0 m bgl and described as a soft dark grey slightly sandy gravelly silt. Occasional organic material was also encountered.

Alluvial Gravel deposits were encountered in all locations across the Site between 1.6 m and >10.0 m bgl (maximum proven depth) with a maximum strata thickness of >6.20 m and generally comprised dark brownish grey sandy slightly silty gravel. The gravel was described as fine to coarse, well rounded to sub-rounded sandstone. Cobbles were noted within the majority of boreholes.

2.4.3 SOLID GEOLOGY

The BGS maps and Geotitles indicates that the Site is underlain by South Wales Middle Coal Measures Formation (interbedded mudstone, siltstone and sandstone).

Information provided in the Opus reports indicate that a layer of strong, thinly interbedded fine grained, highly weathered sandstone and weak, grey, highly weathered mudstone was encountered in BHH04 from 6.5 m bgl to greater than 8.0 m bgl, where the borehole was terminated.

2.5 HYDROGEOLOGY

The superficial deposits underlying the site have been classified by the Environment Agency (EA) as a Secondary Aquifer (undifferentiated) of high permeability and the bedrock as Secondary 'A' Aquifer (permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers).

As described in previous reports, groundwater is typically encountered at a depth of approximately 1.5 m – 2.5 m bgl beneath the majority of the Site, although on the raised earth bund at the west of the Site, is present at approximately 4.0 m – 4.5 m bgl, primarily within the Alluvial Deposits. Groundwater elevation across the Site is typically 4.5 m – 5.5 m AOD.

The River Afan flows generally north-east to south-west and has been classified by the Environment Agency as having a River Quality Objective Grade 1, with a Chemistry General Quality Assessment Grade 'A', i.e. of very good quality that is suitable for salmonid fishery.

Licensed surface water abstractions have not been reported within a 500 m radius of the Site.

None of the aquifers beneath the Site are currently known to be used for potable water resource. Additionally, no licensed groundwater abstractions have been identified within a 1 km radius of the Site and no Groundwater Source Protection Zones (SPZ) are not located within 10 km of the Site.

2.6 HYDROLOGY

The nearest surface water features to the Site are the Port Talbot Docks which lie approximately 60 m to the south and the River Afan some 370 m to the north-west at its closest distance. A small unnamed pond also lies approximately 80 m south-east of the Site.

The Port Talbot Dock maybe in continuity with surrounding groundwaters in the area directly south of the Site. However, the dock does include a concrete wall to the west. Information provided by the Marine Operation Supervisor of the Port Talbot Dock has confirmed that the water levels of this dock are managed. The Dock is fed by the River Afan through a Dock Feeder located approximately 570 m west of the Site.

2.7 CONTAMINATION

2.7.1 SUMMARY OF PREVIOUS RISK ASSESSMENTS

Investigations completed prior to the construction project, completed by Opus International Consultants (UK) Ltd (now WSP) and WSP, were used to support the planning application, are summarised below. Exploratory locations included within this discussion are included as Figure 3 (Appendix A).

Human Health

The primary risk to human health on site was considered to be the inhalation of vapours from impacted soil, groundwater and LNAPL by future users of the commercial premises. Soil concentrations of benzene, naphthalene and aliphatic C8-10 hydrocarbons exceeded a commercial screening at BH104 (3 m bgl). The groundwater vapour generic assessment criteria (GAC), protective of indoor commercial workers, screening value for benzene was exceeded in BHC5, combined with the LNAPL recorded in this area of the Site (BHC5 and BH104_2019) was considered to create a localised source zone. Without empirical soil vapour monitoring and assessment, the potential risk to human health associated with vapours derived from impacted soil/groundwater/product was considered to be moderate.

In addition, lead was identified above commercial GAC at two exploratory locations from samples within the Made Ground, and the presence of asbestos on Site was considered to pose a potential risk in areas of softstanding.

Controlled Waters

Groundwater monitoring in August 2019 following supplementary ground investigation, recorded additional free phase LNAPL in boreholes BHC5 (apparent thickness of 0.03 m) located in the western tank farm and BH104 (apparent thickness of 0.77 m) located approximately 30 m north of BHC5.

Laboratory analysis indicated that detections of total petroleum hydrocarbons (TPH) and BTEX (benzene, toluene, ethylbenzene and xylene) concentrations in groundwater were limited to samples taken from BH105 and BHC5 (maximum TPH 180 mg/l and benzene 64.1 mg/l at HC5). Detections of polyaromatic hydrocarbons (PAH) compounds were lower in concentration and more widely spread but with maximum concentrations detected in samples taken from BHC5 and BH105. Laboratory analysis of a free product sample retrieved from BH104 indicated that the free phase was a petrol range hydrocarbon between C6-C18 and based on a high-level assessment of hydrocarbon band isotope comparison, was estimated at between 1 and 5 years old.

Further product investigation completed in December 2019 and January 2020, identified LNAPL within BH204A and TP203A, hydrocarbon odours and sheens were also noted on groundwater in BH203. Groundwater samples collected from BH202, BH203 and BH205 recorded TPH concentrations below limit of detection (LOD) indicating a limited lateral extent around the primary hotspots. A product sample collected from BH204 was submitted for fingerprint analysis which indicated it was a possibly petrol/kerosene range hydrocarbon (C6-C15) aged at >10 years.

A controlled waters detailed quantitative risk assessment (DQRA) was completed to further assess potential risks identified at generic quantitative risk assessment (GQRA) stage, focussing on dissolved phase concentrations within the groundwater. The DQRA only assessed those risks from the dissolved phase and assumed that the observed LNAPL at the Site would be removed/treated.

The DQRA model was set up using the probabilistic modelling software ConSim. Initial model results, from previous investigation works, suggested a potentially unacceptable risk if assuming the Port Talbot Dock to be the critical receptor. Yet in 2019, WSP monitoring of groundwaters suggested a more westward flow towards the River Afan and Dock Feeder. By consequently assuming this groundwater flow and selecting the Dock Feeder as the closest receptor in that direction (approximately 570 m west) then the risk projections were no longer present. Furthermore, it was considered that should a component of groundwater flow pass south, then dilution ratios in the Port Talbot Dock would likely be very high, reducing the potential for the projected dissolved phase risk. This was supported by a lack of hydrocarbon impact in the surface water samples taken from the Port Talbot Dock and the Dock Feeder.

In summary, the Part 2A regime as reflected within Local Authority planning, seeks to avoid disproportionate regulation being applied to contaminated land causing only low amounts of contamination to the water environment. A consideration of certainty and reasonableness is expected. Following removal of LNAPL, the balance of probabilities of dissolved phase contributions to the identified receptors, based on the data available was considered to be low.

2.7.2 SUMMARY OF CONTAMINANT LINKAGES

In the context of noted exceedances, identified risks at the Site and its proposed development, contaminant linkages were identified following a quantitative assessment as presented in Table 2-1, and required further consideration to mitigate potential risks.

Table 2-1 – Potential Contaminant Linkages (PCL)

PCL	Source / Contamination	Pathways	Receptors*
PCL1	Asbestos and elevated metal concentrations in Made Ground across the Site	Inhalation and ingestion in areas of soft standing	Future site users, neighbours and members of the public
PCL2	Elevated hydrocarbon concentrations in soil and NAPL in soil	Inhalation of hydrocarbon vapours (indoors) through vertical migration through unsaturated soil pore space	Future site users
PCL3	Elevated hydrocarbon concentrations in groundwater and NAPL on groundwater	Inhalation of hydrocarbon vapours (indoors) through vertically migration from saturated and smear zone to unsaturated zone pore space	Future site users
PCL4	NAPL on groundwater and in soils	Lateral migration on groundwater	Groundwater beneath the Site and surface water features (Port Talbot Docks and the River Afan)**

* Construction workers have been excluded from this assessment. It is assumed that potential risks associated with the proposed construction works will be mitigated through adequate risk assessment and method statements, and where required the use of personal protective equipment.

** This is based on the findings of the completed DQRA (WSP, 2020) which indicated that groundwater concentrations at the Site do not pose a significant risk to the identified receptors should the NAPL be removed.

3 REMEDIATION WORKS SCOPE

3.1 OUTLINE STRATEGY AND METHODOLOGY

The section below provides an overview of the remediation strategy, with further details included within the Remediation Strategy (WSP, 2020)

3.1.1 PCL1 - ASBESTOS AND ELEVATED METALS IN MADE GROUND

The most viable approach to the mitigation of the inhalation pathways associated with the asbestos fibres, is to install a cover system in all areas of soft landscaping.

The earthworks scope would broadly consist of the following:

- Removal of the necessary Made Ground and appropriate stockpiling for waste classification and disposal, or characterisation for suitability for reuse;
- Bulk fill where required; and,
- Installation of a 600 mm capping layer to raise land to 7.50 m AOD.

Following liaison with NPTCBC contaminated land officer, it was agreed that the capping layer would comprise a mixture of imported aggregate material (tested to confirm adherence to commercial GAC) along with site-won crushed concrete which would be screened and tested to confirm absence of asbestos.

3.1.2 PCL2 - PETROLEUM HYDROCARBONS IN SOILS

Elevated petroleum hydrocarbons and observed NAPL were identified within BH104, BH204A, BHC5, TP203 and TPH05 as presented on Figure 4 (Appendix A).

As a result, WSP recommend that the area of observed NAPL in soils is subject to the following remedial activities to be protective of future commercial site users:

- Vertical and lateral delineation during site enabling works;
- Excavation of the impacted soils and disposal off site as a hazardous waste; and,
- Chemical validation of the remaining soil on site to prove that the impacted material has been removed.

The exact extents of the impacted soils shall be determined with the use visual inspections complemented with a Photoionization Detector (PID), which will provide in situ field screening of the levels of volatile organic compounds (VOCs) within the soils, supplemented by laboratory testing.

On completion of the remediation works as described above, excavations will be backfilled with a suitable material that conforms to the required specification (Earthworks Specification, WSP 2020).

Any soils to be imported to the Site, should be chemically analysed prior to importation, or stockpiled in a 'quarantine area' until the chemical testing results are analysed, and are deemed suitable for use.

3.1.3 PCL3&4 - FREE PHASE LNAPL IN SOILS AND GROUNDWATER

The following remediation recommendations were outlined in order to allow the most effective removal of LNAPL observed at the site:

- Excavation of hydrocarbon impacted soils to below the water table;

- Installation of a LNAPL recovery system within open excavations;
- Maintaining open excavations in the areas identified and ongoing product recovery until the observed LNAPL has all been removed or for as long as is reasonably practicable; and,
- If required, ongoing LNAPL removing from dedicated recovery boreholes installed following soil removal works and backfill of excavation.

All LNAPL and impacted groundwater generated as part of the product recovery works shall either be treated or disposed of in accordance with waste regulations.

Following remediation works groundwater level monitoring comprising dipping of wells with an oil/water interface probe will be completed weekly for a period of at least three months to confirm the absence of LNAPL at the identified locations.

Following completion of the monitoring works, groundwater samples will be collected from the dedicated monitoring wells to confirm that concentrations of hydrocarbons are lower than the solubility limit and that there are no proximal NAPL sources. Two rounds of groundwater sampling shall be completed as a minimum at least two weeks apart.

3.2 ADDITIONAL VERIFICATION WORKS

3.2.1 GASHOLDER INVESTIGATION

Prior to the discharge of Condition 5 of planning application 2020/0294, Natural Resources Wales (NRW) requested additional ground investigation of the gasholder located towards the east of the Site. This was completed as part Early Contractor Instruction (ECI) works, with the reports below submitted to NRW to allow discharge of Condition 5:

- WSP UK Ltd, Port Talbot Harbourside, Gasholder Investigation, Ref. 70057278-002, dated November 2020.;
- Gas Holder at the British Steelworks, Port Talbot – Historical Memorandum, dated February 2021; and,
- Port Talbot Harbourside – Gasholder Excavation Watching Brief & Sampling – Technical Note, dated May 2021.

Following receipt of the above reports, NRW confirmed that no additional works were required to assess potential risks associated with the gasholder and Condition 5 of the planning conditions was discharged (ref. P2021/0569).

The results of the May 2021 phase of investigation are included within this report (Section 4.3) for completeness.

3.2.2 'UPPER PLATEAU' TRIAL PITTING

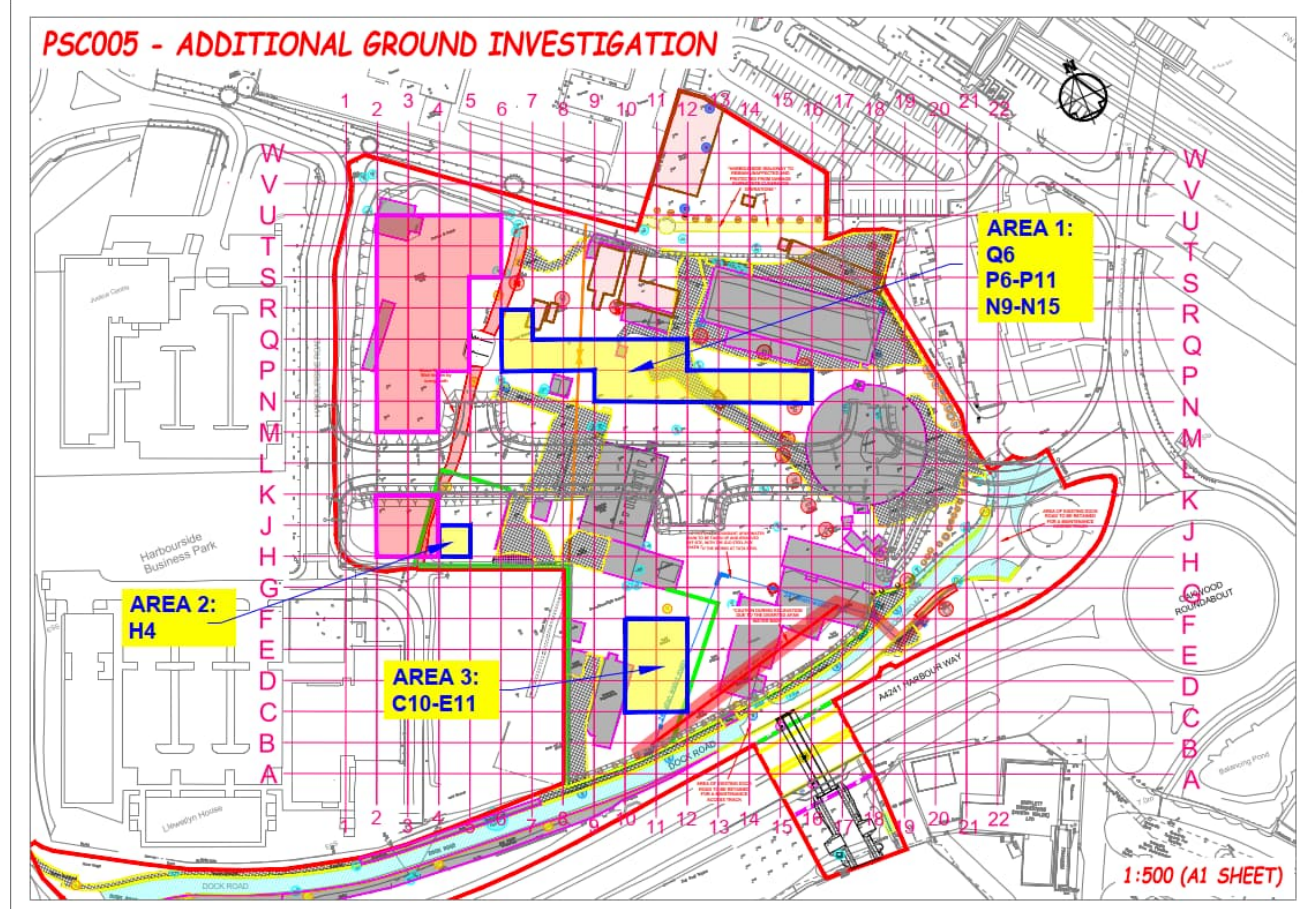
During a site walkover with NPTCBC, the contaminated land officer requested additional information relating to ground conditions of the 'upper plateau' area along the northwest of the Site. As a result of this, four additional trial pits were completed along the north-western boundary following removal of the soil bund, to assess ground conditions beneath proposed formation level. The results of this are included within Section 4.4 of this report.

3.2.3 OBSTRUCTION PROOF DIG

As part of the scope of works completed by ASL, it was required that all hardstanding and below ground structures were removed from the Site to a depth of 1.5m below the formation level of 6.9m AOD. As presented in Image 3-1, large portions of the site were covered during the investigation, with excavations completed across the majority of the Site with the depth equating to the approximate depth of resting groundwater.

- Grey shaded areas – known areas of hardstanding / below ground obstructions requiring removal;
- Pink shaded areas – Upper plateau area with suspected below ground obstructions; and
- Yellow shaded areas – Areas of proposed future development requiring clearance.

Image 3-1 - Buried Obstruction Ground Investigation



These works completed by ASL, with part time site attendance by WSP validated the areas of known LNAPL presence were spatially limited to the southwestern area as identified in the Remediation Strategy (WSP, 2020).

Excluding the areas of known LNAPL presence (see Section 4.5), no other gross hydrocarbon contamination was encountered within any of the areas investigated as part of the proof dig. Limited hydrocarbon contamination was noted in approximate grid reference N12, which correlates to previous investigation location BH105_2019 where hydrocarbon impact was noted. Despite the

absence of LNAPL, a volume of approximately 10m³ soil was removed from the area to ensure site betterment was achieved.

3.3 CONSENTS, LICENSES AND PERMITS

3.3.1 PLANNING CONSENT

The remediation and wider construction works were completed as part of planning application no P2020/0294 which relates to Harbourside Strategic Employment Site and the outline works extract below:

'Construction of an access road, flood mitigation works, land contamination remediation works, improving the load capacity of the ground and associated works to facilitate the regeneration of a former brownfield land for future commercial development.'

Planning Condition 5 related to the management of risks associated with land contamination. This was discharged by planning permission ref. P2021/0569 on the 20th July 2021.

Planning condition 6 relates to the production of a remediation verification report prior to first beneficial use of the road, which this report has been produced to discharge.

3.3.2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

WSP was commissioned by ASL to produce a CEMP which was stated as a requirement within Condition 4 of the planning application. The CEMP was submitted to NPTCBC and the condition discharged by planning permission ref. P2021/0073 on the 25th March 2021.

ASL used the CEMP as a basis for environmental management throughout the duration of the construction works.

3.3.3 MATERIALS MANAGEMENT PLAN (MMP)

WSP was commissioned by ASL to produce a MMP to allow material re-use on the Site. This was submitted to CL:AIRE by a nominated Qualified Person (QP) on the 24th April 2021. A MMP verification report has been produced by WSP under a separate cover¹.

3.4 WSP SAMPLING METHODOLOGY

3.4.1 SOIL SAMPLES

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.

¹ Port Talbot Harbourside – Materials management Plan Verification Report, WSP UK Ltd, dated May 2022, Ref. 70057278-MMP2

Where soil was assessed for potential human health risks and controlled waters risks, the below suite (referred to as **Full Suite**) was analysed:

- Asbestos identification;
- pH;
- Total organic carbon;
- Cyanide;
- Metals and metalloids;
- Phenol;
- Total petroleum hydrocarbons criteria working group (TPH CWG);
- Polyaromatic hydrocarbons (PAH);
- Benzene, toluene, ethylbenzene and xylenes (BTEX); and,
- Methyl tertiary butyl ether (MTBE).

Where soil samples were collected to assess risks to controlled waters only, the below suite (referred to as **CW Suite**) was analysed:

- Total petroleum hydrocarbons criteria working group (TPH CWG);
- Polyaromatic hydrocarbons (PAH);
- Benzene, toluene, ethylbenzene and xylenes (BTEX);
- Phenol;
- Hexavalent chromium; and,
- Total organic carbon.

3.4.2 GROUNDWATER SAMPLES

Samples were collected using low flow methodology with dedicated tubing used for each 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, and date of sampling. The samples for chemical laboratory testing were sent to ALS Ltd, a UKAS and MCERTS accredited laboratory.

Groundwater samples were scheduled for the following suite of analysis:

- Total petroleum hydrocarbons criteria working group (TPH CWG);
- Polyaromatic hydrocarbons (PAH);
- Benzene, toluene, ethylbenzene and xylenes (BTEX);
- Methyl tertiary butyl ether (MTBE); and,
- Phenol.

3.5 RISK ASSESSMENT CRITERIA

Screening of soil and groundwater samples against adopted criteria for validation purposes has been completed in Section 4 to allow potential risks to be identified. The derivation of the criteria used are presented in detail in the below reports, with the criteria presented in the screening summaries (Appendix F):

- WSP UK Ltd, Port Talbot Harbourside Generic Quantitative Risk Assessment, Supplementary Site Investigation Report, Ref 62253048-001, Dated September 2019;
- WSP UK Ltd, Port Talbot Harbourside Controlled Waters Detailed Quantitative Risk Assessment, Ref 62253048-002, Dated February 2020; and,
- WSP UK Ltd, Port Talbot Harbourside, Remediation Strategy, Ref. 62253048-004, dated June 2020.

The risk assessment criteria used for soil and groundwater screening is summarised below:

- Soil samples collected from shallow ground (upper 1.0 m) and the capping layer have been scheduled for laboratory analysis for the aforementioned 'Full Suite' and screened against generic assessment criteria (GAC) for a commercial end use for risk to human health and site specific assessment criteria (SSAC) for controlled waters (remediation validation criteria);
- Soil samples collected from deeper than 1.0 m have been analysed and screened against SSAC for controlled waters (remediation validation criteria);
- Groundwater samples have been analysed and screened against GAC for a commercial end use, considered protective of vapour inhalation risks; and,
- Groundwater samples have not been screened against criteria protective of it as a resource, as the DQRA discounted dissolved phase concentrations as a potential risk; and the presence or absence of LNAPL will be the determining factor in determining whether a risk is present.

4 REMEDIATION WORKS & VERIFICATION

4.1 SEQUENCING OF WORKS

ASL gained access to the site in April 2021, with initial site establishment and welfare compound set up. The general order of works completed by ASL consisted of the following:

- Site establishment;
- Vegetation clearance;
- Utility Disconnection Works (ongoing throughout project);
- Excavation of gasholder foundation to east of the Site;
- Construction of culverts below adjacent PDR for flood alleviation;
- Diversion of TATA water main;
- Cramic Way Improvement Works;
- Removal of below ground structures and concrete crushing (ongoing throughout project);
- Excavation and disposal of hydrocarbon impacted soils (ongoing throughout project);
- LNAPL recovery from open excavations (ongoing throughout project);
- Site raising for flood alleviation (ongoing throughout project);
- Drainage works for road construction;
- Road construction;
- Car park improvement works; and,
- Ecological mitigation.

4.2 WSP SITE ATTENDANCE

WSP visited the Site periodically to observe the remediation works throughout the project, with targeted dates to complete validation sampling works and installation of monitoring boreholes. Following completion, WSP attended the Site weekly for a period of three months to complete gauging of the monitoring boreholes, with two rounds of groundwater sampling completed. A summary of site visits is included in Table 4-1.

Table 4-1 – WSP Site Visit Schedule

Date of Visit	Works Observed
6 th May 2021	WSP visit to observe breaking out of gasholder foundations. Approximately 75% of ring beam exposed and approximately 30% of it broken out. Depth of ring beam foundation 1.5 m – 2.0 m bgl, with periodic metal support structures. No visual / olfactory evidence (V/O) of contamination on excavated soils, excavation edges or groundwater which was encountered at approximately 1.5 m bgl.
30 th July 2021	WSP visit to Site to excavate 4 No trial pits to assess the upper plateau.

Date of Visit	Works Observed
	Four open excavations across the Site associated with the hydrocarbon/LNAPL source removal works. Excavations situated as per previous identifications of LNAPL in exploratory locations.
10 th August 2021	WSP site visit to discuss additional areas of LNAPL encountered which were previously unidentified. Additional LNAPL identified between TP206 & TP207. Discussions undertaken with NPTCBC and ASL regarding additional material generated by surface strip of hydrocarbon area. Agreed that worst areas of material would be removed from site and remaining material to be replaced in-situ.
25 th August 2021	WSP site visit to discuss ongoing LNAPL skimming works with ASL, regarding the best method for the completion of source removal and validation works. Skimming works had been ongoing for one week in targeted areas with approximately 2,200 litres removed.
10 th September 2021	WSP site visit to discuss source removal works.
14 th September 2021	WSP site meeting to discuss progress of works with ASL and NPTCBC. Verification of works completed as part of remediation.
17 th September 2021	WSP site visit to undertake validation sampling of material within areas of known contamination (elevated hydrocarbons and free phase product).
5 th November 2021	WSP site meeting to discuss progress with ASL and NPTCBC. Verification of works completed as part of remediation.
28 th November 2021	WSP attendance on site to undertake trial pitting around the area of hydrocarbon remediation (VAL_TP01 – TP12). Trial pits were excavated to a depth of between 1.5 m and 2.5 m bgl. Samples taken during trial pitting from the smear zone and below the water table, with additional samples taken from the capping layer where present.
6 th December 2021 – 16 th December 2021	WSP present for the drilling and installation of 10No. boreholes to be used for monitoring. Boreholes drilled to 4.5 m to 5.0 m bgl. Collection of soil samples during works.
17 th December 2021 – 5 th April 2022	WSP attend site weekly to complete groundwater monitoring round of installed boreholes to verify the absence of LNAPL. Groundwater samples collected on 10 th March 2022 and 5 th April 2022.
15 th March 2022	Final site meeting with NPTCBC and ASL.

4.3 GAS HOLDER FOUNDATION REMOVAL & VERIFICATION

ASL commenced the breaking out and excavation of the gasholder structure in April 2021.

Ground Conditions

The ground conditions and construction of the gasholder foundation encountered were as expected, based on the typical construction of a Klönne gasholder. A reinforced concrete ring-beam encircled the gasholder foundation, with these foundations reaching a depth of approximately 1.5 m bgl around

the structure. A reinforced concrete pad approximately 0.3 m thick was situated within the ring beam. Occasional pipework (associated with the gasholder and other historic site activities) were present beneath the reinforced concrete pad, with Made Ground immediately present underlain by natural strata typically encountered at <2.0 m bgl.

WSP attended site on 6th May 2021 to inspect the excavation works and to collect representative soil samples from the gasholder to assess potential risks associated with contamination within soils immediately surrounding the gasholder.

A selection of photos showing the excavation of the gasholder structure is presented below.



Left - Reinforced concrete ring-beam encircling gasholder.
Right – Excavation following removal of ring beam.

WSP observed no signs of visual or olfactory evidence of contamination in the exposed soils, and none had been noted by the on-site ASL supervisor during the works. The WSP engineer collected four soil samples (GH1 – GH4) from the excavation extents (soil surrounding the ring-beam) with the locations presented in Figure 5 (Appendix A). Samples were taken from approximately 1.5 m bgl.

Soil Sampling Results

The analytical results are summarised in Table 4-2, and the laboratory testing certificates are provided in full in Appendix D.1.

Table 4-2 - Summary of Gasholder Soil Laboratory Analysis

Determinand	Laboratory Result (mg/kg)*	Comments
Asbestos Identification	Not detected	Asbestos was not identified in any sample.
Cyanide (Total)	<1	All samples were recorded below limit of detection (LOD).
Hexavalent Chromium	<0.6	All samples were recorded below LOD.

Determinand	Laboratory Result (mg/kg)*	Comments
Phenol	<0.01 – 0.0107	Trace concentrations above LOD were identified in sample GH2 only.
TPH CWG	146 - 552	TPH primarily comprised mid to heavy range hydrocarbons (>21 – C35) with light range compounds typically <LOD.
PAH	12.8 - 124	PAH compounds were recorded above LOD in GH1, GH3 and GH4; with generally the same concentrations of individual determinands, the highest typically comprising fluoranthene and benzo(b)fluoranthene.
BTEX & MTBE	<LOD	All samples were recorded below limit of detection.

*All concentrations in mg/kg apart from asbestos, which is measured by visual assessment and, if required, quantification in %.

No exceedances of the remediation validation criteria were recorded, with the concentration of the majority of CoCs below laboratory LOD. As such the risk of adverse impact to controlled waters from the soils adjacent to the former gasholder is considered to be low.

In addition, recorded concentrations were screened against a human health GAC, considered protective of future commercial end users, with no exceedances identified.

The full screening exercise can be found in Appendix F.1.

4.4 UPPER PLATEAU TRIAL PITTING

Following a request from the contaminated land officer, four trial pits were advanced in the 'Upper Plateau' area to identify ground conditions below the proposed finished site level (7.5 m AOD).

Trial pits were excavated by ASL under the supervision of a WSP engineer on the 30th July 2021, named UP-TP01 to UP-TP04. Trial pit logs are included in Appendix E.1 with the locations included in Figure 6 (Appendix A). Eight soil samples were taken and scheduled for the full suite of analysis. Laboratory results are included in Appendix D.2 and screening tables against the adopted criteria are presented in Appendix F.2.

Ground Conditions

Ground conditions recorded during the trial pitting works were consistent with those previously observed in the area, and consistent between the locations completed. Excluding the overburden that was still present during the excavation of UP-TP03 and UP-TP-04 which was subsequently excavated for re-use across the Site.

Ground conditions from the reduced site level of 6.9 m AOD (prior to installation of capping layer) typically comprised Made Ground to approximately 1.0 m bgl, comprising sandy gravel of various lithologies including brick, concrete ash and clinker; consistent with the sites former use as part of the steel works. Beneath this layer of Made Ground was a layer of sandy gravel with cobbles of mudstone. Identified only in UP-TP04, beneath the gravel layer was slightly gravelly sandy SILT with occasional cobbles. These natural ground conditions are consistent with those previously identified, comprising the alluvium / tidal flat deposits of varying grain size ranges.

No visual / olfactory evidence of contamination was noted, with PID readings recorded at 0 ppm for all samples analysed.

Soil Sampling Results

The analytical results of the eight samples are summarised in Table 4-3, and the laboratory testing certificates are provided in full in Appendix D.2.

Table 4-3 - Summary of Upper Plateau Soil Laboratory Analysis

Determinand	Laboratory Result (mg/kg*)	Comments
Asbestos Identification	Trace Amosite	Asbestos was identified in one sample, UP-TP01 (0.5m bgl). Identified as trace detection of amosite loose fibres.
Cyanide (Total)	<1 – 3.43	Six samples were recorded below limit of detection (LOD), with only samples collected from UP-TP01 above LOD.
Hexavalent Chromium	<0.6	All samples were recorded below LOD.
Metals	-	Concentrations of metals were broadly consistent with the exception of samples collected from UP-TP03 which recorded elevated concentrations of cadmium, lead, vanadium and zinc.
Phenol	<0.01	Phenol was recorded <LOD in all samples
TPH CWG	<10 - 40	TPH was recorded above LOD in seven samples, with elevated concentrations (>300 mg/kg) in the shallow (0.5 m bgl) samples collected in UP-TP01 and UP-TP02. Concentrations primarily comprised heavy range (C21-C35) hydrocarbons.
PAH (Total)	<0.118 – 14.3	As above, total PAH was recorded above LOD in seven samples, with the highest concentrations in the shallow samples of UP-TP01 and UP-TP02. Total PAH typically comprised a range of determinands.
BTEX & MTBE	<LOD	All samples were recorded below limit of detection.

*All concentrations in mg/kg apart from asbestos, which is measured by visual assessment and, if required, quantification in %.

Screening

Soil concentrations were screened against criteria for both human health (commercial) and controlled waters (remediation validation) criteria. Screening tables are presented as Appendix F.2.

No exceedances of the controlled waters criteria were identified.

Lead was the only determinand to exceed the adopted human health GAC with the two samples from UP-TP-03 (0.5 m bgl and 1.5 m bgl) recording exceedances. Exceedances of the GAC (1,390 mg/kg) were recorded at 0.5 m bgl (3,840 mg/kg) and 1.5 m bgl (4,160 mg/kg). The presence of locally elevated metal concentrations has been historically identified across the site, consistent with the sites former use as part of the steel works and other industrial activities.

In addition, asbestos was identified in one sample, recorded as loose fibres of amosite.

Discussion

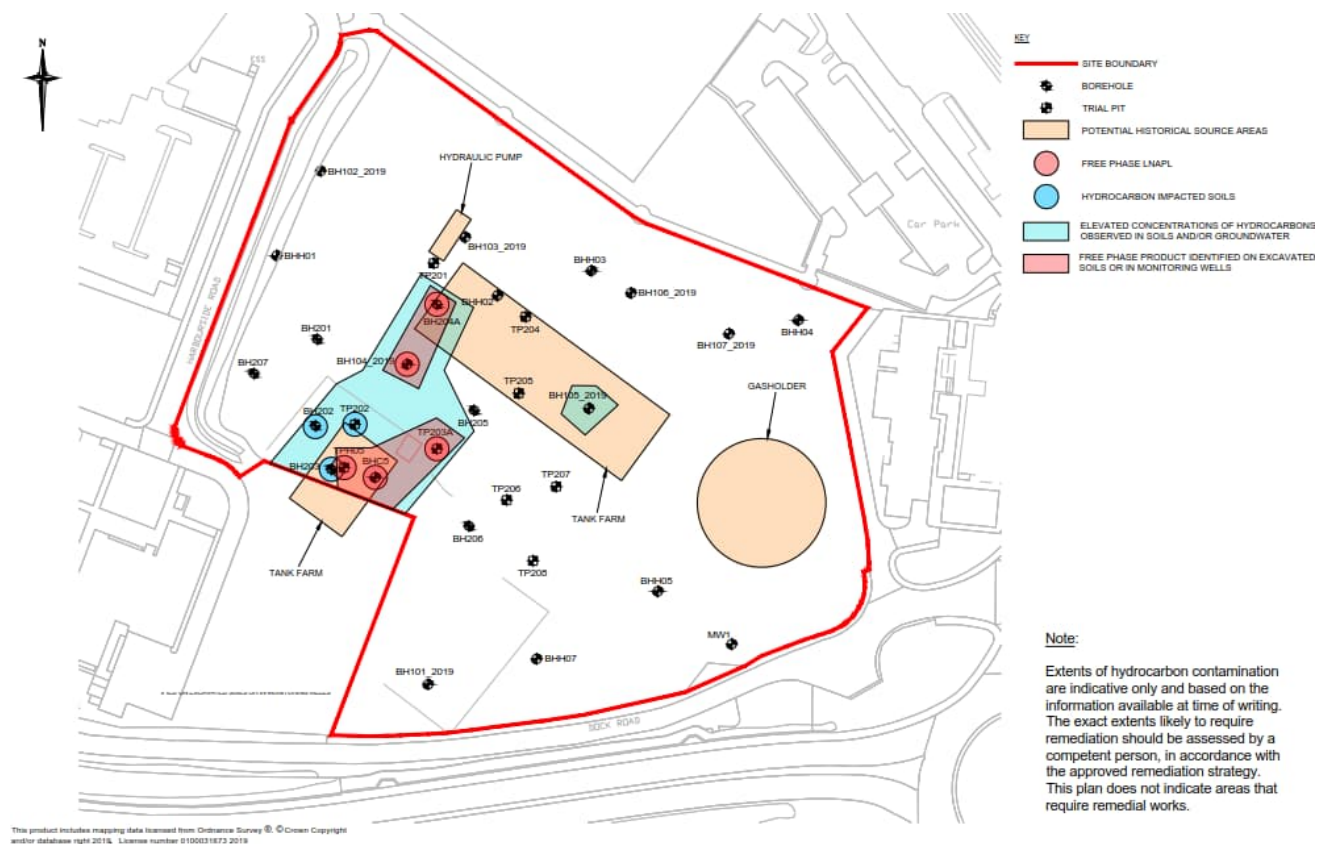
Although the exceedances were identified in shallow soils, the depths recorded on the samples are taken prior to the installation of the capping layer of 600 mm thickness inert material. As such, the identified exceedances and presence of asbestos would not have a viable pathway to affect future human health receptors.

Risks associated with future construction works should be managed through appropriate risk assessments and work control measures.

4.5 HYDROCARBON IMPACTED SOIL AND LNAPL REMOVAL

Following commencement of the construction project at the Site in April 2021, ASL commenced with the excavation and source removal works of the identified LNAPL impacted areas in July 2021. The area towards the southwest of the Site as presented on Figure 4 (Appendix A, extract below - Image 4-1) underwent a reduced level dig from of approximately 7.0 m AOD to 6.0 m AOD to allow easier access for source removal works.

Image 4-1 - Estimated LNAPL Extents (WSP, 2020)



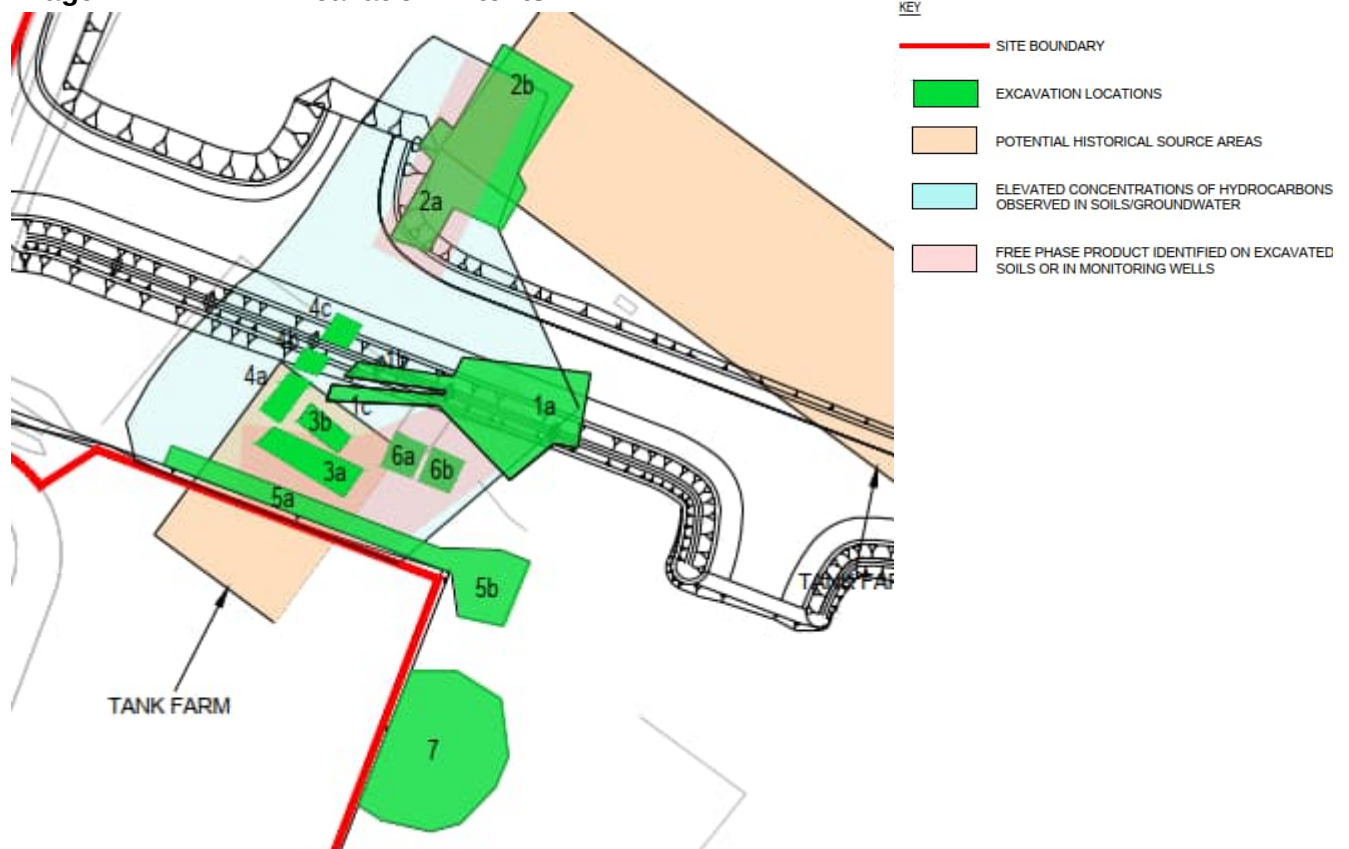
The identified areas (red shading) were excavated to approximately 1.0 m below the resting water table (approximately 4.0 m AOD). Initial excavations commenced at the approximate location of the previously identified LNAPL and widened to approximately 4 m x 4 m centred around the proven LNAPL. Excavated soil was stockpiled on bunded impermeable membrane prior to offsite disposal at a licenced facility (Appendix H.1).

Following initial excavation works, LNAPL skimmers were placed within open excavations to remove LNAPL from the resting water table. Recovered LNAPL was pumped into IBC's awaiting offsite disposal (Appendix H.2) Skimmers were provided and maintained by GPT Environmental. Following the removal of identified LNAPL from the open excavations, the excavations were widened to release any trapped LNAPL within the pore space of surrounding soils. This process was continued in all

directions until the excavation widening was noted not to release LNAPL into the excavation. Where LNAPL was no longer identified in excavations; the excavations were left to stabilise for approximately 10 days to ensure no subsequent ingress. Excavations were subsequently backfilled with suitable material (either imported or site won materials in accordance with the approved Materials Management Plan and earthworks specification).

An extract from Figure 7 (Appendix A) is presented below, and shows the areas targeted and excavation extents for the LNAPL removal works. Other excavation works completed as part of ASL's wider scope in close proximity to the identified hydrocarbon were also impacted; with these extending to resting groundwater level and LNAPL proven to be absent. With the exception of the area to the south of the initially identified LNAPL area (Ref. 7 on Image 4-2 and Figure 7), no other areas of LNAPL were identified during the ground works. The labelled areas (ref. 1-7) on Image 4-2 reflect the areas detailed in Table 4-4.

Image 4-2 - LNAPL Excavation Extents



A summary of the timeline of excavation and skimming works is presented in Table 4-4.

Table 4-4 - LNAPL Excavation & Skimming Timeline

Plan No.	Description	Excavation Start	Skimming Start	Skimming Complete	Backfill	No. of days excavation open	No. of days skimming (on/off to allow recharge)	No. of days with no ingress of LNAPL
1a	TP203A main exc	20-Jul-21	18-Aug-21	16-Sep-21	24-Sep-21	66	29	8
1b	TP203A delineation trench (North)	27-Sep-21	07-Oct-21	22-Oct-21	01-Nov-21	35	15	10
1c	TP203A delineation trench (South)	27-Sep-21	N/A - no LNAPL	N/A	04-Oct-21	7	N/A	N/A
2a	BH104 location	27-Jul-21	18-Aug-21	01-Oct-21	11-Oct-21	76	44	10
2b	BH204A location	27-Jul-21	18-Aug-21	01-Oct-21	11-Oct-21	76	44	10
3a	TPH05 and BHC5 location (South)	27-Aug-21	27-Aug-21	09-Sep-21	27-Sep-21	31	13	18
3b	TPH05 and BHC5 location (North)	08-Sep-21	09-Sep-21	01-Oct-21	11-Oct-21	33	22	10
4a	Delineation of TPH05 going North	30-Sep-21	30-Sep-21	06-Oct-21	20-Oct-21	20	6	14
4b	Delineation of TPH05 going North	04-Oct-21	04-Oct-21	20-Oct-21	01-Nov-21	28	16	12
4c	Delineation of TPH05 going North	04-Oct-21	04-Oct-21	20-Oct-21	01-Nov-21	28	16	12
5a	Deryn North boundary trench	16-Sep-21	N/A - no LNAPL	N/A	18-Oct-21	32	N/A	N/A
5b	Eastern end of Deryn trench	19-Oct-21	22-Oct-21	01-Nov-21	08-Nov-21	20	10	7
6a	Delineation of BHC5 going East	11-Oct-21	15-Oct-21	22-Oct-21	01-Nov-21	21	7	10
6b	Delineation of BHC5 going East	11-Oct-21	15-Oct-21	22-Oct-21	01-Nov-21	21	7	10
7	Adjacent to Deryn East boundary	19-Oct-21	22-Oct-21	05-Nov-21	15-Nov-21	27	14	10

Photographs showing the source removal works are presented in Appendix G.1. Drone photos captured by NPTCBC show the extent of the hydrocarbon excavation works are included in Appendix G.2. Photo 4-1 presented below shows a drone photo to show the ongoing works at the site, with the remediation areas active visible to the bottom of the photo together with previously backfilled excavations.

Photo 4-1 - Drone Survey Photo - 12th October 2021



Following completion of all hydrocarbon impacted soil and LNAPL removal works, approximate volumes of LNAPL / hydrocarbon impacted soils has been removed from the area subject to remediation are:

- **Hydrocarbon Impacted Soil – 618 m³**
- **Recovered LNAPL (skimming) – 21,160L**

All hydrocarbon impacted soil and LNAPL was removed from site as hazardous waste, with waste consignment summary included in Appendix H.1 (soils) and Appendix H.2 (LNAPL).

No additional areas of LNAPL in soils or groundwater have been identified on the wider site. Where V/O evidence of hydrocarbon impact was noted, primarily associated with historical drainage infrastructure (including interceptors), the soil was excavated for offsite disposal.

The boundary to Deryn Properties, to the south of the remediated area was backfilled with cohesive material to reduce/limit any potential migration of contaminants from offsite sources.

It is noted that whilst all observed LNAPL has been removed from the excavations, concentrations of hydrocarbons in groundwater within the remediated areas are still likely to be elevated and close to the saturation concentration (concentration at which LNAPL starts to form). However, due to the source removal works which has removed all identified gross hydrocarbon contamination from the Site, ongoing natural attenuation through dilution, dispersion and degradation in the aquifer, will lead to reduction in concentrations of hydrocarbon compounds in groundwater. The DQRA (WSP, 2020) previously identified that concentrations approaching the level of saturation, do not present a risk to the identified controlled waters receptors.

4.6 LNAPL REMOVAL VERIFICATION TRIAL PITTING

Following completion of the source removal works (detailed in Section 4.5), WSP supervised the completion of trial pitting activities around the LNAPL remediated area to verify the absence of LNAPL within surrounding soils. Trial pitting was completed by ASL under the full time supervision of a WSP engineer on 28th October 2021, named as VAL-TP01 to VAL-TP10. Trial pit locations are included on Figure 8 (Appendix A).

Ground Conditions

Ground conditions identified during the works were broadly consistent between locations, and consistent with prior phases of investigation works. The geological sequence typically comprised the engineered capping layer of approximately 600 mm thickness, underlain by made ground comprising sandy gravel with frequent anthropogenic fragments to approximately 2 m bgl where encountered. Beneath the made ground, granular deposits comprising sandy gravel with frequent cobbles were encountered underlain by more cohesive deposits of sandy gravelly silt with occasional cobbles.

Groundwater was encountered in all exploratory locations, with strikes ranging from circa 1.5 to 2.4 m bgl depending on starting ground level and the geological strata, with cohesive deposits typically recording a deeper strike. Groundwater levels typically rested at around 1.6 – 2.0m bgl.

Evidence of hydrocarbon contamination was limited to two locations, however no gross hydrocarbon contamination (LNAPL presence) was identified, as presented in Table 4-5.

Table 4-5 – Validation Trial Pit V/O Evidence of Contamination

Location	Depth (m bgl)	Comment
VAL-TP05	1.3 – 2.5	Moderate hydrocarbon odour and sheen
VAL-TP12	1.3 – 2.0	Moderate hydrocarbon odour and sheen

Soil Sampling Results

The analytical results of the eight samples are summarised in Table 4-6, and the laboratory testing certificates are provided in full in Appendix D.3. Soil samples were collected from all locations at or below the smear zone (~1.5 - 2.5 m bgl) and scheduled for the CW Suite, with additional soil samples collected from the capping layer (where installed) to verify conformance scheduled for the full suite.

Table 4-6 - Summary of LNAPL Removal Trial Pit Validation Soil Laboratory Analysis

Determinand	Laboratory Result (mg/kg*)	Comments
Asbestos Identification	Not Detected	Asbestos was not detected in the four samples collected from the capping layer.
Cyanide (Total)	<1 – 2.35	Thirteen samples were recorded below limit of detection (LOD), with low concentrations recorded in samples collected from the smear zone of VAL-TP04, VAL-TP06 and VAL-TP07.
Hexavalent Chromium	<0.6	All samples were recorded below LOD.
Metals	-	Concentrations of metals were broadly consistent between the shallow samples of capping layer analysed.
Phenol	<0.01 – 0.0215	Phenol was recorded <LOD in fourteen samples, with trace concentrations recorded in samples collected from VAL-TP07 (0.3 m bgl, 0.0215 mg/kg) and VAL-TP12 (1.7 m bgl, 0.0113 mg/kg).
TPH CWG	37.1 – 1,480	TPH was recorded above LOD in all samples analysed, with elevated concentrations (>300 mg/kg) noted in VAL-TP04 (2.3 m bgl, 1,480 mg/kg) and VAL-TP11 (1.5 m bgl, 897 mg/kg). Where elevated concentrations were recorded, the concentration typically comprised heavy range (C21-C35) compounds.
PAH (Total)	1.44 - 122	PAH was notably elevated in the sample collected from VAL-TP04 (2.3 m bgl, 122 mg/kg), with all other samples recorded <30 mg/kg. Total PAH concentrations comprised a wide range of determinands.
MTBE	<LOD	All samples were recorded below limit of detection.
BTEX (Total)	<0.4 – 5.53	Total BTEX was recorded below LOD in four samples, with concentrations above 2 mg/kg recorded in samples from the smear zone of VAL-TP07 – VAL-TP09 and VAL-TP11. Concentrations, where elevated, typically comprised benzene in higher proportion to the other determinands.

*All concentrations in mg/kg apart from asbestos, which is measured by visual assessment and, if required, quantification in %.

Screening

Soil concentrations were screened against assessment criteria for both human health (commercial) and controlled waters (remediation validation) criteria.

No exceedances of the human health criteria, from samples collected from either the capping layer or underlying strata were identified.

Exceedances of the controlled water criteria are presented in Table 4-7 and shown in Figure 8 (Appendix A).

Table 4-7 – LNAPL Removal Trial Pit Validation Soil Exceedances of CW criteria

Determinand	Validation Criteria (mg/kg)	Maximum Concentration (mg/kg)	No. of Exceedances
Benzene	1.0	3.98	3
Toluene	0.557	1.07	2

Determinand	Validation Criteria (mg/kg)	Maximum Concentration (mg/kg)	No. of Exceedances
Ethylbenzene	0.450	0.48	1
Naphthalene	0.4	10.3	10

Benzene, toluene and ethylbenzene exceedances were recorded from samples collected from the smear zone in location VAL-TP07 to VAL-TP09 and VAL-TP11, located to the north and east of the LNAPL removal excavation area.

Exceedances of the naphthalene screening criteria were widespread, with the majority of samples collected during the works recording exceedances. With the exception of the sample collected from VAL-TP09 (1.5 m bgl, 10.3 mg/kg), all other samples recorded concentrations below 2.5 mg/kg.

Discussion

Despite the above exceedances, the risk is considered limited, with the primary goal of the remedial works being to remove the identified LNAPL. No gross contamination was identified within any of the trial pits completed, with PID readings low and a typical absence of visual and olfactory evidence of hydrocarbon contamination recorded. The validation criteria are also considered conservative; with them deemed to be protective of soil concentrations on the identified downgradient boundary (northwestern edge of site, nearest the River Afan); and the recorded exceedances recorded towards the centre of the Site.

4.7 INSTALLATION OF VERIFICATION BOREHOLES

Installation of Verification Boreholes was carried out between 6th and 16th December 2021. The installation works were subcontracted by ASL to CJ Associates (CJA) under the part time supervision of WSP. Borehole locations were identified by WSP and communicated to ASL who cleared locations for CJA to drill. Exploratory holes were positioned to verify source removal works within remediated areas as well as providing down gradient coverage to ensure no LNAPL migration towards the site boundaries. Due to programme constraints and the construction of the road, boreholes could not be installed within the footpath of the road (shown in Figure 9, Appendix A).

All ten of the boreholes were installed as groundwater monitoring wells to a maximum of 5.0 m bgl, with response zones between 1.0 m bgl and 5.0 m bgl to ensure any LNAPL would be identified in the screened section. The rationale of the borehole locations are presented in Table 4-8.

Table 4-8 – Verification Borehole Installation Details

Borehole ID	Rationale
BH301	Southeastern coverage to assess potential residual risks to dock.
BH302	Located immediately upgradient of LNAPL removal excavations.
BH303	Located within LNAPL removal excavations(BHC5 / TP203A)
BH304	Located on site boundary with Deryn Land, within LNAPL removal excavation (BHC5 / TPH05)
BH305	Located within LNAPL removal excavation, encountered during remedial works.

Borehole ID	Rationale
BH306	Located on site boundary to assess potential residual risks to River Afan.
BH307	Located downgradient of LNAPL removal excavation (BH104 / BH204A)
BH308	Located within LNAPL removal excavation (BH104 / BH204A)
BH309	Located upgradient of LNAPL removal excavation (BH104 / BH204A)
BH310	Located adjacent to LNAPL removal excavation (BH104 / BH204A)

Ground Conditions

Ground conditions identified during the works were broadly consistent between locations, and consistent with prior phases of investigation works. The geological sequence typically comprised the engineered capping layer of approximately 600 mm thickness, underlain by made ground comprising sandy gravel with frequent anthropogenic fragments to approximately 2 – 3 m bgl. Beneath the made ground, granular deposits comprising sandy gravel with frequent cobbles were encountered underlain by more cohesive deposits of sandy gravelly silt with occasional cobbles.

Evidence of hydrocarbon contamination was identified in several locations, as presented below.

Table 4-9 – Borehole V/O Evidence of Contamination

Location	Depth (m bgl)	Maximum PID Reading (ppm)	Comment
BH302	2.0 – 5.0	-	Moderate hydrocarbon odour noted below water table
BH303	3.0 – 4.6	-	Hydrocarbon odour and sheen on arisings below water table
BH304	2.8 – 4.5	516.8	Hydrocarbon odour and sheen on arisings below water table
BH305	2.0 – 4.6	-	Hydrocarbon odour and sheen on arisings below water table, becoming stronger at 3.0 m bgl
BH307	3.5 – 5.0	133	Moderate hydrocarbon odour and sheen on arisings below water table
BH308	3.0 – 5.0	45	Moderate hydrocarbon odour
BH309	2.7 – 5.0	279.3	Hydrocarbon odour
BH310	3.5 – 5.0	478	Hydrocarbon odour

Soil Sampling Results

The analytical results of the 19 No. samples are summarised in Table 4-10, and the laboratory testing certificates are provided in full in **Appendix D.4**. Soil samples were collected from all locations at or

below the smear zone (~2.5 – 4.0 m bgl) and scheduled for the CW Suite, with additional soil samples collected from the capping layer (where installed) to verify conformance scheduled for the full suite.

Table 4-10 - Summary of LNAPL Removal Borehole Validation Soil Laboratory Analysis

Determinand	Laboratory Result (mg/kg*)	Comments
Asbestos Identification	Not Detected	Asbestos was not detected in the nine samples collected from the capping layer.
Cyanide (Total)	<1 – 1.61	Eighteen samples recorded cyanide <LOD, with one sample (BH309, 4.7m bgl) recording 1.61 mg/kg.
Hexavalent Chromium	<0.6 – 0.849	Eighteen samples recorded hexavalent chromium <LOD, with one sample (BH302, 0.5 m bgl) recording 0.849 mg/kg.
Phenol	<0.01 – 0.0448	Phenol was recorded <LOD in fifteen samples, with low concentrations recorded in samples collected from BH304 (0.5 m bgl, 0.01 mg/kg), BH307 (0.5 m bgl, 0.0448 mg/kg), BH307 (4.0 m bgl, 0.0114 mg/kg) and BH310 (0.2 m bgl, 0.0336 mg/kg).
TPH CWG	<10 – 105	TPH was recorded below LOD in five samples collected from below the resting water table, with the remaining samples broadly consistent. TPH concentrations typically comprised mid to heavy range hydrocarbons C16 – C35).
PAH (Total)	0.122 - 20	PAH concentrations were broadly consistent between samples and within the same order of magnitude. Concentrations included a wide range of PAH compounds, but naphthalene is noted to be the dominant species in the majority of samples.
MTBE	<LOD	All samples were recorded below limit of detection.
BTEX (Total)	<D.4 – 3.52	Total BTEX was recorded below LOD in nine samples, with concentrations above 2 mg/kg recorded in one sample (BH301, 2.5 m bgl, 3.52 mg/kg).

*All concentrations in mg/kg apart from asbestos, which is measured by visual assessment and, if required, quantification in %.

Screening

Soil concentrations were screened against assessment criteria for both human health (commercial) and controlled waters (remediation validation) criteria.

No exceedances of the human health criteria, from samples collected from either the capping layer or underlying strata were identified.

Exceedances of the controlled water criteria are presented in Table 4-11 and shown in Figure 9 (Appendix A).

Table 4-11 – LNAPL Removal Borehole Validation Soil Exceedances of CW criteria

Determinand	Validation Criteria (mg/kg)	Maximum Concentration (mg/kg)	No. of Exceedances
Toluene	0.557	0.966	2
Total Xylenes	1.0	1.64	1
Naphthalene	0.4	8.26	12

Toluene recorded limited exceedances in BH301 (smear zone) and BH302 (capping layer), with xylenes recording an exceedance in BH301 (smear zone). The presence of these compounds within BH301 is unclear, with the area a distance away from the LNAPL removal works; however, it is noted that potential localised elevated concentrations of BTEX compounds have historically been identified across the Site. As such, these localised limited exceedances are not considered to present an unacceptable risk.

Exceedances of the naphthalene screening criteria were widespread, with the majority of samples collected during the works recording exceedances, including areas not within the remediation area (BH301, BH302, BH307).

Discussion

As previously mentioned, despite the above exceedances, the risk is considered limited, with the primary goal of the remedial works being to remove the identified LNAPL. No gross contamination was identified within any of the boreholes completed, with PID readings typically low and a typical absence of visual and olfactory evidence of hydrocarbon contamination recorded. The validation criteria are also considered conservative and are deemed to be protective of soil concentrations on the identified downgradient boundary (northwestern edge of site, nearest River Afan); with the location closest to the receptor (BH307) not recording any exceedances.

4.8 GROUNDWATER MONITORING

4.8.1 GAUGING

Groundwater level monitoring was undertaken on a weekly basis between 17th December 2021 and 5th April 2022, totalling 16 No. visits, following the installation of the monitoring wells (BH301 – BH310). During each visit the depth and thickness of LNAPL (if encountered) and water were assessed and recorded using an oil/water interface probe. All locations were accessible during each monitoring visit.

No LNAPL was recorded in any of the borehole locations. Full details of the monitoring events are included in Appendix I.

4.8.2 SAMPLING

Groundwater samples were collected from the monitoring network on two occasions; 10th March 2022 and 5th April 2022, by a WSP engineer in accordance with the methodology outlined in Section 3.4.2.

A total of 20 No. samples were collected over the two rounds of monitoring, with the laboratory certificates presented in Appendix D.5.

Results

A summary of the laboratory analysis of groundwater samples is presented in Table 4-12, with full results included in Appendix D.5.

Table 4-12 – Summary of Post Remediation Groundwater Sampling Results

Determinand	Laboratory Result (µg/l)	Comments
Phenol	<2 - 50	Phenol was recorded >LOD in five samples during the first sampling round (BH302, BH303, BH305, BH307 and BH310) and one sample during the second round (BH303).

Determinand	Laboratory Result (µg/l)	Comments
TPH CWG	<10 – 46,800	TPH was recorded below LOD in three samples collected during the first sampling round (BH301, BH304 and BH306) and four samples during the second round (BH301, BH304 – BH306). The highest concentrations were recorded in BH303 during the two sampling rounds (46,800 µg/l and 25,400 µg/l), comprising predominantly light range GRO (C5-C12). Concentrations above 5,000 µg/l were recorded only in the samples from BH303, and the sample collected from BH307 during round 1 (12,400 µg/l). Concentrations were typically lower during the second round of sampling.
PAH (Total)	<0.082 – 2,330	Total PAH concentrations were recorded <LOD in two samples – BH301 (round 2 only) and BH304 (both rounds). Concentrations above 500 µg/l were recorded in B303 (both rounds) and BH307 (Round 1 only). Total PAH concentrations almost entirely comprised naphthalene.
MTBE	<1	MTBE was recorded <LOD in all samples.
Benzene	<1 – 21,200	Benzene was recorded <LOD in four samples during both rounds (BH301, BH304 – BH306). Elevated concentrations were recorded in BH303 during Round 1 (21,200 µg/l), with the second highest concentration recorded in BH303 (round 2) at 5,170 µg/l. Concentrations above 1,000 µg/l were recorded in BH307 (3,580 µg/l – round 1; 1,410 – round 2) and BH310 (1,420 µg/l – round 1). Concentrations were typically lower during the second round of sampling.
Toluene	<1 – 9,980	As with benzene, concentrations of toluene, ethylbenzene and xylenes were recorded at elevated concentrations in BH303 during round 1 compared to round 2 and compared to the wider dataset. Concentrations in BH307 (both rounds) and BH310 (round 1 only) also recorded total BTEX concentrations >1,000 µg/l.
Ethylbenzene	<1 – 1,570	
Total Xylenes	<2 – 6,070	

Screening

Groundwater samples have been screened against GAC considered protective of a commercial end use, to assess potential risks associated with the inhalation of groundwater derived vapours. Full details of the assessment criteria derivation can be found in Appendix F. Consistent with observed site conditions, a soil type of a 'sandy loam' has been adopted.

No exceedances of the adopted screening criteria were identified. Full results of the screening exercise are presented in Appendix F.5.

It should be noted that the GAC used are considered conservative, with an estimated depth to water of 1 m bgl (0.85 m below foundation level) used in the derivation of the model. Groundwater has been identified as being typically between 2.0 and 2.5 m bgl in BH303 (Appendix I), highlighting the conservatism of the GAC used.

4.8.3 DISCUSSION

The highest concentrations of hydrocarbons were recorded in BH303, located within the area of LNAPL removal works (TP203A/BHC5). Concentrations of hydrocarbons in nearby boreholes (BH302, BH304 and BH305) were noticeably lower, indicating that elevated concentrations are spatially limited as identified during previous phases of works. Due to the remedial works completed (LNAPL removal

only) it was anticipated that concentrations would be elevated and just below the saturation concentration.

TPH and BTEX concentrations on the site boundaries (BH301, BH304 and BH306) were all recorded below the LOD, which are considered protective of the identified controlled waters receptors the River Afan (BH306) and Port Talbot Docks (BH301). BH304 is adjacent to Deryn land and highlights that cross border contamination is unlikely to be occurring at present. As such, the risks to controlled waters are considered to be acceptable and in accordance with the findings of the previously completed DQRA (WSP, 2020). With the removal of all identified LNAPL (21,160L) and hydrocarbon impacted soils (618 m³), significant betterment has been achieved with natural attenuation likely to lead to ongoing reductions in observed concentrations over time.

No exceedances of the GAC considered protective of a commercial end use have been identified, as such risks to future commercial site users from groundwater derived vapours are considered limited.

4.9 ADDITIONAL REMEDIAL WORKS

ASBESTOS REMOVAL

During the groundworks associated with the wider construction project, localised potential asbestos containing materials (ACMs) were identified by ASL. An asbestos management plan was implemented throughout the construction works and air monitoring was periodically completed to ensure no risk to construction workers or neighbouring properties. No elevated concentrations of asbestos were identified during the air monitoring works.

A summary of asbestos containing materials identified during the works is presented in Appendix J and Figure 10 (Appendix A). Where suspected ACMs were identified, the material was quarantined prior to testing by a qualified individual. Following receipt of the results the material was stored in a sealed on-site skip prior to disposal in-line with the Control of Asbestos Regulations (2012) by an appropriately licensed contractor. Waste transfer notes are included in Appendix H.3.

5 POTENTIAL CONTAMINANT LINKAGES SUMMARY – POST REMEDIATION

5.1 PCL1 – ASBESTOS AND ELEVATED METALS IN SOILS – HUMAN HEALTH

The presence of asbestos and elevated concentrations of metals within shallow soils at the site was previously identified as a potential risk to human health receptors.

During the construction project and associated remedial works, additional soil samples have been collected and screened against criteria considered protective of a commercial end use. Of the soil samples collected, only two have identified exceedances of GAC, taken from UP-TP03 for lead. In addition, ACM's were identified in discrete areas throughout the site (removed where encountered) and asbestos fibres identified in soil samples.

Notwithstanding the above, the remedial strategy to limit the identified risk related to breaking the pathway through the construction of an engineered barrier. The barrier was constructed from a combination of imported material (tested to ensure conformance) and site-won crushed concrete which was screened for asbestos. The engineered cover was constructed across the Site from base at 6.9 m AOD to finished site level of 7.5 m AOD. This 600 mm thickness ensures that the risk from any potentially contaminated material in the Made Ground beneath does not impact human health receptors during routine day-to-day use while the site remains undeveloped.

Cover layer installation and thickness was routinely checked by WSP engineers during site visits, and exploratory locations completed following installation validated appropriate thicknesses in several areas of the Site. Samples collected of the capping layer during ground investigation works were screened against commercial GAC with no exceedances identified. No asbestos was identified in any sample collected from the capping layer.

It is noted that the cover layer is only a temporary measure, whilst final development plans are agreed, and the cover layer will likely be removed during future construction works. Any potential risks to construction workers where the cover layer is removed should be managed through appropriate work control measures and risk assessments. As part of future construction works, the design should ensure that the pathway between potentially contaminated soils below 6.9 m AOD and receptors at the site surface is broken, with either building footprints, external hardstanding or appropriate capping² in areas of softstanding.

5.2 PCL2 – PETROLEUM HYDROCARBONS AND NAPL IN SOILS – HUMAN HEALTH

Throughout the construction and remediation works, an estimated total of 618 m³ of hydrocarbon impacted material has been removed from the Site. The vast majority of hydrocarbon impacted

² BRE465:2004 – Cover Systems for Land Regeneration

material was removed from the LNAPL source removal works towards the southwest of the Site, with smaller localised areas of contaminated soil removed during excavation works across the wider site.

Soil samples collected throughout the project from potential areas of concern (LNAPL areas) and unknown (gasholder and upper plateau) have been screened against human health GAC protective of commercial end users, with no exceedances of hydrocarbon determinands identified. Furthermore, the potential risks associated with human health is limited due to the installation of the capping layer across the Site. Future works which remove the capping layer should have appropriate work control procedures to prevent potential risk from the underlying soils, as noted in PCL1.

5.3 PCL3 – ELEVATED HYDROCARBON CONCENTRATIONS IN GROUNDWATER AND NAPL ON GROUNDWATER – HUMAN HEALTH

Following the remedial works, no LNAPL has been identified on site although elevated concentrations of hydrocarbons remain in discrete areas of the Site. No exceedances of a commercial GAC considered protective of future site users have been identified from the network of groundwater monitoring wells installed post remediation.

Whilst elevated concentrations of petroleum hydrocarbons remain in discrete areas of the Site, the risks associated with these based on the proposed future use of the Site (commercial development) are considered acceptably low. Ongoing natural attenuation following the source removal works will lead to decreasing concentrations over time with the risk profile continue to lower. Any subsurface structures within the identified areas of hydrocarbon contamination should adopt protective measures associated with vapours, with service ducts leading to buildings appropriately sealed to prevent the creation of a preferential pathway.

5.4 PCL4 – LNAPL ON GROUNDWATER AND IN SOILS – CONTROLLED WATERS

LNAPL was previously identified in relatively discrete areas, contained to the southwestern portion of the Site. Excavation works within these areas throughout the remediation works have ensured that all identified LNAPL has been removed from the area of concern, through either impacted soil removal, or from skimming within open excavations. Excavations previously identified areas of LNAPL and were extended until no LNAPL was noted to be released from excavation extents. Following the completion of skimming works within each excavation, equilibration was allowed to occur for a period of approximately ten days in which time no LNAPL was identified. Excavations were then backfilled with suitable material.

Throughout the project, a total of 21,160L LNAPL was removed through skimming, and 618 m³ of hydrocarbon impacted soil removed from site.

Validation trial pits were completed around the perimeter of the remediated area, with no gross hydrocarbon contamination encountered. Monitoring wells subsequently installed throughout the remediated area and immediate surrounding area to assess for potential LNAPL accumulation. Weekly gauging was completed following the installation for a period of three months, with no LNAPL identified in any location.

Localised exceedances of the remediation criteria have been noted for BTEX compounds in close vicinity of LNAPL remedial works, with wider exceedances of naphthalene. However, these concentrations observed have shown not to present elevated concentrations of these contaminants

in groundwater, with boundary monitoring wells (BH301, BH304 and BH306) recording concentrations of TPH and BTEX compounds recorded below LOD and trace/low concentrations of PAH determinands.

Groundwater samples collected post completion, identified elevated concentrations of hydrocarbons within the remediated areas, however these were anticipated with the works only focussed on removing LNAPL rather than treating dissolved phase concentrations. Boreholes installed on the site boundaries recorded concentration of TPH and BTEX compounds below the LOD. Ongoing natural attenuation within the impacted groundwater will provide ongoing site betterment with the source material (LNAPL) effectively removed from the Site.

6 SUMMARY & CONCLUSIONS

6.1 SUMMARY

WSP UK Ltd. (WSP) was commissioned by Andrew Scott Ltd. (ASL) to provide stewardship, advice, part time supervision and validation works during the construction project at Port Talbot Harbourside. The project, commissioned by Neath Port Talbot County Borough Council (NPTCBC), comprised enabling works comprising remediation, ground improvement works, flood mitigation and construction of an access road to facilitate future commercial development. The works were covered under planning application P2020/0294 which was granted by NPTCBC with conditions, several of which related to the management of potential land contamination.

WSP's scope comprised providing stewardship with regards to the remediation works and adherence to the approved remediation strategy (WSP, 2020), combined with gathering verification and validation data of remedial works completed. In addition, where data gaps were identified by the regulators, WSP collected additional data to ensure a robust conceptual site model and risk assessment could be completed to discharge Condition 6.

Additional data was collected in relation to the gasholder to the east of the Site to satisfy NRW and allow the discharge of Condition 5, which was discharged in July 2021.

The Contaminated land officer from NPTCBC requested additional investigation to the west of the Site, to assess sub-surface conditions beneath the former raised bund. A series of trial pits were completed and soil samples collected, with laboratory results screened against applicable assessment criteria. No exceedances of controlled waters assessment criteria were identified, with one location recording concentrations of lead above the human health assessment criteria as well as identification of asbestos. The findings are consistent with the wider site, with localised concentrations of metals encountered; however, the mitigation measures implemented through the remediation (capping layer) ensuring risks are mitigated.

LNAPL source removal works were completed through the excavation and disposal of hydrocarbon impacted soils and skimming of LNAPL from open excavations. Areas of known LNAPL were targeted and excavations extended until no LNAPL was released from excavation walls. Skimming was completed until no LNAPL was present, and the excavations left open for approximately 10 days to confirm an absence of LNAPL. A total of 618 m³ hydrocarbon impacted soils and 21,160L LNAPL was removed during the works. Following backfill of the excavations, trial pits were completed around the perimeter to validate the absence of additional gross hydrocarbon impact and groundwater monitoring wells installed to validate LNAPL removal works. Weekly groundwater monitoring was completed for a period of three months, with no LNAPL identified in any exploratory location. Groundwater samples collected during the monitoring period identified elevated concentrations of hydrocarbons within the remediated areas, consistent with the LNAPL removal works which lowered concentrations below the saturation concentration. Groundwater samples collected from the downgradient site boundaries recorded concentrations of TPH and BTEX below limit of detection, indicating that hydrocarbon contamination within groundwater is spatially limited.

A theoretical risk remains to potential site users within proximity of BH303, where concentrations of hydrocarbon determinands in groundwater have been recorded above the GAC for a commercial end use.

Through the source removal works, significant betterment has been achieved, over and above what was initially anticipated given the spatial distribution of LNAPL previously identified.

6.2 CONCLUSIONS

Works completed by ASL, under the supervision of WSP, were in accordance with the approved Remediation Strategy (WSP, 2020), with verification of the works completed herein. A summary of the status of the previously identified potential contaminant linkages is presented below:

- PCL1 – Asbestos and Elevated Metals in Soils – Whilst asbestos and elevated concentrations of metals may be present in underlying soils, the pathway to impact human health receptors has been effectively managed through the installation of a 600 mm capping layer, which has been sampled to confirm conformance and depth verified.
- PCL2 – Petroleum Hydrocarbons in Soils – Source removal works have been completed in identified areas to mitigate the identified risks, including the removal of 618 m³ hydrocarbon impacted soils. Potential risks to human health receptors have been assessed with no exceedances of human health assessment criteria from soil sources.
- PCL3&4 – Free phase LNAPL – A total of 21,160L LNAPL has been removed during skimming activities from the identified areas. Excavations were extended until no LNAPL was noted to be released, all visible LNAPL skimmed and removed from site, with excavations retained open following completion to validate removal works. Monitoring wells installed following source removal works were monitored weekly for a three month period with no LNAPL identified. Potential risks to human health receptors have been assessed with no exceedances of human health assessment criteria from groundwater sources.

On the basis of the completed works, it is considered that the works detailed within the approved remediation strategy have been completed and the remedial end goals achieved to ensure risks to future development are limited.

6.3 RESIDUAL CONTAMINATION RISK AND RECOMMENDATIONS

Following completion of the remediation works, no unacceptable risks remain to controlled waters receptors; and no unacceptable risks remain to human health users based on the current site status.

During future construction works, potential risks may arise, associated with disturbance of soils underlying the current capping layer and/or the construction of structures.

- Any future construction works should consider risks associated with the disturbance and exposure of underlying soils which may contain elevated concentrations of hydrocarbons, metals and asbestos. Appropriate work control measures should be implemented to protect construction workers. Future site development plans should also include a barrier to prevent a pathway between underlying soils and site users, whether that be through hardstanding (building footprint or car parking etc.) or engineered capping layers in areas of soft landscaping.
- Consideration should be given to the use of appropriate future construction materials with regards to the elevated concentrations of hydrocarbons observed at the site including buried structures and utility infrastructure, including the sealing of ductwork to prevent pathways of vapours into future buildings.

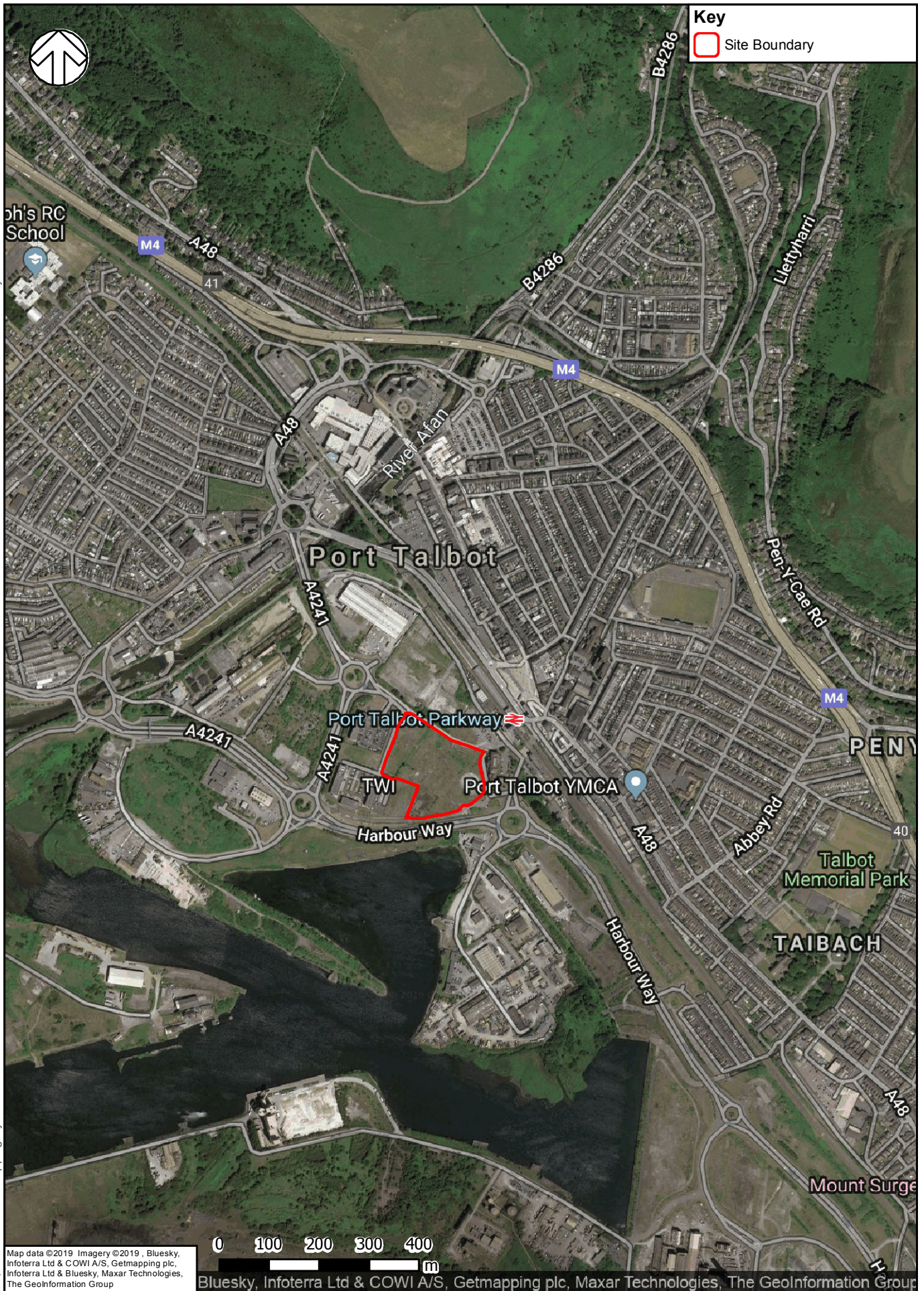


Following regulatory approval, it is recommended that the monitoring wells are appropriately decommissioned in-line with regulatory guidance to prevent the creation of preferential pathways. The site surface should be finished with inert material to match the capping layer present across the remaining site.

Appendix A

FIGURES





C2014B / GA / 0101

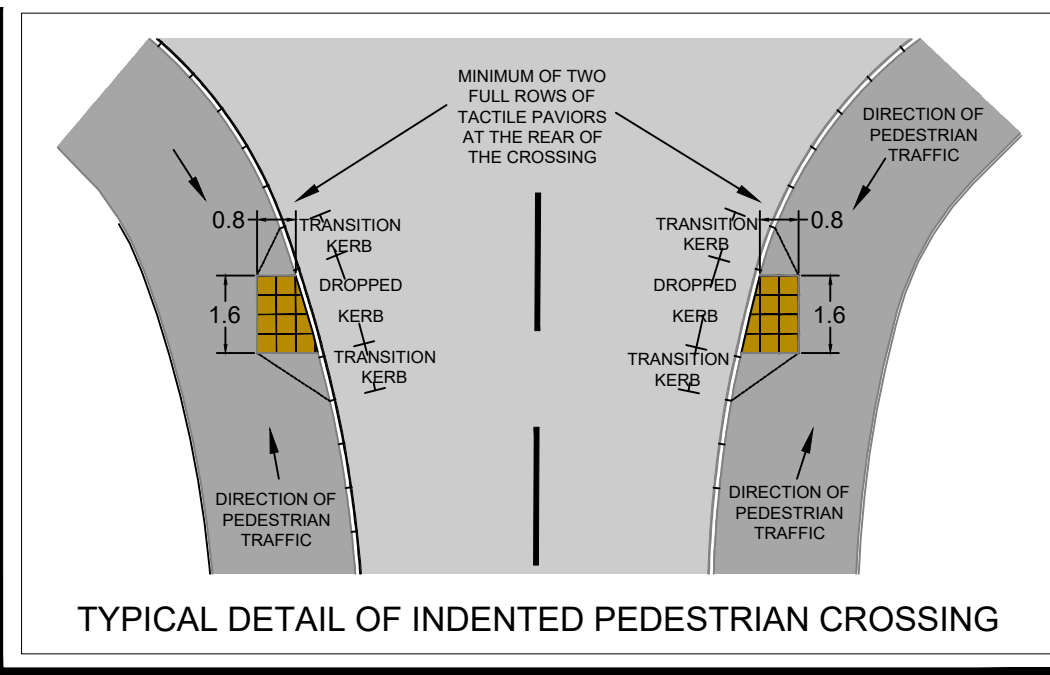
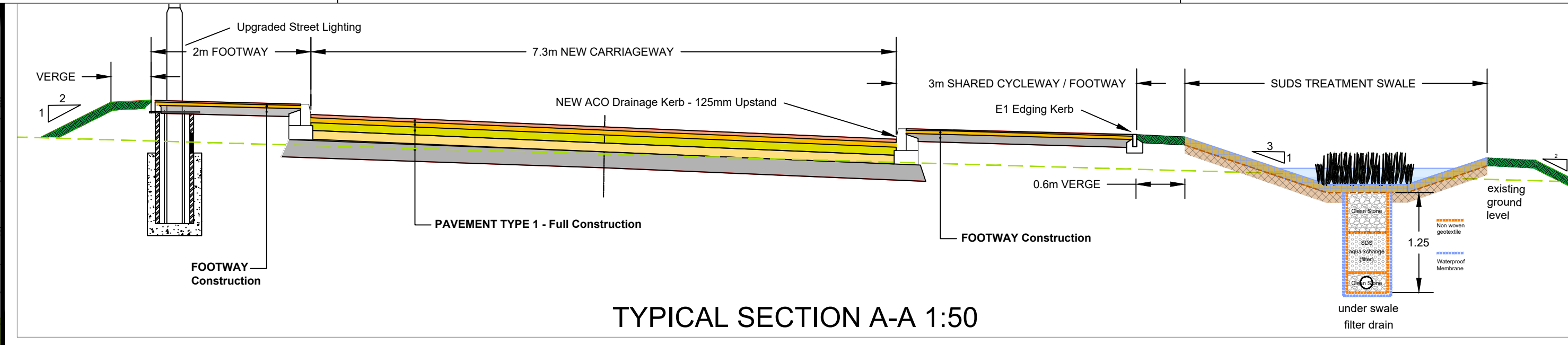
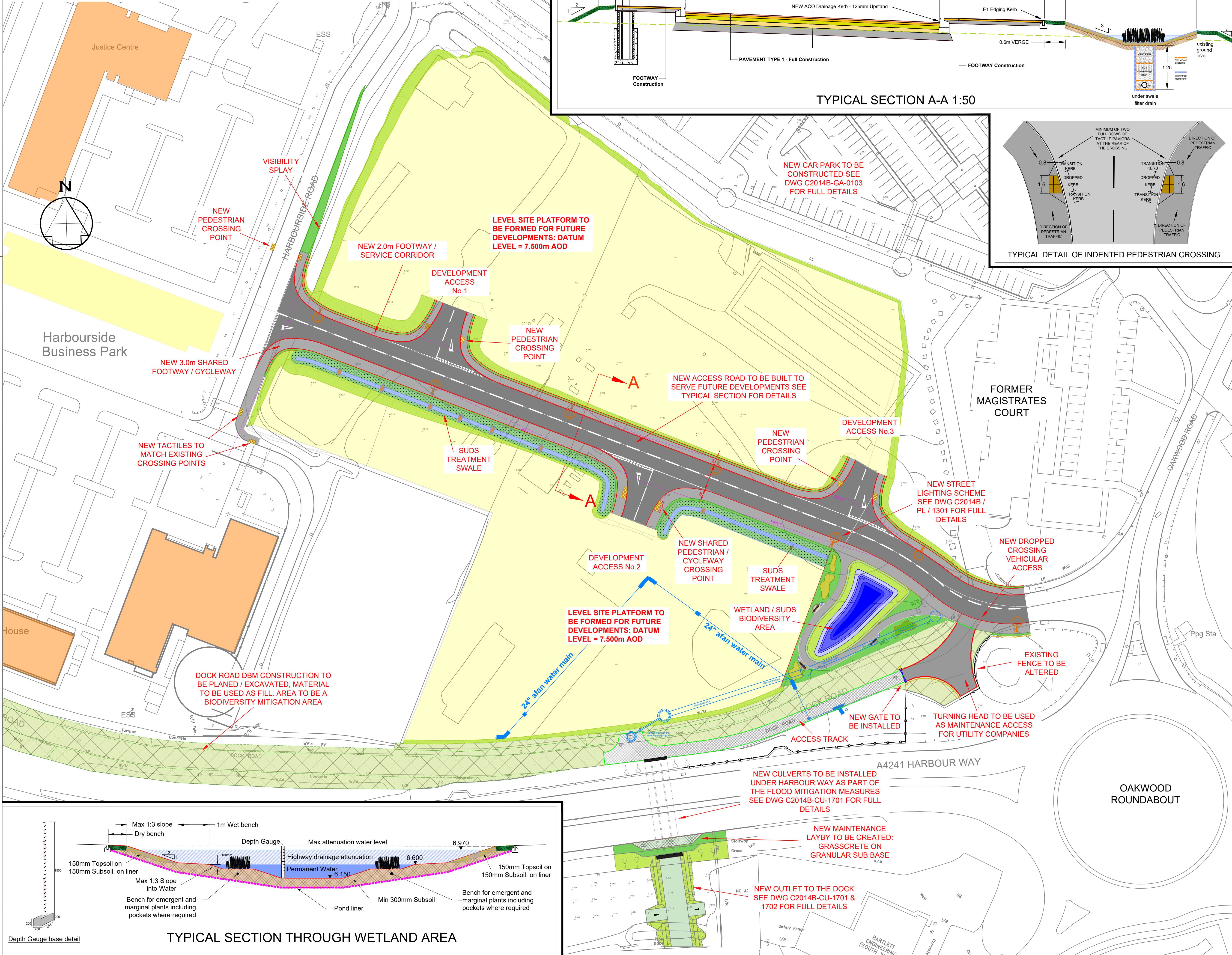
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GENERAL ARRANGEMENT - ACCESS ROAD

C2014B HARBOURSIDE STRATEGIC EMPLOYMENT SITE

Job Title

HARBOURSIDE STRATEGIC EMPLOYMENT SITE



NOTES

1. All dimensions are in millimetres unless otherwise stated.
2. For SITE CLEARANCE details see drawings C2014B / SC / 0201 and 0202.
3. For ACCOMMODATION works see drawing C2014B / F / 0301.
4. For DRAINAGE details see C2014B / DR / series of drawings.
5. For EARTHWORKS details see C2014B / EW / series of drawings.
6. For ROAD PAVEMENT details see drawing C2014B / RP / 0701.
7. For KERBS, FOOTWAYS and PAVED AREAS details see drawing C2014B / K / 1101.
8. For TRAFFIC SIGNS and ROAD MARKING details see drawing C2014B / RM / 1201.
9. For STREET LIGHTING details see C2014B / PL / series of drawings.
10. For FLOOD MITIGATION CULVERT details see C2014B / CU / series of drawings.
11. For EXISTING SERVICES see drawing C2014B / SU / 2701.

LEGEND

PROPOSED FOOTWAY CONSTRUCTION

NEW CARRIAGEWAY CONSTRUCTION

HIGHWAY VERGES

HIGHWAY EMBANKMENTS

LEVEL PLATFORM TO BE FORMED FOR FUTURE DEVELOPMENTS: 7.5M AOD.

AREA OF SITE TO BE USED FOR TRANSLOCATED MATERIAL

DBM MAINTENANCE ACCESS TRACK

NEW CROSSING POINTS

PROPOSED NEW STREET LIGHTING

PROPOSED SUDS TREATMENT SWALE / WATER GARDEN WITH TREATMENT AND ATTENUATION FILTER DRAIN BELOW

Note: Site will be developed by others following the ground remediation and construction of the infrastructure.

Rev

Details

Dr

Ch

Ap

Date

Client

Cyngor Castell-nedd Port Talbot
Neath Port Talbot Council

ENGINEERING AND TRANSPORT

NICOLA PEARCE BSC (Hons), Dip TP, MRTPI
DIRECTOR OF ENVIRONMENT AND REGENERATION
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NEATH SA11 2GG

Job Title

C2014B HARBOURSIDE STRATEGIC EMPLOYMENT SITE

GENERAL ARRANGEMENT - ACCESS ROAD

File No.

Financial Code No. 26.007500.B054.300916

Drawn

Checked

MCB

Approved

HHH

Date

JAN '20

Date

JAN '20

Date

JAN '20

Scales

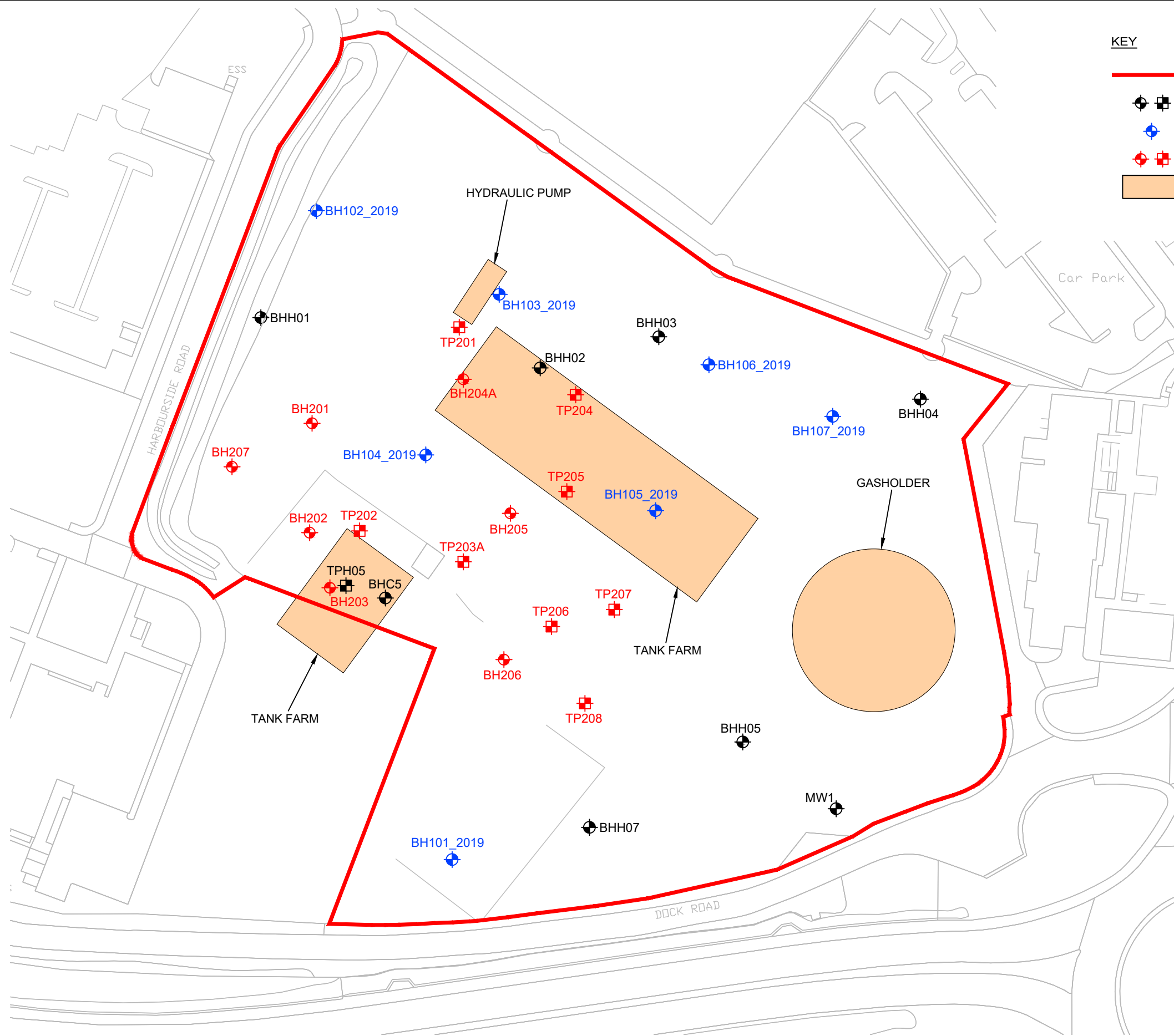
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Status

TENDER

Drawing No.

C2014B / GA / 0101



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Rev	Date	Description	By	Chk	App	Notes:	 Kings Orchard 1 Queen Street Bristol BS2 0HQ Tel: 44-(0)1179-306200	Client:	ANDREW SCOTT LTD	Title:	EXPLORATORY HOLE LOCATION PLAN ALL PHASES	Drawn: CEW Checked: RE Designed: RE Approved: Date: 24/02/2020 Scale: 1:1000 A3 Sheet: Project Number: Drawing Number: Revision: 62253048 FIGURE 2 © Copyright WSP
								Project:	PORT TALBOT HARBOURSIDE			



KEY

- SITE BOUNDARY
- BOREHOLE
- TRIAL PIT
- POTENTIAL HISTORICAL SOURCE AREAS
- FREE PHASE LNAPL
- HYDROCARBON IMPACTED SOILS
- ELEVATED CONCENTRATIONS OF HYDROCARBONS OBSERVED IN SOILS AND/OR GROUNDWATER
- FREE PHASE PRODUCT IDENTIFIED ON EXCAVATED SOILS OR IN MONITORING WELLS

Note:

Extents of hydrocarbon contamination are indicative only and based on the information available at time of writing. The exact extents likely to require remediation should be assessed by a competent person, in accordance with the approved remediation strategy. This plan does not indicate areas that require remedial works.

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

Tel: 44-(0)1179-306200

Client:

ANDREW SCOTT LTD

Project:

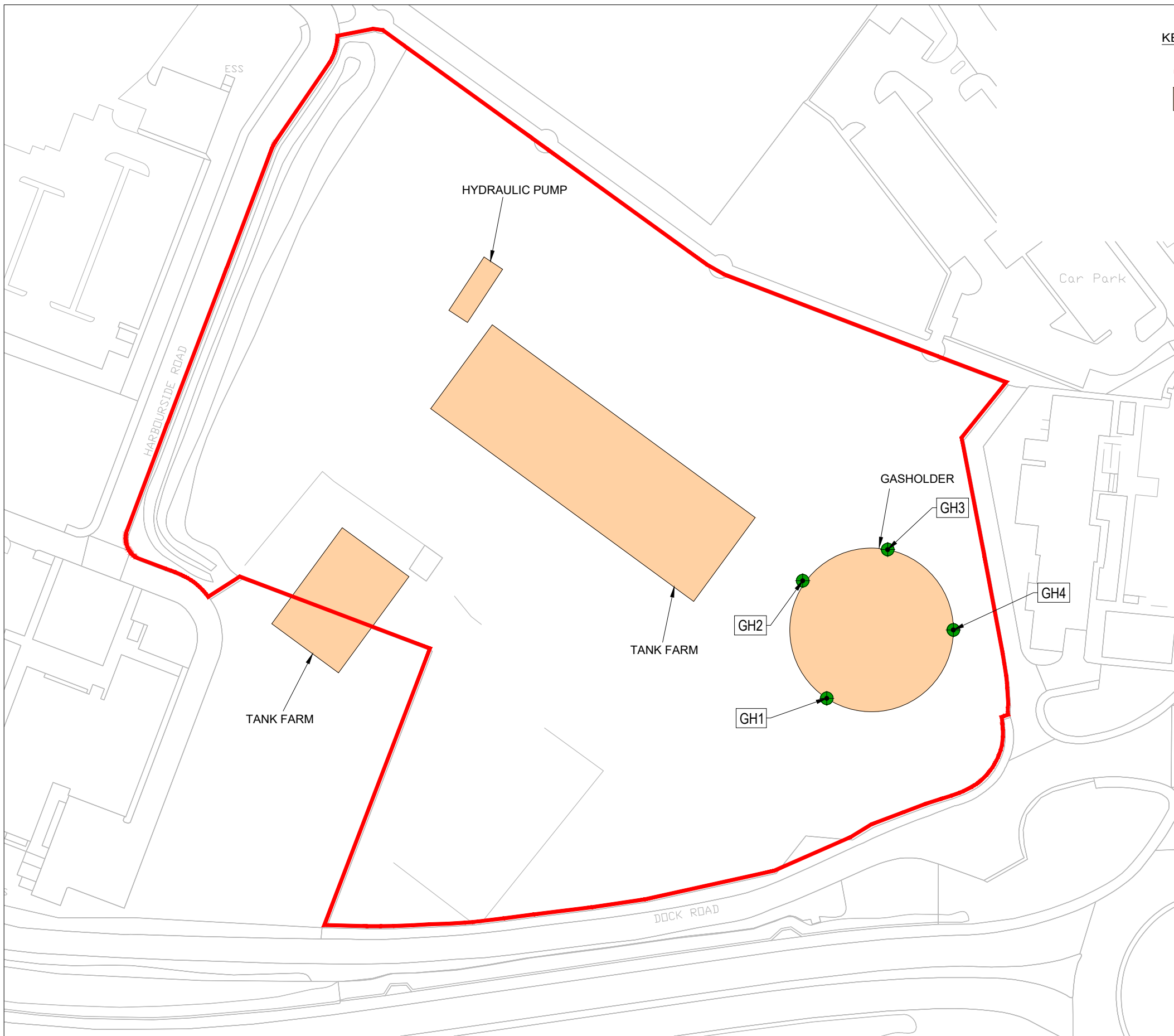
PORT TALBOT HARBOURSIDE

Title:

INDICATIVE
HYDROCARBON
CONTAMINATION
DISTRIBUTION

Drawn: CEW		Checked: RE	
Designed: RE		Approved:	
Date: May 2020	Scale: 1:1000	A3	Sheet:
Project Number: 62253048		Drawing Number: FIGURE 5	Revision:
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KEY

- Site Boundary
- Potential historical source areas
- Validation samples collected May 2021

Note
Gasholder validation samples are approximate. Collected from excavation extents following removal of ring beam at approximately 1.5m bgl

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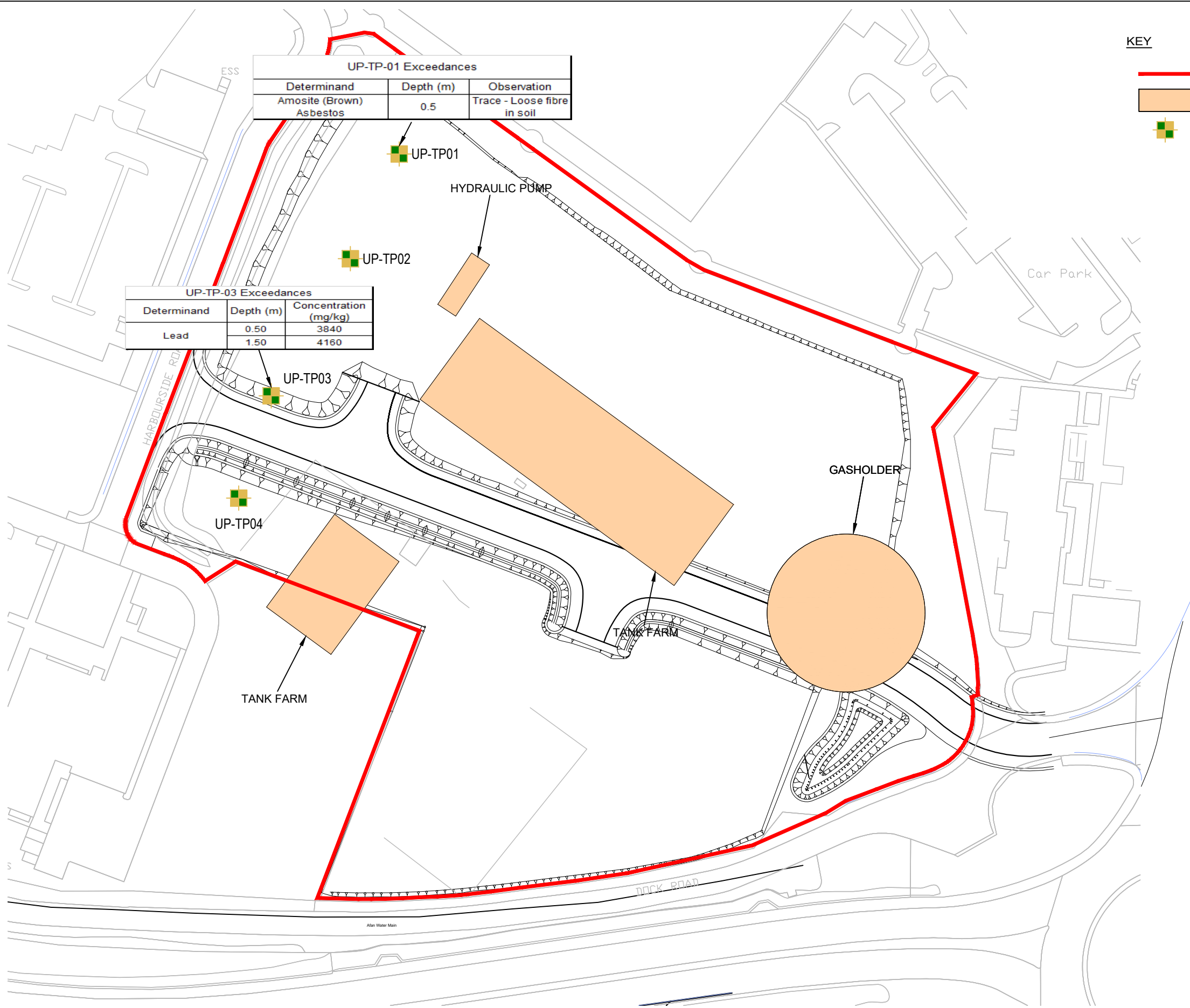


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Client:
ANDREW SCOTT LTD
Project:
PORT TALBOT HARBOURSIDE

Title:
**GASHOLDER
EXPLORATORY HOLE
LOCATION PLAN
WSP 2021**

Drawn: NB		Checked: RE	
Designed: RE		Approved:	
Date: 20/05/2021	Scale: 1:1000	A3	Sheet:
Project Number:		Drawing Number:	
70057278		Figure 2	
Revision:			
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KEY

- Site Boundary
- Potential historical source areas
- Trial Pit

Determinand	Human Health Generic Assessment Criteria Limits (mg/kg)
Lead	1390
Amosite (Brown) Asbestos	Visual inspection

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Rev	Date	Description	By	Chk	App	Notes
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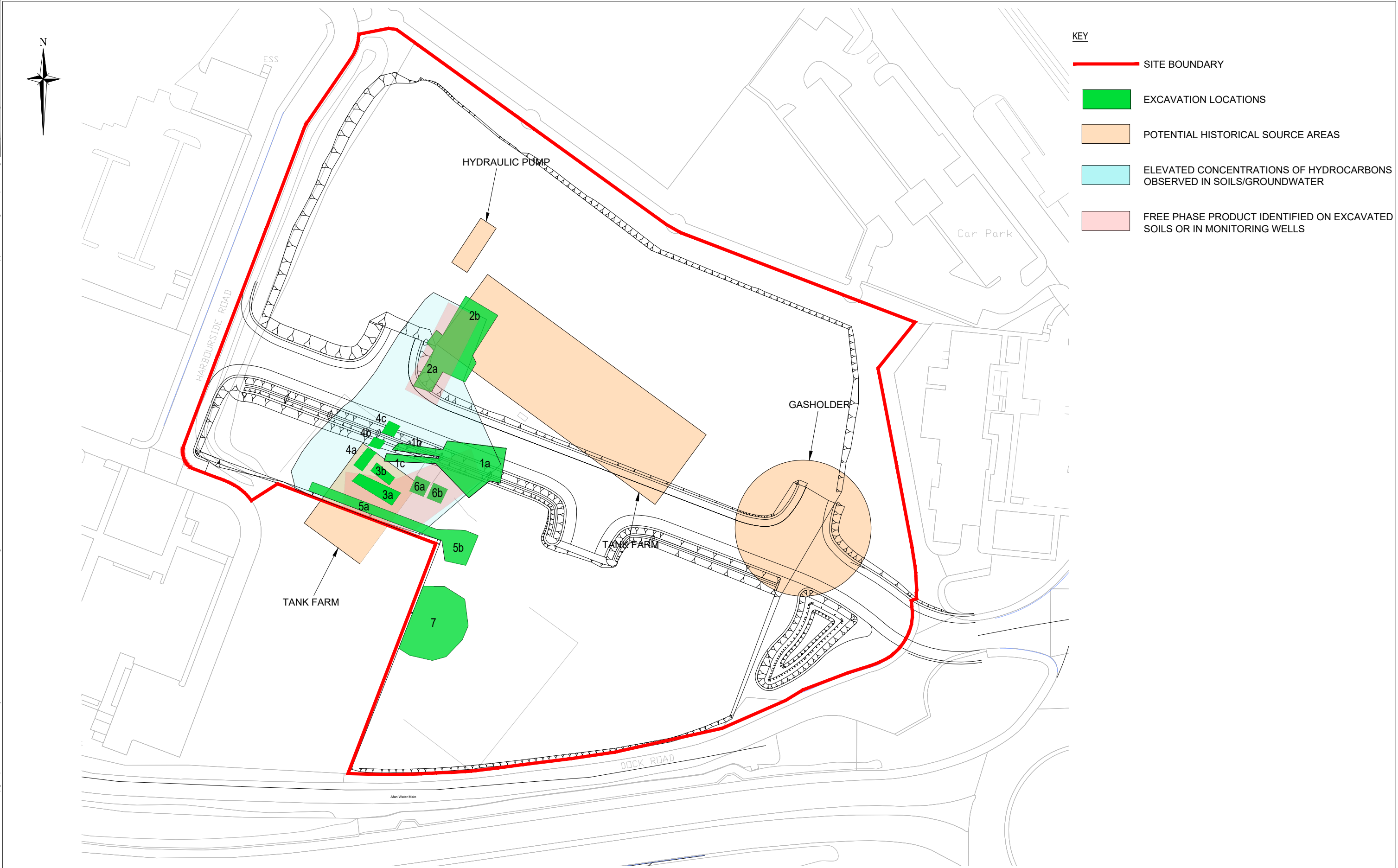
Tel: 44-(0)1179-306200

Client:
ANDREW SCOTT LTD

Project:
PORT TALBOT HARBOURSIDE

Title:
**UPPER PLATEAU
TRIAL PIT PLAN**

Drawn: NB		Checked: RE	
Designed: RE		Approved:	
Date: 22/04/2022	Scale: 1:1000	A3	Sheet:
Project Number:		Drawing Number:	
70057278		Figure 6	
Revision:			
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Tel: 44-(0)1179-306200

Client:
ANDREW SCOTT LTD

Project:
PORT TALBOT HARBOURSIDE

Title:
LNAPL EXCAVATION LOCATIONS

Drawn: CEW		Checked: RE	
Designed: RE		Approved:	
Date: May 2020	Scale: 1:1000	A3	Sheet:
Project Number: 62253048		Drawing Number: Figure 7	
		Revision:	

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

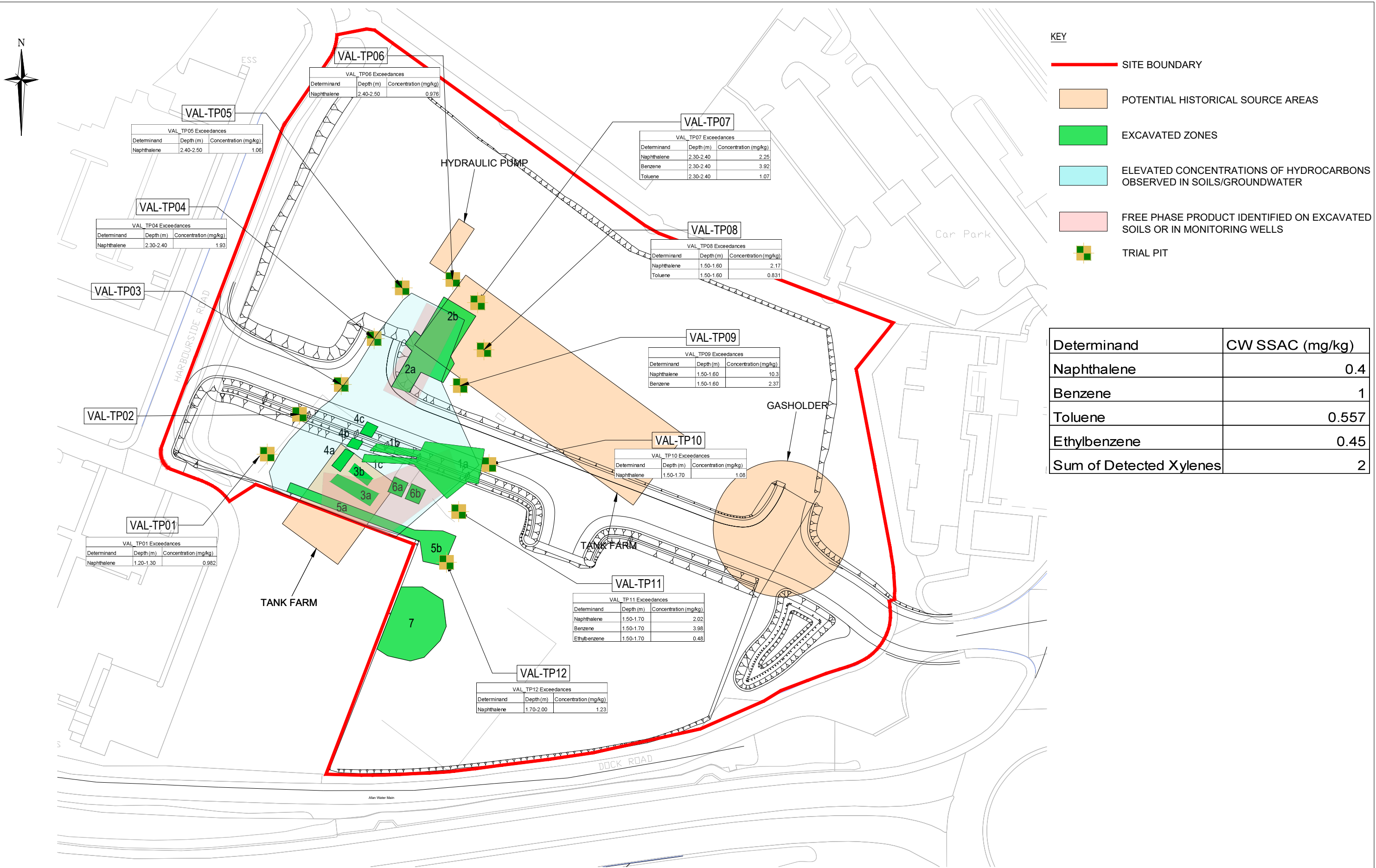
Tel: 44-(0)1179-306200

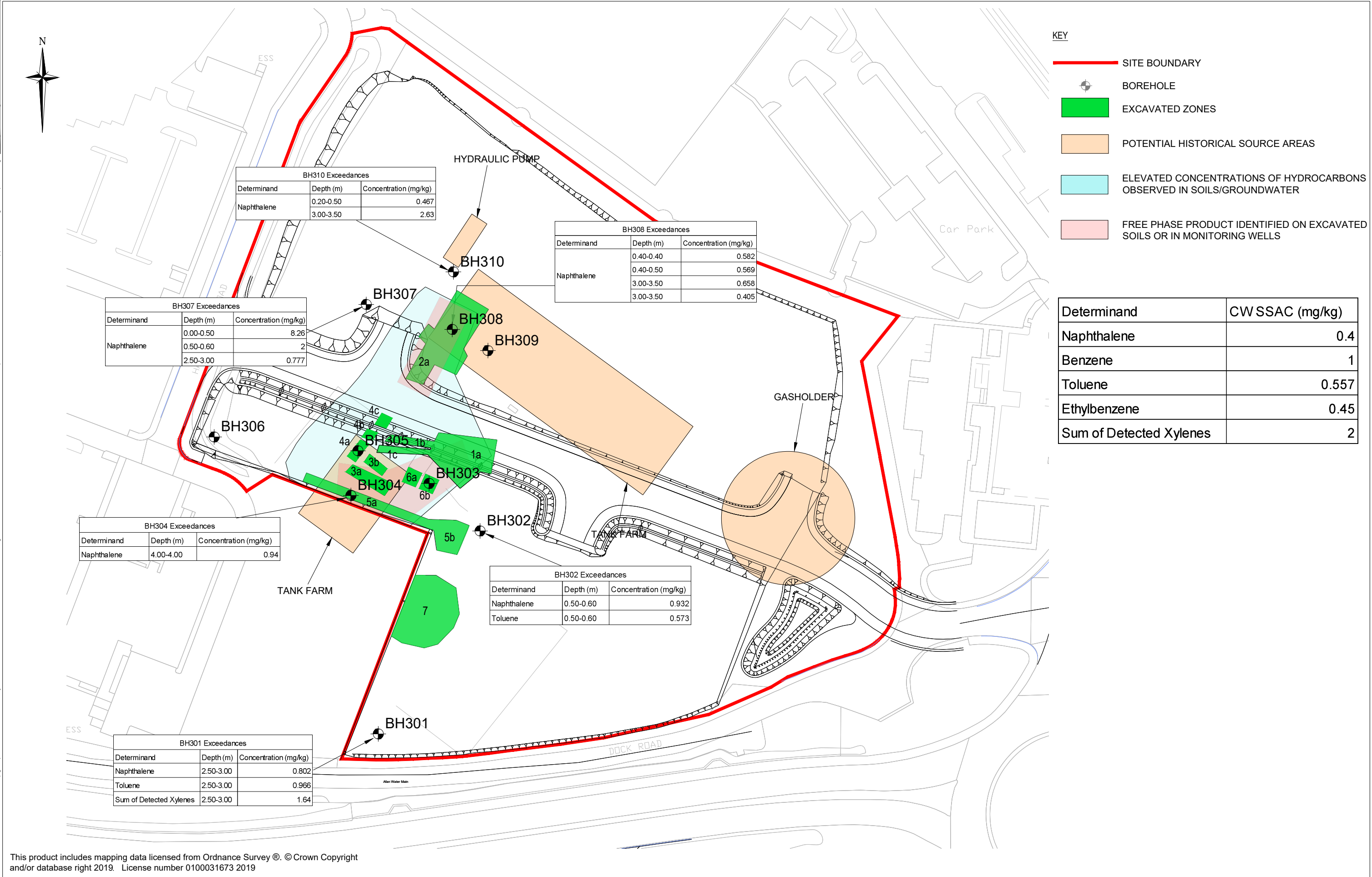
Client:
ANDREW SCOTT LTD

Project:
PORT TALBOT HARBOURSIDE

Title:
**LNAPL EXCAVATION
VALIDATION TRIAL PIT
LOCATIONS**

Drawn: CEW	Checked: RE		
Designed: RE	Approved:		
Date: April 2022	Scale: 1:1000	A3	Sheet:
Project Number: 62253048	Drawing Number: Figure 8	Revision:	
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Tel: 44-(0)1179-306200

Client:
ANDREW SCOTT LTD

Project:
PORT TALBOT HARBOURSIDE

Title:
**MONITORING WELL
LOCATIONS
POST REMEDIATION**

Drawn: CEW		Checked: RE	
Designed: RE		Approved:	
Date: May 2020	Scale: 1:1000	A3	Sheet:
Project Number: 62253048		Drawing Number: Figure 9	
		Revision:	
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Rev	Date	Description	By	Chk	App	Notes
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Kings Orchard
1 Queen Street
Bristol BS2 0HQ
Tel: 44-(0)1179-306200

Client:
ANDREW SCOTT LTD

Project:
PORT TALBOT HARBOURSIDE

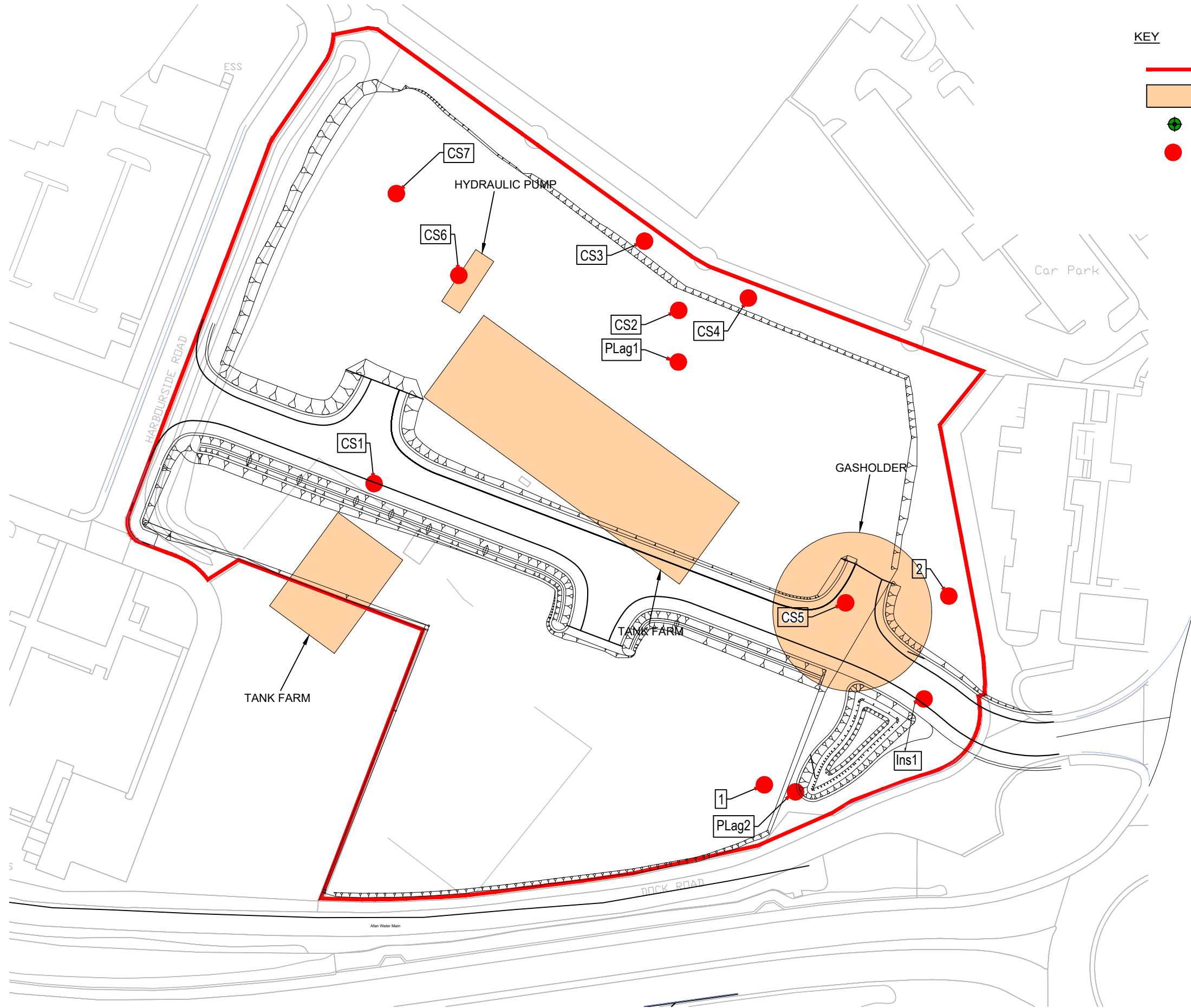
Title:
SUSPECTED ACM LOCATIONS

Drawn: NB		Checked: RE		
Designed: RE		Approved:		
Date: 22/04/2022	Scale: 1:1000	A3	Sheet:	
Project Number:		Drawing Number:		Revision:
70057278		Figure 10		
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KEY

- Site Boundary
- Potential historical source areas
- Validation samples collected May 2021
- Suspected ACM Location



Appendix B

PLANNING CONDITIONS



**NEATH PORT TALBOT COUNTY BOROUGH COUNCIL
CYNGOR BWRDEISTREF SIROL CASTELL-NEDD PORT TALBOT**

**TOWN AND COUNTRY PLANNING ACT 1990
THE TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT
PROCEDURE)(WALES) ORDER 2012**

APPROVAL OF FULL PLANNING PERMISSION

Name and address of the applicant

NPTCBC Engineering & Transport -
Amanda Philips
The Quays
Brunel Way
Baglan Energy Park
Neath
Neath Port Talbot
SA11 2GG

DATE REGISTERED: 15 April 2020

APPLICATION NO: P2020/0294

LOCATION: Harbourside Strategic Employment Site, Harbourside Road,
Port Talbot

PROPOSAL: Construction of an access road, flood mitigation works, land
contamination remediation works, improving the load capacity
of the ground and associated works to facilitate the
regeneration of a former brownfield land for future commercial
development.

NEATH PORT TALBOT COUNTY BOROUGH COUNCIL as the Local Planning Authority
in pursuance of its power under the above mentioned Act and Order hereby **GRANTS
PLANNING PERMISSION** for the development as described above to be carried out in
accordance with the application and the plans submitted therewith, subject to compliance
with the following conditions:

This Decision Notice is REVISION NUMBER 4, issued on 20/07/2021

Conditions:-

Time Limit Conditions

- 1 The development shall begin no later than five years from the date of this decision.
Reason:
To comply with the requirements of Section 91 of the Town and Country Planning
Act 1990.

List of Approved Plans

- 2 The development shall be carried out in accordance with the following approved plans and documents:

C2014B-LOC-001-P Location Plan (Rev B)
C2014B-CR-0001-P Contractor Routes
C2014B-GA-0101-P General Arrangement- Access Road
C2014B-GA-0104-P General Arrangement Standard Details
C2014B-SC-0201-P Site Clearance main development site and carpark extension
C2014B-F-0301-P Accommodation Works
C2014B-DR-0501-P Drainage Main Development
C2014B-DR-0504-P Drainage Long section and Control Camber Details
C2014B-DR-0505-P Drainage Construction Details and Typical sections
C2014B-DR-0506-P Drainage Standard Details
C2014B-DR-0507-P Drainage Gully Types and Gully Connections
C2014B-EW-0601-P Earthworks
C2014B-EW-0602-P Biodiversity Mitigation Areas (Rev A)
C2014B-RP-0701-P Road Pavements
C2014B-K-1101-P Kerbs Footways and paved Areas
C2014B-RM-1201-P Traffic Signs and Road Markings
C2014B-PL-1301-P Lighting Design
C2014B-PL-1302-P Lighting Standard Detail
C2014B-CU-1701-P Flood mitigation Culvert General Arrangement 1 of 2
C2014B-CU-1702-P Flood mitigation Culvert general arrangement 2 of 2
C2014B-SU-2701-P Existing Services
C2014B-SP-0101-P Swept Path Analysis
C2014B-XS- 0001 Cross section location
C2014B-XS- 0002 Cross section 1 of 2
C2014B-XS- 0003 Cross section 2 of 2
C2014B-DR-WW-0001 Drainage main Development
C2014B-SU-AWM-D-001 Afan water Main

Reason:

In the interests of clarity.

Pre-Commencement Conditions

- 3 Prior to any development commencing on site, the developer must do the following:-
- a) Notify the Local Planning Authority in writing that you intend to commence development by submitting a Formal Notice under Article 24B of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012 (DMPWO) in the form set out in Schedule 5A (a newly inserted Schedule) of the DMPWO (or in a form substantially to the like effect); and
 - b) Display a Site Notice (as required by Section 71ZB of the 1990 Act) in the form set out in Schedule 5B (a newly inserted Schedule) of the DMPWO (or in a form substantially to the like effect), such Notice to be firmly affixed and displayed in a prominent place, be legible and easily visible, and be printed on durable material. Such Notice must thereafter be displayed at all times when development is being carried out.

Reason:

To comply with procedural requirements in accordance with Article 24B of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012 (DMPWO) and Section 71ZB of the Town and Country Planning Act 1990.

NOTE: Templates of the required Notice and Site Notice are available to download at www.npt.gov.uk/planning

The applicant notified Local Planning Authority in line with the above condition under planning permission ref. P2021/0201 on the 26/02/2021

- 4 No development shall commence on site, including site clearance, until a Construction Environmental Management Plan (CEMP) has been submitted to and approved in writing by the Local Planning Authority. The CEMP shall be made with reference to the requirements of British Standard BS5228-1:2009 - "Code of practice for noise and vibration control on construction and open sites". The CEMP should include the following information: -
 - (a) Construction methods: details of the extent and phasing of development; details of construction materials or techniques to be used; details for the storage and management of plant and materials used in constructing the development and details, waste and contaminated land.
 - (b) General Site Management: details of the construction programme including timetable; details of site clearance; construction drainage, site setup plan detailing sensitive receptors, buffer zones and relevant protection measure maintenance of security hoarding including decorative displays and facilities for public viewing; details of complaint investigation procedures.
 - (c) Control of Nuisances: Identification of the significant construction and demolition noise & vibration sources; details of physical and operational management controls necessary to mitigate noise & vibration emissions; A dust management plan (in accordance with the IAQM guidance on demolition and construction) and measures to control light spill.
 - (d) Traffic Management: details of site deliveries; details for the loading and unloading of plant and materials; details of wheel wash facilities; details for the parking of vehicles of site operatives and visitors; The erection and maintenance of security hoarding; A scheme for recycling/disposing of waste resulting from demolition and construction works and a scoping route for all deliveries to and from the development.
 - (e) Hours of working on site, including specified hours for deliveries; details of restrictions to be applied during construction and demolition works (including timing, duration and frequency of works) to prevent noise or nuisance amenity issues to surrounding properties.
 - (f) Biodiversity Management: tree and hedgerow protection, invasive species management (to include Himalayan balsam and Japanese knotweed), species/habitats protection and mitigation measures.

(g) Water Framework Directive (WFD) Assessment: details of the proposal to be assessed against the Water Framework Directive's objectives.

(h) Soil management: topsoil stripping, storage and amelioration for re-use.

(i) CEMP masterplan: detailing the development, location of landscape and environmental resources, design proposals and objectives for integration and mitigation.

(j) Resource Management: fuel and chemical storage, waste management, water consumption and energy consumption.

(k) Pollution Prevention: demonstrate compliance with relevant Guidelines for Pollution Prevention, incident response plan and site drainage plan.

(l) Responsible Persons: details of the persons and bodies responsible for activities associated with the CEMP and emergency contact details

The CEMP shall be implemented as approved throughout the site preparation and construction phases of the development.

Reason:

In order to ensure necessary management measures are agreed and implemented to protect local amenity, especially for people living and/or working nearby, highway safety during construction, biodiversity, controlled waters, human health and to accord with Policies BE1, EN7, EN8 and TR2 of the Local Development Plan.

Details in respect of the above condition were approved by planning permission ref. P2021/0073 on the 25/02/2021

- 5 Notwithstanding the submitted information, No construction works to the road shall commence until a scheme which shall include the following components to deal with the risks associated with contamination of the site is undertaken by competent persons in accordance with the following document: -Development of Land Affected by Contamination: A Guide for Developers (WLGA & EAW, 2012) and shall each be submitted to and approved, in writing, by the Local Planning Authority:

1. A preliminary risk assessment of the application site and the biodiversity mitigation area 2 shown on drawing C2014B / EW / 0602 which has identified:

- a) all previous uses
- b) potential contaminants associated with those uses
- c) a conceptual model of the site indicating sources, pathways and receptors
- d) potentially unacceptable risks arising from contamination at the site.

2. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

3. The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

Any changes to these components require the express consent of the Local Planning Authority. The scheme shall be implemented as approved.

Reasons

To ensure that information provided for the assessment of the risks from land contamination to the future users of the land, neighbouring land, controlled waters, property and ecological systems is sufficient to enable a proper assessment, and to ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors. Natural Resources Wales considers that the controlled waters at this site are of high environmental sensitivity due to proximity to surface water and being situated on a Secondary A aquifer. Contamination is known/strongly suspected at site due to historical contaminative uses, and to ensure compliance with Policies SP16 and EN8 of the Neath Port Talbot Local Development Plan.

Details in respect of the above condition were amended by a non-material Amendment under planning permission ref. P2021/0072 on the 26/02/2021

Details in respect of the above condition were approved by planning permission ref. P2021/0569 on the 20/07/2021

- 6 Notwithstanding the submitted information, prior to the first beneficial use of the road, a verification report demonstrating completion of the works set out in the approved remediation strategy and the effectiveness of the remediation is submitted to and approved, in writing, by the Local Planning Authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the Local Planning Authority.

Reasons

To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors, and to demonstrate that the remediation criteria relating to controlled waters have been met, and (if necessary) to secure longer-term monitoring of groundwater quality. This will ensure that there are no longer remaining unacceptable risks to controlled waters following remediation of the site, and to ensure compliance with Policies SP16 and EN8 of the Neath Port Talbot Local Development Plan.

Details in respect of the above condition were amended by a non-material Amendment under planning permission ref. P2021/0072 on the 26/02/2021

- 7 No development shall commence until details of a method statement and risk assessment for the protection of the structural condition of the water main assets crossing the site has been submitted to and approved in writing by the Local Planning Authority. The approved protection measures shall be implemented in full before any other development hereby permitted has commenced, and shall be retained at all times for the duration of the approved operations including the restoration works.

Reason:

To ensure that the proposed development does not affect the integrity of the public water supply system in the interests of public health and safety, and to ensure the development complies with Policy SP16 and BE1 of the Neath Port Talbot Local Development Plan

Details in respect of the above condition were approved by planning permission ref. P2020/1006 on the 20/11/2020

- 8 Notwithstanding the submitted information, no development shall commence until a scheme is submitted to and approved in writing by the Local Planning Authority detailing the Tata pipe diversion having regard to Welsh Waters apparatus which is in the vicinity. The pipe shall be diverted in accordance with the agreed details
- Reason

To ensure the Tata water pipe diversion does not have any unacceptable impact upon Welsh Waters apparatus and public health and safety and ensure the development complies with Policy SP16 and BE1 of the Neath Port Talbot Local Development Plan

Details in respect of the above condition were approved by planning permission ref. P2020/1006 on the 20/11/2020

- 9 Notwithstanding the submitted information, no development shall commence until a scheme has been submitted to and approved in writing by the Local Planning Authority detailing landscaping and biodiversity mitigation measures on both the application site and the biodiversity mitigation areas identified on Dwg. C2014B/EW/0602 Rev A, along with a timescale for their implementation and completion. The mitigation shall be implemented in accordance with the agreed timescale and maintained as such thereafter.

Reason:

In the interest of biodiversity enhancement and mitigation and visual amenity, and to ensure the development complies with Policies SP15 and EN6 of the Neath Port Talbot Local Development Plan.

Details in respect of the above condition were approved by planning permission ref. P2021/0124 on the 24/02/2021

- 10 Notwithstanding the submitted information, prior to the commencement of development, a landscape management plan, including management responsibilities and maintenance, for all landscaped and biodiversity mitigation areas (as identified on Dwg. C2014B/EW/0602 Rev A), to also include how the site will be managed post construction, shall have been submitted to and approved in writing by the Local Planning Authority. The landscape management plan shall be implemented and adhered to in accordance with the approved details thereafter.

Reason:

In the interest of visual amenity, and to ensure the long term management and maintenance of all landscaped areas that lie outside of the curtilage of individual properties, and to ensure the development complies with Policies SP15 and BE1 of the Neath Port Talbot Local Development Plan.

Details in respect of the above condition were approved by planning permission ref. P2021/0124 on the 24/02/2021

Action Conditions

- 11 In the event that contamination is found at any time when carrying out the approved development that was not previously identified, work on site shall cease immediately and shall be reported in writing to the Local Planning Authority. A Desk Study, Site Investigation, Risk Assessment and where necessary a Remediation Strategy must be undertaken in accordance with the following document:- Development of Land Affected by Contamination: A Guide for Developers (WLGA & EAW, 2012). This document shall be submitted to and agreed in writing with the Local Planning Authority. Prior to occupation of the development, a verification report which demonstrates the effectiveness of the agreed remediation, shall be submitted to and agreed in writing with the Local Planning Authority.

Reasons

To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other off site receptors. Given the complexity of the site it is considered possible that there may be unidentified areas of contamination at the site that could pose a risk to controlled waters if they are not remediated, and to ensure compliance with Policies SP16 and EN8 of the Neath Port Talbot Local Development Plan.

- 12 All works shall be subject to Road Safety Audits, stages 2, 3 and 4 in accordance with the Design Manual for Roads and Bridges. Each stage of the Road Safety Audit shall be submitted to and approved in writing by the Local Planning Authority. Stage 2 shall be submitted prior to the first beneficial use of the development; Stage 3 shall be submitted upon completion of the development, and stage 4 shall be submitted 1 year after the completion of the development. All issues highlighted at each stage shall be addressed to the written approval of the Local Planning Authority within 3 months of approval of that stage of the Road Safety Audit .

Reason

In the interest of highway and pedestrian safety and to ensure accordance with Policies TR1, TR2 and BE1

Regulatory Conditions

- 13 No surface water and/or land drainage shall be allowed to connect directly or indirectly with the public sewerage network.

Reason:

To prevent hydraulic overloading of the public sewerage system and highway drainage network, to protect the health and safety of existing residents and ensure no pollution of or detriment to the environment, and to ensure the development complies with Policy SP16 and BE1 of the Neath Port Talbot Local Development Plan.

Details in respect of the above condition were amended by a non-material Amendment under planning permission ref. P2021/0072 on the 26/02/2021

- 14 No infiltration of surface water drainage into the ground is permitted other than with the express written consent of the Local Planning Authority, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to controlled waters. The development shall be carried out in accordance with the approval details.

Reason

There is an increased potential for pollution from inappropriately located infiltration systems such as soakaways, unsealed porous pavement systems or infiltration basins and to ensure the development complies with Policy SP16 and BE1 of the Neath Port Talbot Local Development Plan.

Informatives:

1 Please note that SAB approval will be required prior to any work commencing. It is a breach of approval required under Paragraph 7 (1) Schedule 3 of the Flood and Water Management Act 2010 whereby action will be taken by the Authority under The Sustainable Drainage (Enforcement) (Wales) Order 2018.

2 As of 7th January 2019, this proposed development may be subject to Schedule 3 of the Flood and Water Management Act 2010. In the event this proposed development amounts to a total impermeable area of 100sqm or more, approval of Sustainable Drainage Systems (SuDS) features will be required in accordance with the Statutory standards for sustainable drainage systems - designing, constructing, operating and maintaining surface water drainage systems. It would therefore be recommended that the developer engage in consultation with the Council's drainage team, as the determining SuDS Approval Body (SAB), in relation to proposals for SuDS features. Please note, Dwr Cymru Welsh Water is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation. The applicant may need to apply to Dwr Cymru / Welsh Water for any connection to the public sewer under S106 of the Water Industry Act 1991. If the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Gravity Foul Sewers and Lateral Drains, and conform with the publication Sewers for Adoption- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com. The applicant is also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist us in dealing with the proposal the applicant may contact Dwr Cymru Welsh Water to establish the location and status of the apparatus. Under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

The decision to recommend planning permission has been taken in accordance with Section 38 of The Planning and Compulsory Purchase Act 2004, which requires that, in determining a planning application the determination must be in accordance with the Development Plan unless material considerations indicate otherwise. The Development Plan comprises the Neath Port Talbot Local Development Plan (2011-2026) adopted January 2016.

It is considered that the proposal development would help bring this designated strategic regeneration area to fulfilment with an aim to provide a mixed use development that will increase employment opportunities within Port Talbot and surrounding areas. The

proposal therefore represents an appropriate form of development that would have no unacceptable impact on visual amenity and the character of the area as a whole. Highway and pedestrian safety, residential amenity, pollution, flooding and biodiversity.

Accordingly, the proposed development is in accordance with Policies SP1, SP2, SP3 SP4, SP5, SP7, SP11, SP12, SP15, SP16, SP20, SP21, SRA2, SC1, I1, H1/17, EC1/4, EN6, EN8, TR1, BE1 and R1/3 of the Neath Port Talbot Local Development Plan.

It is further considered that the decision complies with the Council's well-being objectives and the sustainable development principle in accordance with the requirements of the Well-being of Future Generations (Wales) Act 2015.

Signed: 

Ceri Morris – Head of Planning & Public Protection

Date: 5 October 2020

IMPORTANT:

(1) Please note that for all decisions issued after 16th March 2016 for outline or full planning permission, a revised decision notice will be issued whenever a subsequent consent is given, for example providing details of any Reserved Matters approvals (outline applications only) and/or approval of conditions (including on Reserved Matters). This will ensure that the current status of the conditions applied to a consent is clear. Accordingly you are advised to visit www.npt.gov.uk/planning to view the application documentation to see if this is the current version, or whether it has been superseded by a more up-to-date revision of this Decision Notice. For Reserved Matters approvals the revised Decision Notice will only be shown under the Outline approval.

(2) Please note that this consent is specific to the plans and particulars approved as part of the application. Any departure from the approved plans will constitute unauthorised development and may be liable to enforcement action. You (or any subsequent developer) should advise the Council of any actual or proposed variations from the approved plans immediately so that you can be advised how to best resolve the matter.

(3) In addition, any conditions that the Council has imposed on this consent will be listed above and should be read carefully. It is your (or any subsequent developers) responsibility to ensure that the terms of all conditions are met in full at the appropriate time (as outlined in the specific condition). Please note that any works carried out without compliance with the conditions attached to this approval will be entirely at the risk of the persons involved and may result in formal action being taken by the Local Planning Authority.

(4) The developer should have regard to Sections 4, 7, 8 and 8A of the Chronically Sick and Disabled Persons Act 1970 and to the British Standards Institution's Code of Practice for "Design of buildings and their approaches to meet the needs of disabled people" (BS 8300:2009+A1:2010).

(5) From 1st October 2012 it has been an offence to install a public sewer or lateral drain without having an adoption agreement in place. From the 1st October 2012 the vast majority of all existing private sewers and lateral drains which link with the public sewer network were transferred to Welsh Water. For further details on how this will affect your development please contact: Welsh Water Developer Services, PO Box 3146, Cardiff, CF30 0EH. Telephone No. 0800 9172652 or email: developer.services@dwrcymru.com.

IMPORTANT INFORMATION: TOWN AND COUNTRY PLANNING ACT 1990

The applicant's attention is drawn to the notes below.

- (1) If the applicant is aggrieved by the decision of the Local Planning Authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Welsh Government under Section 78 of the Town and Country Planning Act 1990 (as amended).
- (2) You can also appeal to the Welsh Government against a decision to refuse permission or grant subject to conditions in respect of applications made for :- Listed Building or Conservation Area Consent; Consent under a Tree Preservation Order; Advertisement Consent.
- (3) You can also appeal If your application for a Certificate of Lawful Existing Use or Lawful Proposed Use is partly or wholly refused or is granted differently from what you asked for (under Section 195/196) of the Town and Country Planning Act 1990 (as amended).
- (4) If you are aggrieved of the LPAs decision, the following deadlines apply for appeals to be submitted to the Welsh Government (from the date of the Council's decision):-

(1) Planning Permission (with the exception of Minor Commercial and Householder applications – see below)	Within 6 Months
(2) Householder Appeal see endnote i	Within 12 weeks
(3) Minor Commercial Appeal see endnote i	Within 12 weeks
(4) Listed Building or Conservation Area Consent appeals	Within 6 months
(5) Tree Preservation Order (TPO) Consent	Within 28 days
(6) Advertisement Consent	Within 8 weeks
(7) Certificate of Lawfulness of Existing (Section 191) or Proposed (Section 192) Use or Development	Within 6 months
(8) Hazardous Substances Consent	Within 6 months
- (5) Appeals must be made on a form which is obtainable from the Planning Inspectorate, Crown Buildings, Cathays Park, Cardiff, CF10 3NQ – Tel 0303 444 5940, or online at www.planningportal.gov.uk/pcs .
- (6) The Welsh Government has power to allow a longer period for the giving of notice of appeal but they will not normally be prepared to exercise this power unless there are special circumstances which excuse the delay in giving notice of appeal.
- (7) The Welsh Government is not required to entertain an appeal if it appears to them that permission for the proposed development could not have been granted having regard to the statutory requirements to the provisions of the development order, and to any directions given under the Order. They do not in practice refuse to entertain appeals solely because the decision of the Local Planning Authority was based on a direction given by them.
- (8) If permission to develop land is refused or granted subject to conditions, whether by the Local Planning Authority or by the Welsh Government, and the owner of the land claims that the land has become incapable of reasonable beneficial use in its existing state and cannot be rendered capable of reasonable beneficial use by the carrying out of any development which has been or would be permitted, he may serve on the County Borough Council, in which the land is situated, as the case may be, a **purchase notice** requiring that Council purchase his interest in the land in

accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

Making an Appeal

- (9) Please note that for all applications received by the LPA after 5th May 2017, it is now a requirement that any appeal made to the Planning Inspectorate (other than Householder and Minor Commercial Appeals, and appeals against refusal to grant advertisement consent) must be accompanied by all the information and evidence you intend to rely upon (a **“full statement of case”**). You must also send a copy of the notice of appeal and full statement of case to the LPA.
- (10) In addition, for ‘planning appeals’ an amendment to an application following notice of appeal may only be made to correct an error.
- (11) Additional details and information on making an appeal to the Welsh Government is available from the Planning Inspectorate at the above address and website. The relevant documents are entitled “making your planning appeal” and “planning appeals Public Local Inquiries”.
- (12) Further correspondence regarding this application should bear the reference number quoted on the top of the decision notice.

THIS NOTICE RELATES ONLY TO A PLANNING DECISION AND DOES NOT RELATE TO OTHER LEGISLATION INCLUDING ANY LEGISLATION UNDER:

- BUILDING REGULATIONS – Please contact buildingcontrol@npt.gov.uk or 01639 686949 to discuss all aspects of the service that is offered by Building Control
- HIGHWAY LEGISLATION

IF PLANNING CONSENT HAS BEEN GRANTED IT IS ADVISABLE TO ESTABLISH WHETHER ANY OTHER FORM OF CONSENT IS REQUIRED AND TO OBTAIN SUCH CONSENT BEFORE COMMENCING DEVELOPMENT

ⁱ Please see the [Town and Country Planning \(Referred Applications and Appeals Procedure\) \(Wales\) Regulations 2017](#) for appeal procedures and for full definitions of:

- *“householder application”* (essentially an application for the enlargement, improvement or other alteration of a dwellinghouse, or development within the curtilage of such a dwellinghouse, or change of use to enlarge the curtilage of a dwelling house)
- *“householder appeal”* means an appeal in relation to a householder application, but excludes an appeal against conditions on the grant of planning permission; or an appeal which is accompanied by an enforcement or listed building consent appeal.
- *“minor commercial application”* (essentially relates to existing buildings of no more than 250 square metres gross external floor space at ground floor level, currently in use for any of the purposes set out in Schedule 1A to The Town and Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2015 which is an application for change of use from Class A1 to A2 or A3; or Class A2 to A3); or the carrying out of building or other operations to a shop front.
- *“minor commercial appeal”* means an appeal in relation to a minor commercial application but excludes an appeal against conditions on the grant of planning permission; or an appeal which is accompanied by an enforcement or listed building consent appeal.

Appendix C

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 D

LABORATORY CERTIFICATES



Appendix D.1

GASHOLDER





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: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation: 17 May 2021
Customer: WSP PB BBC
Sample Delivery Group (SDG): 210508-31
Your Reference: Port Talbot Harbourside
Location: Port Talbot Harbourside
Report No: 598260

We received 4 samples on Saturday May 08, 2021 and 4 of these samples were scheduled for analysis which was completed on Monday May 17, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

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

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

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

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	210508-31	Client Reference:	Port Talbot Harbourside	Report Number:	598260
Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24233372	GH1	ES	0.00 - 0.00	06/05/2021
24233380	GH2	ES	0.00 - 0.00	06/05/2021
24233386	GH3	ES	0.00 - 0.00	06/05/2021
24233393	GH4	ES	0.00 - 0.00	06/05/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210508-31 Client Reference: Port Talbot Harbourside Report Number: 598260
Location: Port Talbot Harbourside Order Number: 70057278-GH1 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)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24233372	24233380	24233386	24233393
						GH1	GH2	GH3	GH4
						ES	ES	ES	ES
						0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
						1kg Cardboard Container (ALE210)	250g Amber Jar (ALE215)	1kg Cardboard Container (ALE210)	250g Amber Jar (ALE215)
						S	S	S	S
						S	S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4				X	X	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4				X	X	X	X
EPH CWG GC (S)	All	NDPs: 0 Tests: 4				X	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4				X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4				X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 4				X	X	X	X
PAH by GCMS	All	NDPs: 0 Tests: 4				X	X	X	X
pH	All	NDPs: 0 Tests: 4				X	X	X	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 4				X	X	X	X
Sample description	All	NDPs: 0 Tests: 4				X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 4				X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 4				X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 4				X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210508-31 **Client Reference:** Port Talbot Harbourside **Report Number:** 598260
Location: Port Talbot Harbourside **Order Number:** 70057278-GH1 **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
24233372	GH1	0.00 - 0.00	Dark Brown	Sandy Loam	Stones	Vegetation
24233380	GH2	0.00 - 0.00	Dark Brown	Sandy Loam	Stones	None
24233386	GH3	0.00 - 0.00	Dark Brown	Sandy Loam	Stones	None
24233393	GH4	0.00 - 0.00	Dark Brown	Sandy Loam	Stones	Vegetation

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210508-31 Client Reference: Port Talbot Harbourside Report Number: 598260
Location: Port Talbot Harbourside Order Number: 70057278-GH1 Superseded Report:

TPH CWG (S)

Results Legend			Customer Sample Ref.	GH1	GH2	GH3	GH4		
#	ISO17025 accredited.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
M	mCERTS accredited.		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
aq	Aqueous / settled sample.		Date Sampled	06/05/2021	06/05/2021	06/05/2021	06/05/2021		
diss.filt	Dissolved / filtered sample.		Sampled Time						
tot.unfilt	Total / unfiltered sample.		Date Received	08/05/2021	08/05/2021	08/05/2021	08/05/2021		
*	Subcontracted - refer to subcontractor report for accreditation status.		SDG Ref	210508-31	210508-31	210508-31	210508-31		
**	% 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		Lab Sample No.(s)	24233372	24233380	24233386	24233393		
(F)	Trigger breach confirmed		AGS Reference	ES	ES	ES	ES		
1-4*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
GRO Surrogate % recovery**	%	TM089	96.3	56.1	94.8	88.3			
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01			
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01			
Aliphatics >C8-C10	<0.01 mg/kg	TM089	0.0108	<0.01	<0.01	<0.01			
Aliphatics >C10-C12	<1 mg/kg	TM414	<1	<1	<1	<1			
Aliphatics >C12-C16	<1 mg/kg	TM414	<1	3.76	<1	1.12			
Aliphatics >C16-C21	<1 mg/kg	TM414	6.08	12.2	4.76	10.6			
Aliphatics >C21-C35	<1 mg/kg	TM414	17.1	51.1	10.5	21.7			
Aliphatics >C35-C44	<1 mg/kg	TM414	2.39	8.21	1.52	1.76			
Total Aliphatics >C10-C44	<5 mg/kg	TM414	26.2	75.4	17.6	35.2			
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	TM414	552	146	339	444			
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01			
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01			
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01			
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1	<1	<1	<1			
Aromatics > EC12-EC16	<1 mg/kg	TM414	9.04	2.37	5.02	6.35			
Aromatics > EC16-EC21	<1 mg/kg	TM414	81.2	6.35	47.6	63.5			
Aromatics > EC21-EC35	<1 mg/kg	TM414	372	54.9	227	285			
Aromatics >EC35-EC44	<1 mg/kg	TM414	63.6	7.28	41.1	53.8			
Aromatics > EC40-EC44	<1 mg/kg	TM414	7.97	1.78	4.74	6.44			
Total Aromatics > EC10-EC44	<5 mg/kg	TM414	526	70.9	321	409			
Total Aliphatics & Aromatics >C5-C44	<10 mg/kg	TM414	552	146	339	444			
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05	<0.05			
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05	<0.05			
GRO >C5-C10	<0.02 mg/kg	TM089	<0.02	<0.02	<0.02	<0.02			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210508-31 Client Reference: Port Talbot Harbourside Report Number: 598260
Location: Port Talbot Harbourside Order Number: 70057278-GH1 Superseded Report:

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
11/05/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
11/05/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
11/05/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
11/05/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 210508-31 **Client Reference:** Port Talbot Harbourside **Report Number:** 598260
Location: Port Talbot Harbourside **Order Number:** 70057278-GH1 **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
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
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: 210508-31 Client Reference: Port Talbot Harbourside Report Number: 598260
Location: Port Talbot Harbourside Order Number: 70057278-GH1 Superseded Report:

Test Completion Dates

Lab Sample No(s)	24233372	24233380	24233386	24233393
Customer Sample Ref.	GH1	GH2	GH3	GH4
AGS Ref.	ES	ES	ES	ES
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	11-May-2021	11-May-2021	11-May-2021	11-May-2021
Cyanide Comp/Free/Total/Thiocyanate	14-May-2021	14-May-2021	14-May-2021	14-May-2021
EPH CWG GC (S)	11-May-2021	11-May-2021	11-May-2021	11-May-2021
GRO by GC-FID (S)	12-May-2021	13-May-2021	12-May-2021	12-May-2021
Hexavalent Chromium (s)	14-May-2021	14-May-2021	14-May-2021	14-May-2021
Metals in solid samples by OES	13-May-2021	13-May-2021	17-May-2021	17-May-2021
PAH by GCMS	11-May-2021	11-May-2021	11-May-2021	11-May-2021
pH	12-May-2021	12-May-2021	12-May-2021	12-May-2021
Phenols by HPLC (S)	12-May-2021	11-May-2021	12-May-2021	12-May-2021
Sample description	08-May-2021	08-May-2021	08-May-2021	08-May-2021
Total Organic Carbon	14-May-2021	14-May-2021	14-May-2021	14-May-2021
TPH CWG GC (S)	12-May-2021	13-May-2021	12-May-2021	12-May-2021
VOC MS (S)	11-May-2021	11-May-2021	11-May-2021	11-May-2021

SDG:	210508-31
Location:	Port Talbot Harbourside

Client Reference:	Port Talbot Harbourside
Order Number:	70057278-GH1

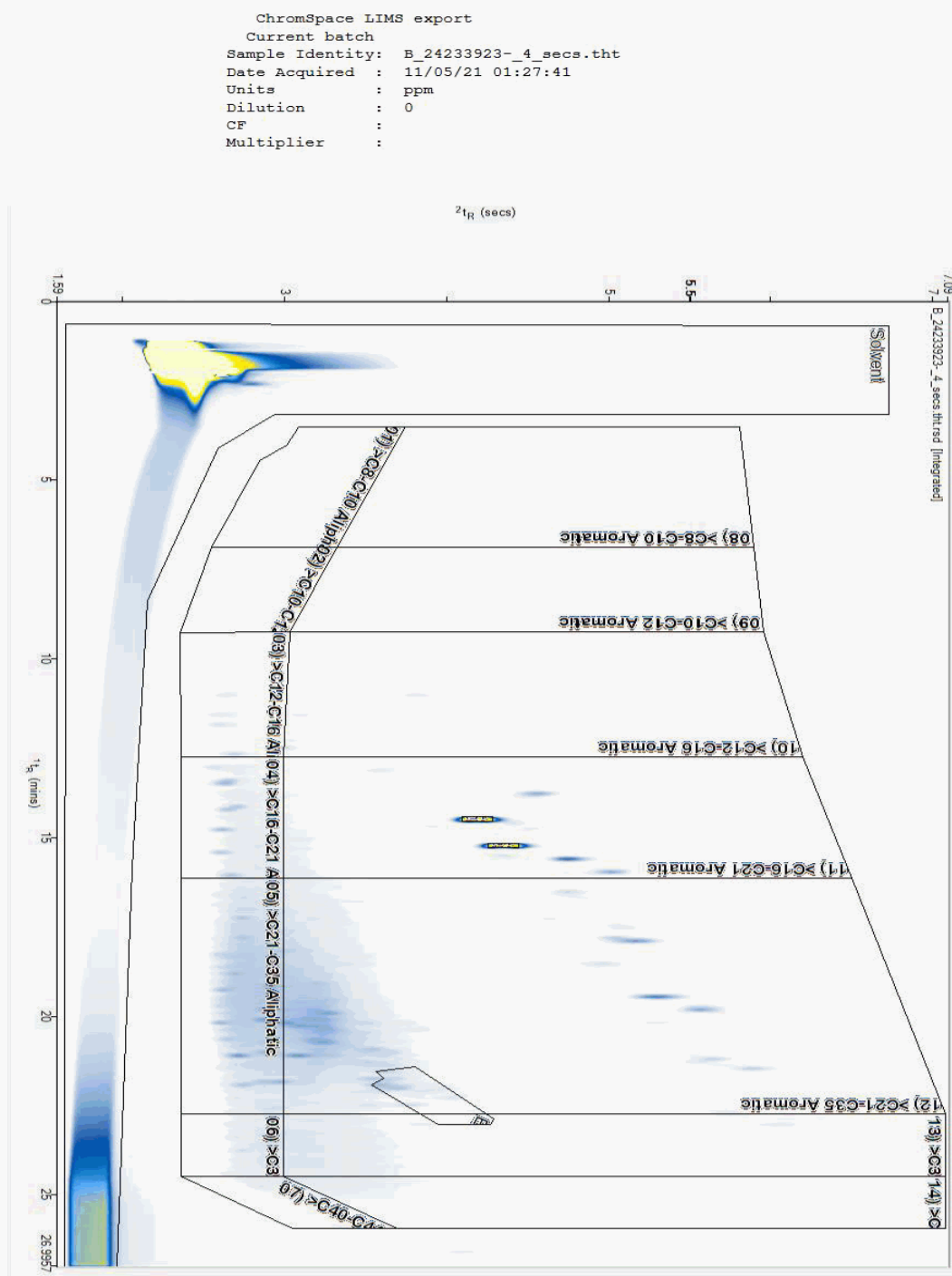
Report Number: 598260
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24233923
Sample ID : GH2

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

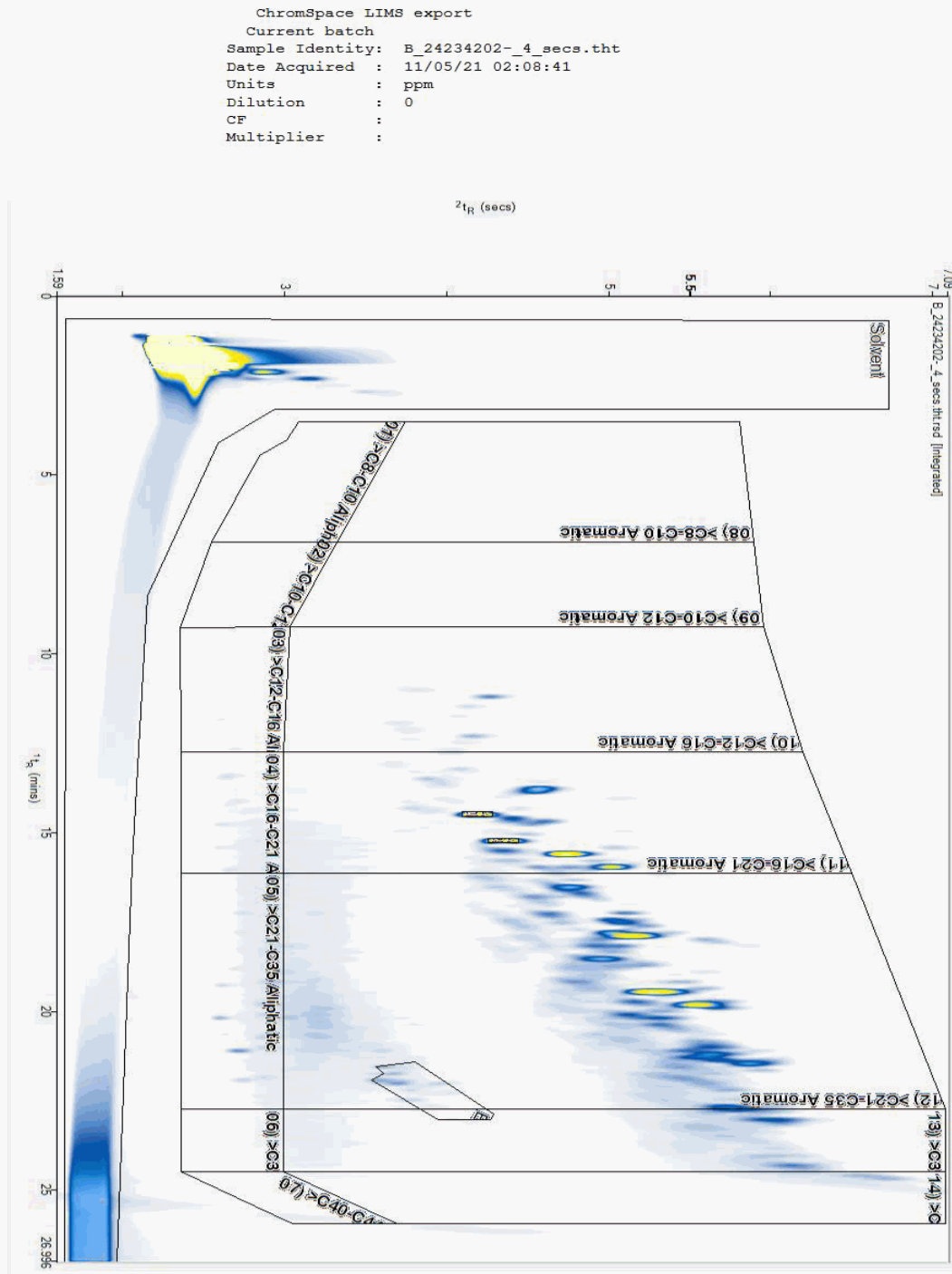
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Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24234202
Sample ID : GH4

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

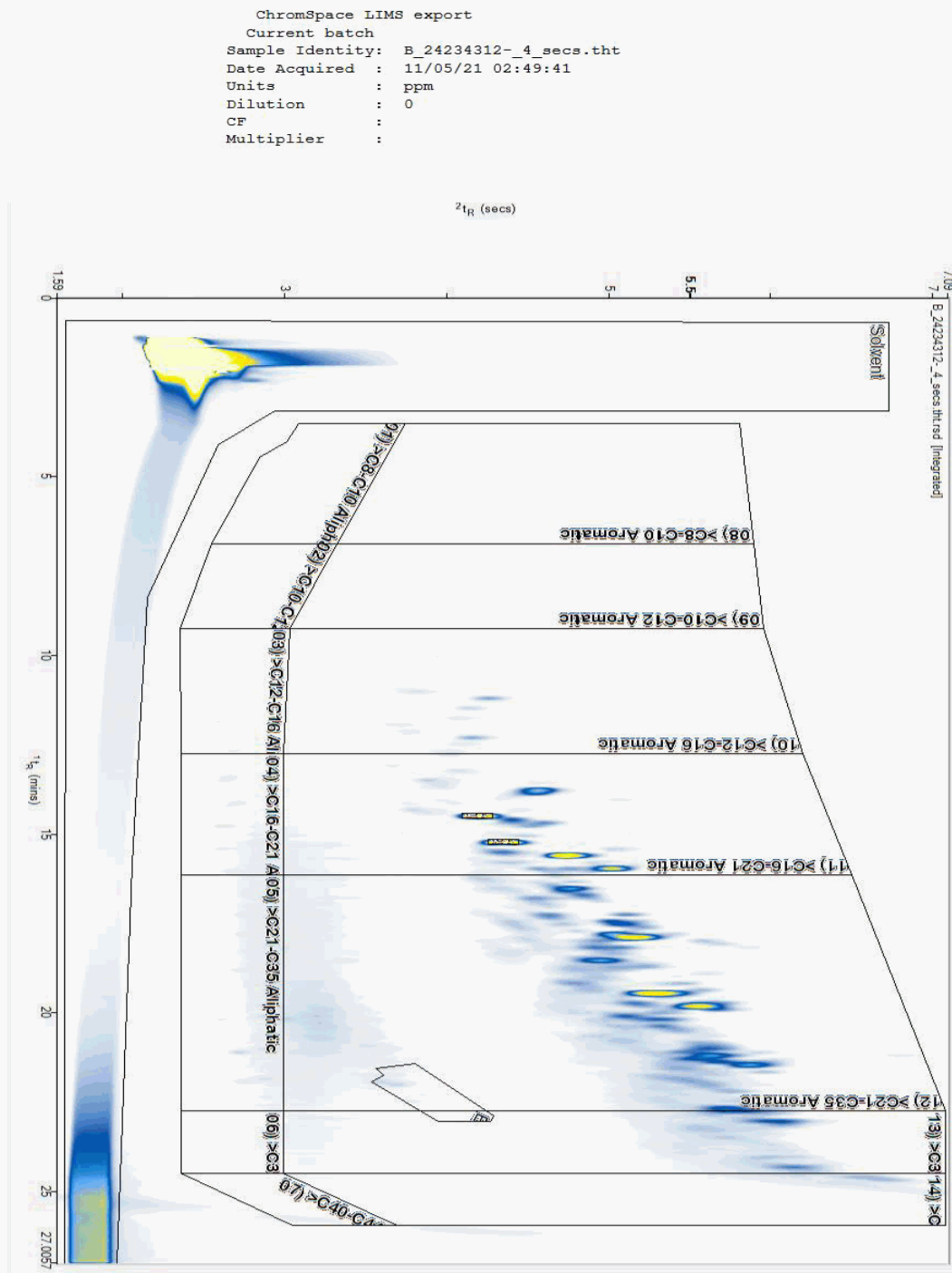
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Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24234312
Sample ID : GH3

Depth : 0.00 - 0.00



SDG:	210508-31
<u>Location:</u>	Port Talbot Harbourside

Client Reference:	Port Talbot Harbourside
Order Number:	70057278-GH1

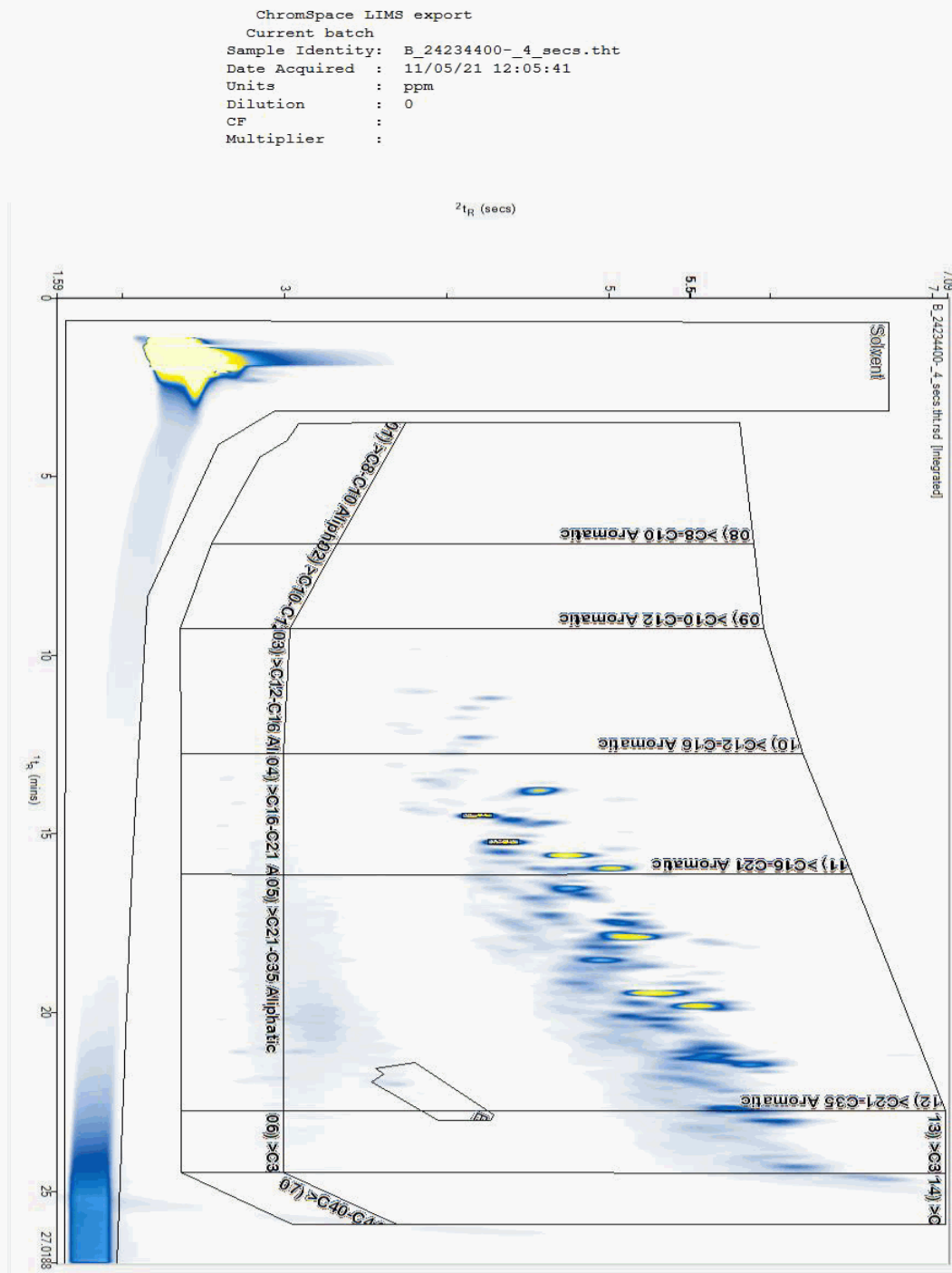
Report Number: 598260
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24234400
Sample ID : GH1

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

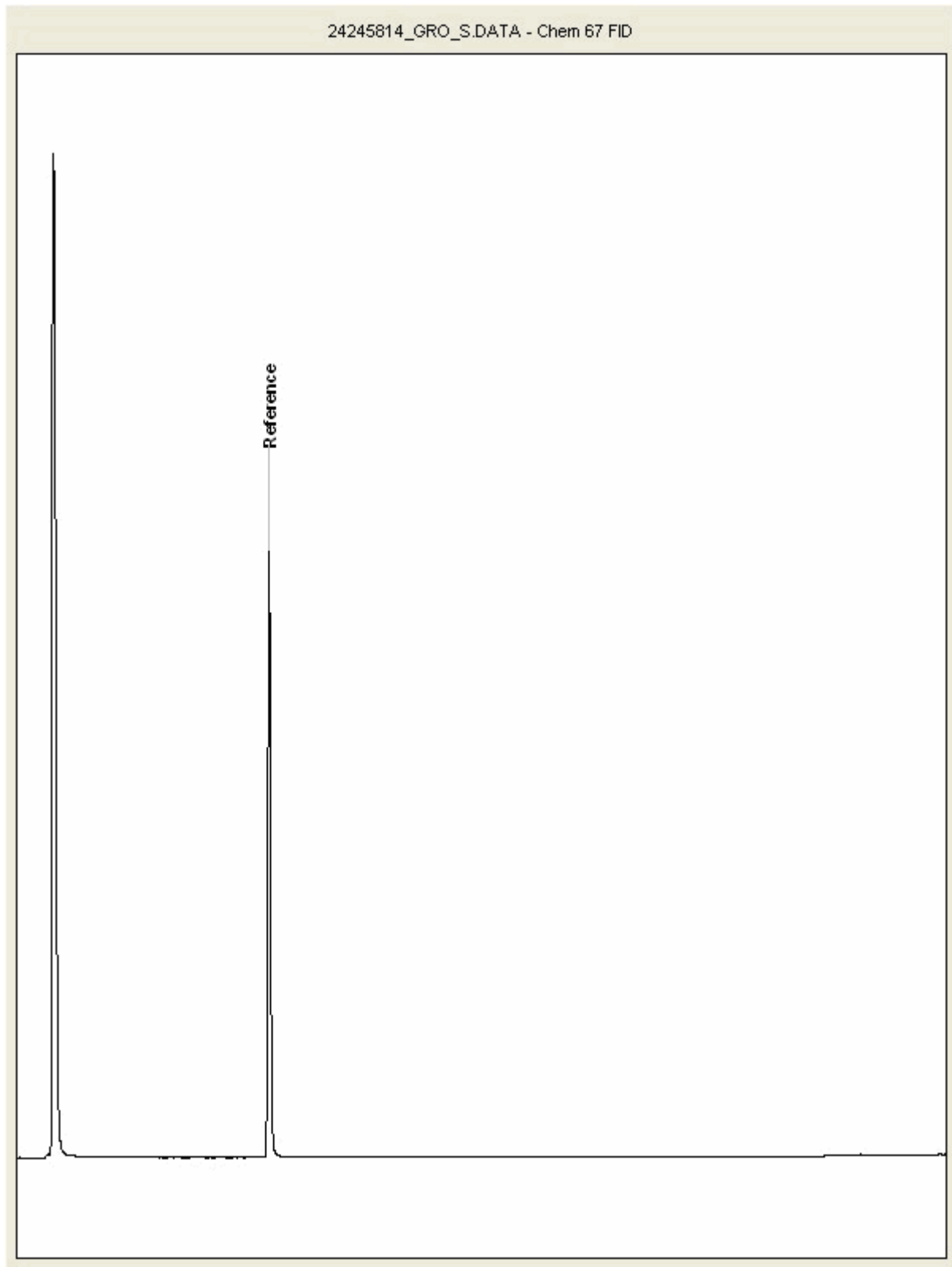
SDG:	210508-31	Client Reference:	Port Talbot Harbourside	Report Number:	598260
Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24245814
Sample ID : GH4

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

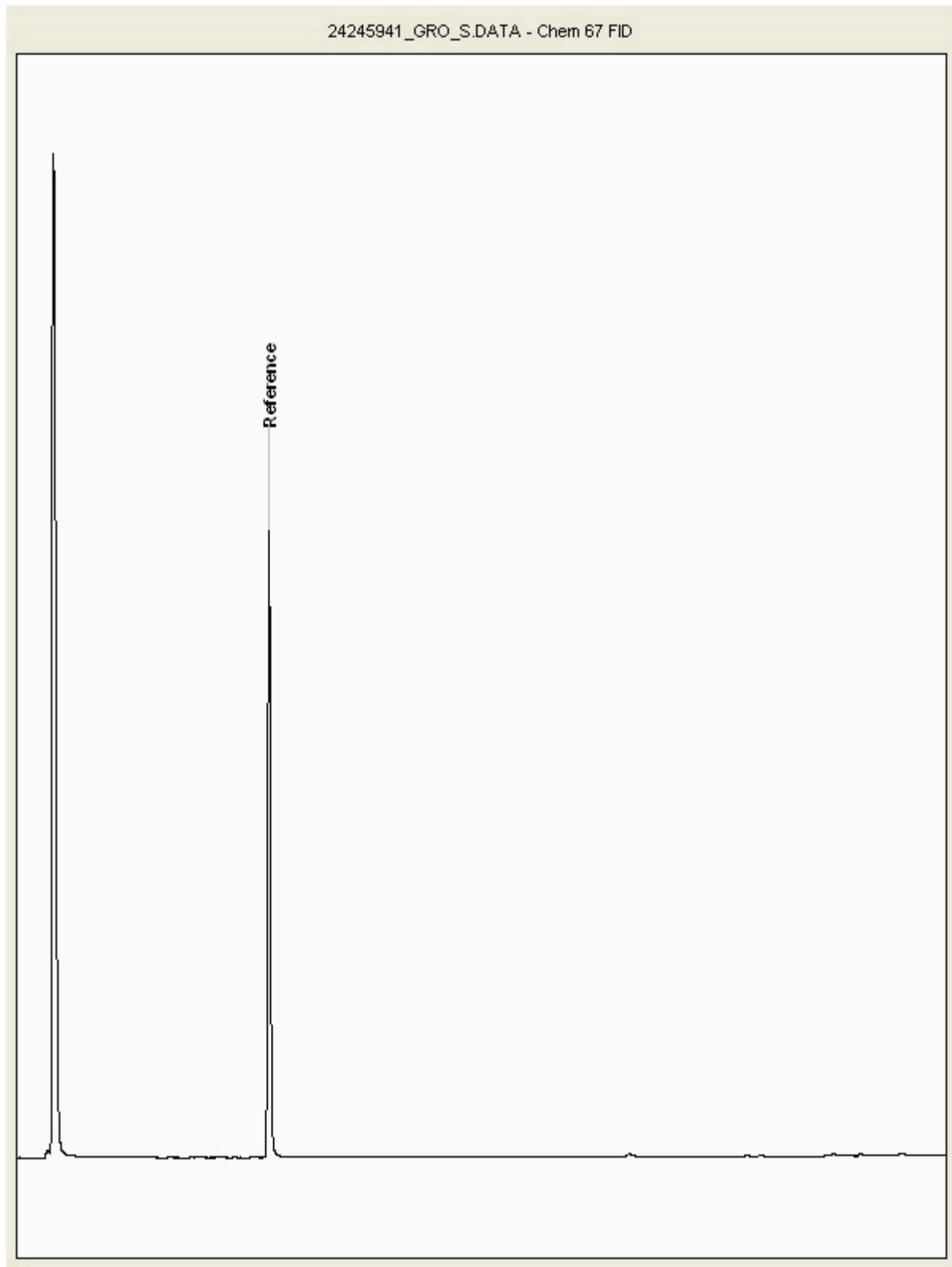
SDG:	210508-31	Client Reference:	Port Talbot Harbourside	Report Number:	598260
Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24245941
Sample ID : GH1

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

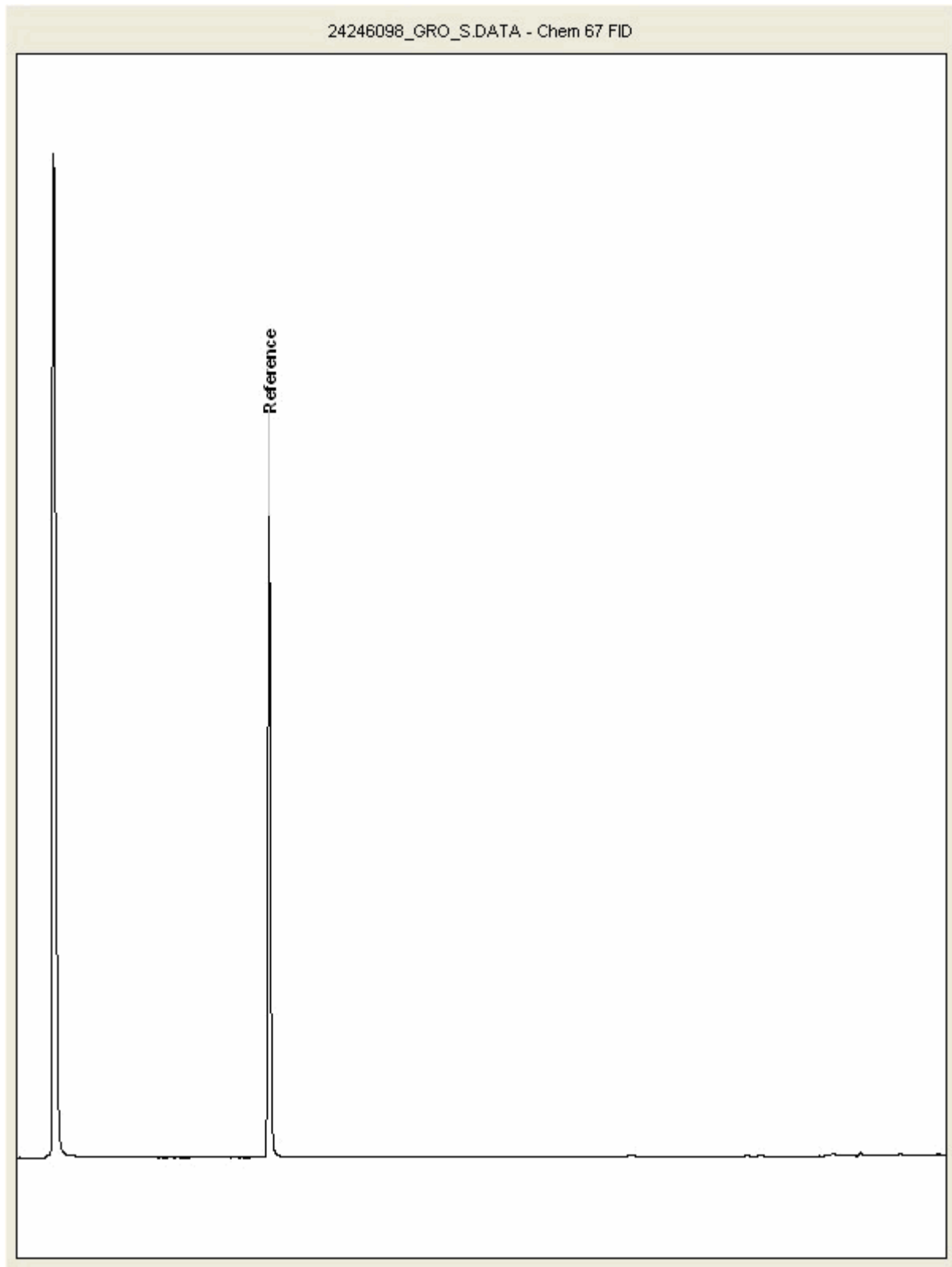
SDG:	210508-31	Client Reference:	Port Talbot Harbourside	Report Number:	598260
Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24246098
Sample ID : GH3

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

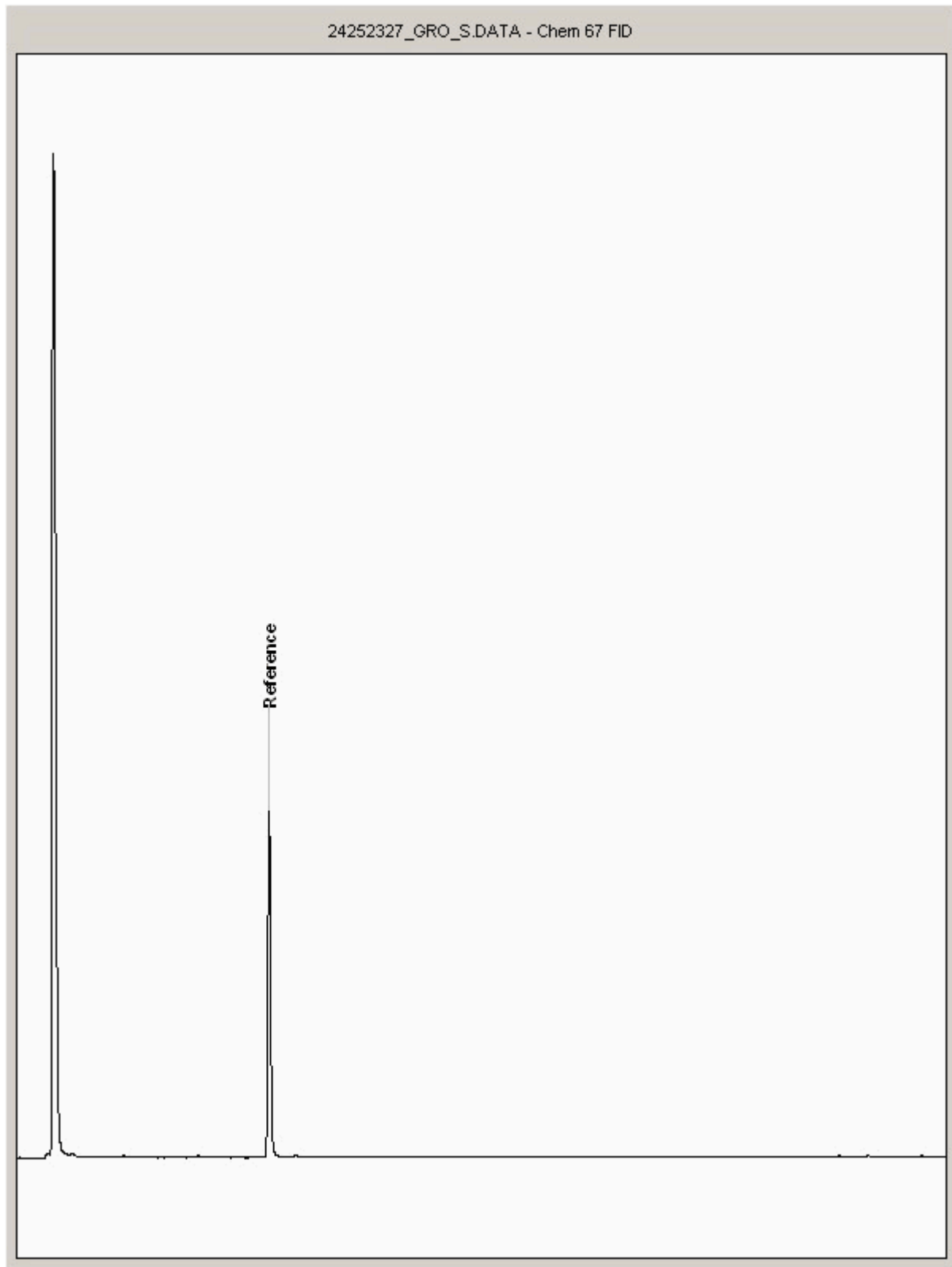
SDG:	210508-31	Client Reference:	Port Talbot Harbourside	Report Number:	598260
Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24252327
Sample ID : GH2

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

SDG:	210508-31	Client Reference:	Port Talbot Harbourside	Report Number:	598260
Location:	Port Talbot Harbourside	Order Number:	70057278-GH1	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 D.2

UPPER PLATEAU





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: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation: 14 February 2022
Customer: WSP PB BBC
Sample Delivery Group (SDG): 210731-84
Your Reference: Port Talbot Harbourside
Location: Harbourside
Report No: 633468
Order Number: 70057278-RW2

This report has been revised and directly supersedes 608658 in its entirety.

We received 8 samples on Saturday July 31, 2021 and 8 of these samples were scheduled for analysis which was completed on Monday August 09, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

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: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24728655	UP-TP-01	ES	0.50	30/07/2021
24728661	UP-TP-01	ES	1.50	30/07/2021
24728668	UP-TP-02	ES	0.50	30/07/2021
24728673	UP-TP-02	ES	1.50	30/07/2021
24728679	UP-TP-03	ES	2.00	30/07/2021
24728684	UP-TP-03	ES	3.00	30/07/2021
24728689	UP-TP-04	ES	2.00	30/07/2021
24728698	UP-TP-04	ES	3.00	30/07/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

Results Legend



Test



No Determination Possible

Sample Types -

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

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
24728689	UP-TP-04	ES	2.00	60g VOC (ALE21 S) 250g Amber Jar (ALE21 O) 1kg Cardboard Container	S
24728684	UP-TP-03	ES	3.00	60g VOC (ALE21 S) 250g Amber Jar (ALE21 O) 1kg Cardboard Container	S
24728679	UP-TP-03	ES	2.00	60g VOC (ALE21 S) 250g Amber Jar (ALE21 O) 1kg Cardboard Container	S
24728673	UP-TP-02	ES	1.50	60g VOC (ALE21 S) 250g Amber Jar (ALE21 O) 1kg Cardboard Container	S
24728668	UP-TP-02	ES	0.50	60g VOC (ALE21 S) 250g Amber Jar (ALE21 O) 1kg Cardboard Container	S
24728655	UP-TP-01	ES	0.50	60g VOC (ALE21 S) 250g Amber Jar (ALE21 O) 1kg Cardboard Container	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 8			
Boron Water Soluble	All	NDPs: 0 Tests: 8			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8			
EPH CWG GC (S)	All	NDPs: 0 Tests: 8			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 8			
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 8			
Metals in solid samples by OES	All	NDPs: 0 Tests: 8			
PAH by GCMS	All	NDPs: 0 Tests: 8			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 8			
Sample description	All	NDPs: 0 Tests: 8			
TPH CWG GC (S)	All	NDPs: 0 Tests: 8			
VOC MS (S)	All	NDPs: 0 Tests: 8			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

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
24728655	UP-TP-01	0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
24728661	UP-TP-01	1.50	Dark Brown	Sandy Silt Loam	Stones	Brick
24728668	UP-TP-02	0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
24728673	UP-TP-02	1.50	Dark Brown	Sandy Silt Loam	Stones	None
24728679	UP-TP-03	2.00	Dark Brown	Sandy Silt Loam	Stones	None
24728684	UP-TP-03	3.00	Dark Brown	Loamy Sand	Stones	Vegetation
24728689	UP-TP-04	2.00	Dark Brown	Sandy Silt Loam	Stones	Vegetation
24728698	UP-TP-04	3.00	Dark Brown	Sandy Silt Loam	Stones	Vegetation

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

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

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

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

SDG: 210731-84

Report Number: 633468

Superseded Report: 608658

Client Ref.: Port Talbot Harboursid

Location: Harbourside

PAH by GCMS

[illegible]

SDG: 210731-84

Report Number: 633468

Superseded Report: 608658

Client Ref.: Port Talbot Harboursid

Location: Harbourside

TPH CWG (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

TPH CWG (S)

Results Legend		Customer Sample Ref.	UP-TP-04	UP-TP-04			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.00	3.00			
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.		30/07/2021	30/07/2021			
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.		31/07/2021	31/07/2021			
*	Subcontracted - refer to subcontractor report for accreditation status.		210731-84	210731-84			
**	% 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		24728689	24728698			
(F)	Trigger breach confirmed		ES	ES			
1-4*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM089	97	104			
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	<0.01			
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	0.0222			
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	0.0269			
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1 #	<1 #			
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1 #	<1 #			
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1 #	<1 #			
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	1.58 #	<1 #			
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1			
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414	<5	<5			
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414	24.7	<10			
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	<0.01			
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	<0.01			
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	0.0187			
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1 #	<1 #			
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1 #	<1 #			
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414	6.4 #	<1 #			
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	15 #	<1 #			
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	1.3	<1			
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1			
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414	23	<5			
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414	23	<10			
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089	<0.05	<0.05			
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089	<0.05	<0.05			
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089	<0.02	<0.02			

SDG: 210731-84

Report Number: 633468

Superseded Report: 608658

Client Ref.: Port Talbot Harbourside

Location: Harbourside

VOC MS (S)

[illegible]

SDG: 210731-84

Report Number: 633468

Superseded Report: 608658

Client Ref.: Port Talbot Harbourside

Location: Harbourside

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

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	UP-TP-01ES 0.50 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728655 TM048	04.08.21	Emily Anderton	Loose fibre in soil	Trace (#)	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	UP-TP-01ES 1.50 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728661 TM048	03/08/2021	James Richards	-	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	UP-TP-02ES 0.50 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728668 TM048	03.08.21	Emily Anderton	-	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	UP-TP-02ES 1.50 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728673 TM048	03.08.21	Emily Anderton	-	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	UP-TP-03ES 2.00 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728679 TM048	03/08/2021	James Richards	-	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	UP-TP-03ES 3.00 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728684 TM048	03/08/2021	James Richards	-	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	UP-TP-04ES 2.00 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728689 TM048	03.08.21	Emily Anderton	-	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	UP-TP-04ES 3.00 SOLID 30/07/2021 00:00:00 31/07/2021 05:00:00 210731-84 24728698 TM048	03/08/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
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: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	24728655	24728661	24728668	24728673	24728679	24728684	24728689	24728698
	UP-TP-01	UP-TP-01	UP-TP-02	UP-TP-02	UP-TP-03	UP-TP-03	UP-TP-04	UP-TP-04
	ES	ES	ES	ES	ES	ES	ES	ES
	0.50	1.50	0.50	1.50	2.00	3.00	2.00	3.00
	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	04-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021
Boron Water Soluble	05-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021
Cyanide Comp/Free/Total/Thiocyanate	05-Aug-2021	05-Aug-2021	09-Aug-2021	09-Aug-2021	09-Aug-2021	05-Aug-2021	09-Aug-2021	09-Aug-2021
EPH CWG GC (S)	03-Aug-2021	03-Aug-2021	04-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021
GRO by GC-FID (S)	03-Aug-2021	03-Aug-2021	03-Aug-2021	02-Aug-2021	02-Aug-2021	03-Aug-2021	02-Aug-2021	03-Aug-2021
Hexavalent Chromium (s)	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021
Metals in solid samples by OES	05-Aug-2021	05-Aug-2021	06-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021	06-Aug-2021
PAH by GCMS	04-Aug-2021	04-Aug-2021	05-Aug-2021	05-Aug-2021	04-Aug-2021	05-Aug-2021	05-Aug-2021	05-Aug-2021
Phenols by HPLC (S)	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021
Sample description	31-Jul-2021	31-Jul-2021	31-Jul-2021	31-Jul-2021	31-Jul-2021	31-Jul-2021	31-Jul-2021	31-Jul-2021
TPH CWG GC (S)	03-Aug-2021	03-Aug-2021	04-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021	03-Aug-2021
VOC MS (S)	04-Aug-2021	04-Aug-2021	04-Aug-2021	04-Aug-2021	04-Aug-2021	05-Aug-2021	04-Aug-2021	05-Aug-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

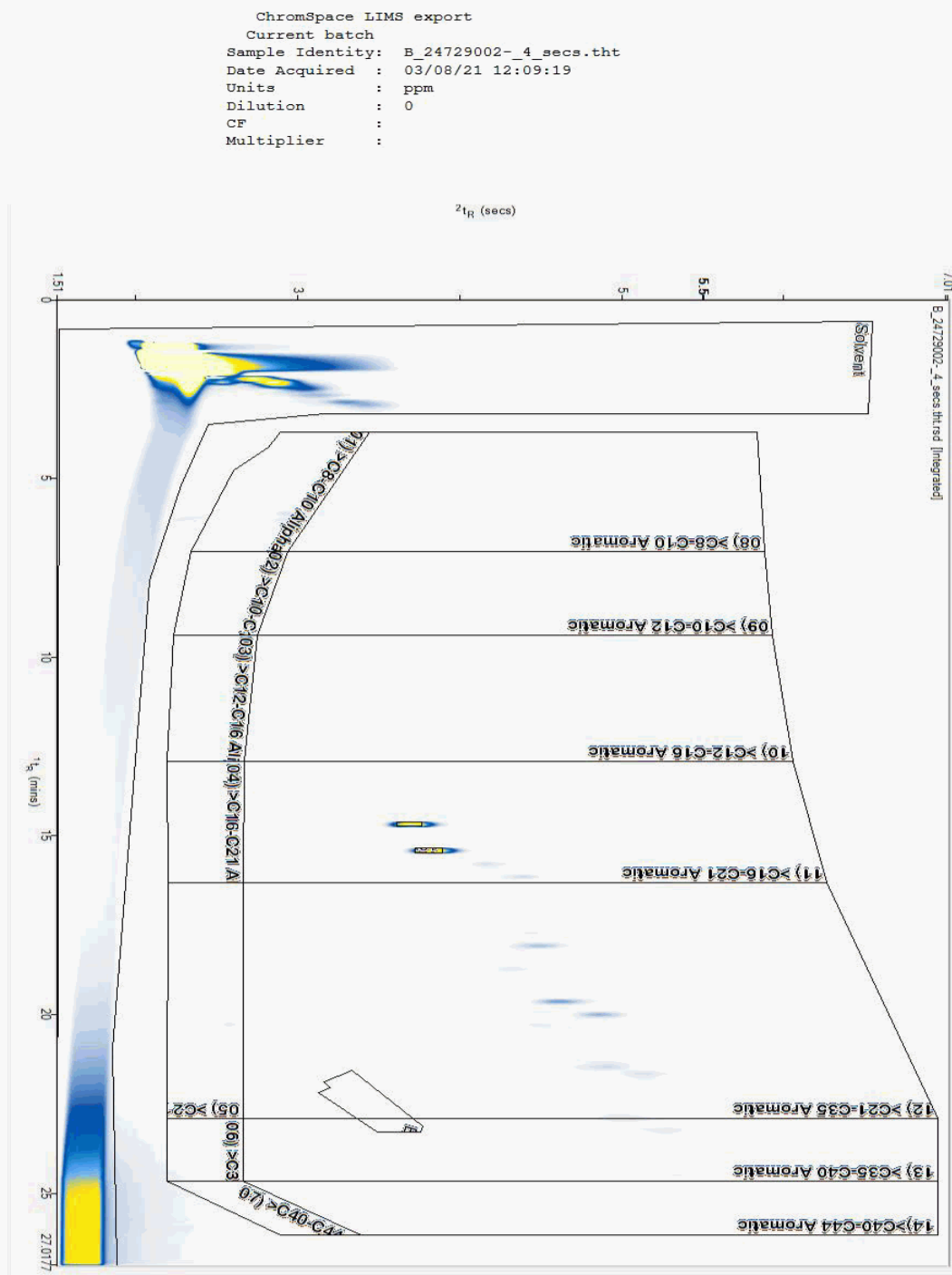
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729002
Sample ID : UP-TP-03

Depth : 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

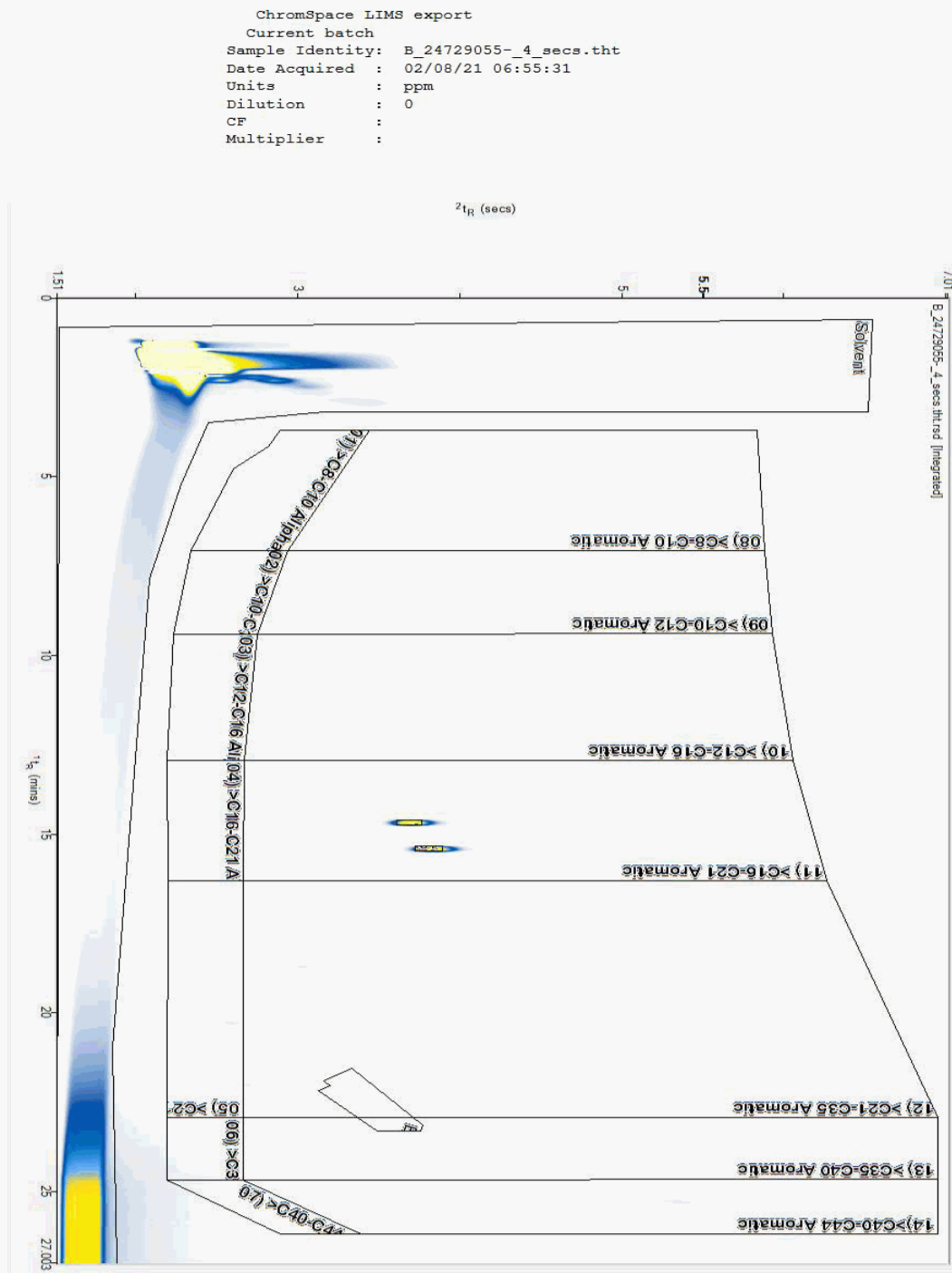
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729055
Sample ID : UP-TP-04

Depth : 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

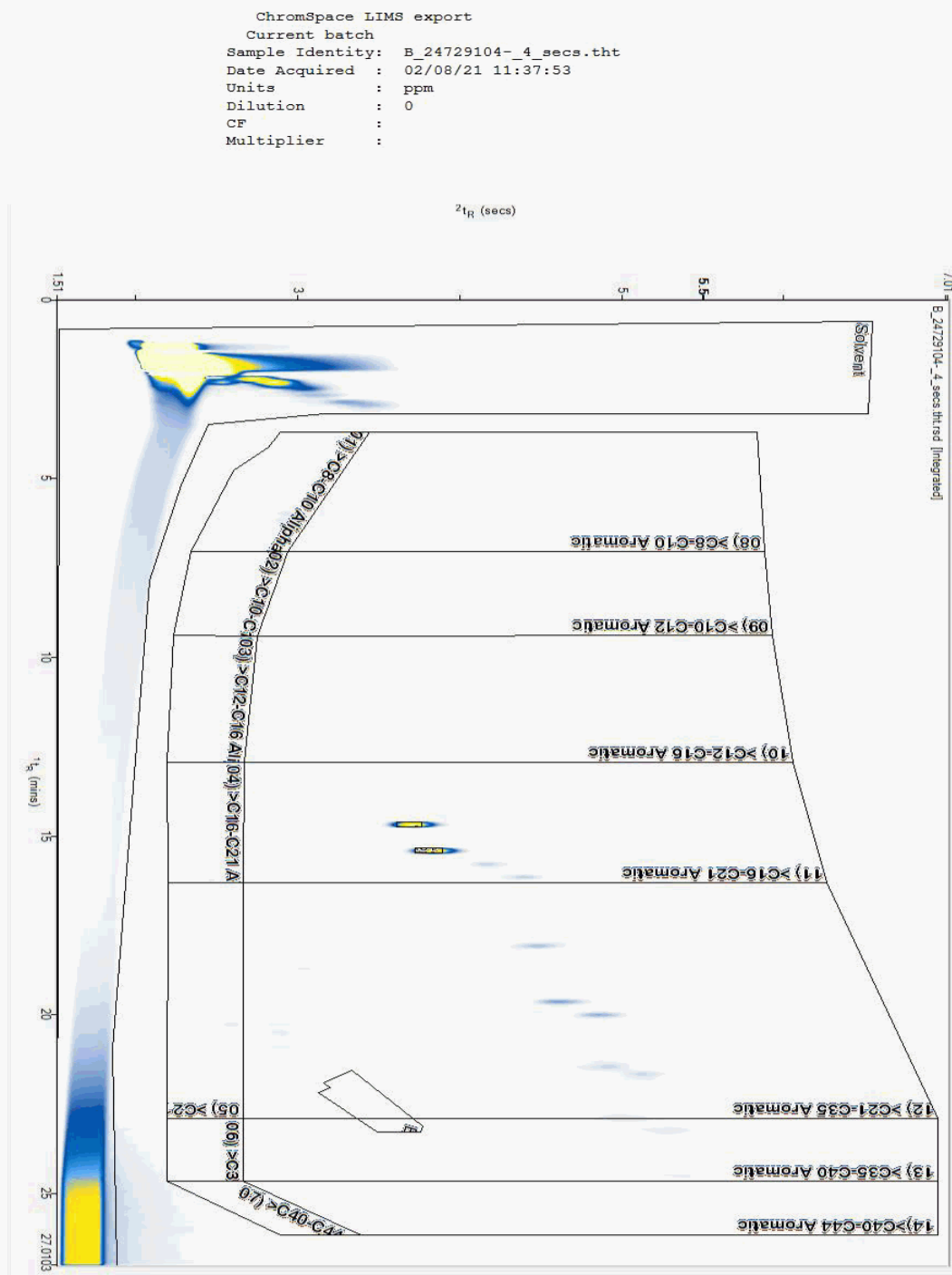
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729104
Sample ID : UP-TP-03

Depth : 2.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

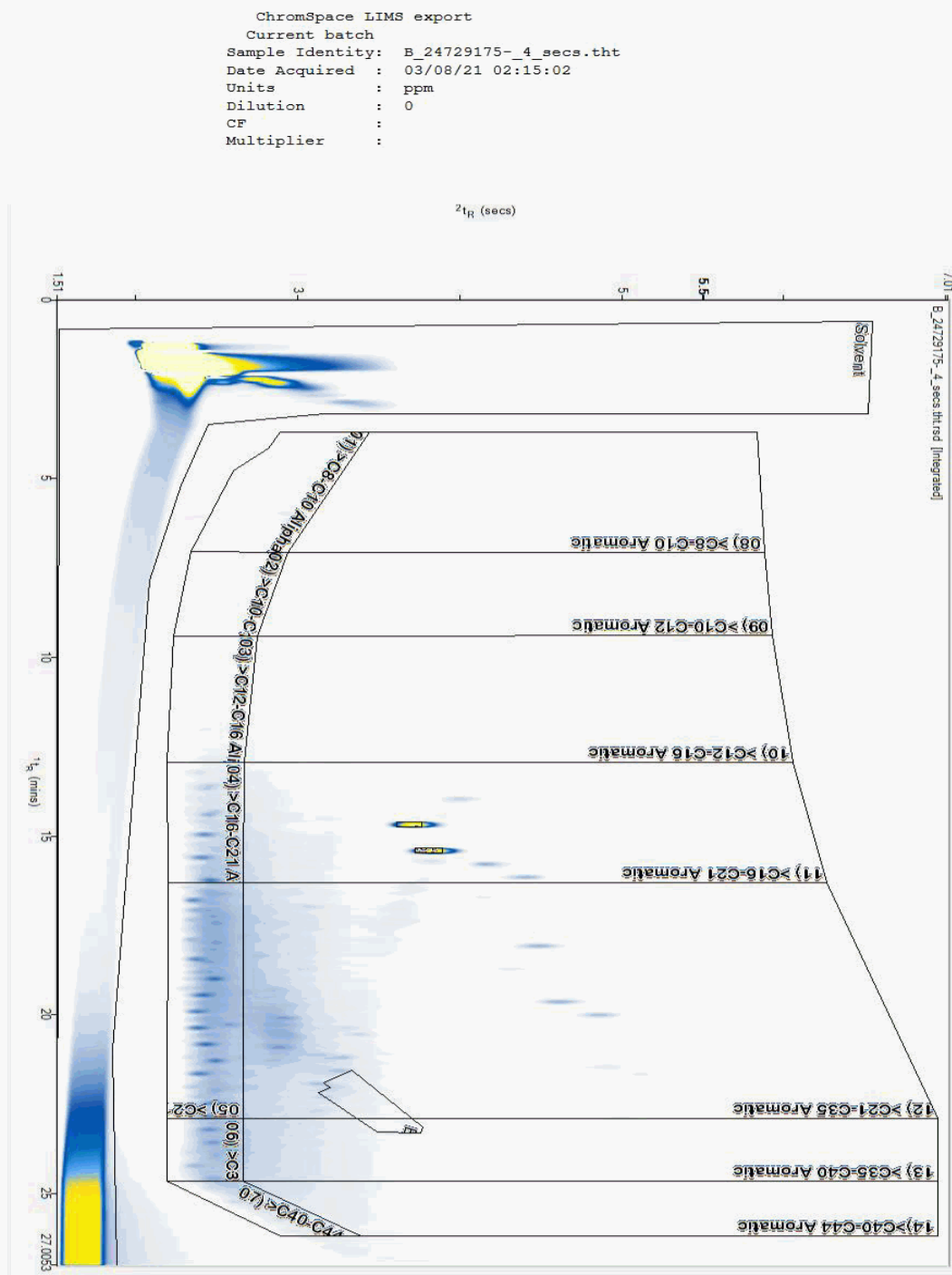
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729175
Sample ID : UP-TP-02

Depth : 1.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

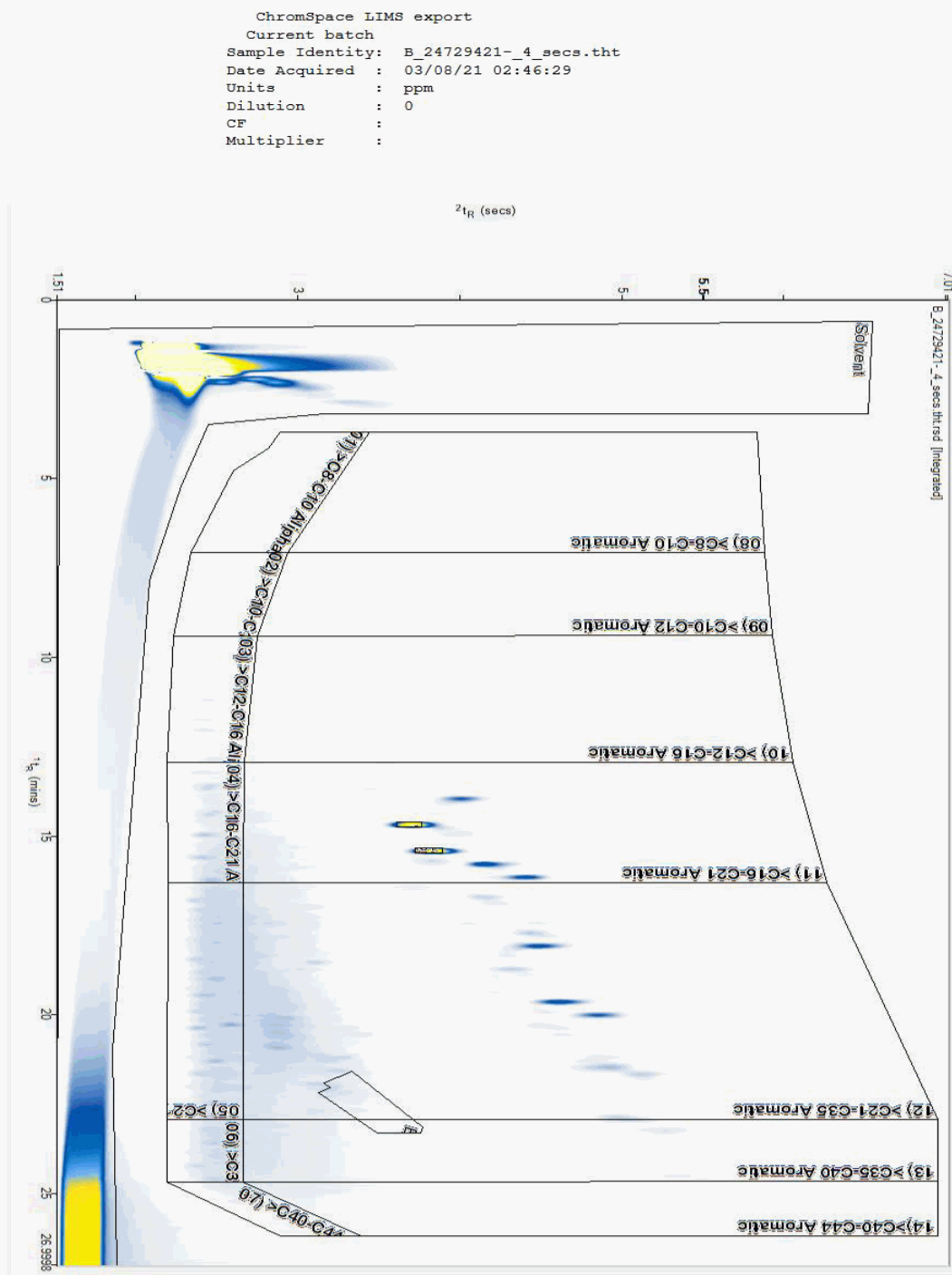
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729421
Sample ID : UP-TP-01

Depth : 1.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

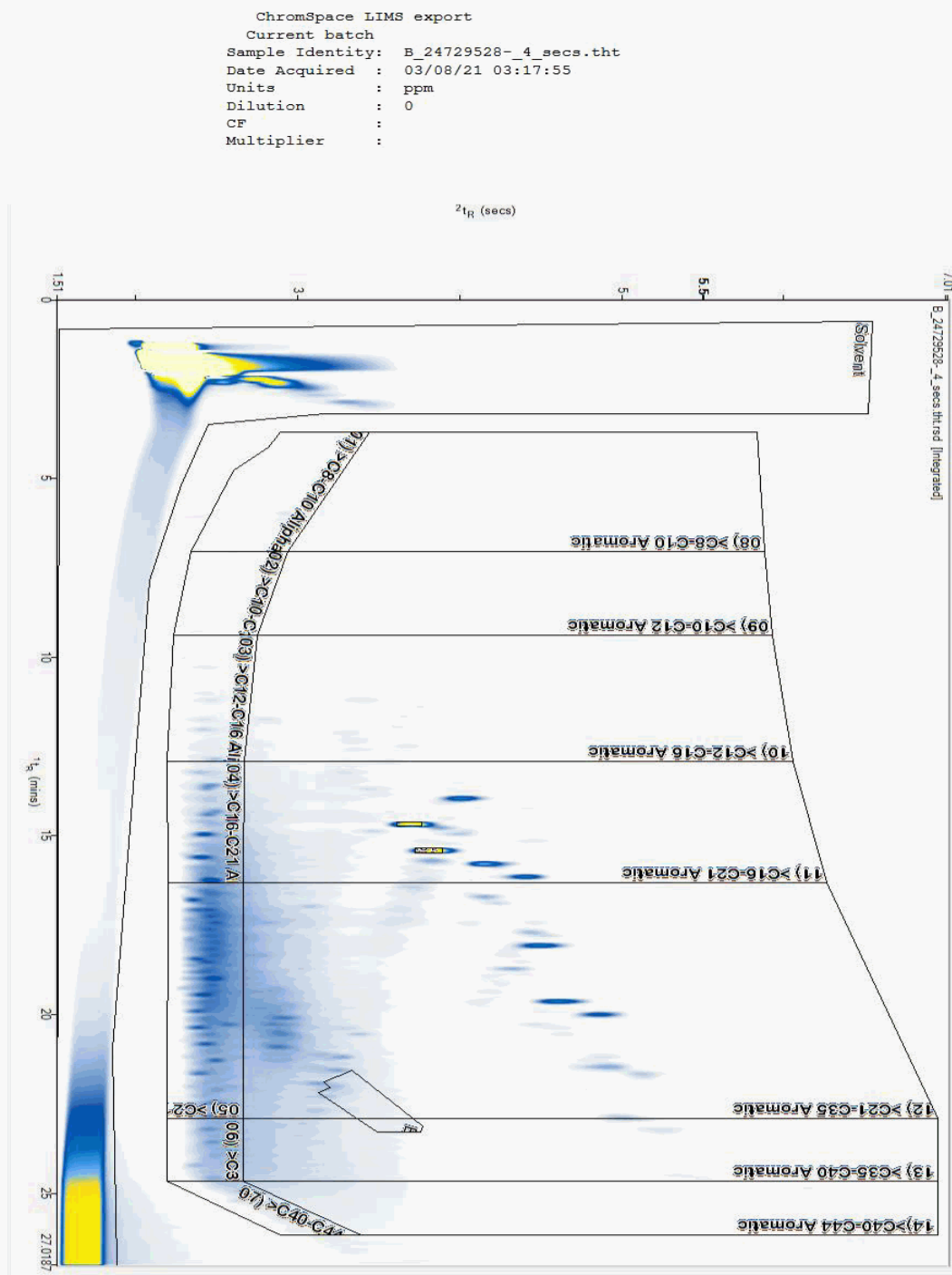
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729528
Sample ID : UP-TP-01

Depth : 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

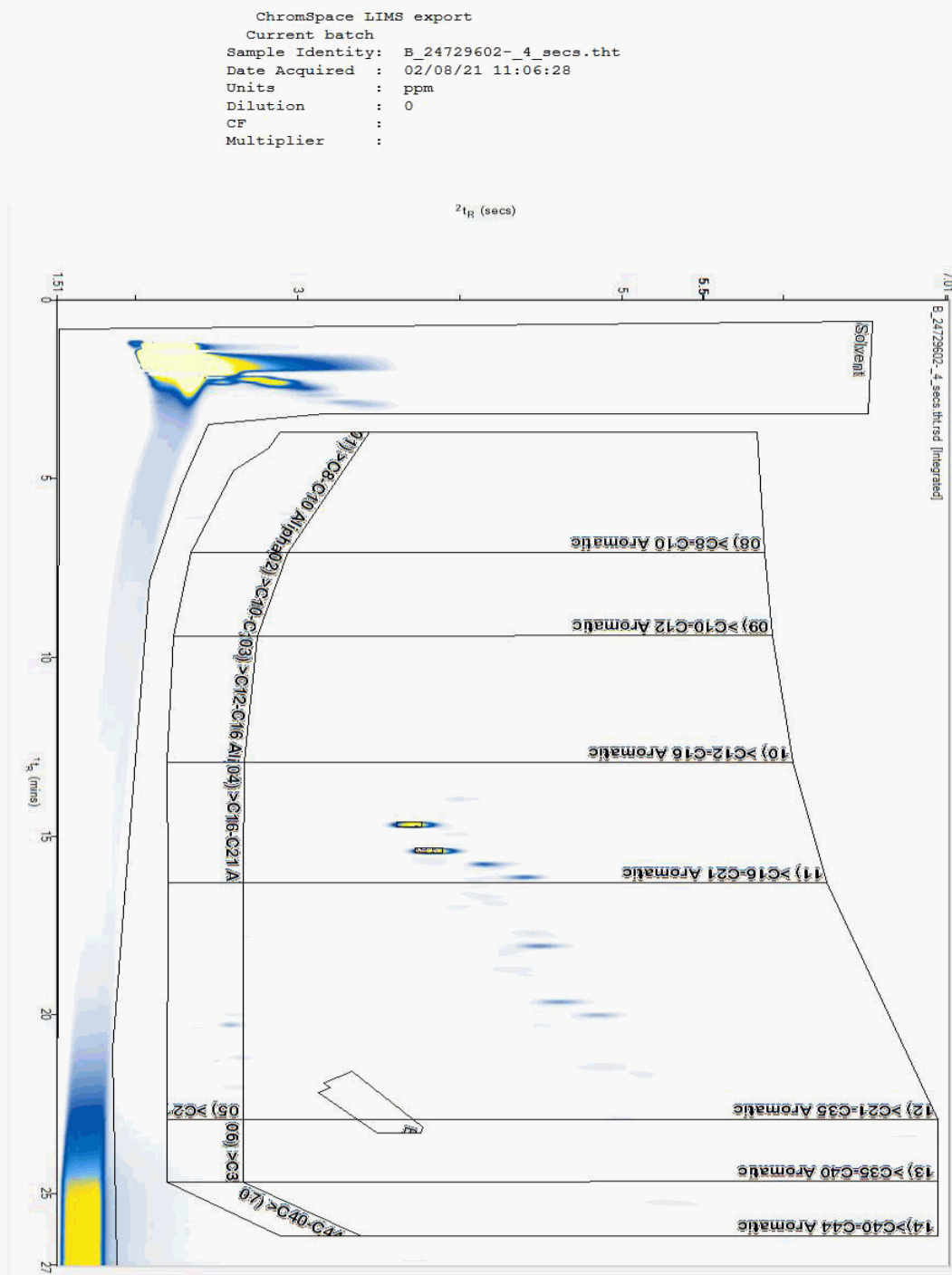
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729602
Sample ID : UP-TP-04

Depth : 2.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

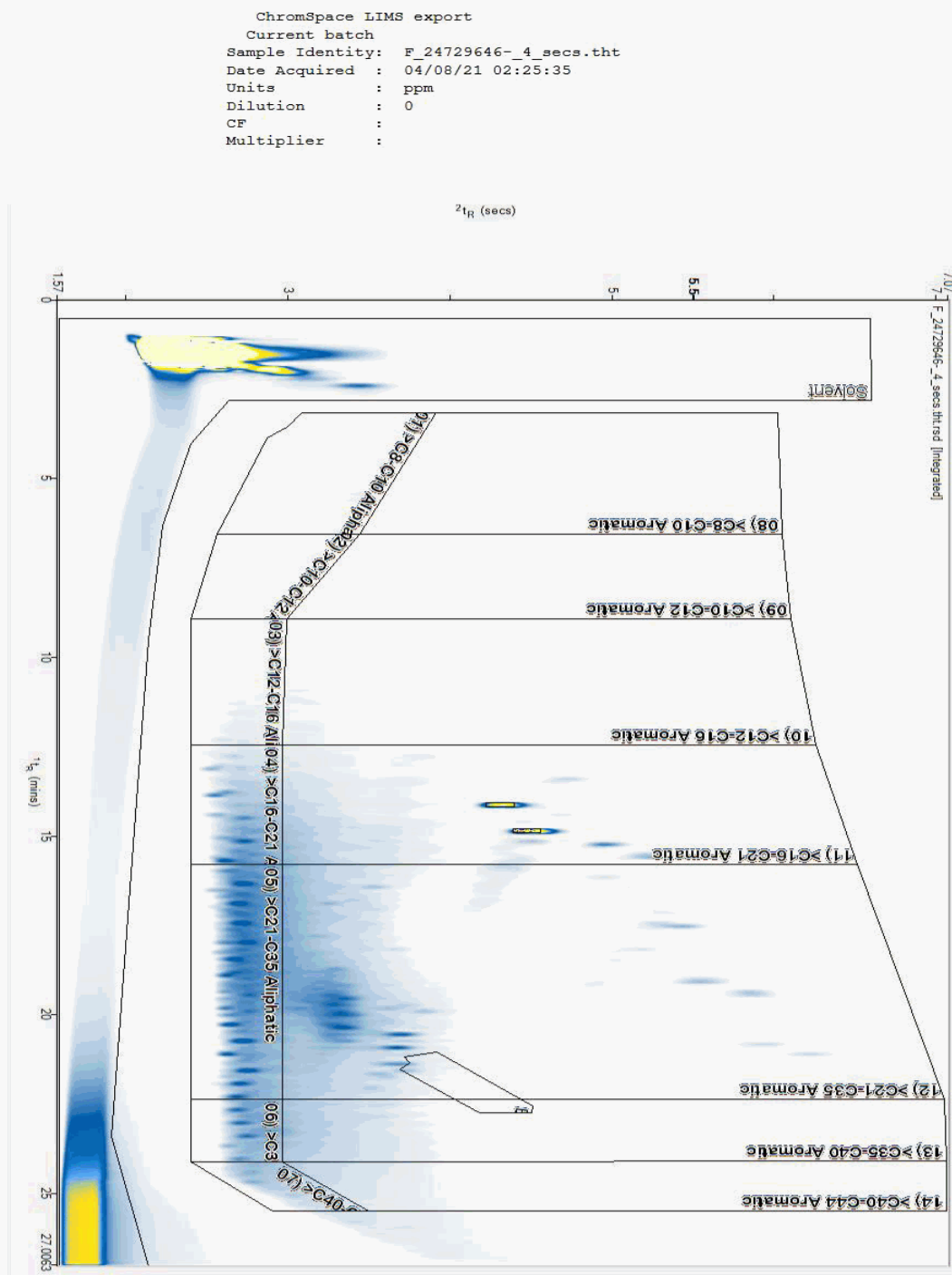
Superseded Report: 608658

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24729646
Sample ID : UP-TP-02

Depth : 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

Superseded Report: 608658

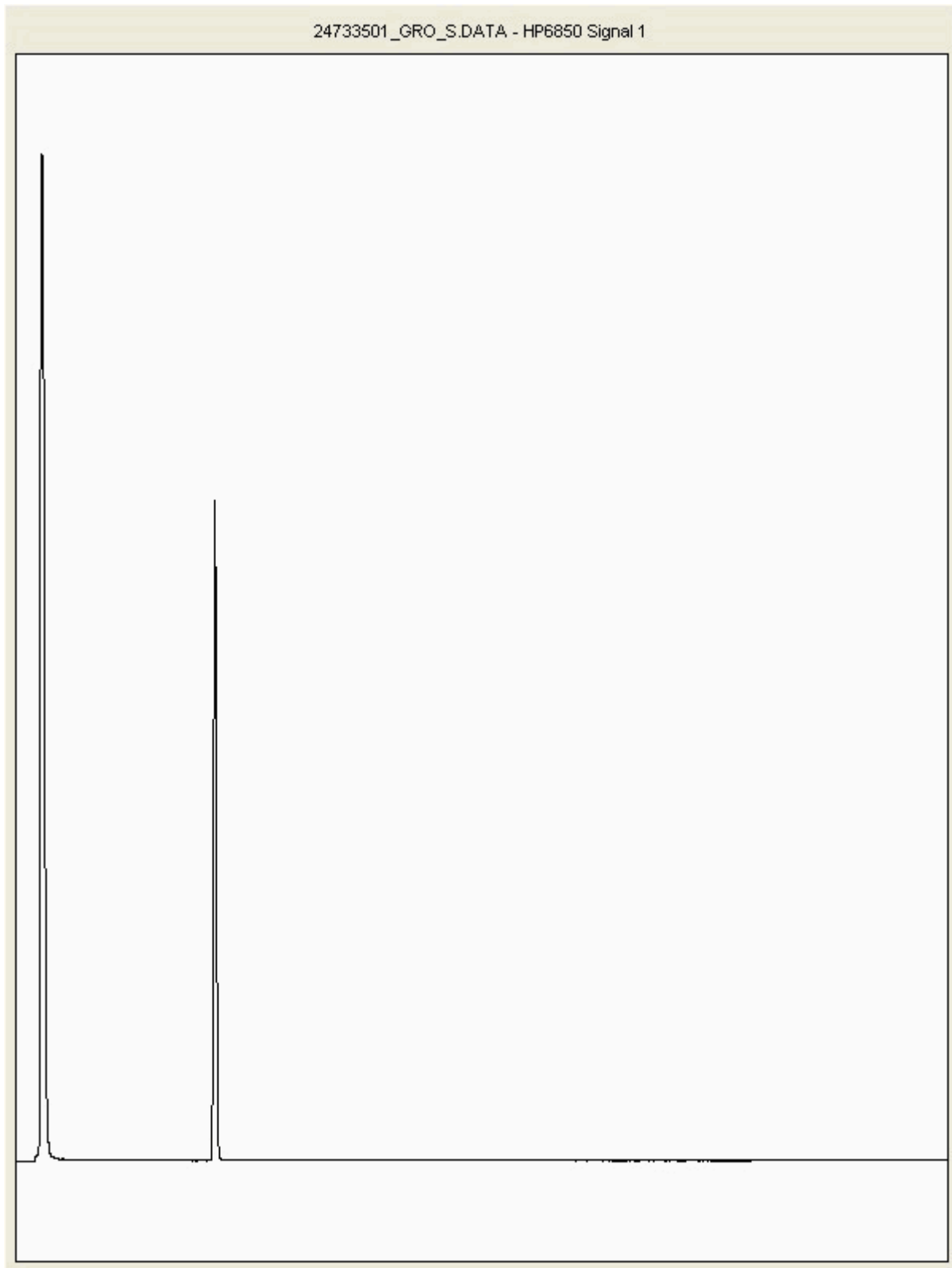
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24733501
Sample ID : UP-TP-02

Depth : 1.50

24733501_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

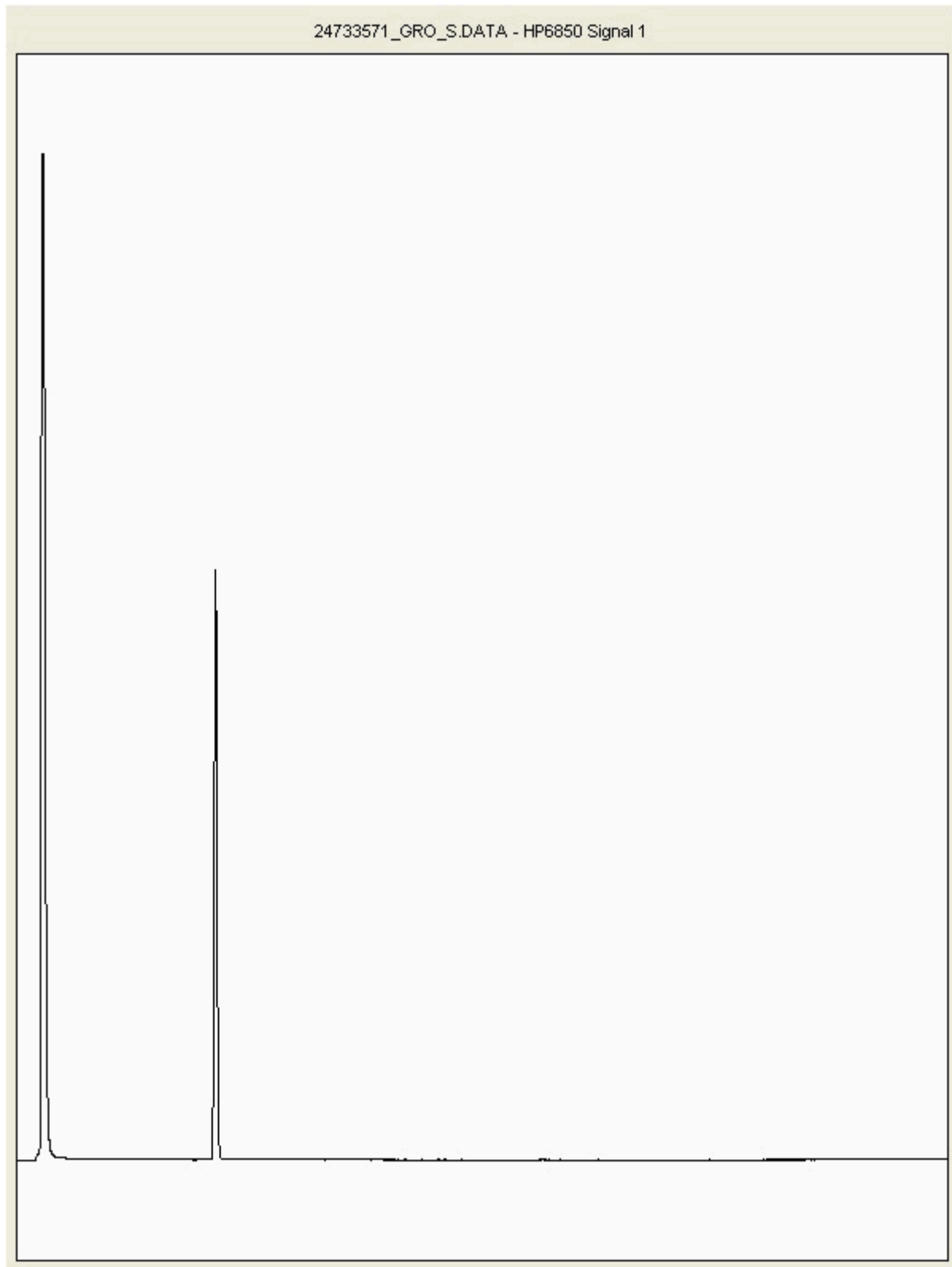
Superseded Report: 608658

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24733571
Sample ID : UP-TP-04

Depth : 2.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

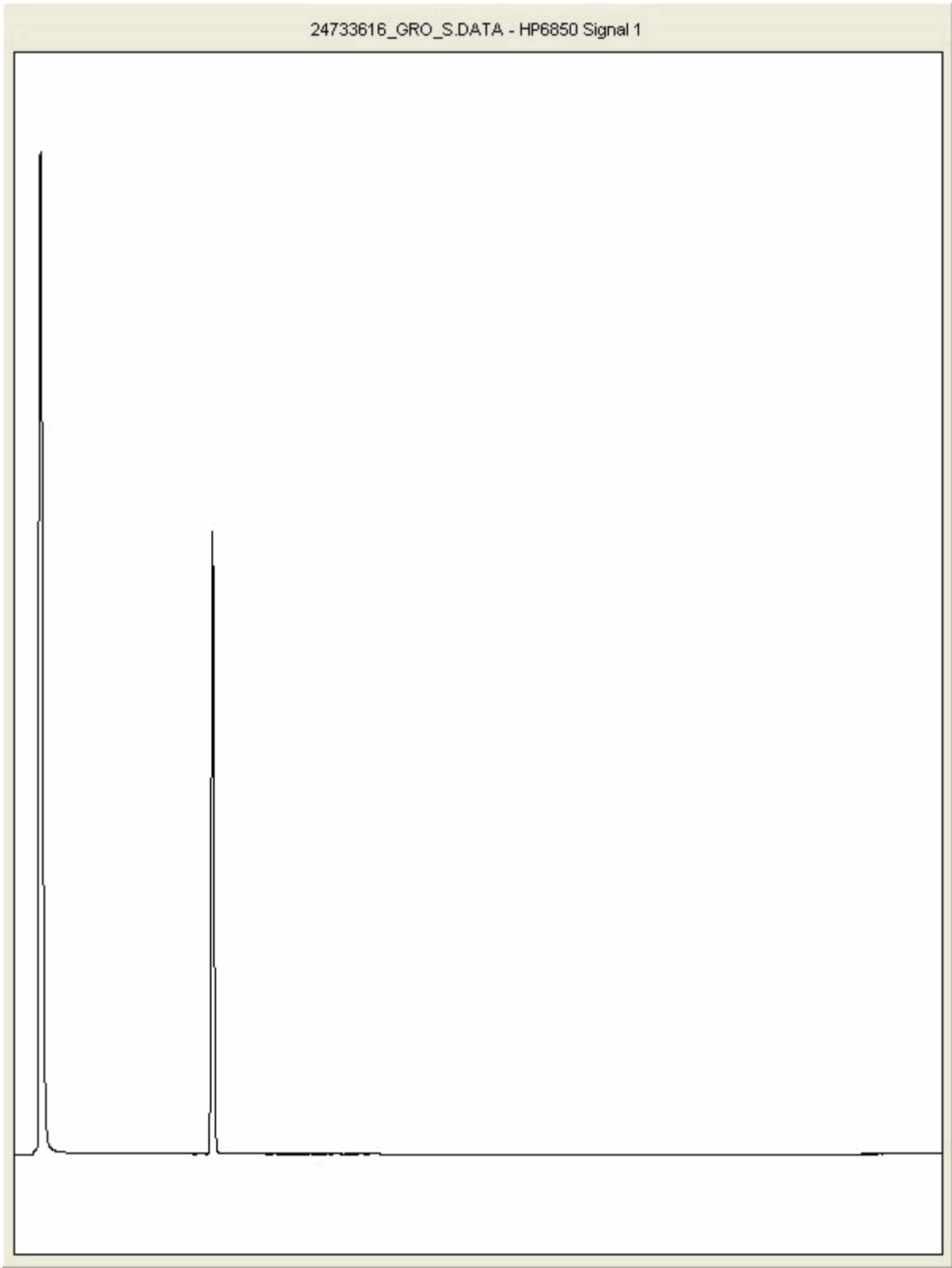
Superseded Report: 608658

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24733616
Sample ID : UP-TP-03

Depth : 2.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

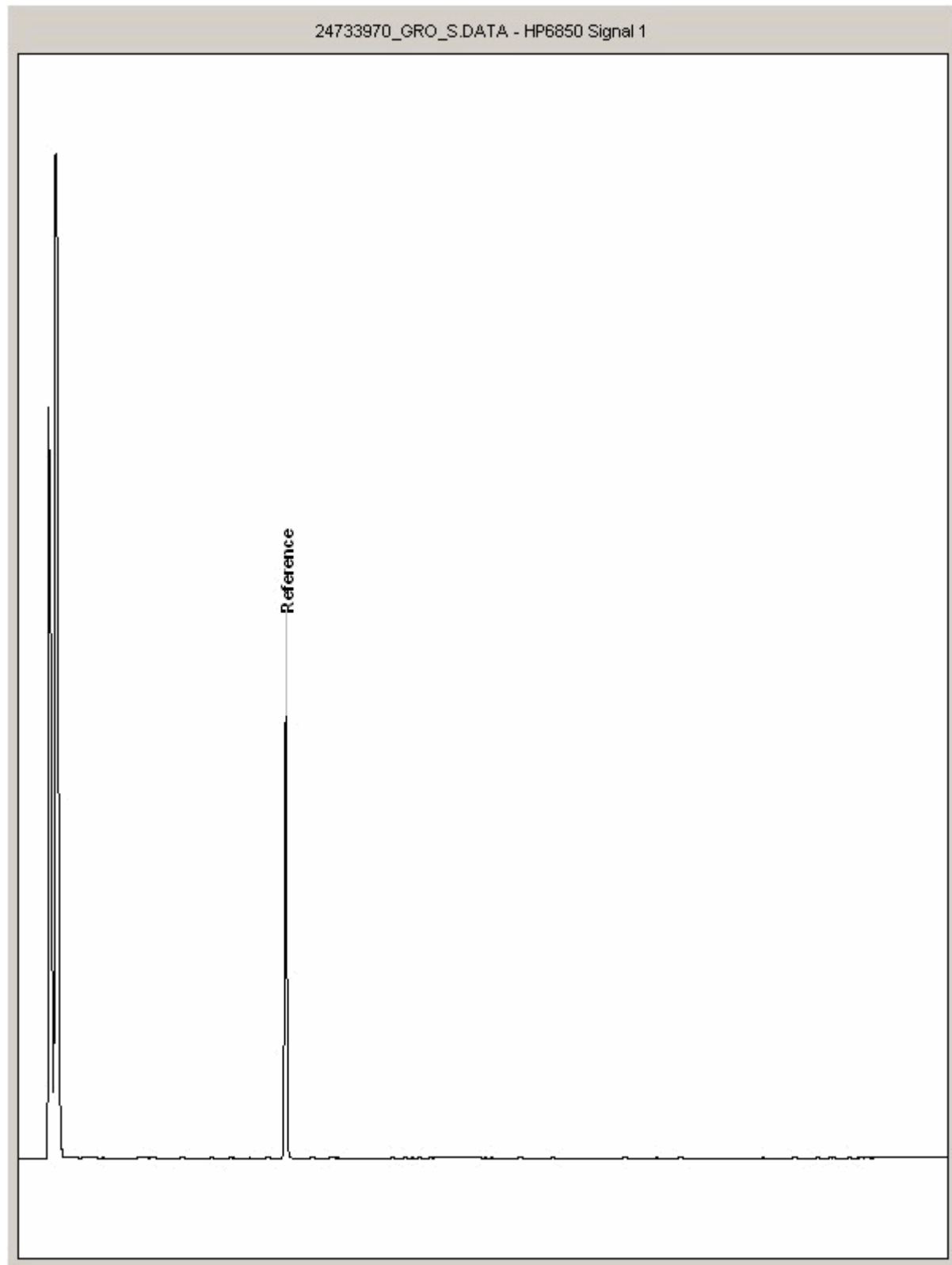
Superseded Report: 608658

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24733970
Sample ID : UP-TP-04

Depth : 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

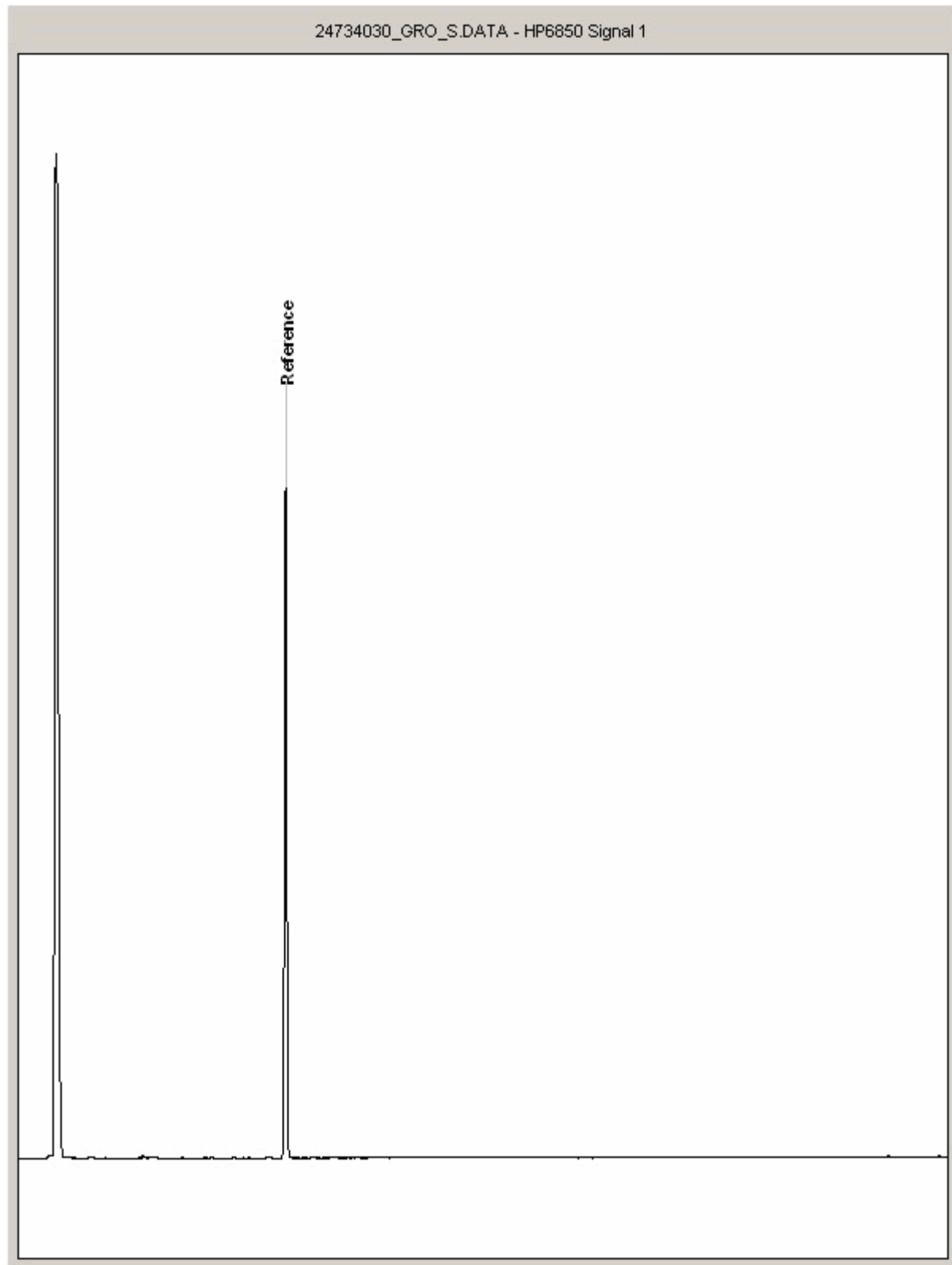
Superseded Report: 608658

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24734030
Sample ID : UP-TP-03

Depth : 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harboursid

Report Number: 633468
Location: Harbourside

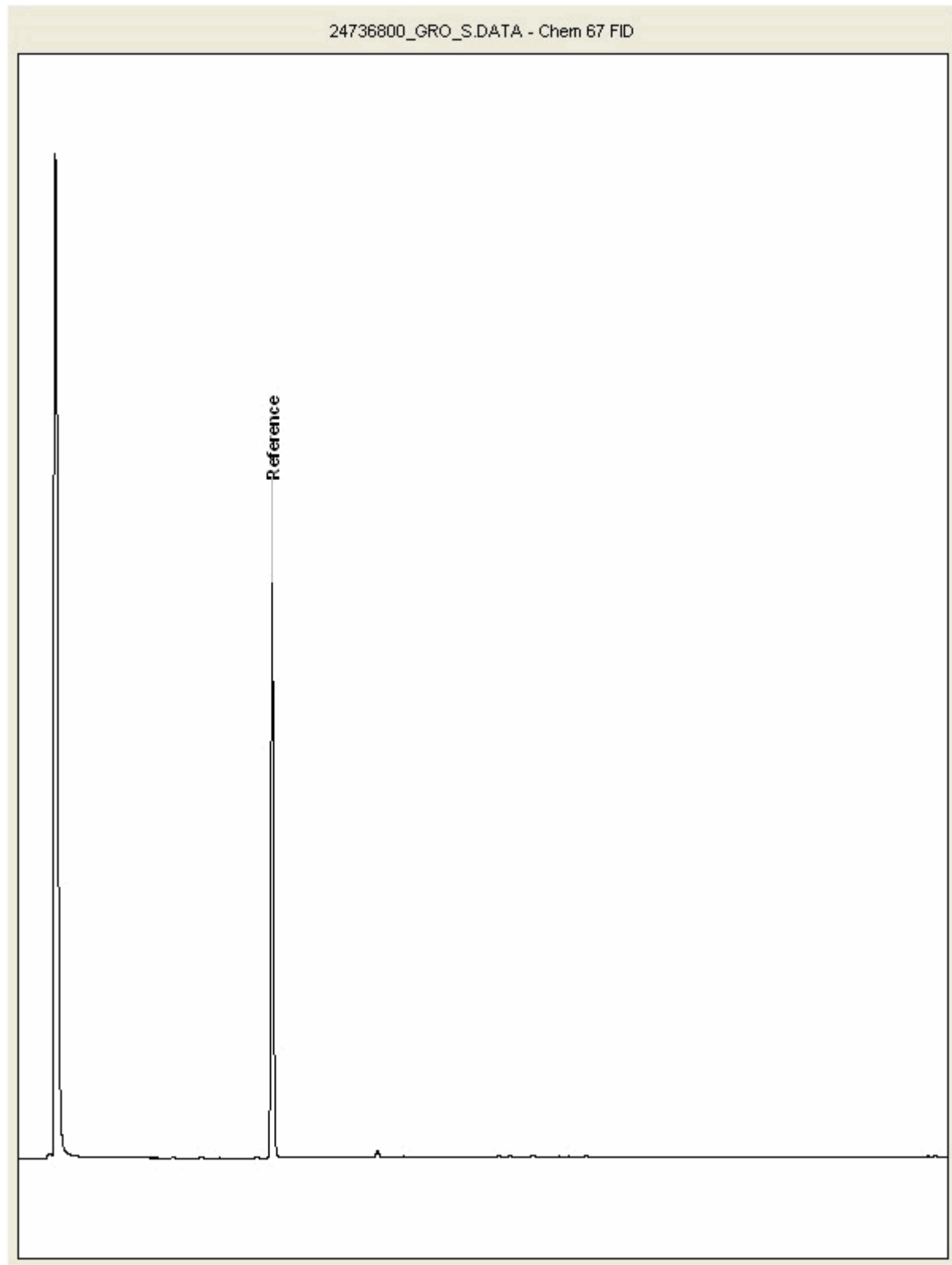
Superseded Report: 608658

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24736800
Sample ID : UP-TP-02

Depth : 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

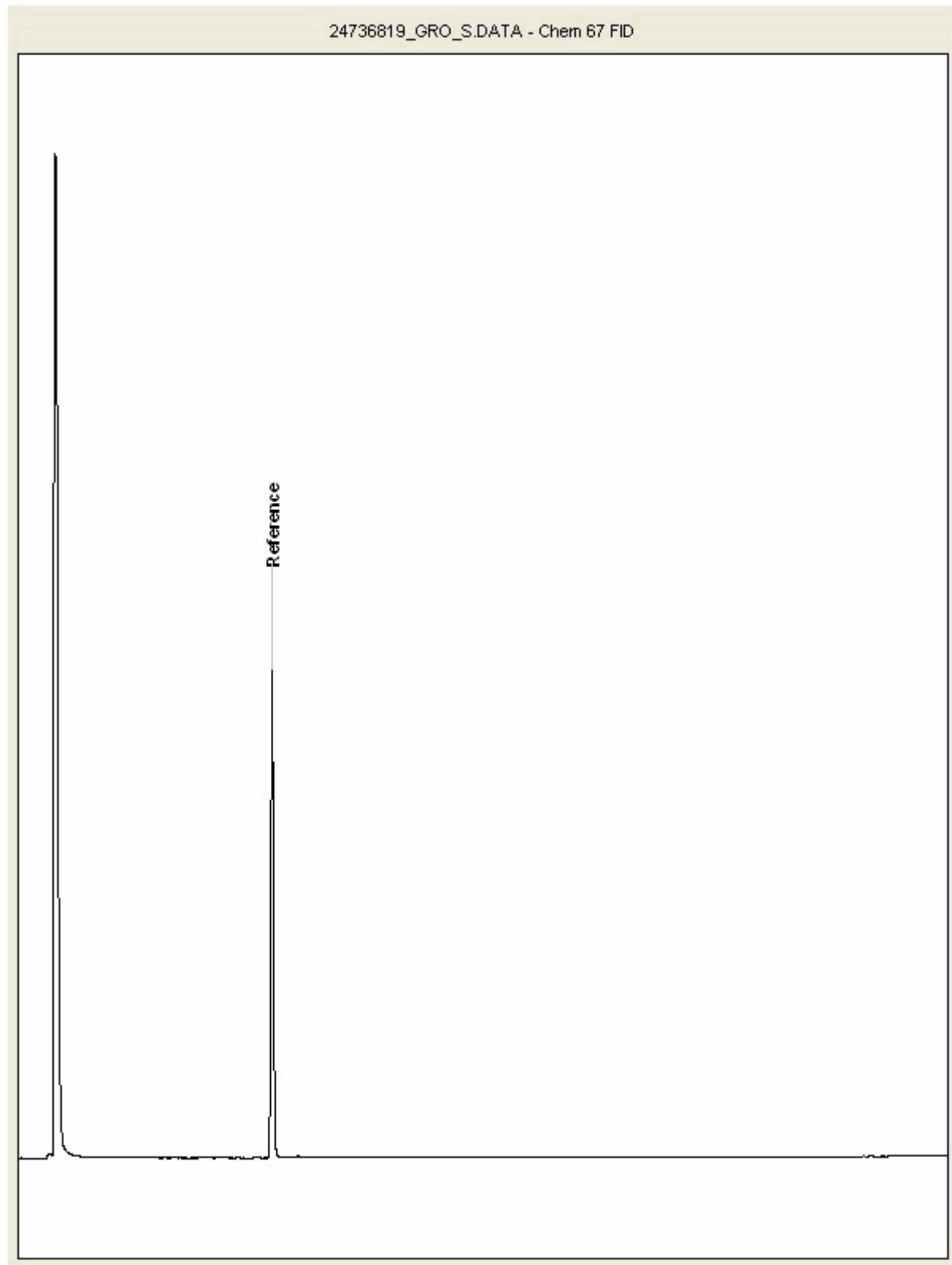
Superseded Report: 608658

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24736819
Sample ID : UP-TP-01

Depth : 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 210731-84
Client Ref.: Port Talbot Harbourside

Report Number: 633468
Location: Harbourside

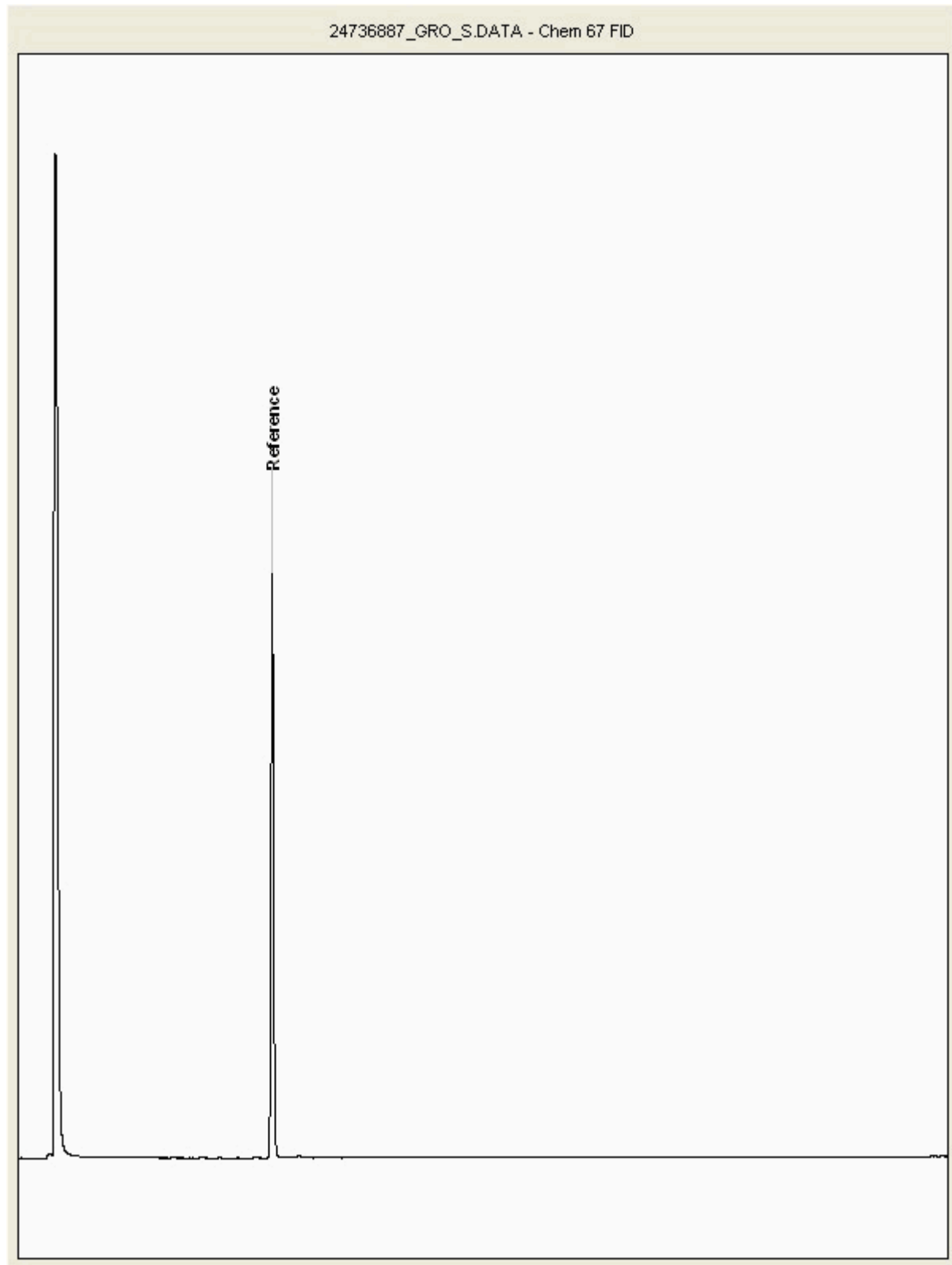
Superseded Report: 608658

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24736887
Sample ID : UP-TP-01

Depth : 1.50



ALS Environmental, Land	QF.7.5.1 Data Amendments Form (Issue No. 4)
	Date: 03/03/2020
	Issued and Authorised by Quality Manager

SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Previous Reference	New Reference	Supersedes Report
210731-84	24728655	TP1	14/02/2022	Sample ID Change	TP1	UP-TP-01	608658
210731-84	24728661	TP1	14/02/2022	Sample ID Change	TP1	UP-TP-01	608658
210731-84	24728668	TP2	14/02/2022	Sample ID Change	TP2	UP-TP-02	608658
210731-84	24728673	TP2	14/02/2022	Sample ID Change	TP2	UP-TP-02	608658
210731-84	24728679	TP3	14/02/2022	Sample ID Change	TP3	UP-TP-03	608658
210731-84	24728684	TP3	14/02/2022	Sample ID Change	TP3	UP-TP-03	608658
210731-84	24728689	TP4	14/02/2022	Sample ID Change	TP4	UP-TP-04	608658
210731-84	24728698	TP4	14/02/2022	Sample ID Change	TP4	UP-TP-04	608658



CERTIFICATE OF ANALYSIS

SDG:	210731-84	Client Reference:	Port Talbot Harbourside	Report Number:	633468
Location:	Harbourside	Order Number:	70057278-RW2	Superseded Report:	608658

Appendix

General

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. 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

20. 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 (2021), 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 and soils are obtained from supplied bulk materials and soils 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 (2021).

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

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.

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 D.3

VALIDATION TRIAL PITS





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:	09 November 2021
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	211030-52
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	620463
Order Number:	70057278-RW2

We received 16 samples on Saturday October 30, 2021 and 16 of these samples were scheduled for analysis which was completed on Tuesday November 09, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

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: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25246583	VAL_TP01	ES	1.20 - 1.30	28/10/2021
25246630	VAL_TP02	ES	1.20 - 1.40	28/10/2021
25246635	VAL_TP03	ES	1.50 - 1.60	28/10/2021
25246640	VAL_TP04	ES	0.30 - 0.40	28/10/2021
25246646	VAL_TP04	ES	2.30 - 2.40	28/10/2021
25246655	VAL_TP05	ES	0.40 - 0.50	28/10/2021
25246664	VAL_TP05	ES	2.40 - 2.50	28/10/2021
25246669	VAL_TP06	ES	0.30 - 0.40	28/10/2021
25246674	VAL_TP06	ES	2.40 - 2.50	28/10/2021
25246589	VAL_TP07	ES	0.30 - 0.40	28/10/2021
25246594	VAL_TP07	ES	2.30 - 2.40	28/10/2021
25246599	VAL_TP08	ES	1.50 - 1.60	28/10/2021
25246604	VAL_TP09	ES	1.50 - 1.60	28/10/2021
25246612	VAL_TP10	ES	1.50 - 1.70	28/10/2021
25246620	VAL_TP11	ES	1.50 - 1.70	28/10/2021
25246625	VAL_TP12	ES	1.70 - 2.00	28/10/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

Superseded Report:

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type
	25246674		VAL_TP06		ES		2.40 - 2.50		60g VOC (ALE215)		S
	25246669		VAL_TP06		ES		0.30 - 0.40		250g Amber Jar (ALE215)		S
	25246664		VAL_TP05		ES		2.40 - 2.50		60g VOC (ALE215)		S
	25246655		VAL_TP05		ES		0.40 - 0.50		250g Amber Jar (ALE215)		S
	25246646		VAL_TP04		ES		2.30 - 2.40		60g VOC (ALE215)		S
	25246640		VAL_TP04		ES		0.30 - 0.40		250g Amber Jar (ALE215)		S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4									
Boron Water Soluble	All	NDPs: 0 Tests: 4									
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 16									
EPH CWG GC (S)	All	NDPs: 0 Tests: 16									
GRO by GC-FID (S)	All	NDPs: 0 Tests: 16									
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 16									
Metals in solid samples by OES	All	NDPs: 0 Tests: 4									
PAH by GCMS	All	NDPs: 0 Tests: 16									
pH	All	NDPs: 0 Tests: 4									
Phenols by HPLC (S)	All	NDPs: 0 Tests: 16									
Sample description	All	NDPs: 0 Tests: 16									
Total Organic Carbon	All	NDPs: 0 Tests: 4									
TPH CWG GC (S)	All	NDPs: 0 Tests: 16									
VOC MS (S)	All	NDPs: 0 Tests: 16									



CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

Superseded Report:

Sample Descriptions

Grain Sizes

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

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
25246583	VAL_TP01	1.20 - 1.30	Dark Brown	Sandy Loam	Stones	Vegetation
25246630	VAL_TP02	1.20 - 1.40	Dark Brown	Sandy Loam	Vegetation	Stones
25246635	VAL_TP03	1.50 - 1.60	Dark Brown	Sandy Loam	Vegetation	Stones
25246640	VAL_TP04	0.30 - 0.40	Light Brown	Sandy Loam	Stones	None
25246646	VAL_TP04	2.30 - 2.40	Dark Brown	Sandy Silt Loam	Stones	None
25246655	VAL_TP05	0.40 - 0.50	Light Brown	Loamy Sand	Stones	None
25246664	VAL_TP05	2.40 - 2.50	Dark Brown	Sandy Loam	Stones	None
25246669	VAL_TP06	0.30 - 0.40	Light Brown	Loamy Sand	Stones	None
25246674	VAL_TP06	2.40 - 2.50	Dark Brown	Loamy Sand	Stones	None
25246589	VAL_TP07	0.30 - 0.40	Dark Brown	Sandy Loam	Stones	Brick
25246594	VAL_TP07	2.30 - 2.40	Dark Brown	Sandy Loam	Stones	None
25246599	VAL_TP08	1.50 - 1.60	Dark Brown	Sandy Loam	Vegetation	Stones
25246604	VAL_TP09	1.50 - 1.60	Dark Brown	Sandy Silt Loam	Stones	None
25246612	VAL_TP10	1.50 - 1.70	Dark Brown	Loamy Sand	Stones	None
25246620	VAL_TP11	1.50 - 1.70	Dark Brown	Sandy Loam	Stones	None
25246625	VAL_TP12	1.70 - 2.00	Dark Brown	Sandy Clay Loam	Stones	None

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

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

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

CERTIFICATE OF ANALYSIS



CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278Report Number: 620463
Location: Port Talbot Harbourside

Superseded Report:

TPH CWG (S)

Results Legend			Customer Sample Ref.	VAL_TP01	VAL_TP02	VAL_TP03	VAL_TP04	VAL_TP04	VAL_TP05
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.20 - 1.30	1.20 - 1.40	1.50 - 1.60	0.30 - 0.40	2.30 - 2.40	0.40 - 0.50
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.			28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
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			30/10/2021	30/10/2021	30/10/2021	30/10/2021	30/10/2021	30/10/2021
(F)	Trigger breach confirmed			211030-52	211030-52	211030-52	211030-52	211030-52	211030-52
1-4+5@	Sample deviation (see appendix)			25246583	25246630	25246635	25246640	25246646	25246655
Component	LOD/Units	Method							
GRO Surrogate % recovery**	%	TM089		78.9	91.3	91.9	102	76.5	93.9
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0174	0.0101	<0.01	<0.01	0.0476	<0.01
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089		0.0682	0.0466	0.0448	0.0301	0.252	0.0174
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089		0.131	0.262	0.113	0.0484	0.706	0.025
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414		<1	<1	<1	<1	4.92	<1
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414		1.12	<1	<1	<1	7.82	1.36
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414		5.89	2.49	9.72	2.98	2.78	5.33
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414		21.6	13.7	165	13.4	5.45	24.5
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414		1.16	5.2	29	6.31	2.55	15.3
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414		30.3	22.1	204	22.9	23.5	46.6
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414		126	62.5	253	37	1480	64.9
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089		0.161	0.103	0.033	0.014	0.218	<0.01
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089		0.0322	0.137	0.0507	0.0215	0.0843	<0.01
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089		0.088	0.175	0.0755	0.0323	0.471	0.0163
Aromatics >EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414		2.75	2.66	1.46	<1	20.8	<1
Aromatics >EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414		<1	1.23	<1	<1	24.5	<1
Aromatics >EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414		5.75	4.54	1.35	1.02	137	1.2
Aromatics >EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414		74.9	30	44.3	10.8	1130	15.1
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		11	2.01	<1	1.89	137	1.06
Aromatics >EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414		2.35	<1	<1	<1	16.5	<1
Total Aromatics >EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414		95.2	40.4	48.5	14.1	1450	18.4
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414		126	63.3	253	37.1	1480	65
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089		0.217	0.319	0.158	0.0785	1.01	<0.05
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089		0.281	0.416	0.159	0.0677	0.772	<0.05
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089		0.498	0.735	0.317	0.146	1.78	<0.02

SDG: 211030-52
Client Ref.: 70057278

TPH CWG (S)[illegible]



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Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

Superseded Report:

TPH CWG (S)

Results Legend			Customer Sample Ref.		VAL_TP09	VAL_TP10	VAL_TP11	VAL_TP12		
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		1.50 - 1.60	1.50 - 1.70	1.50 - 1.70	1.70 - 2.00		
M	mCERTS accredited.				Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
aq	Aqueous / settled sample.				28/10/2021	28/10/2021	28/10/2021	28/10/2021		
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.				30/10/2021	30/10/2021	30/10/2021	30/10/2021		
*	Subcontracted - refer to subcontractor report for accreditation status.				211030-52	211030-52	211030-52	211030-52		
**	% 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				25246604	25246612	25246620	25246625		
(F)	Trigger breach confirmed				ES	ES	ES	ES		
1-4*\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM089			87.2	115	109	99.3		
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089			0.0244	0.0191	0.0688	0.0147		
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089			0.117	0.103	0.42	0.153		
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089			0.678	0.404	1.83	1.66		
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414			<1	<1	17.1	3.07		
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414			<1	<1	26.6	9.98		
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414			<1	1.97	106	14.5		
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414			5.54	16.2	109	17.8		
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414			1.19	7.65	33.4	13.6		
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414			7.13	26.9	292	59		
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414			27.1	62.3	891	234		
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089			0.866	0.284	1.98	0.0961		
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089			0.192	0.0988	0.174	0.487		
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089			0.453	0.269	1.22	1.1		
Aromatics >EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414			12.3	4.71	27.6	15.5		
Aromatics >EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414			<1	2.91	91.3	16.2		
Aromatics >EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414			<1	3.29	94.4	12.9		
Aromatics >EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414			6.02	23.2	369	125		
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414			<1	1.4	17.4	5.4		
Aromatics >EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414			<1	<1	2.76	<1		
Total Aromatics >EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414			20	35.5	599	175		
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414			29.5	63.5	897	238		
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089			0.82	0.526	2.32	1.82		
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089			1.51	0.651	3.38	1.69		
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089			2.33	1.18	5.69	3.51		



CERTIFICATE OF ANALYSIS

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SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
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Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

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

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	VAL_TP04ES 0.30 - 0.40 SOLID 28/10/2021 00:00:00 30/10/2021 05:00:00 211030-52 25246640 TM048	06/11/2021	Paul Poynton	N/A	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	VAL_TP05ES 0.40 - 0.50 SOLID 28/10/2021 00:00:00 30/10/2021 05:00:00 211030-52 25246655 TM048	06/11/2021	Paul Poynton	N/A	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	VAL_TP06ES 0.30 - 0.40 SOLID 28/10/2021 00:00:00 30/10/2021 05:00:00 211030-52 25246669 TM048	05/11/2021	Emily Anderton	-	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	VAL_TP07ES 0.30 - 0.40 SOLID 28/10/2021 00:00:00 30/10/2021 05:00:00 211030-52 25246589 TM048	05/11/2021	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



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Location: Port Talbot Harbourside

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
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
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).



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Superseded Report:

Test Completion Dates

Lab Sample No(s)	25246583	25246630	25246635	25246640	25246646	25246655	25246664	25246669	25246674	25246589
Customer Sample Ref.	VAL_TP01	VAL_TP02	VAL_TP03	VAL_TP04	VAL_TP04	VAL_TP05	VAL_TP05	VAL_TP06	VAL_TP06	VAL_TP07
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	1.20 - 1.30	1.20 - 1.40	1.50 - 1.60	0.30 - 0.40	2.30 - 2.40	0.40 - 0.50	2.40 - 2.50	0.30 - 0.40	2.40 - 2.50	0.30 - 0.40
Type	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				06-Nov-2021		06-Nov-2021		05-Nov-2021		05-Nov-2021
Boron Water Soluble				05-Nov-2021		05-Nov-2021		08-Nov-2021		05-Nov-2021
Cyanide Comp/Free/Total/Thiocyanate	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	04-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021
EPH CWG GC (S)	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	03-Nov-2021	04-Nov-2021	03-Nov-2021	04-Nov-2021
GRO by GC-FID (S)	05-Nov-2021	08-Nov-2021	05-Nov-2021	05-Nov-2021	08-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	08-Nov-2021	05-Nov-2021
Hexavalent Chromium (s)	05-Nov-2021	05-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	04-Nov-2021
Metals in solid samples by OES				08-Nov-2021		08-Nov-2021		08-Nov-2021		08-Nov-2021
PAH by GCMS	04-Nov-2021	05-Nov-2021	04-Nov-2021	04-Nov-2021	03-Nov-2021	04-Nov-2021	03-Nov-2021	04-Nov-2021	03-Nov-2021	04-Nov-2021
pH				05-Nov-2021		05-Nov-2021		05-Nov-2021		04-Nov-2021
Phenols by HPLC (S)	05-Nov-2021	05-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	05-Nov-2021	04-Nov-2021	04-Nov-2021
Sample description	02-Nov-2021	02-Nov-2021	02-Nov-2021	02-Nov-2021	02-Nov-2021	01-Nov-2021	01-Nov-2021	01-Nov-2021	01-Nov-2021	02-Nov-2021
Total Organic Carbon				09-Nov-2021		09-Nov-2021		09-Nov-2021		09-Nov-2021
TPH CWG GC (S)	05-Nov-2021	08-Nov-2021	05-Nov-2021	05-Nov-2021	08-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	08-Nov-2021	05-Nov-2021
VOC MS (S)	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021

Lab Sample No(s)	25246594	25246599	25246604	25246612	25246620	25246625
Customer Sample Ref.	VAL_TP07	VAL_TP08	VAL_TP09	VAL_TP10	VAL_TP11	VAL_TP12
AGS Ref.	ES	ES	ES	ES	ES	ES
Depth	2.30 - 2.40	1.50 - 1.60	1.50 - 1.60	1.50 - 1.70	1.50 - 1.70	1.70 - 2.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Cyanide Comp/Free/Total/Thiocyanate	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021
EPH CWG GC (S)	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
GRO by GC-FID (S)	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021
Hexavalent Chromium (s)	04-Nov-2021	05-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
PAH by GCMS	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
Phenols by HPLC (S)	04-Nov-2021	05-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021	04-Nov-2021
Sample description	02-Nov-2021	02-Nov-2021	02-Nov-2021	02-Nov-2021	02-Nov-2021	02-Nov-2021
TPH CWG GC (S)	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021
VOC MS (S)	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021	05-Nov-2021



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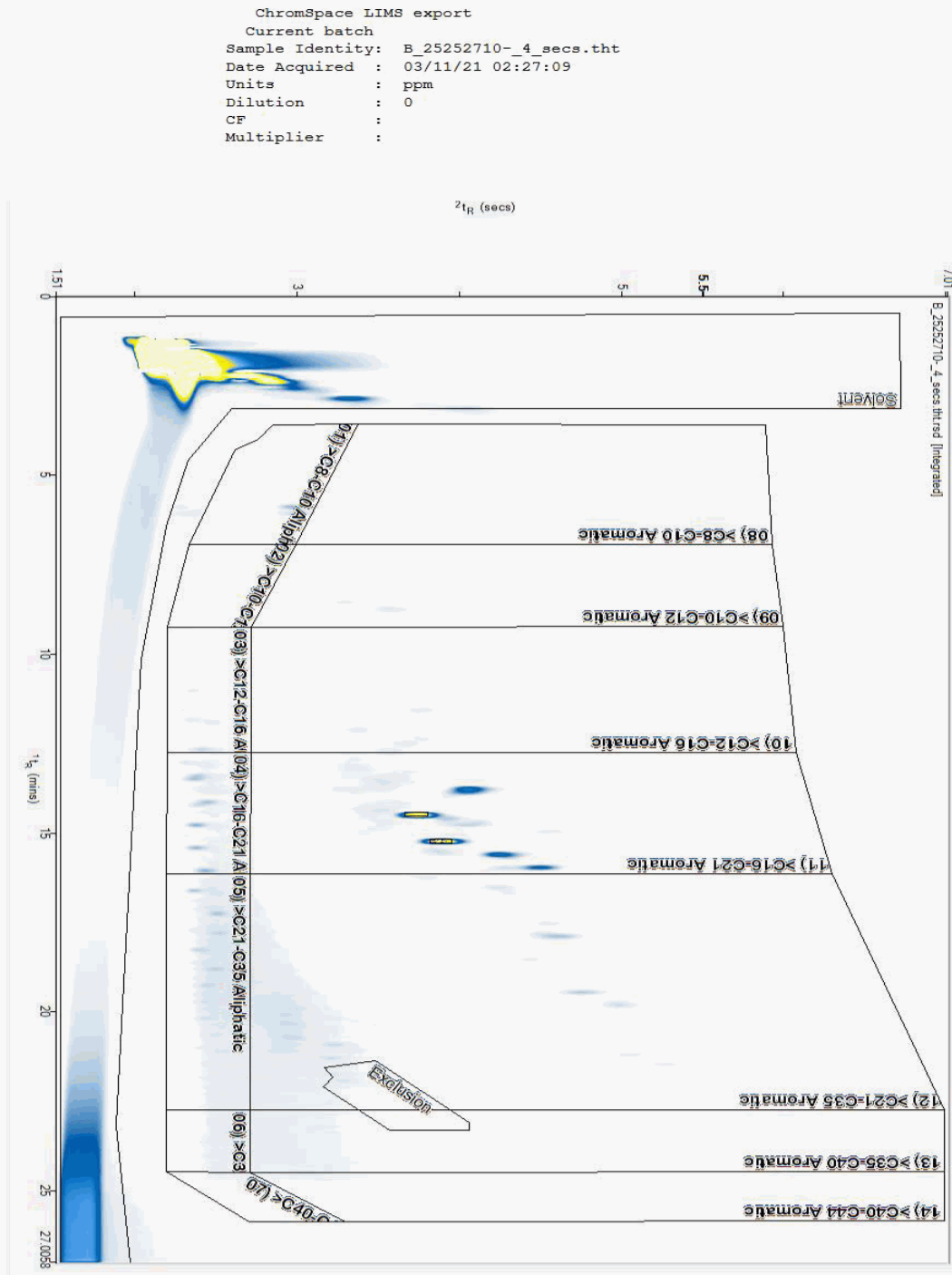
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25252710
Sample ID : VAL_TP06

Depth : 0.30 - 0.40





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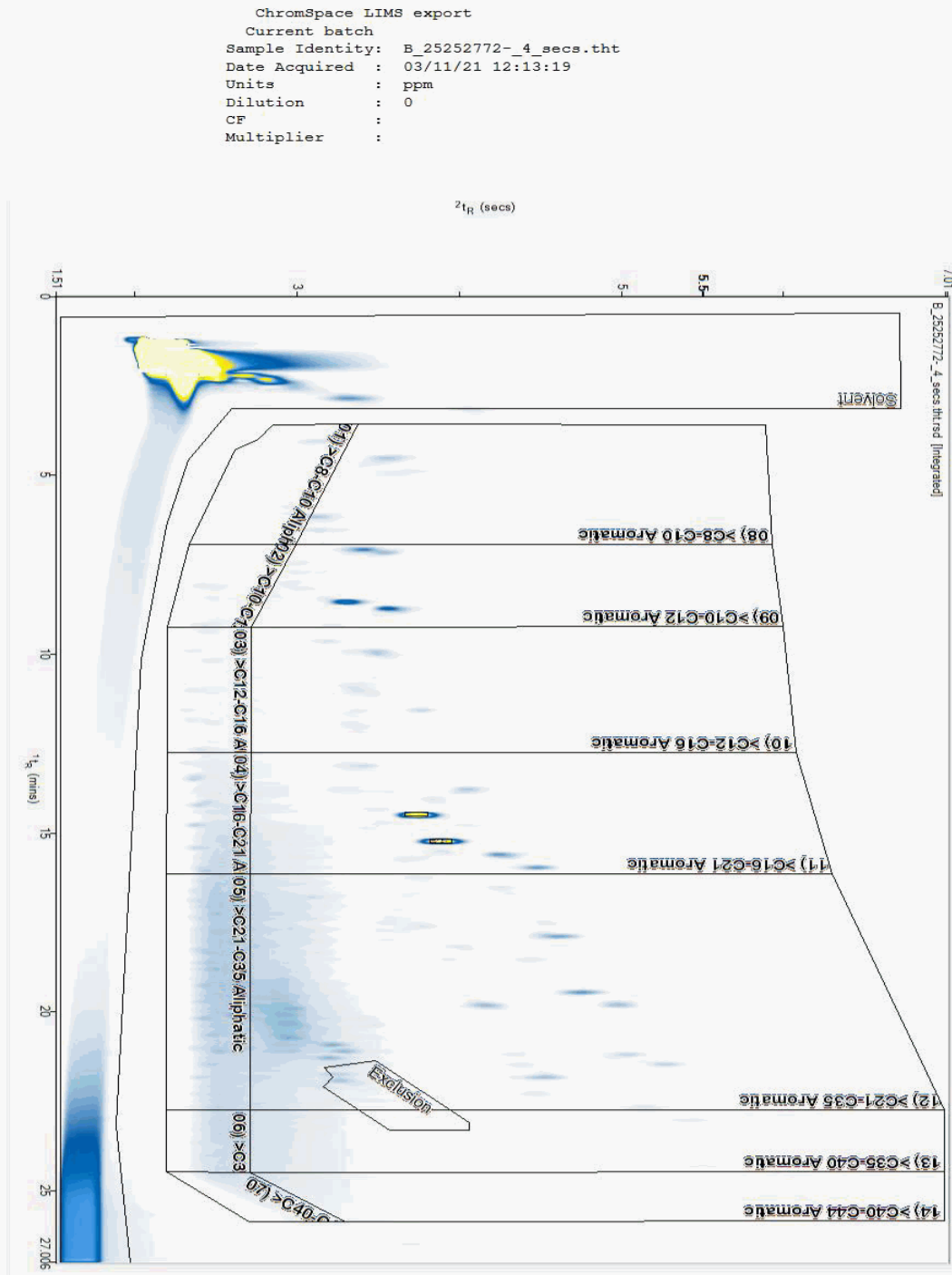
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25252772
Sample ID : VAL_TP05

Depth : 2.40 - 2.50





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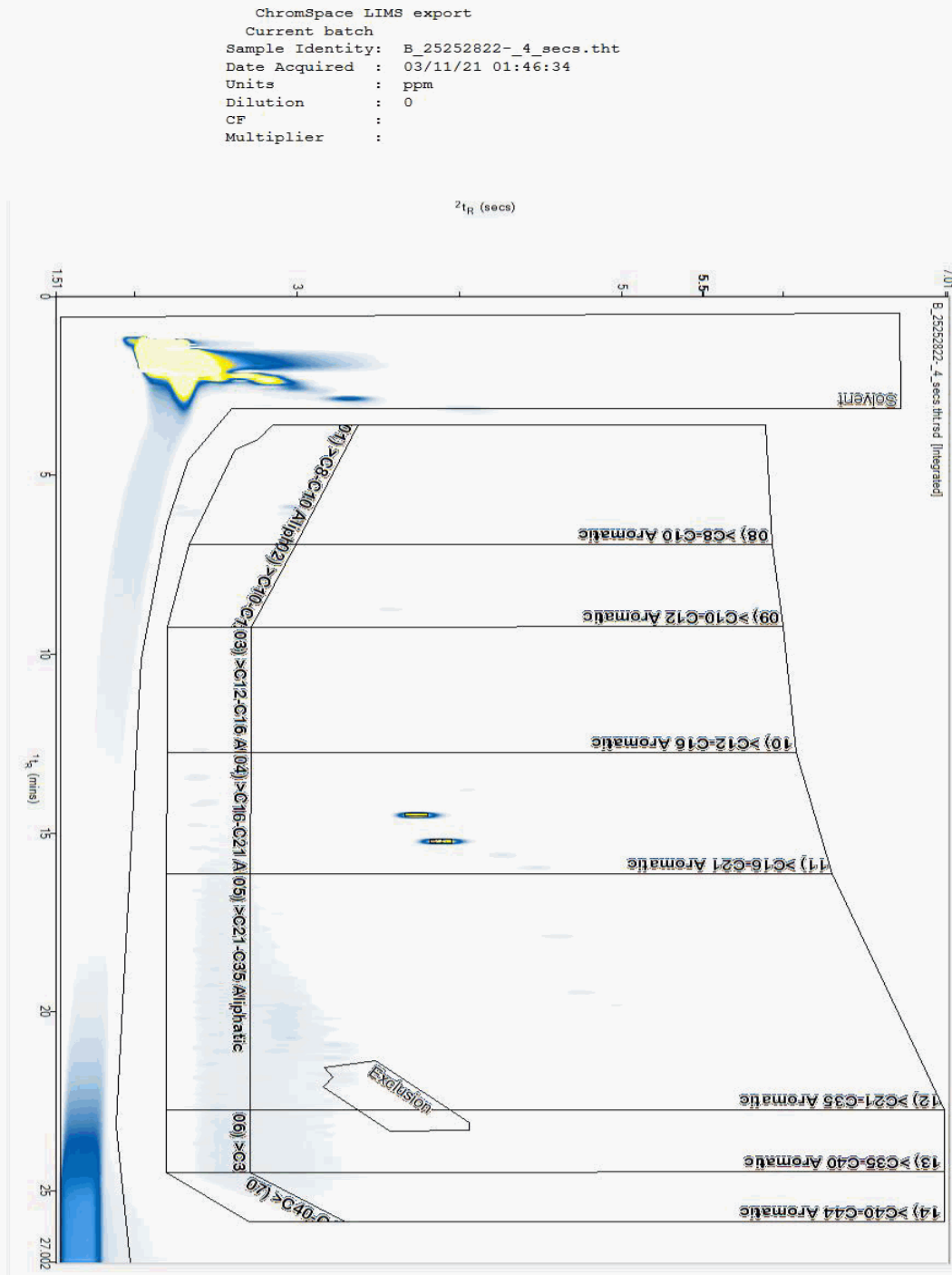
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25252822
Sample ID : VAL_TP05

Depth : 0.40 - 0.50





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Report Number: 620463
Location: Port Talbot Harbourside

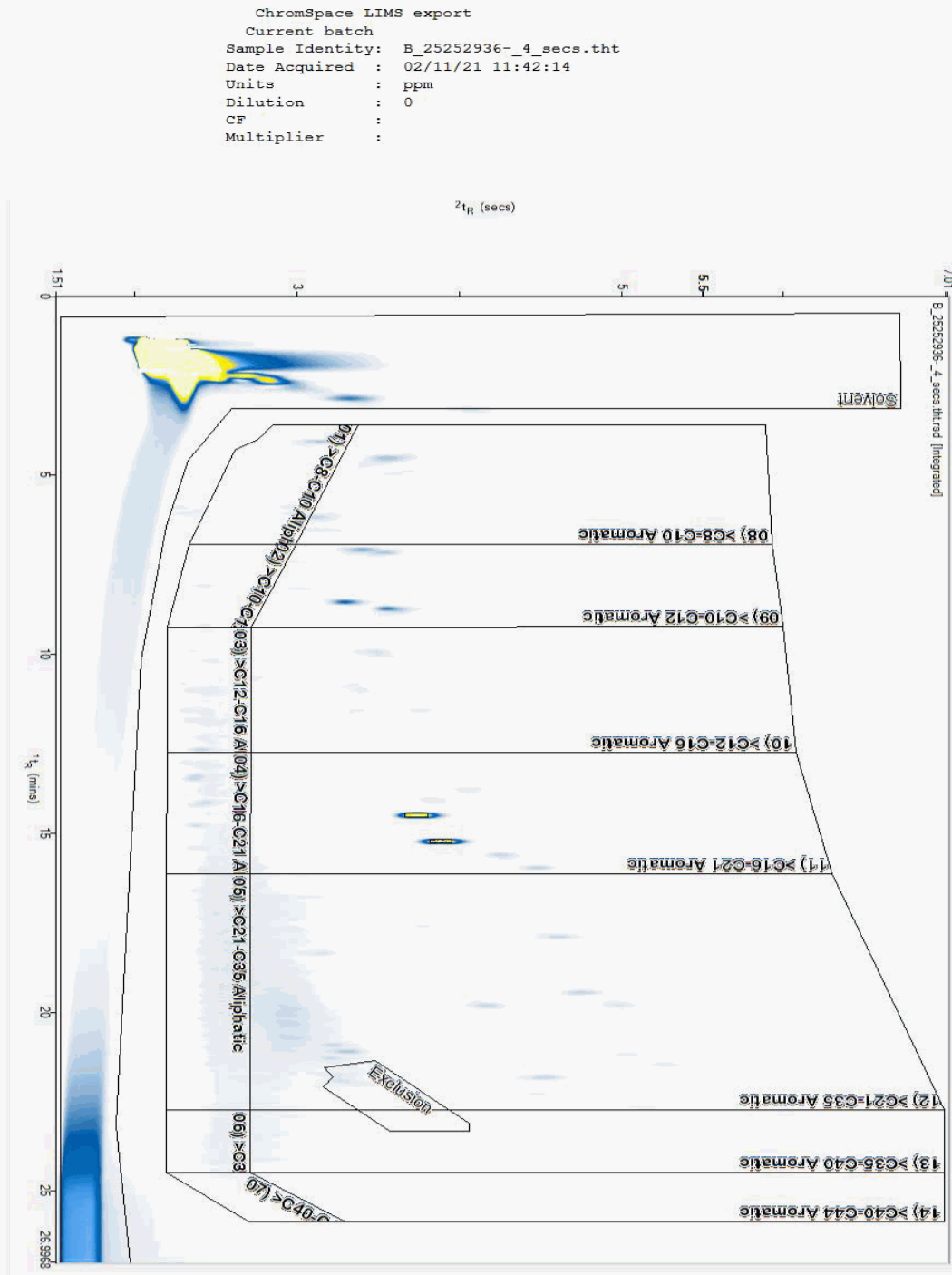
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25252936
Sample ID : VAL_TP06

Depth : 2.40 - 2.50



SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

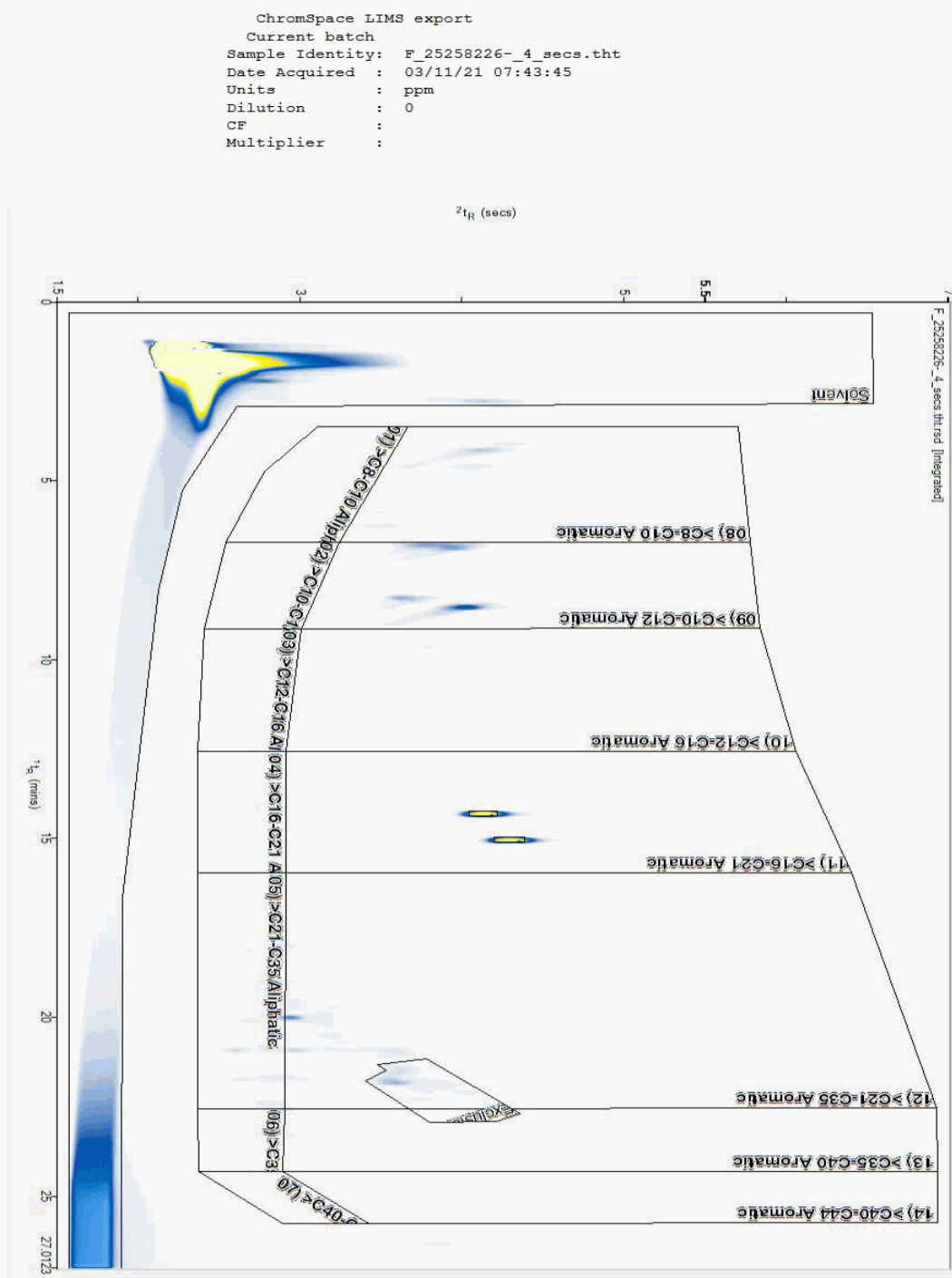
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258226
Sample ID : VAL TP09

Depth : 1.50 - 1.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

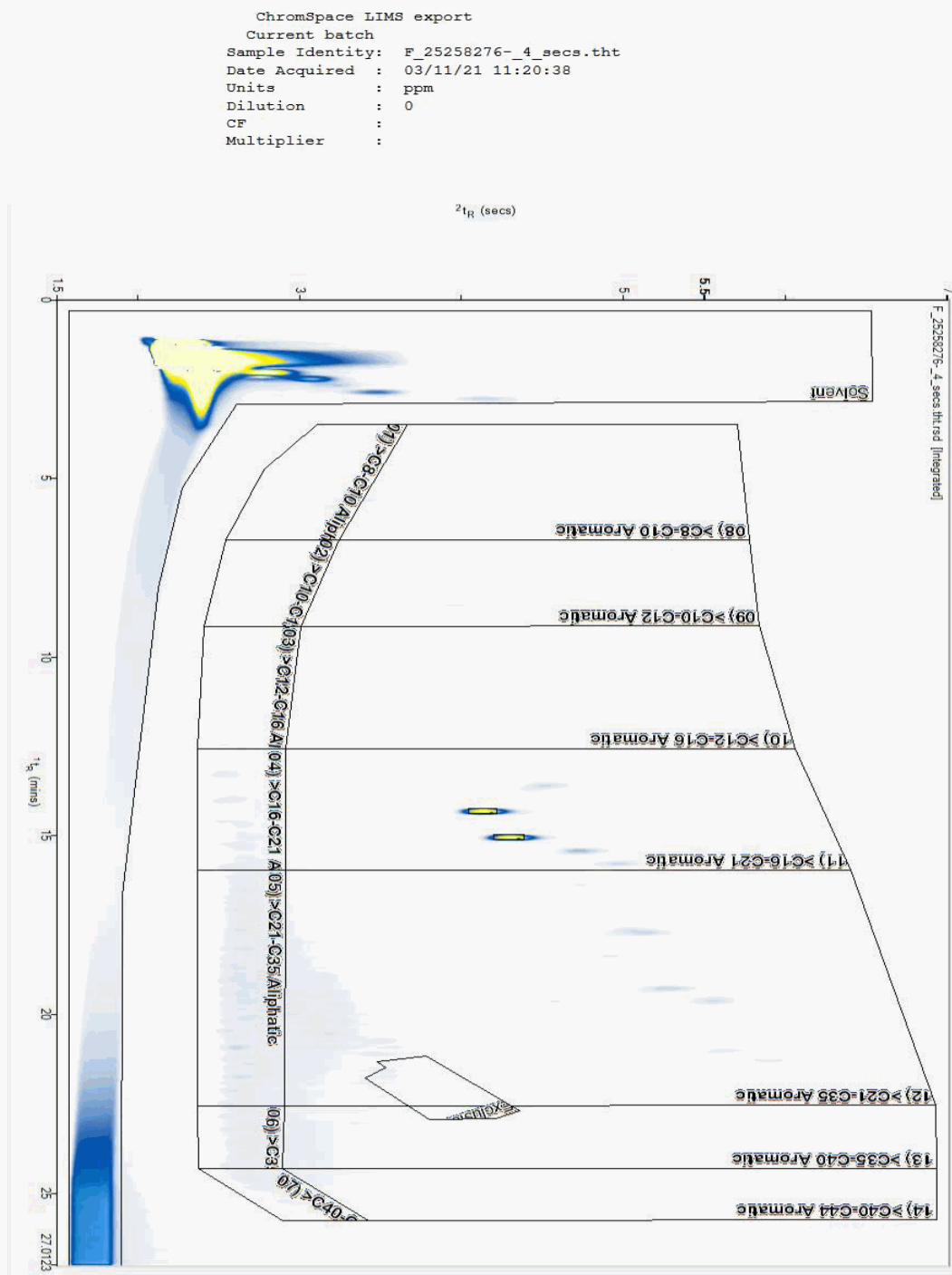
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258276
Sample ID : VAL_TP07

Depth : 0.30 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

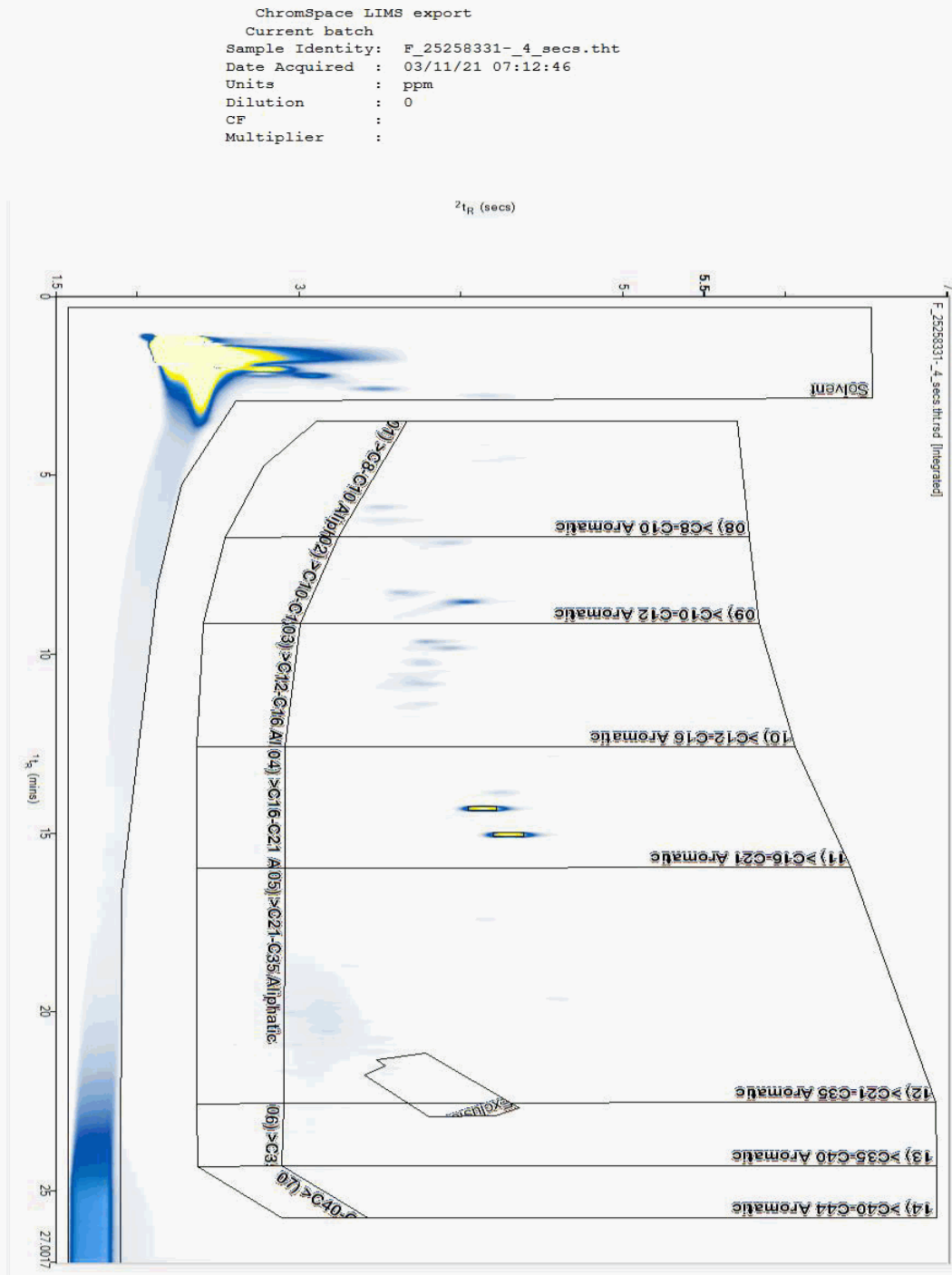
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258331
Sample ID : VAL_TP07

Depth : 2.30 - 2.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

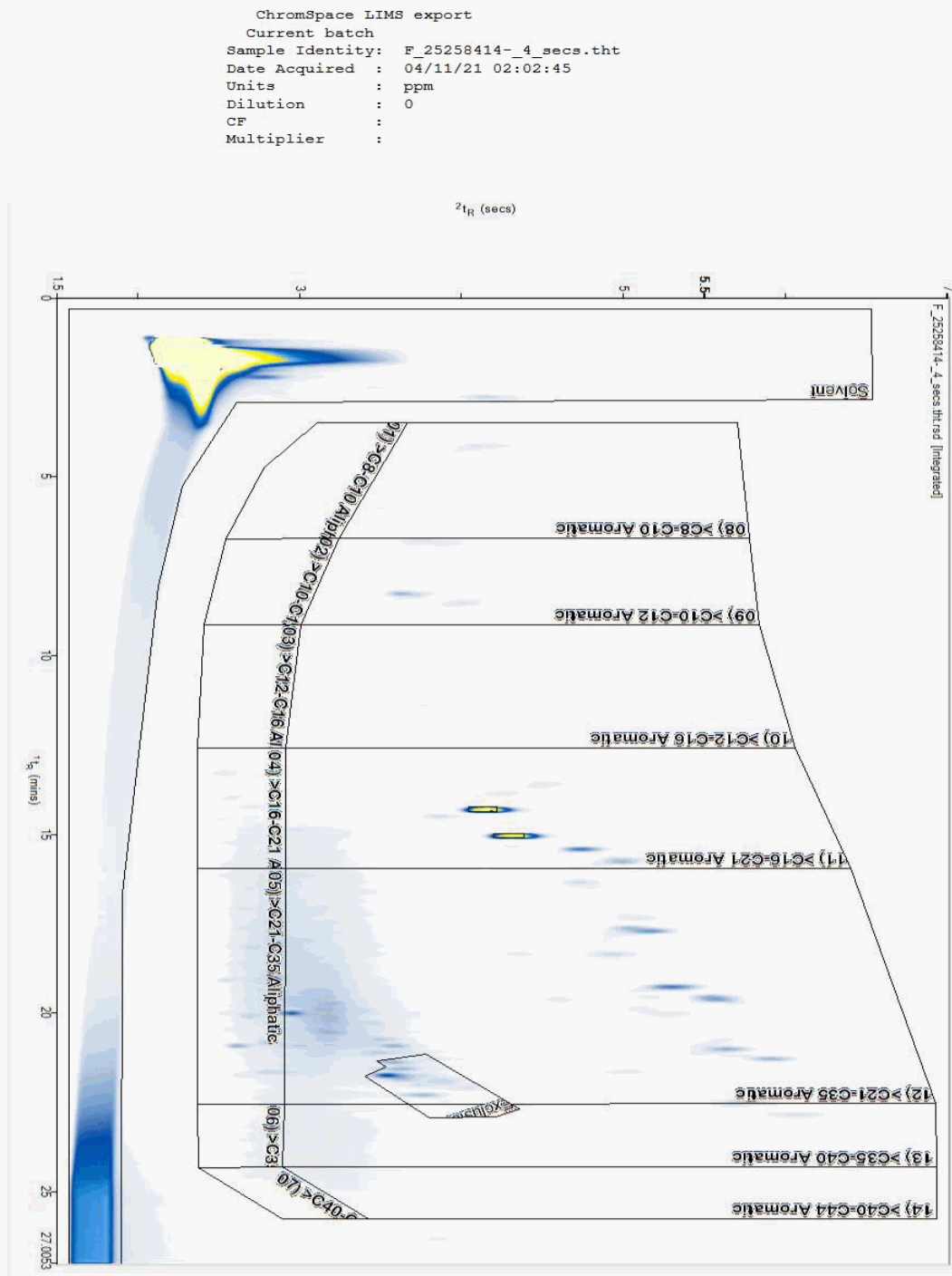
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258414
Sample ID : VAL_TP01

Depth : 1.20 - 1.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

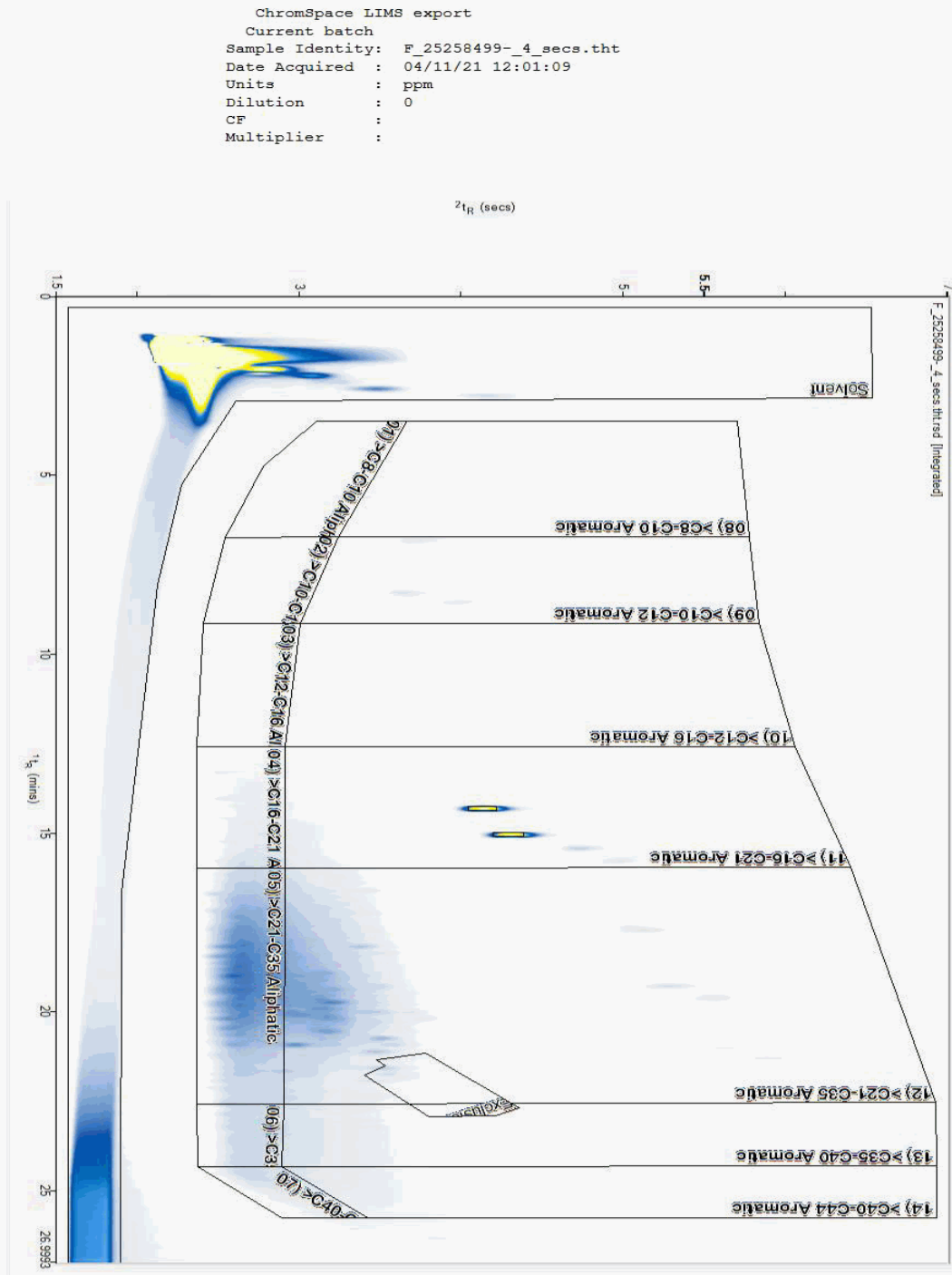
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258499
Sample ID : VAL_TP03

Depth : 1.50 - 1.60



SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

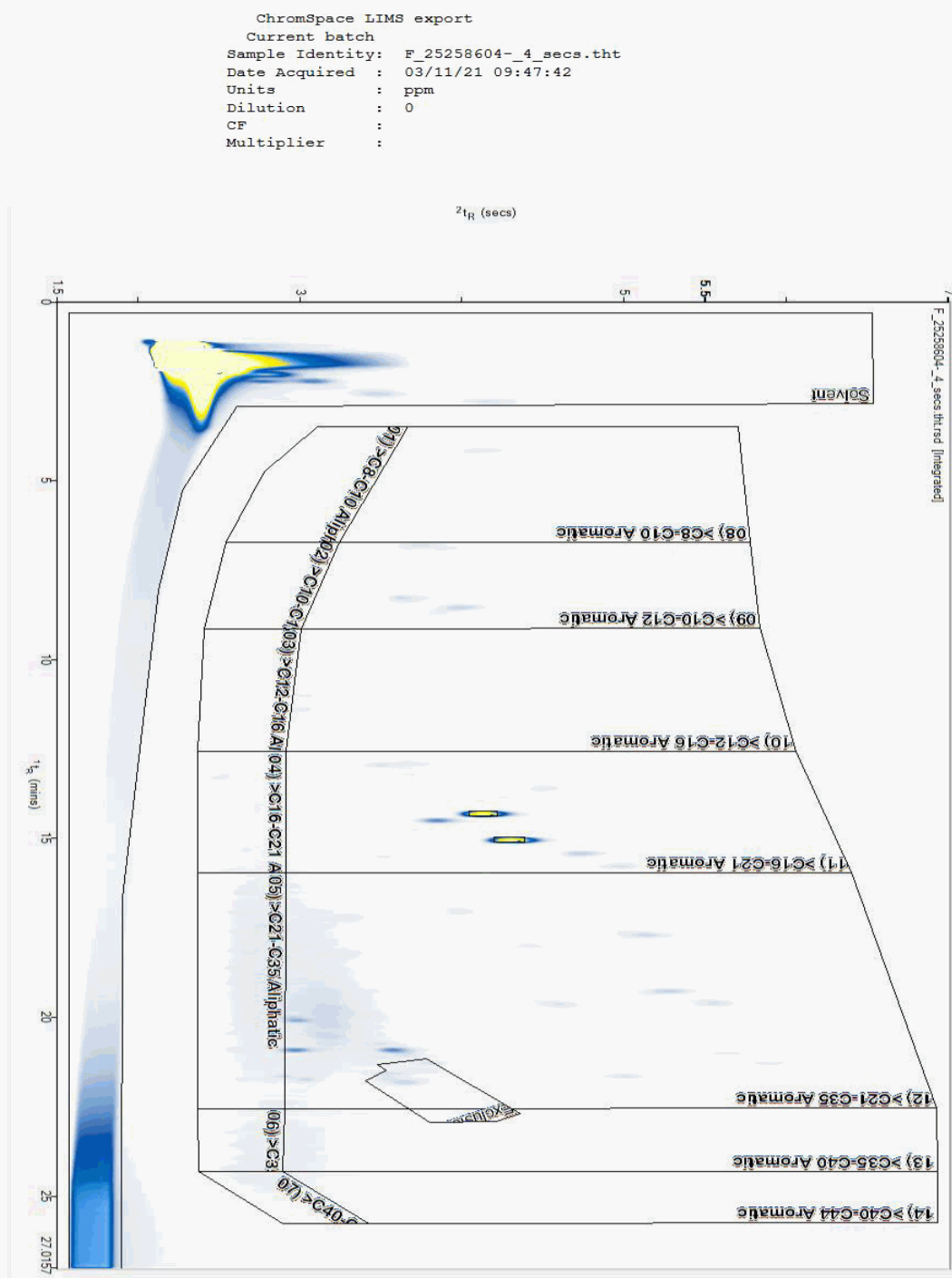
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258604
Sample ID : VAL TP02

Depth : 1.20 - 1.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

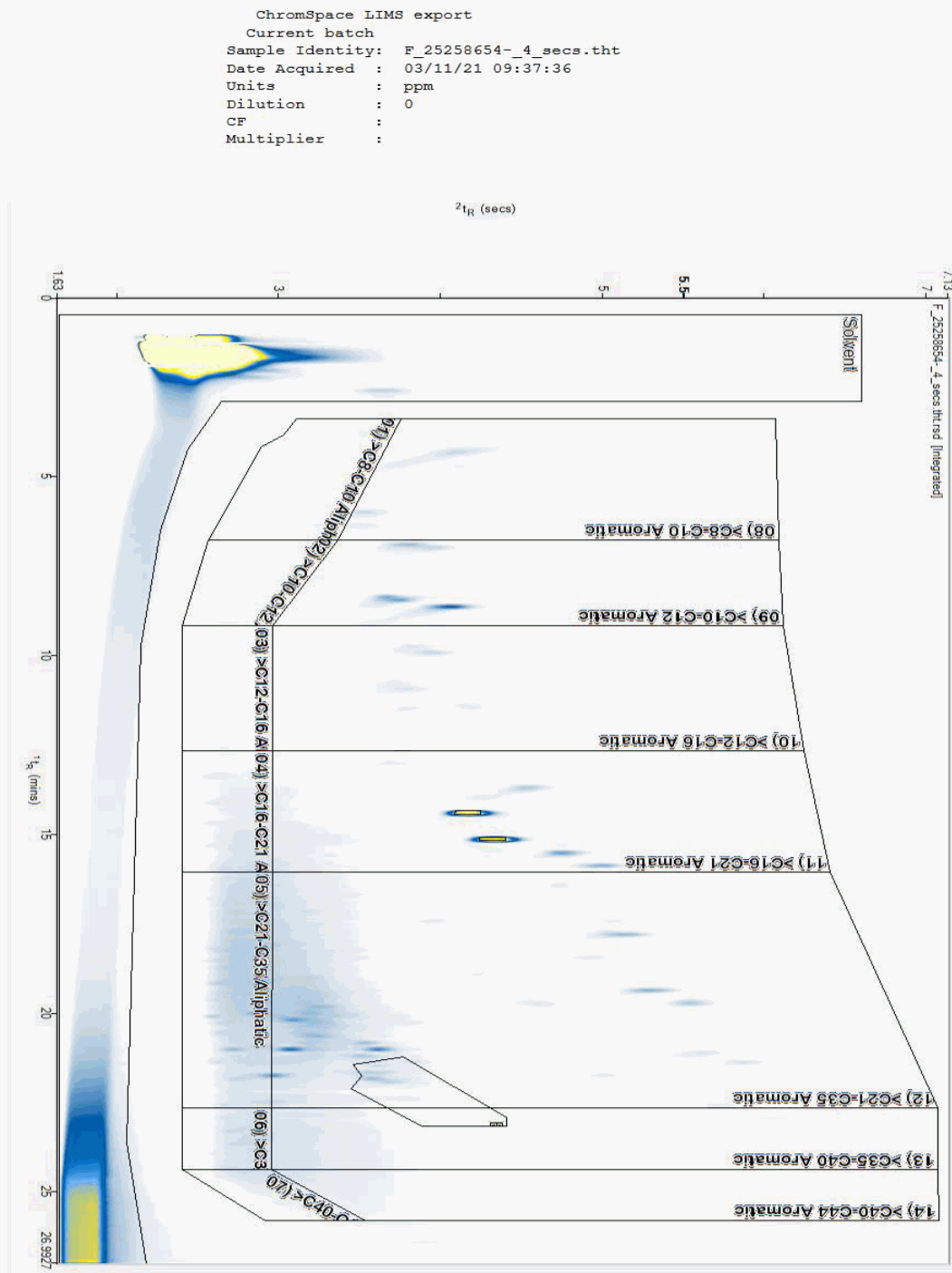
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258654
Sample ID : VAL_TP08

Depth : 1.50 - 1.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

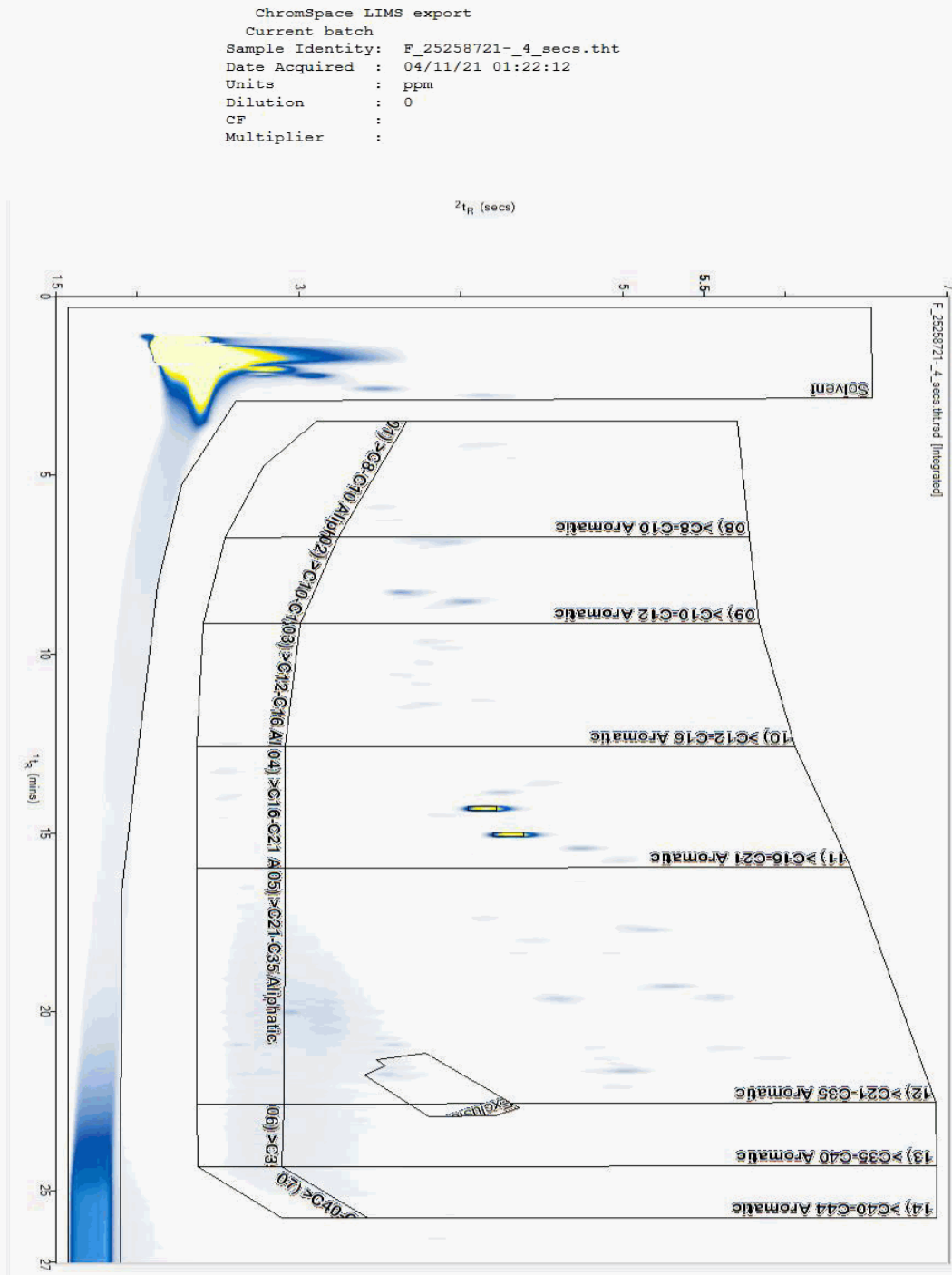
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258721
Sample ID : VAL_TP10

Depth : 1.50 - 1.70





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

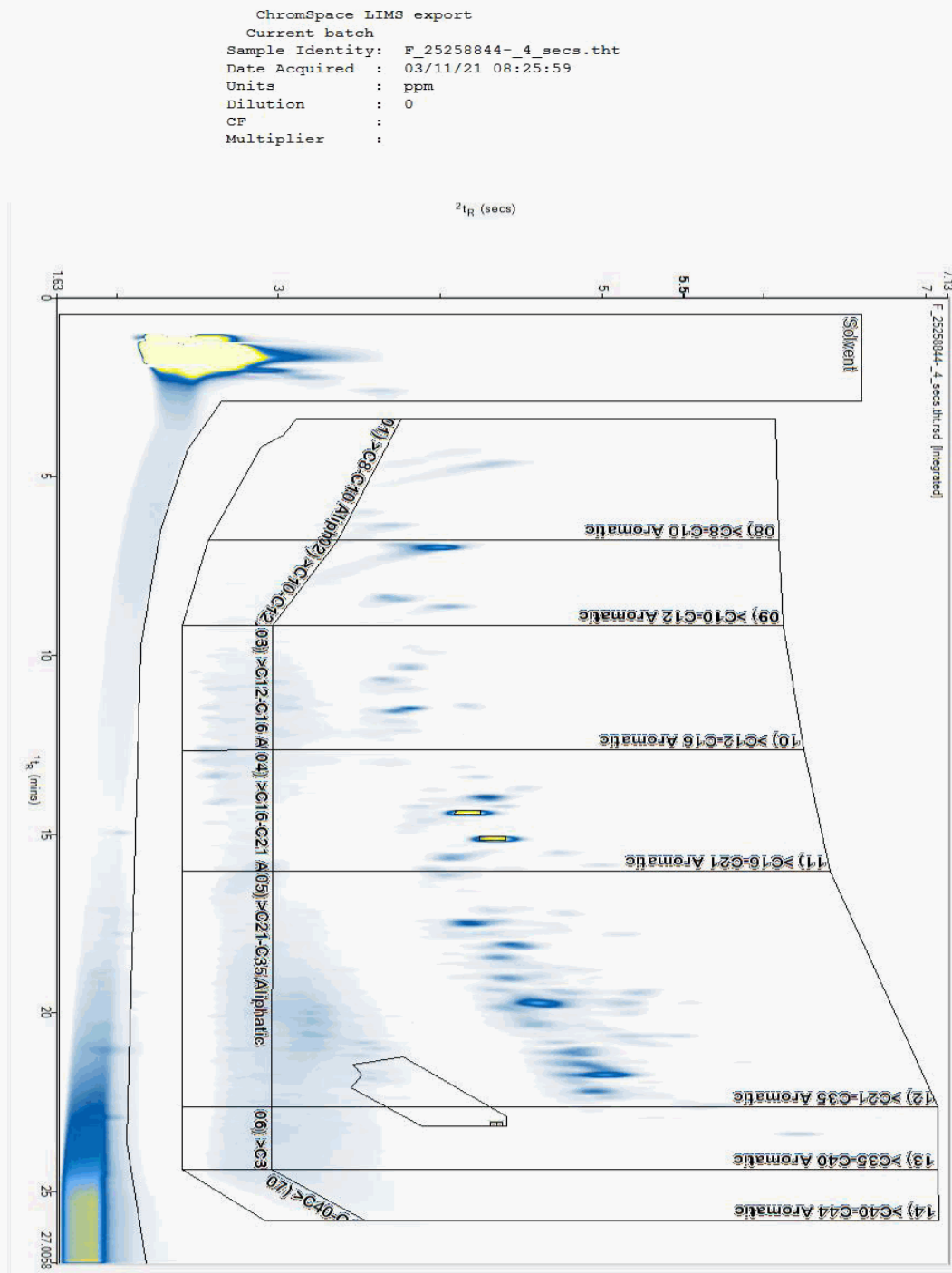
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25258844
Sample ID : VAL_TP12

Depth : 1.70 - 2.00



SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

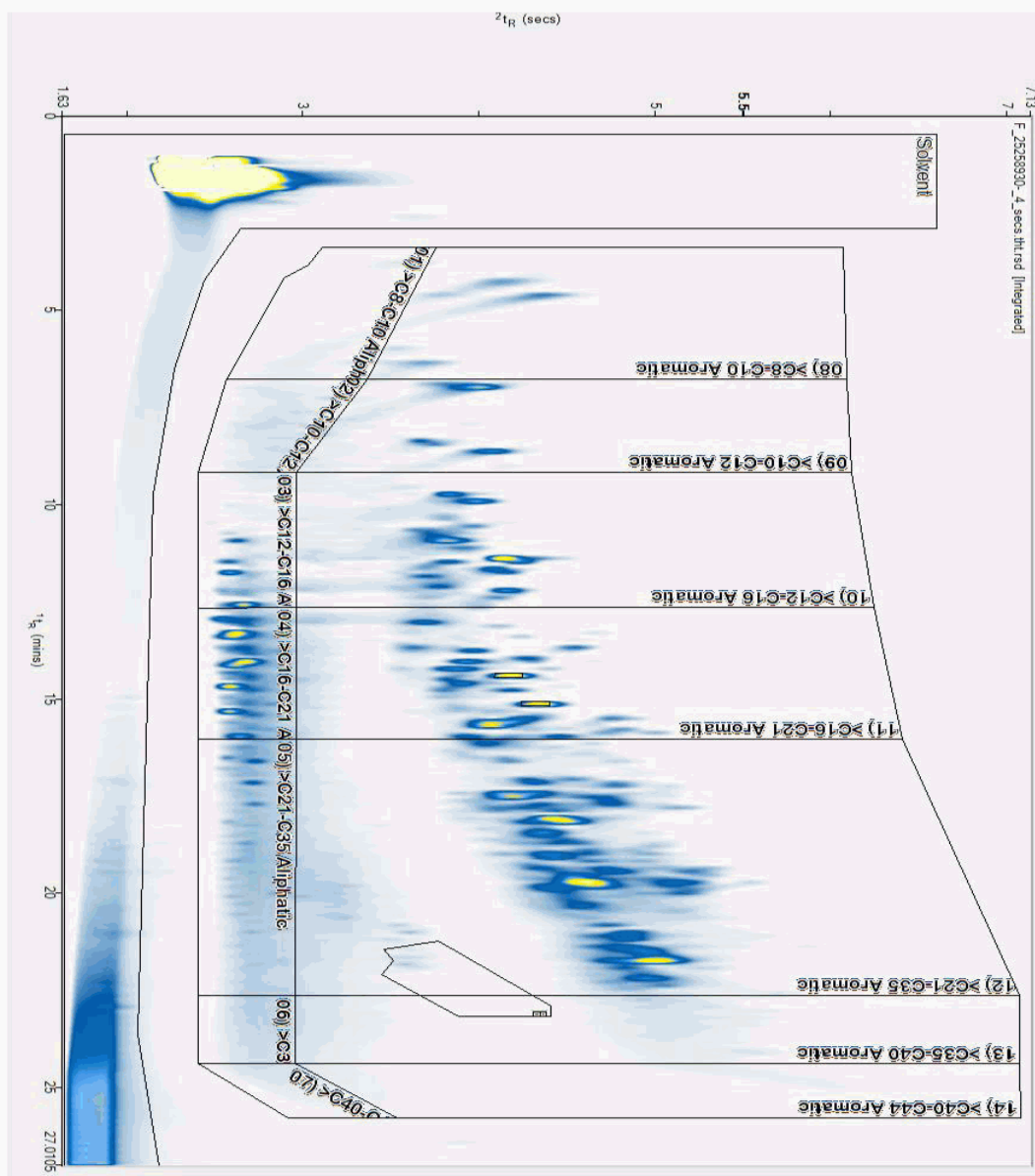
Sample No : 25258930
Sample ID : VAL TP11

Depth : 1.50 - 1.70

```

ChromSpace LIMS export
Current batch:
Sample Identity: F_25258930-_4_secs.tht
Date Acquired  : 03/11/21 07:23:48
Units          : ppm
Dilution       : 0
CF             :
Multiplier     :

```





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

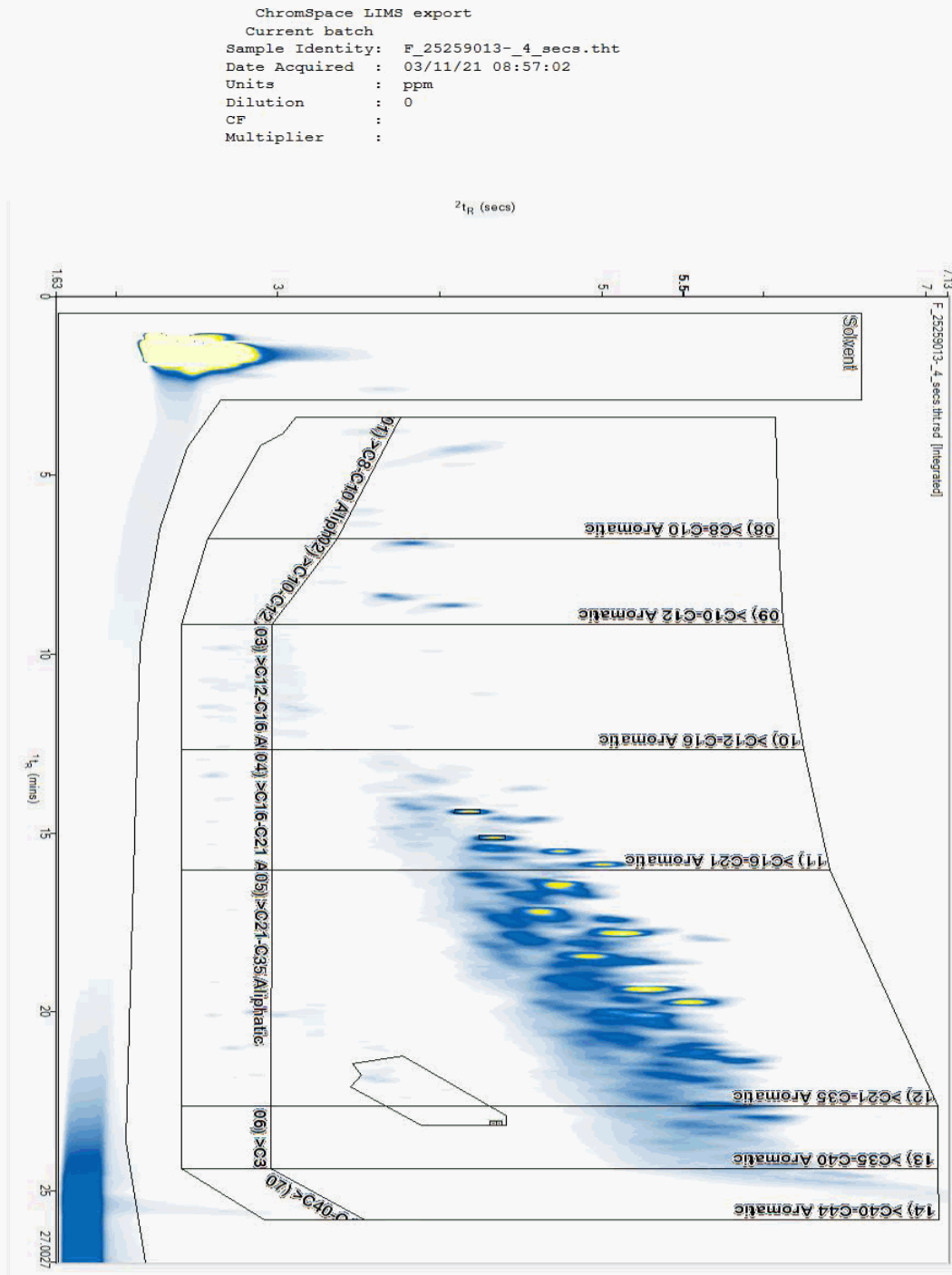
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25259013
Sample ID : VAL_TP04

Depth : 2.30 - 2.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

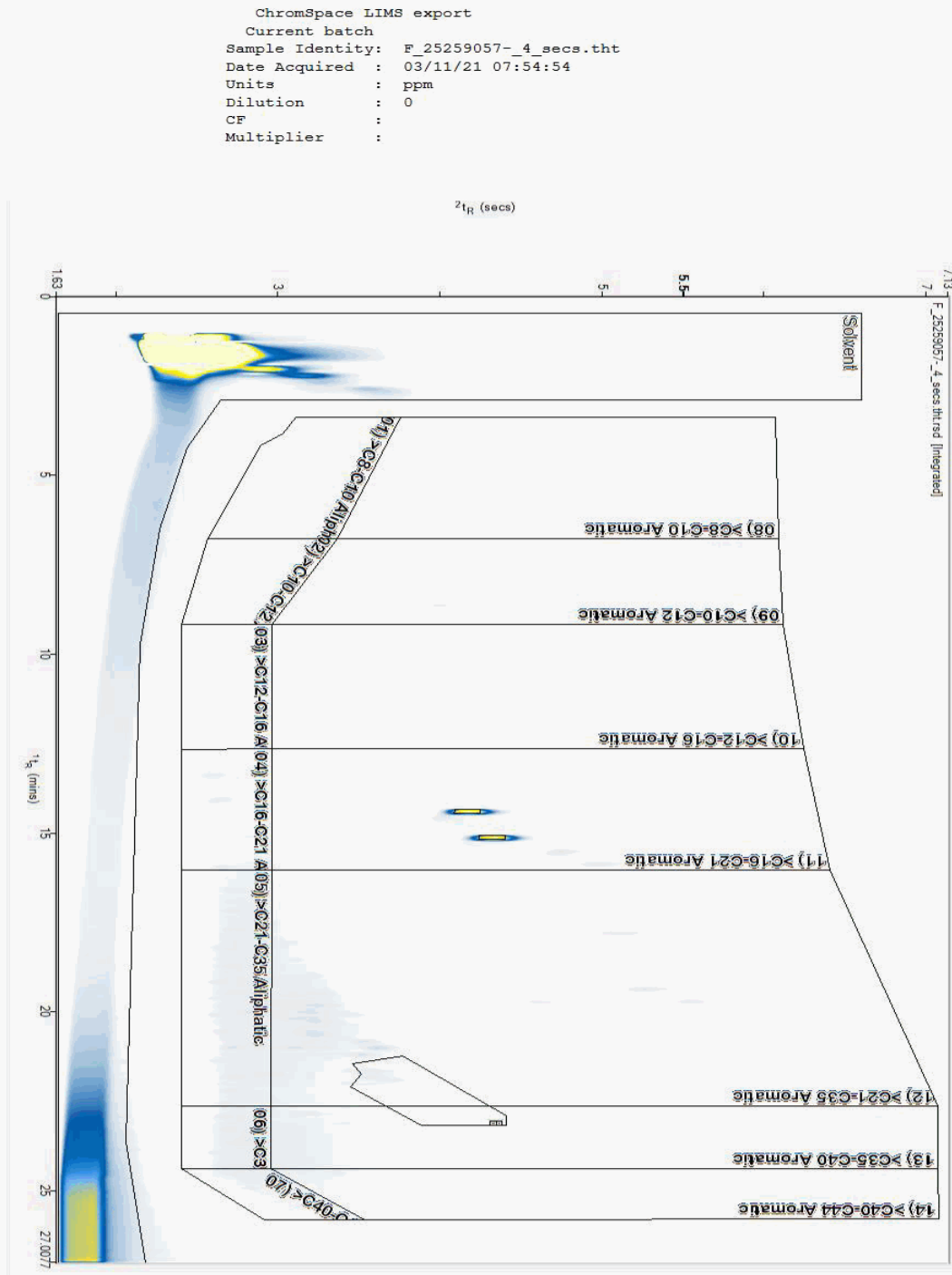
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25259057
Sample ID : VAL_TP04

Depth : 0.30 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

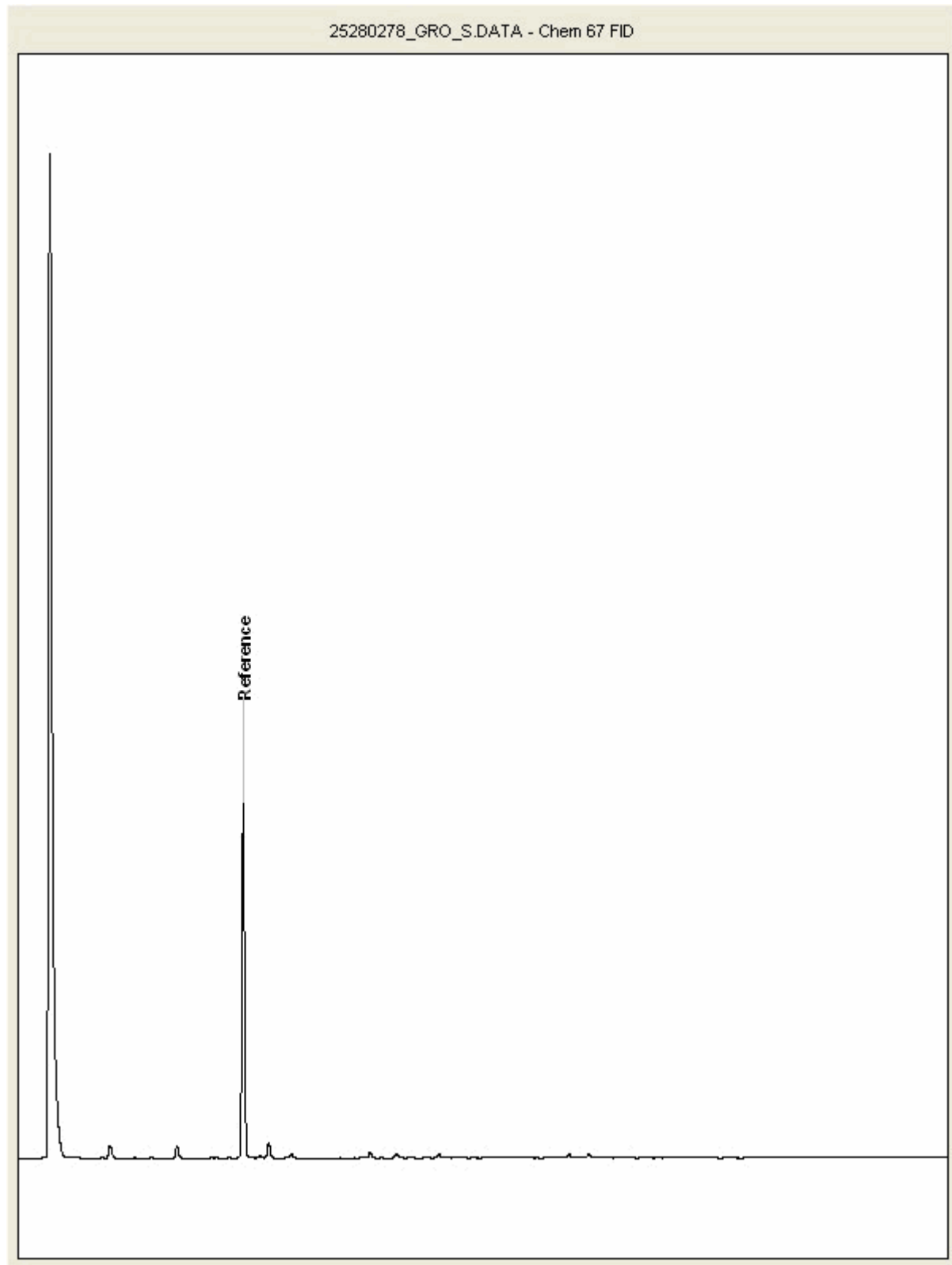
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25280278
Sample ID : VAL_TP07

Depth : 2.30 - 2.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

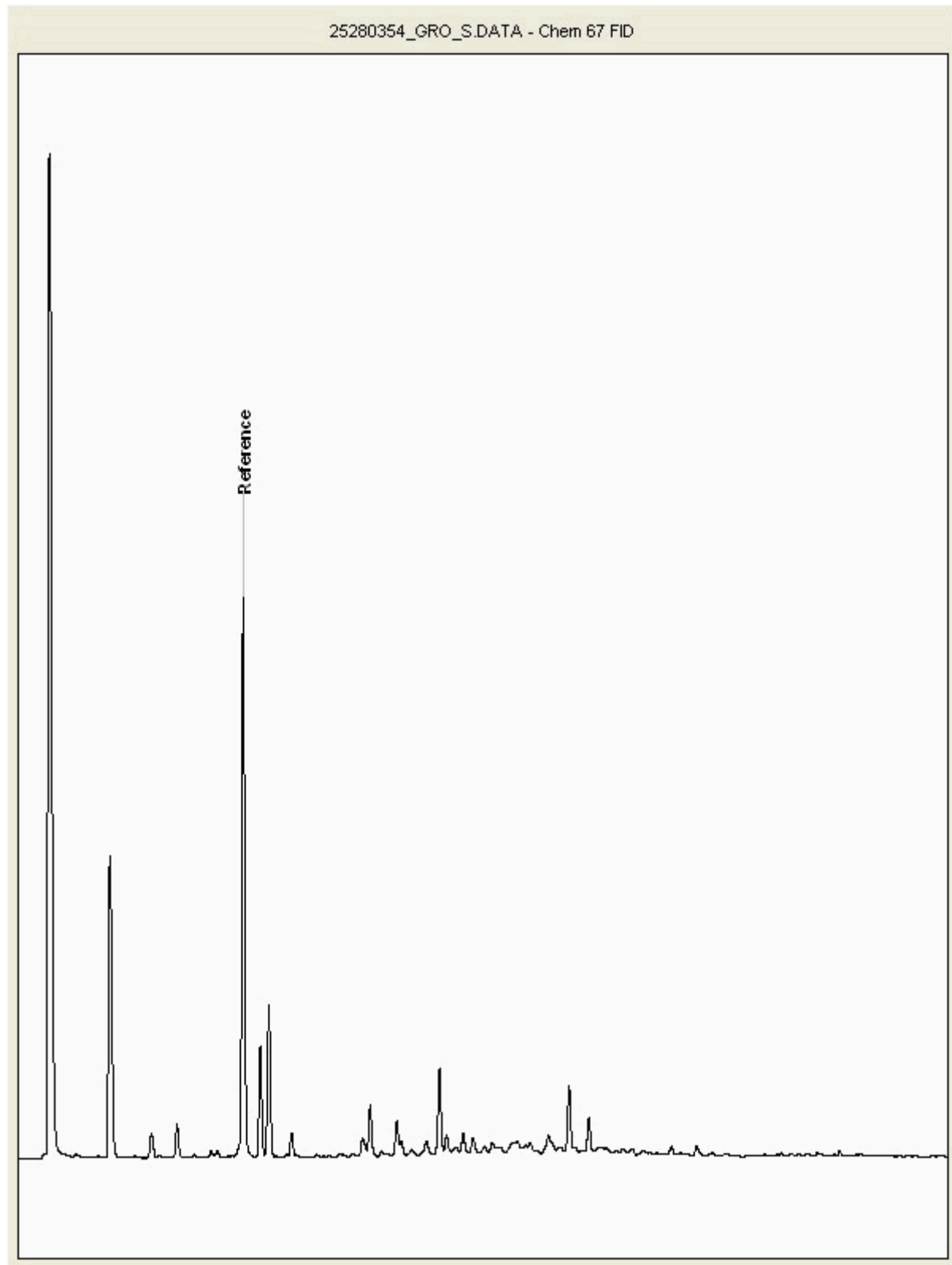
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25280354
Sample ID : VAL_TP11

Depth : 1.50 - 1.70





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

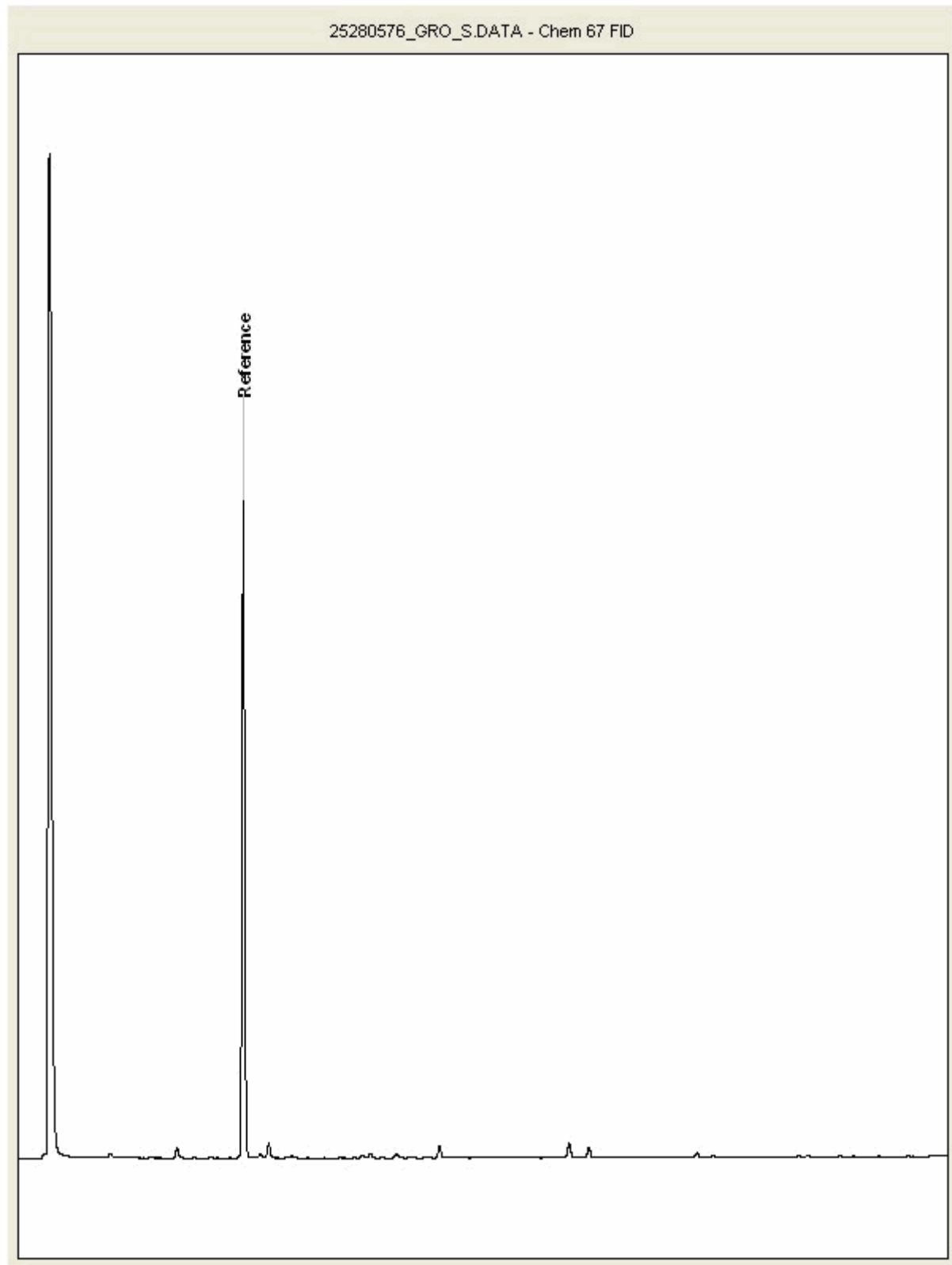
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25280576
Sample ID : VAL_TP07

Depth : 0.30 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

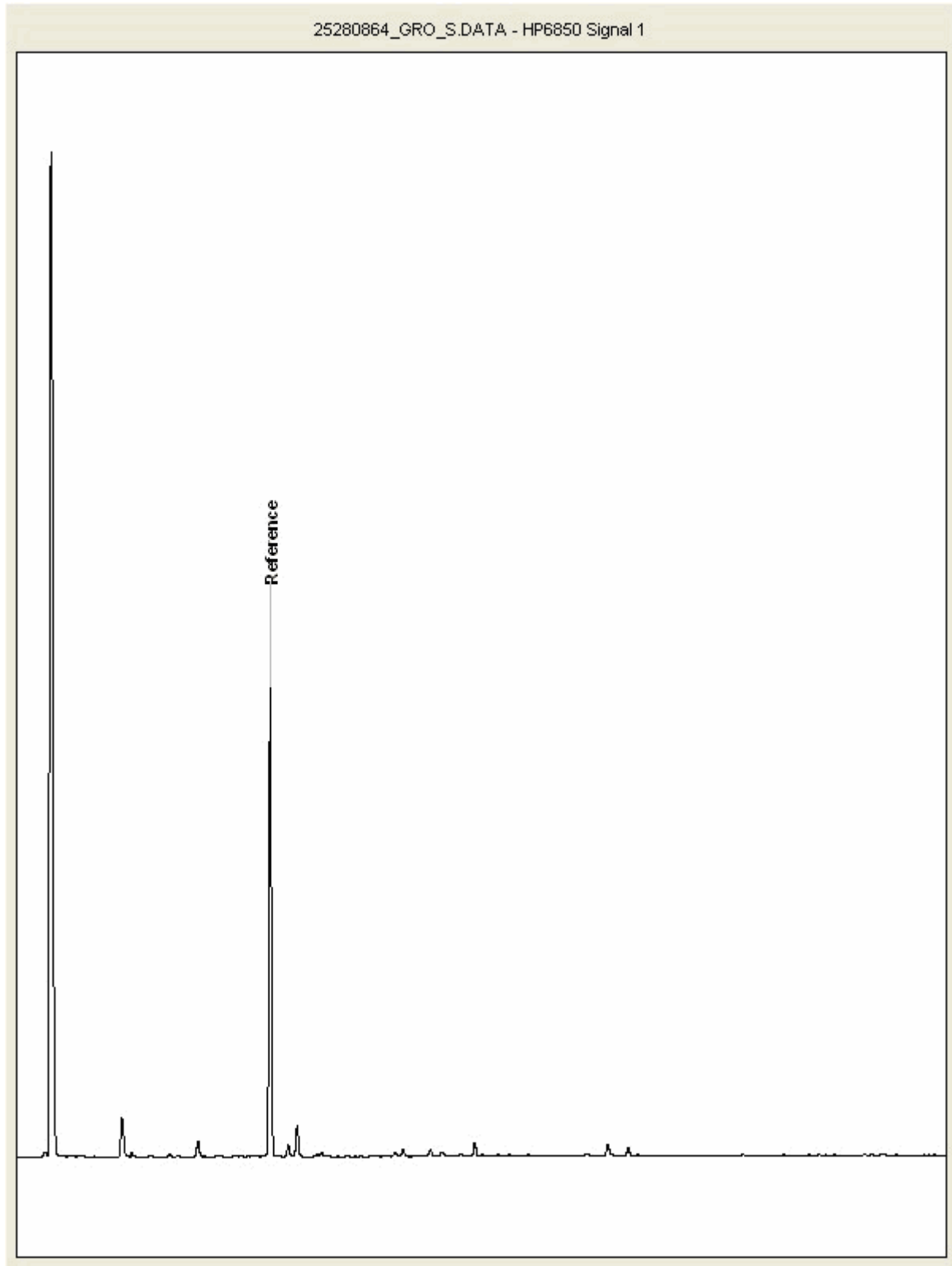
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25280864
Sample ID : VAL_TP10

Depth : 1.50 - 1.70





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

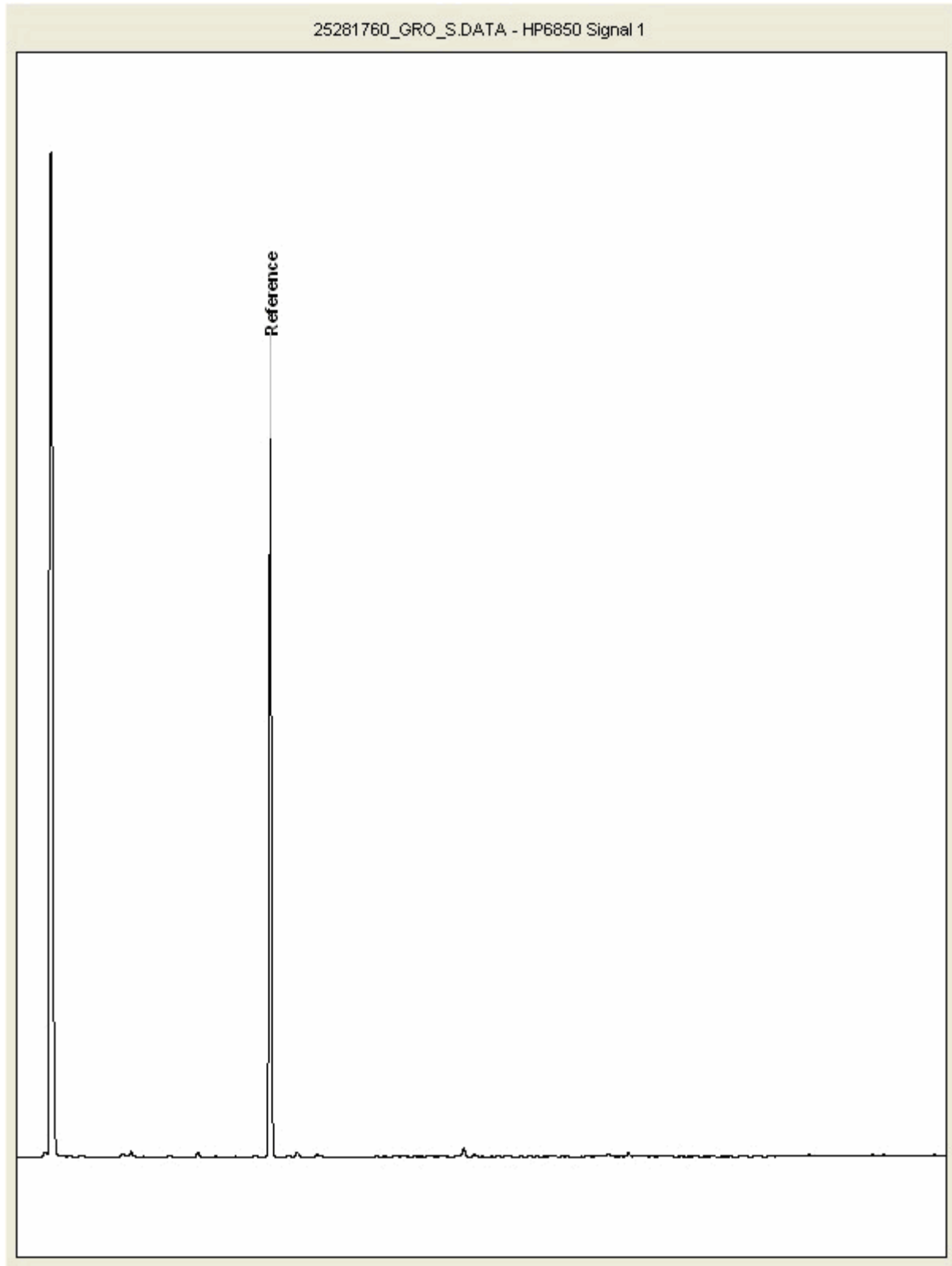
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25281760
Sample ID : VAL_TP05

Depth : 0.40 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

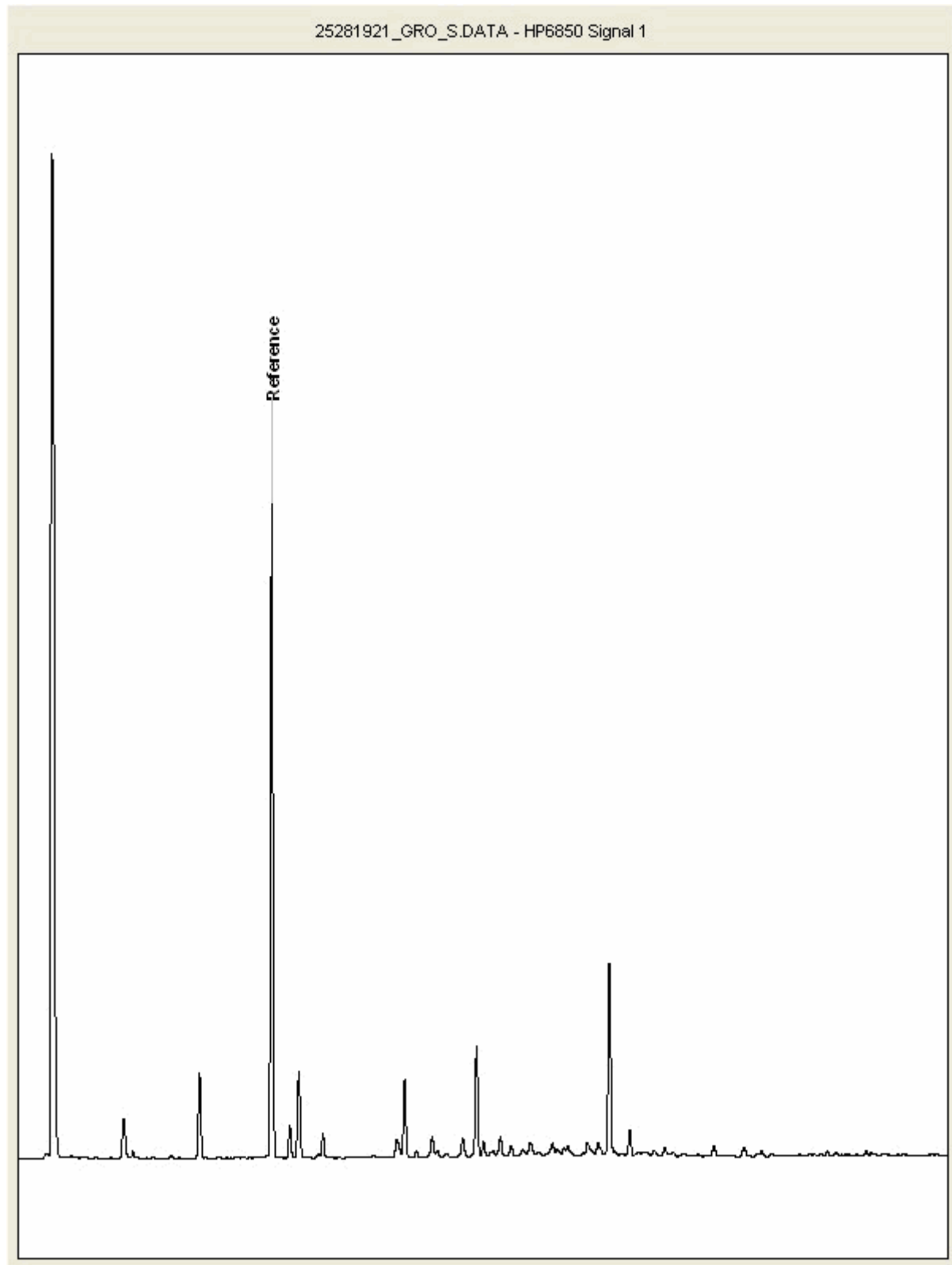
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25281921
Sample ID : VAL_TP05

Depth : 2.40 - 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

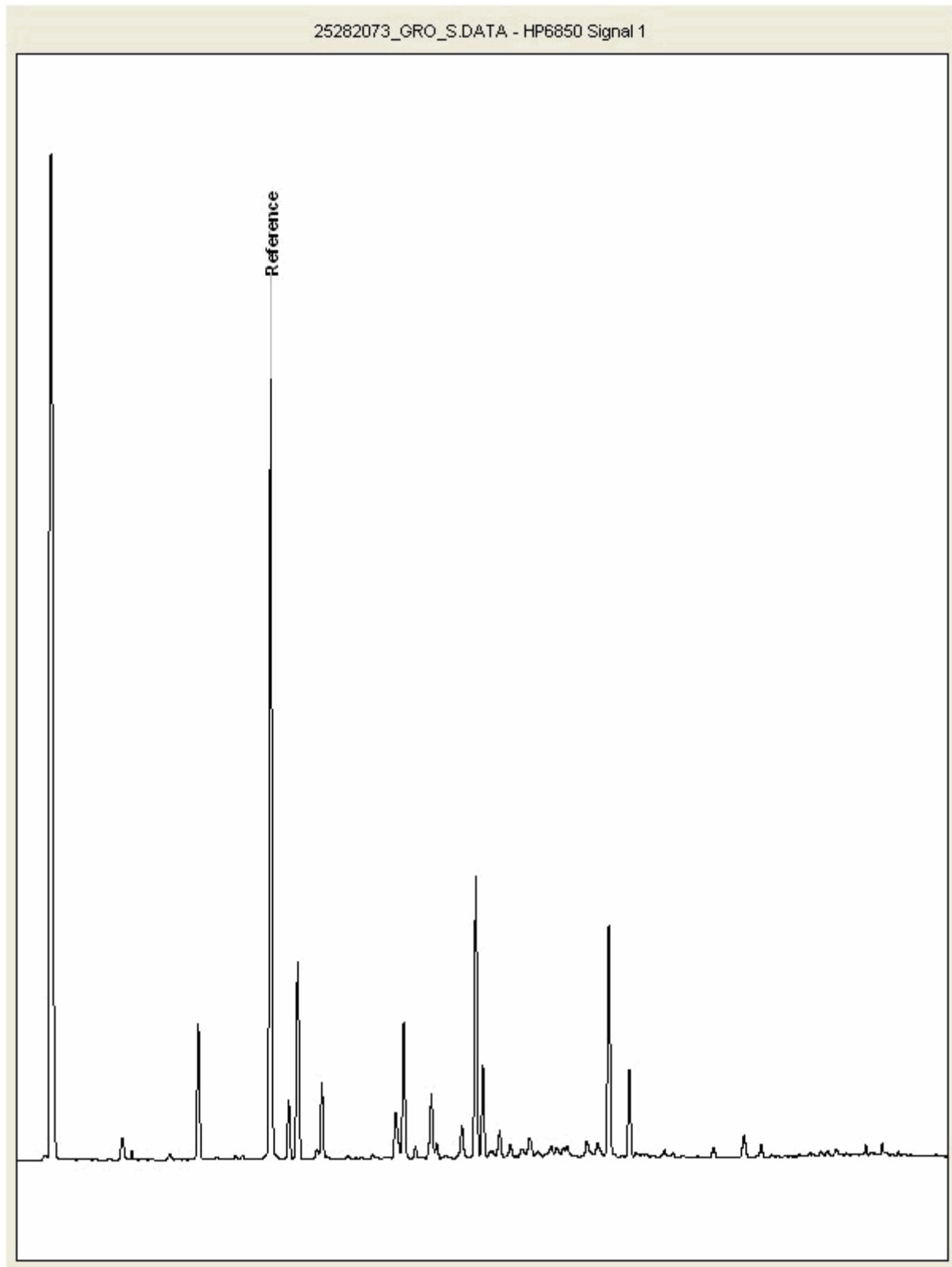
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25282073
Sample ID : VAL_TP12

Depth : 1.70 - 2.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

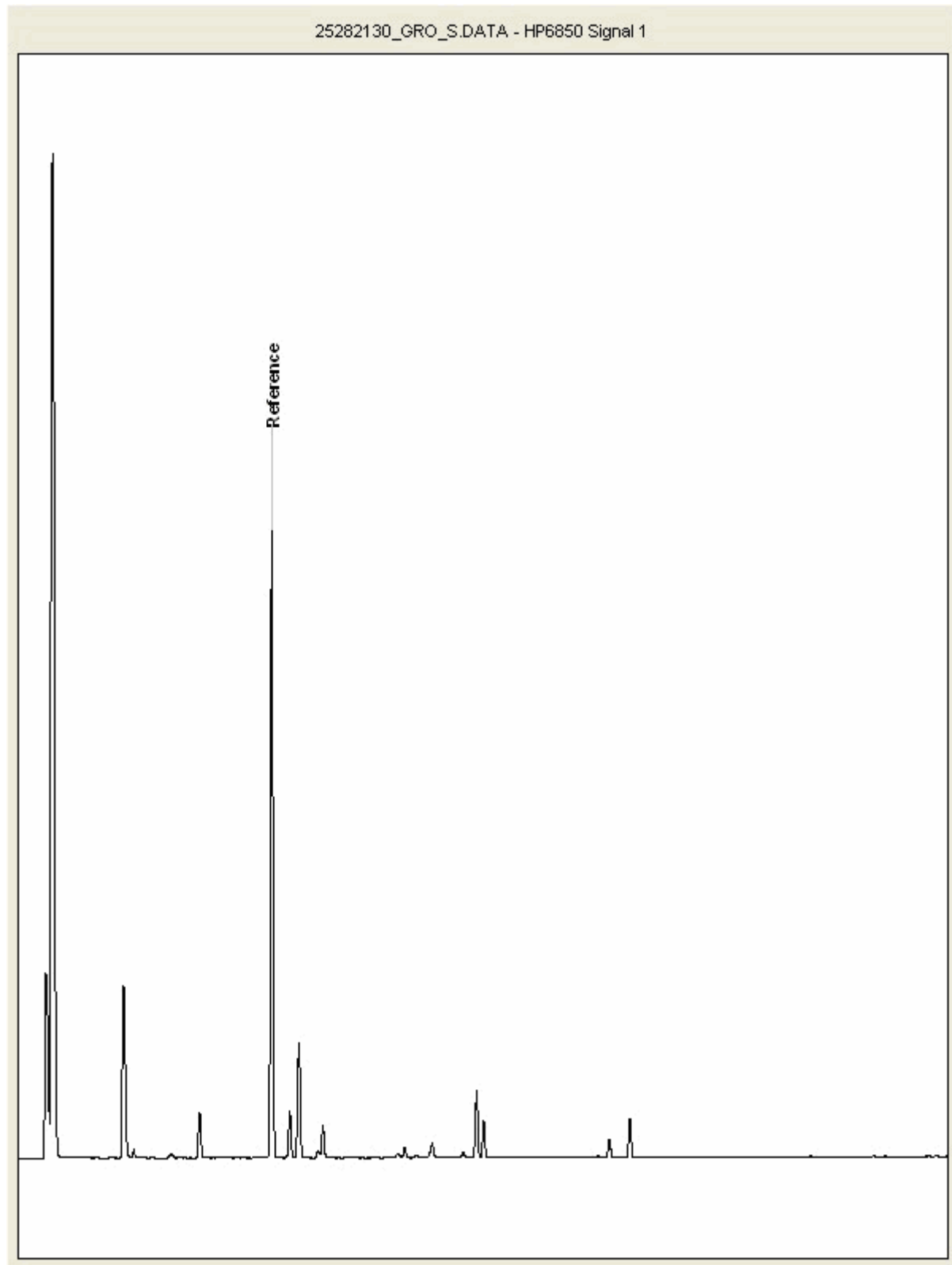
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25282130
Sample ID : VAL_TP09

Depth : 1.50 - 1.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

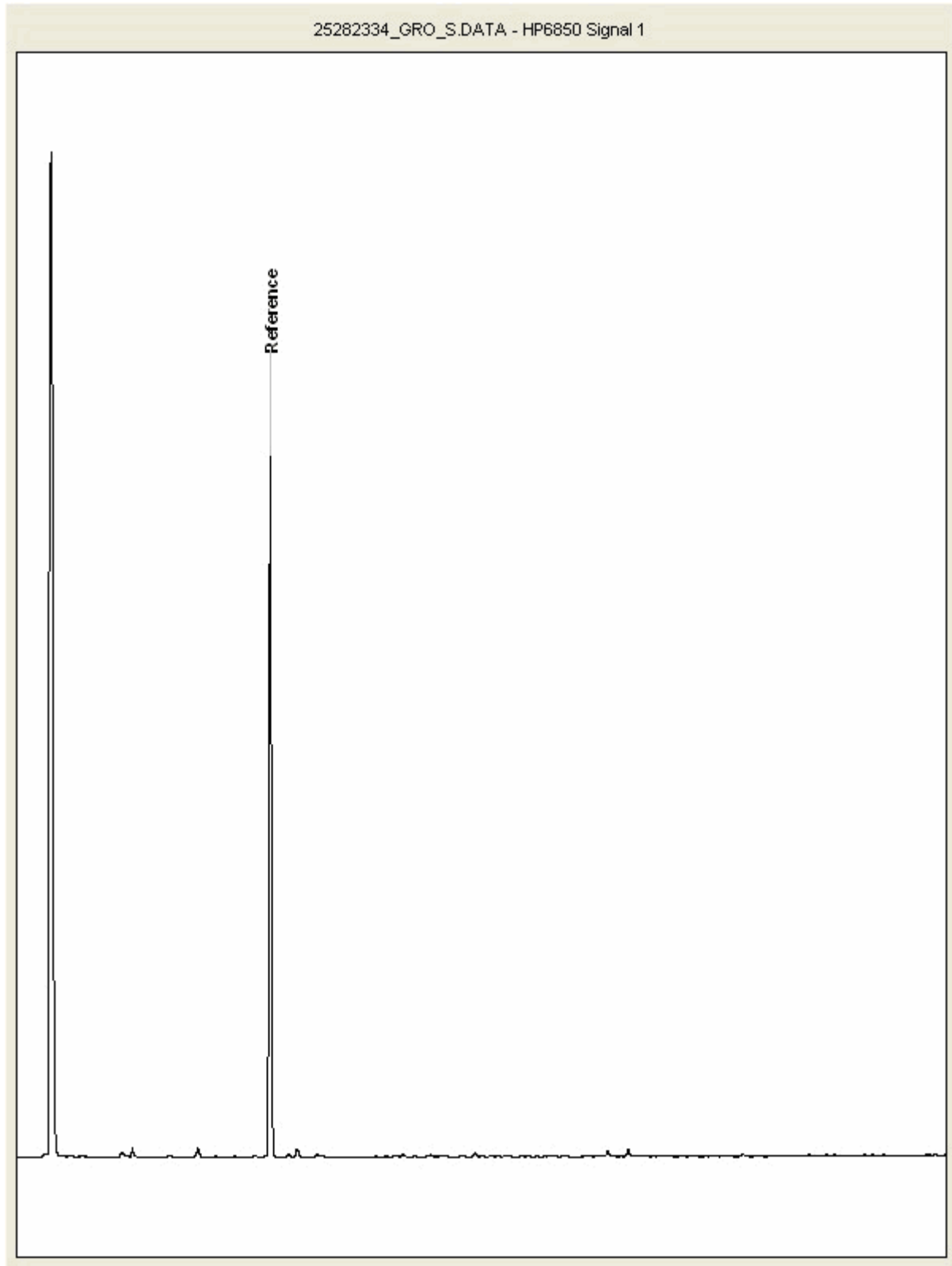
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25282334
Sample ID : VAL_TP04

Depth : 0.30 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

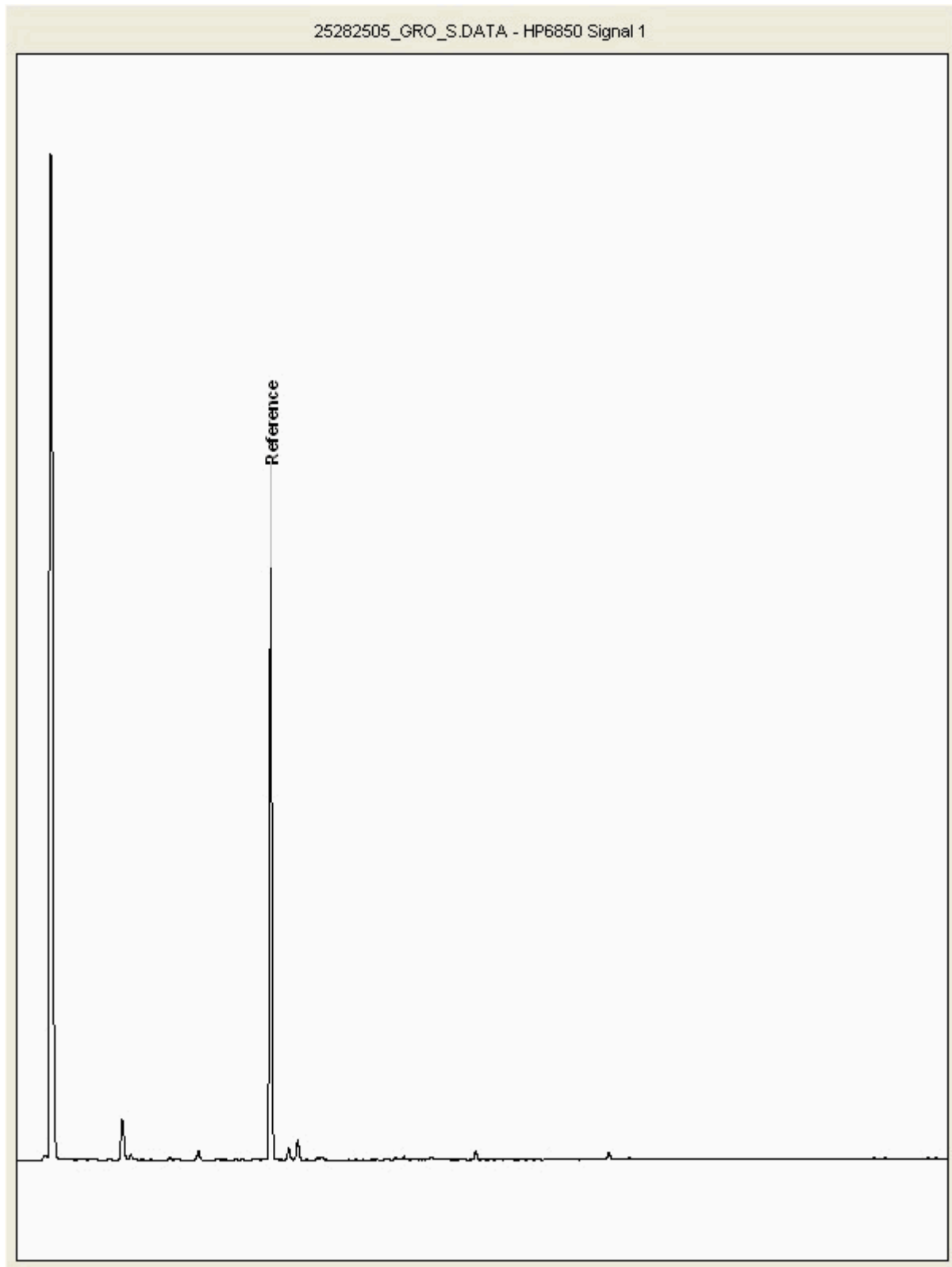
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25282505
Sample ID : VAL_TP01

Depth : 1.20 - 1.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

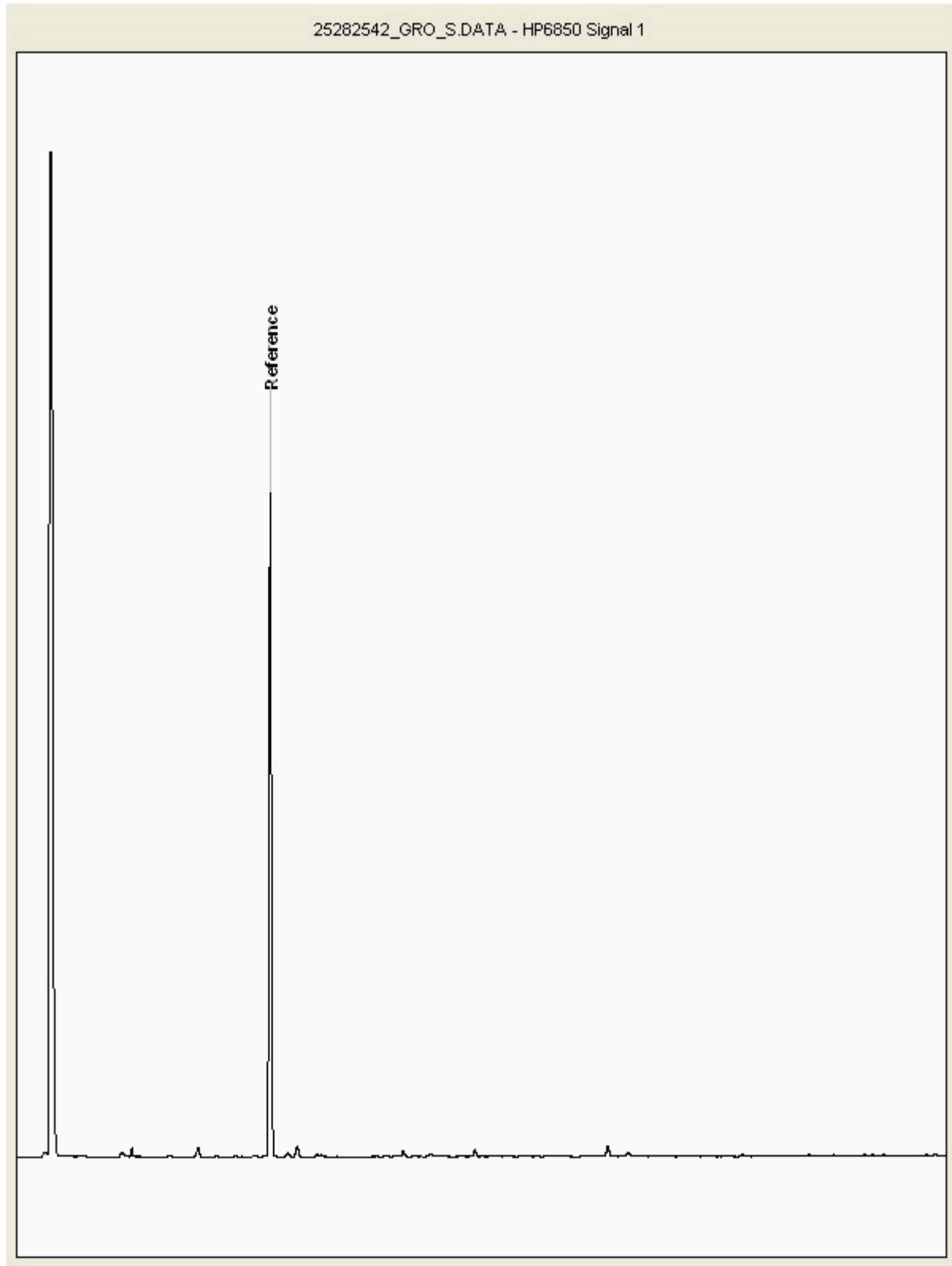
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25282542
Sample ID : VAL_TP06

Depth : 0.30 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

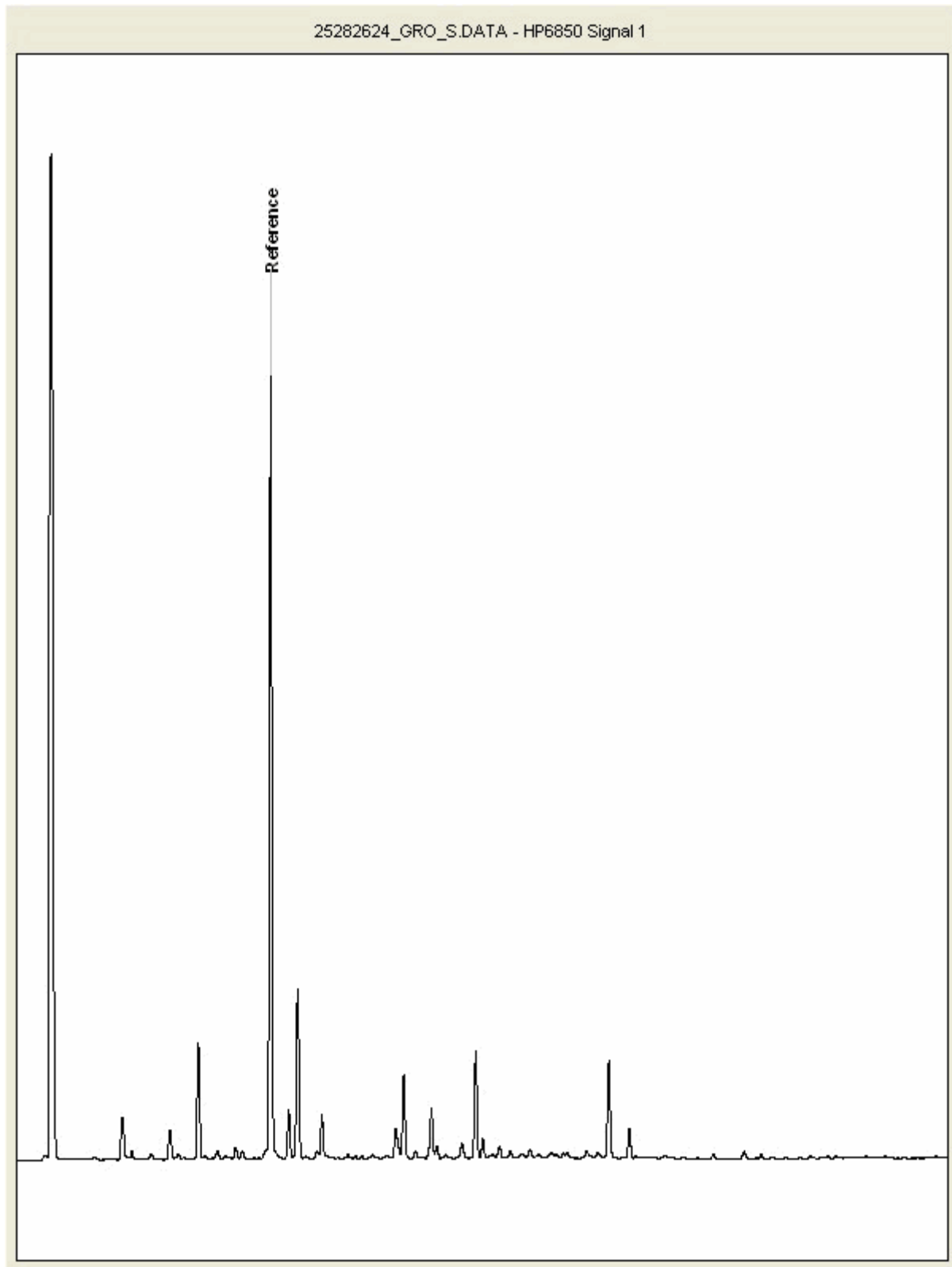
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25282624
Sample ID : VAL_TP08

Depth : 1.50 - 1.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

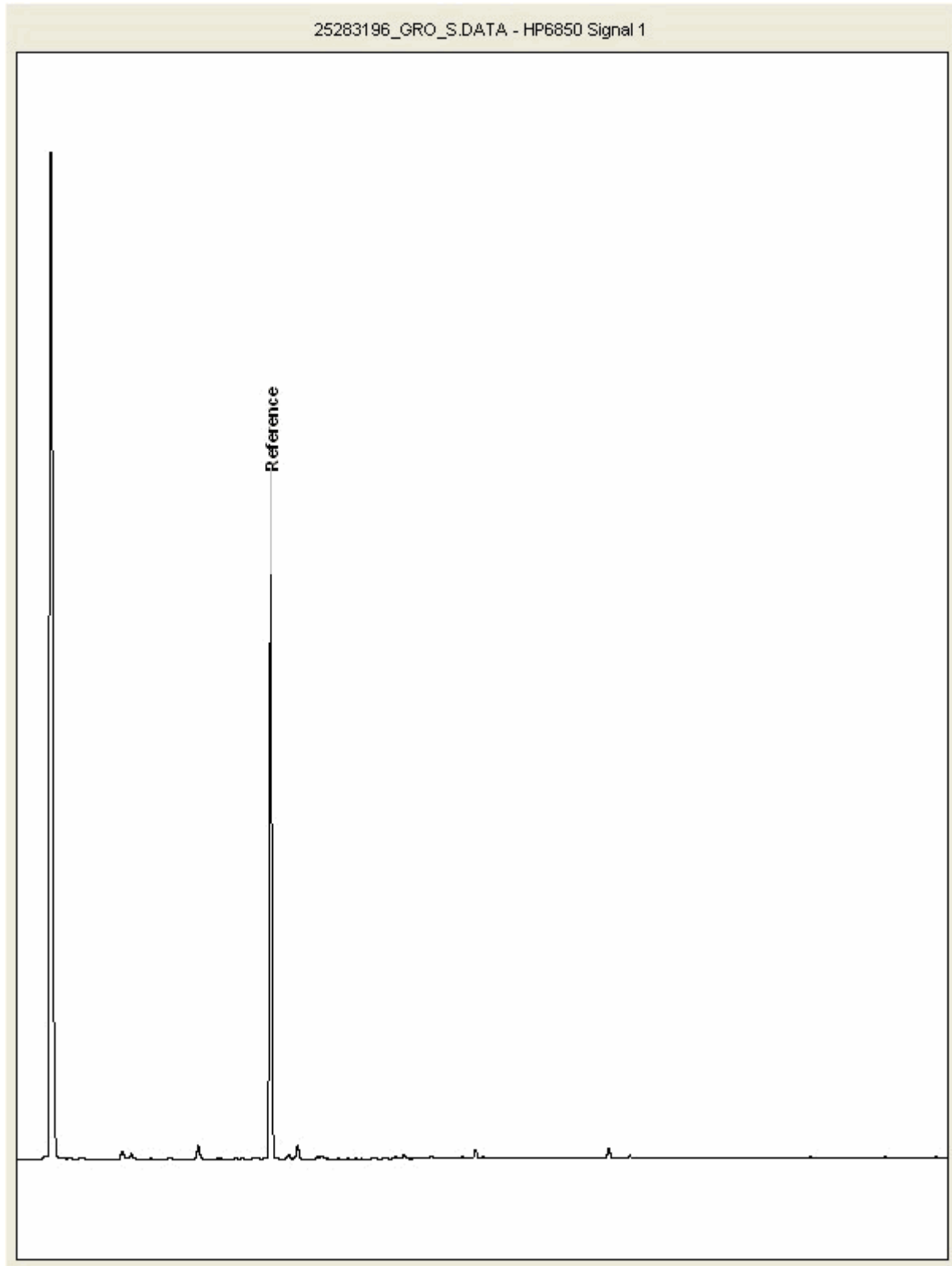
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25283196
Sample ID : VAL_TP03

Depth : 1.50 - 1.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

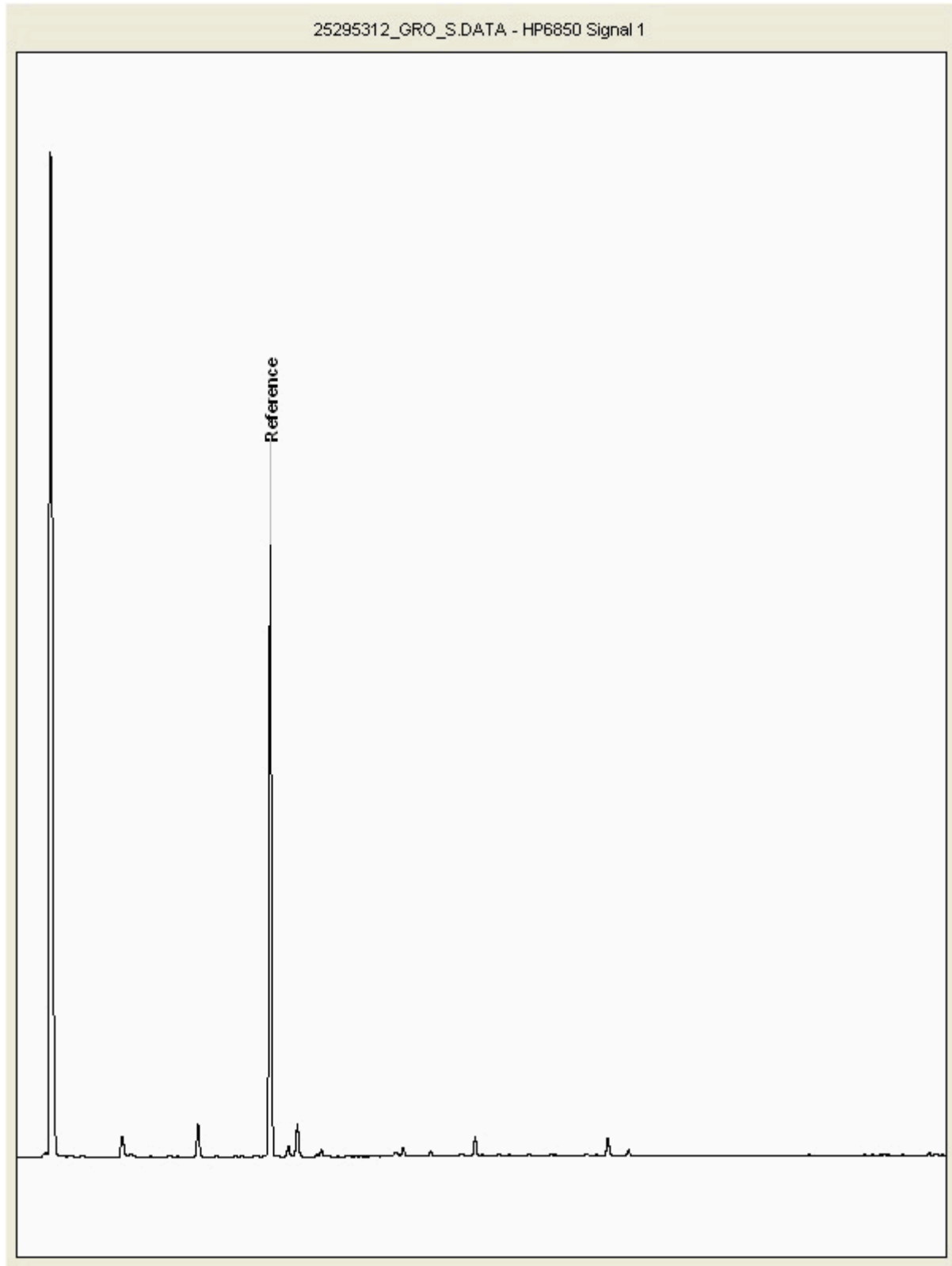
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25295312
Sample ID : VAL_TP02

Depth : 1.20 - 1.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

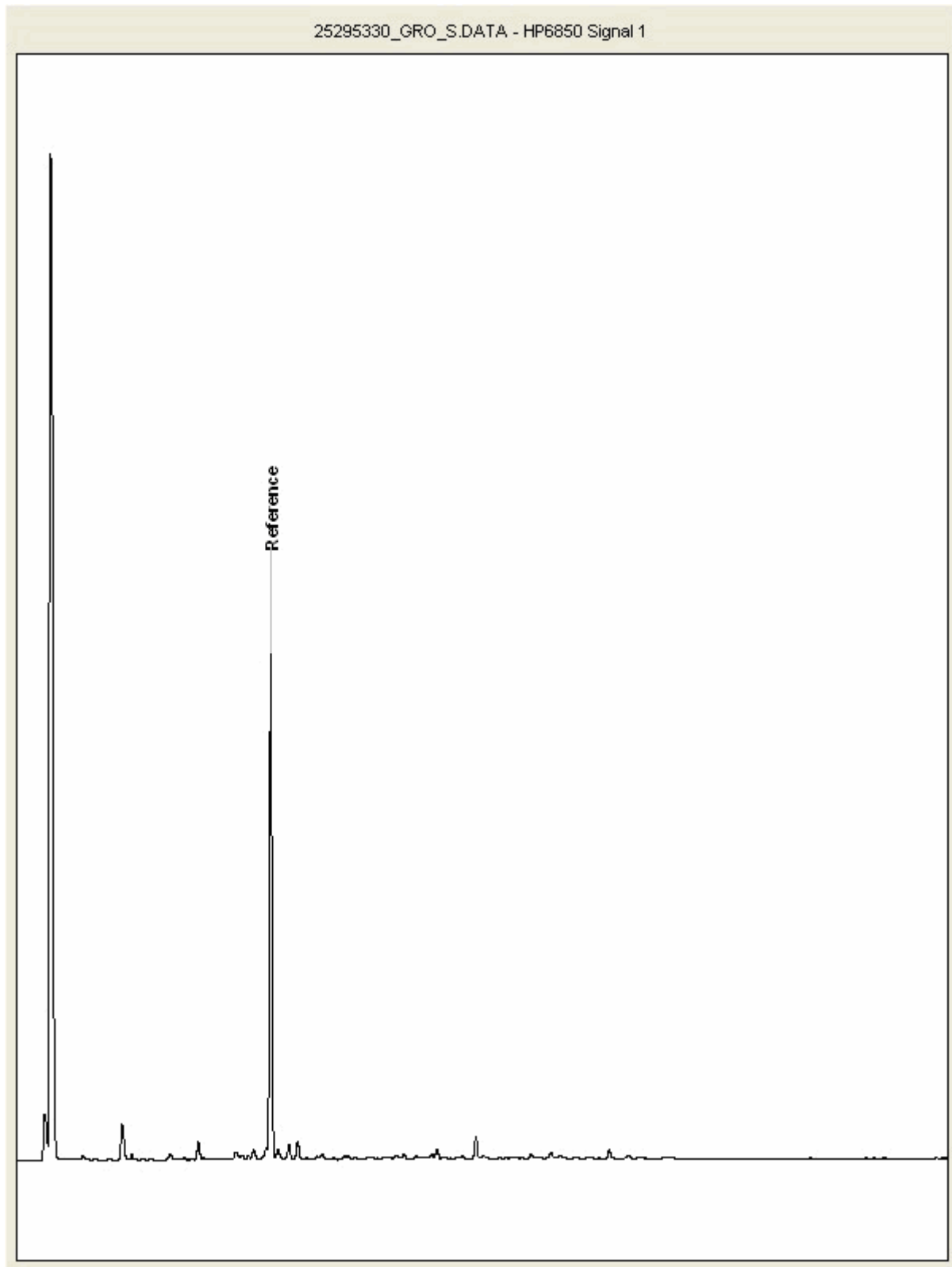
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25295330
Sample ID : VAL_TP04

Depth : 2.30 - 2.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211030-52
Client Ref.: 70057278

Report Number: 620463
Location: Port Talbot Harbourside

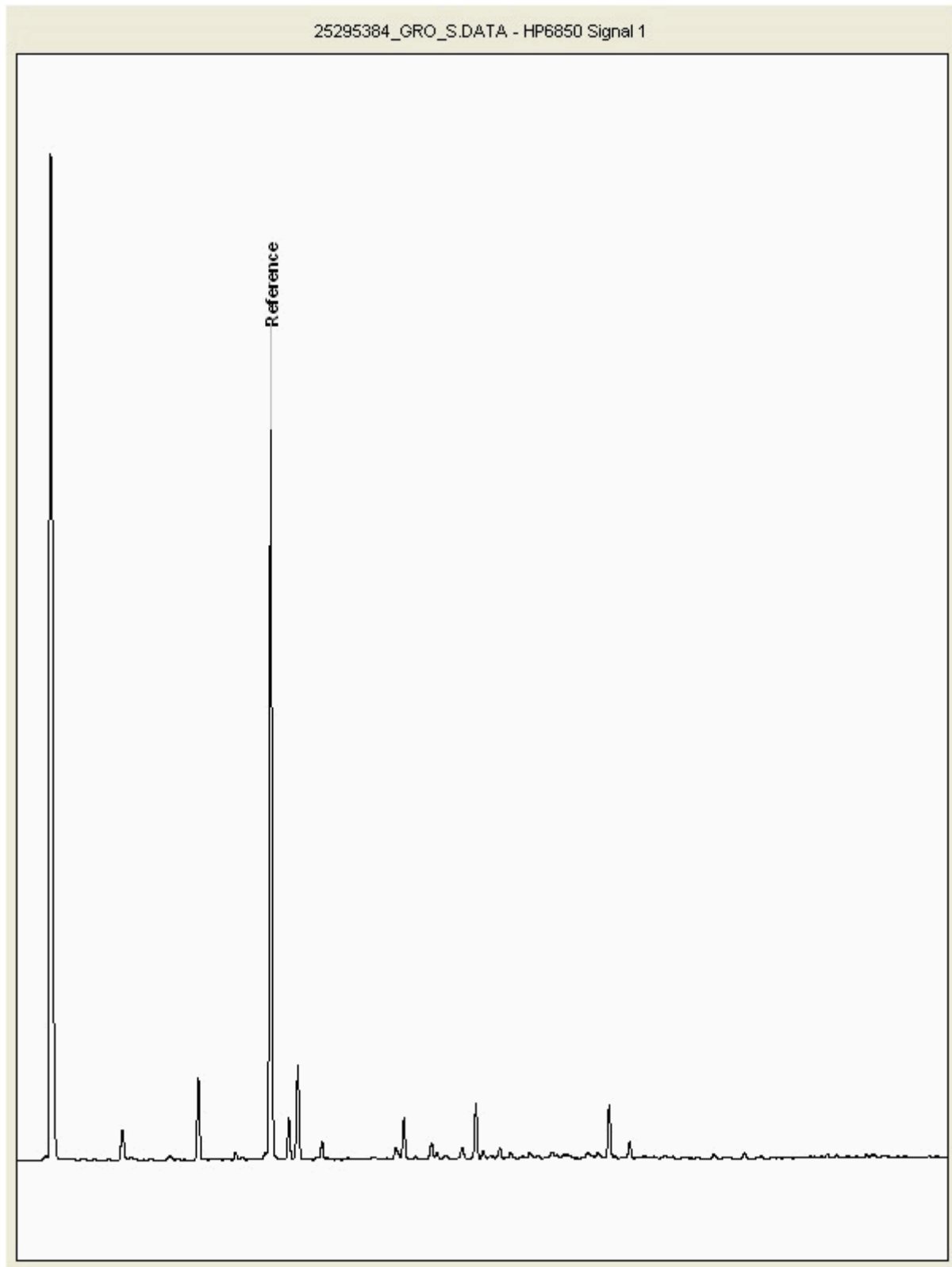
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25295384
Sample ID : VAL_TP06

Depth : 2.40 - 2.50





CERTIFICATE OF ANALYSIS

SDG:	211030-52	Client Reference:	70057278	Report Number:	620463
Location:	Port Talbot Harbourside	Order Number:	70057278-RW2	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. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. 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

20. 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.

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.

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 D.4

VALIDATION BOREHOLES - SOILS





Unit 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

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

Attention: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation:	21 December 2021
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	211211-73
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	626817
Order Number:	70057278

We received 4 samples on Saturday December 11, 2021 and 4 of these samples were scheduled for analysis which was completed on Tuesday December 21, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

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: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25507263	BH308	ES	0.40 - 0.40	09/12/2021
25507269	BH308	ES	3.00 - 3.50	09/12/2021
25507276	BH309	ES	0.30 - 0.30	09/12/2021
25507286	BH309	ES	4.70 - 4.70	09/12/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

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)

Customer Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

			25507263	25507269	25507276	25507286
			BH308	BH308	BH309	BH309
			ES	ES	ES	ES
			0.40 - 0.40	3.00 - 3.50	0.30 - 0.30	4.70 - 4.70
			250g Amber Jar (ALE210)	250g Amber Jar (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			1kg Cardboard Container	60g VOC (ALE215)	1kg Cardboard Container	250g Amber Jar (ALE210)
			S	S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X	
Boron Water Soluble	All	NDPs: 0 Tests: 2		X		X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4	X	X	X	X
EPH CWG GC (S)	All	NDPs: 0 Tests: 4	X	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4		X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X		X	
PAH by GCMS	All	NDPs: 0 Tests: 4	X	X	X	X
pH	All	NDPs: 0 Tests: 2	X		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 4	X	X	X	X
Sample description	All	NDPs: 0 Tests: 4	X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 2	X		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 4	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 4		X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

Superseded Report:

Sample Descriptions

Grain Sizes

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

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
25507263	BH308	0.40 - 0.40	Dark Brown	Loamy Sand	Stones	None
25507269	BH308	3.00 - 3.50	Dark Brown	Sand	Stones	None
25507276	BH309	0.30 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
25507286	BH309	4.70 - 4.70	Dark Brown	Sand	Stones	None

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

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

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

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817

Superseded Report:

Location: Port Talbot Harbourside

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278Report Number: 626817
Location: Port Talbot Harbourside

Superseded Report:

TPH CWG (S)

Results Legend			Customer Sample Ref.		BH308	BH308	BH309	BH309		
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH308	0.40 - 0.40	3.00 - 3.50	0.30 - 0.30	4.70 - 4.70		
M	mCERTS accredited.				Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
aq	Aqueous / settled sample.				09/12/2021	09/12/2021	09/12/2021	09/12/2021		
diss.filt	Dissolved / filtered sample.				11/12/2021	11/12/2021	11/12/2021	11/12/2021		
tot.unfilt	Total / unfiltered sample.				211211-73	211211-73	211211-73	211211-73		
*	Subcontracted - refer to subcontractor report for accreditation status.				25507263	25507269	25507276	25507286		
**	% 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				ES	ES	ES	ES		
(F)	Trigger breach confirmed									
1-4*\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM089			99.1	117	127	110		
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089			<0.01	<0.01	<0.01	<0.01		
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089			0.0693	0.0487	0.0381	0.0243		
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089			0.315	0.255	0.0706	0.0623		
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414			<1 #	<1 #	<1 #	<1 #		
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414			<1 #	<1 #	<1 #	<1 #		
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414			3.58 #	<1 #	1.53 #	<1 #		
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414			21 #	<1 #	11 #	<1 #		
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414			19.7	<1	2.75	<1		
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414			44.7	<5	15.3	<5		
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414			68.1	<10	105	<10		
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089			0.0605	0.0303	0.0224	0.0243		
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089			0.153	0.053	0.028	0.0106		
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089			0.21	0.17	0.047	0.0412		
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414			1.33 #	4.93 #	<1 #	<1 #		
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414			1.21 #	<1 #	1.78 #	<1 #		
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414			4.29 #	<1 #	17.2 #	<1 #		
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414			15.2 #	1.46 #	52.7 #	<1 #		
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414			1.39	<1	18	<1		
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414			<1	<1	4.66	<1		
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414			23.4	7.98	89.8	<5		
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414			68.9	<10	105	<10		
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089			0.384	0.304	0.109	0.0866		
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089			0.424	0.253	0.0974	0.076		
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089			0.807	0.557	0.206	0.163		



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

Superseded Report:

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	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref.	BH308ES 0.40 - 0.40 SOLID	20/12/2021	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)											
Sample Type	09/12/2021 00:00:00										
Date Sampled	11/12/2021 05:00:00										
Date Received	211211-73										
SDG	25507263										
Original Sample	TM048										
Method Number											
Cust. Sample Ref.	BH309ES 0.30 - 0.30 SOLID	20/12/2021	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)											
Sample Type	09/12/2021 00:00:00										
Date Sampled	11/12/2021 05:00:00										
Date Received	211211-73										
SDG	25507276										
Original Sample	TM048										
Method Number											



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

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
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
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: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

Superseded Report:

Test Completion Dates

Lab Sample No(s)	25507263	25507269	25507276	25507286
Customer Sample Ref.	BH308	BH308	BH309	BH309
AGS Ref.	ES	ES	ES	ES
Depth	0.40 - 0.40	3.00 - 3.50	0.30 - 0.30	4.70 - 4.70
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)

Asbestos ID in Solid Samples	20-Dec-2021		20-Dec-2021	
Boron Water Soluble	16-Dec-2021		17-Dec-2021	
Cyanide Comp/Free/Total/Thiocyanate	16-Dec-2021	16-Dec-2021	16-Dec-2021	16-Dec-2021
EPH CWG GC (S)	20-Dec-2021	17-Dec-2021	17-Dec-2021	20-Dec-2021
GRO by GC-FID (S)	21-Dec-2021	21-Dec-2021	21-Dec-2021	21-Dec-2021
Hexavalent Chromium (s)	20-Dec-2021	20-Dec-2021	20-Dec-2021	20-Dec-2021
Metals in solid samples by OES	17-Dec-2021		18-Dec-2021	
PAH by GCMS	20-Dec-2021	20-Dec-2021	17-Dec-2021	20-Dec-2021
pH	16-Dec-2021		16-Dec-2021	
Phenols by HPLC (S)	16-Dec-2021	20-Dec-2021	17-Dec-2021	16-Dec-2021
Sample description	14-Dec-2021	15-Dec-2021	15-Dec-2021	15-Dec-2021
Total Organic Carbon	20-Dec-2021		20-Dec-2021	
TPH CWG GC (S)	21-Dec-2021	21-Dec-2021	21-Dec-2021	21-Dec-2021
VOC MS (S)	20-Dec-2021	20-Dec-2021	20-Dec-2021	20-Dec-2021



CERTIFICATE OF ANALYSIS

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SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

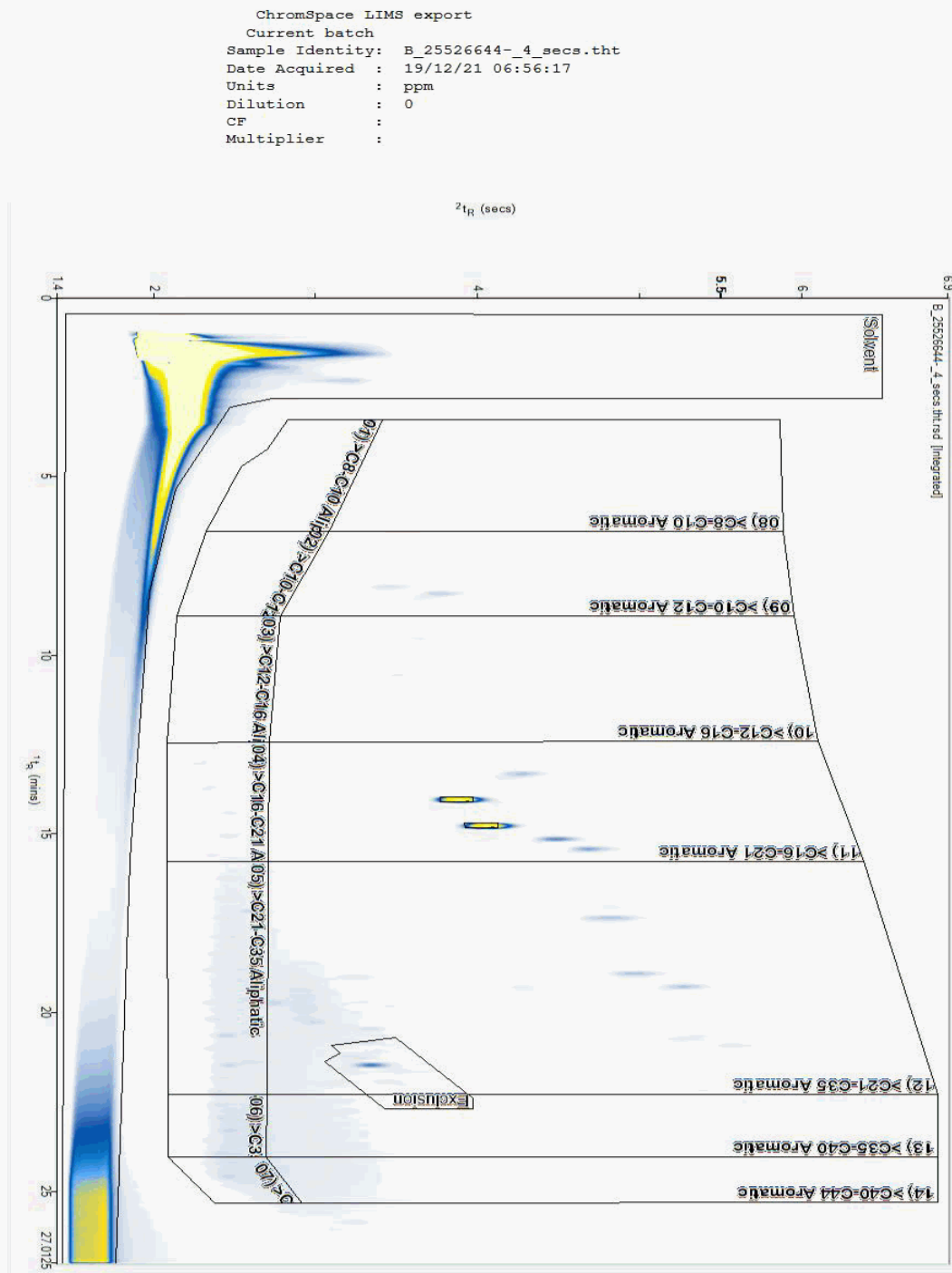
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25526644
Sample ID : BH308

Depth : 0.40 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

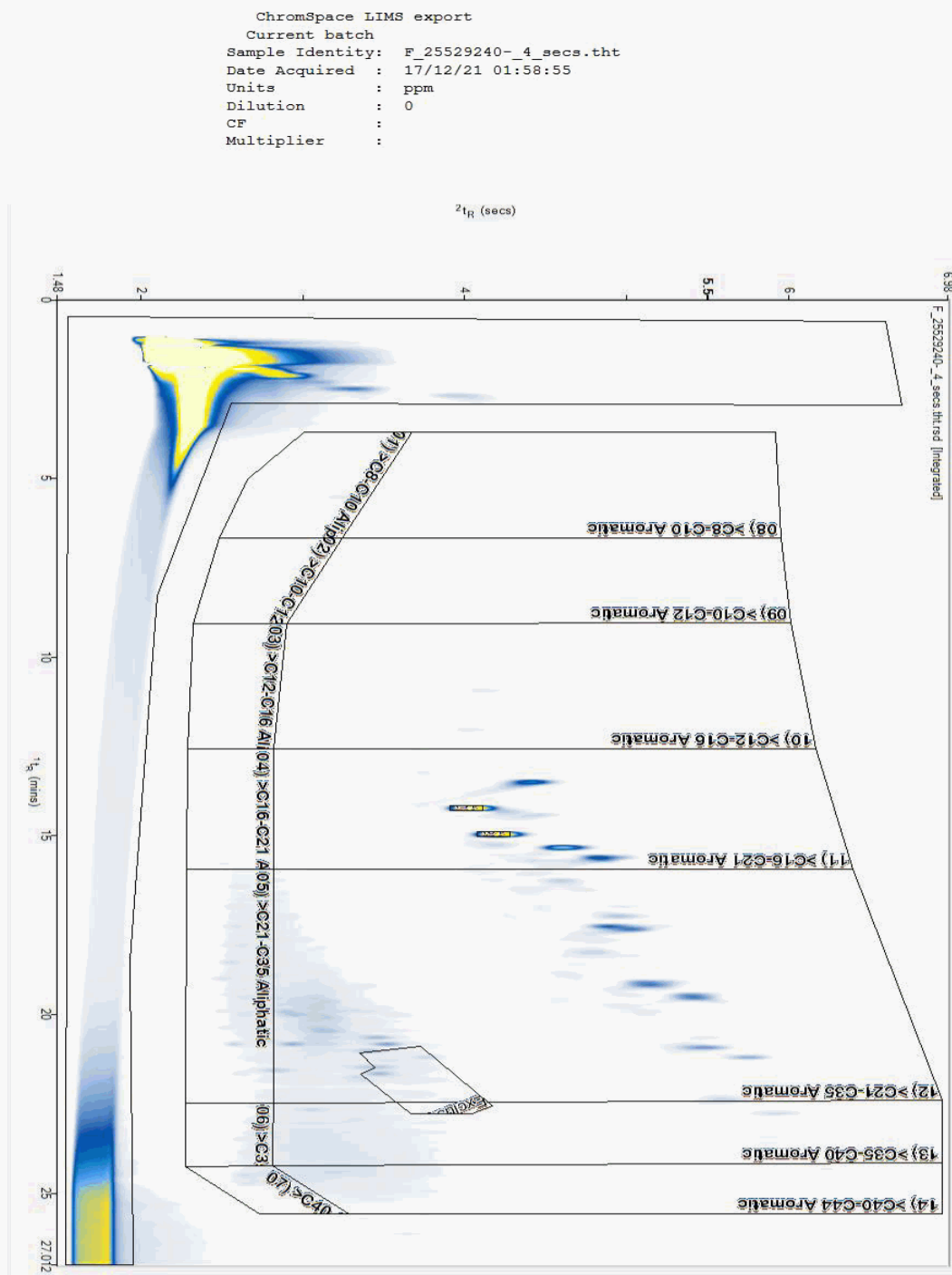
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25529240
Sample ID : BH309

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

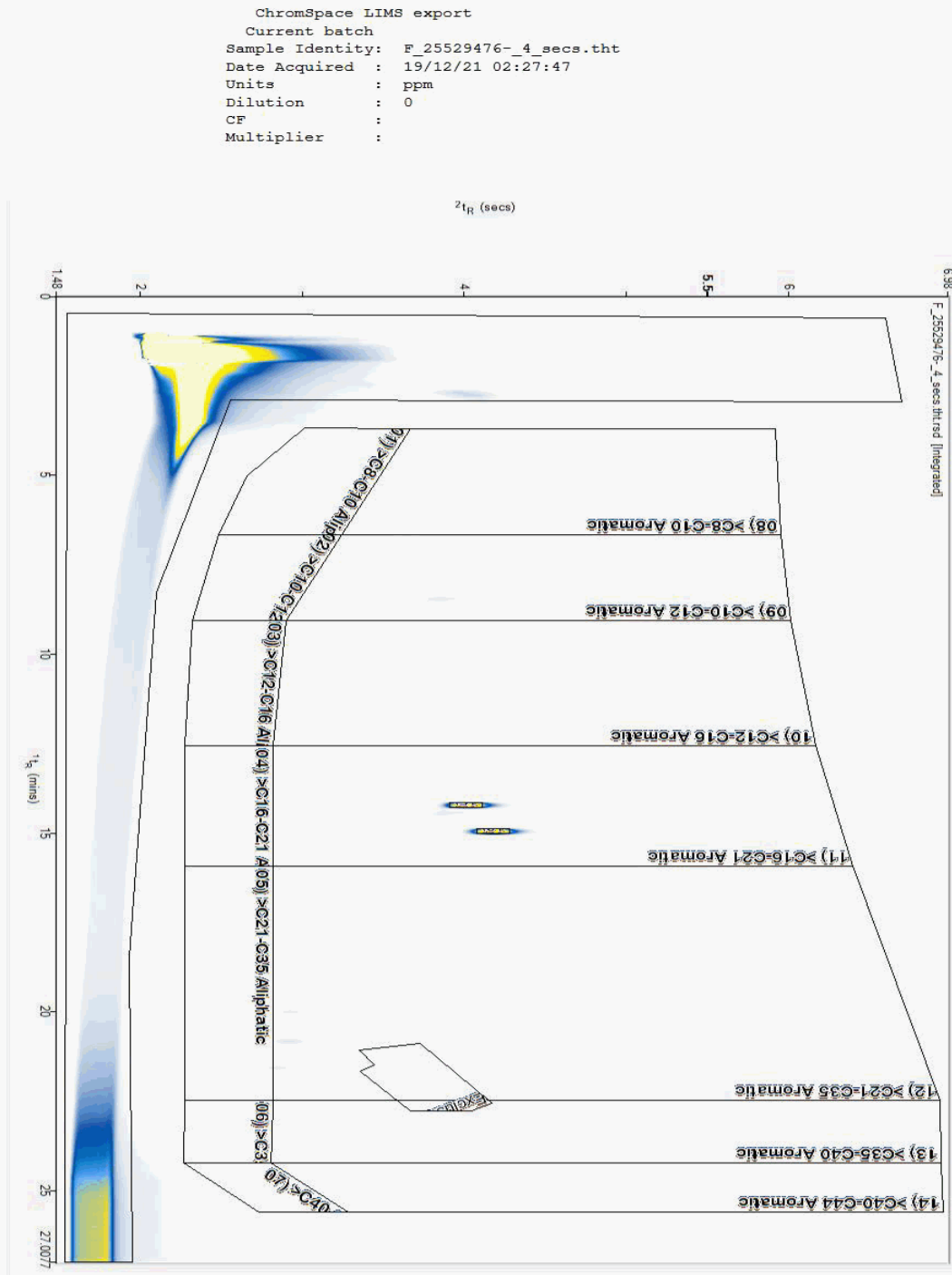
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25529476
Sample ID : BH309

Depth : 4.70 - 4.70





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

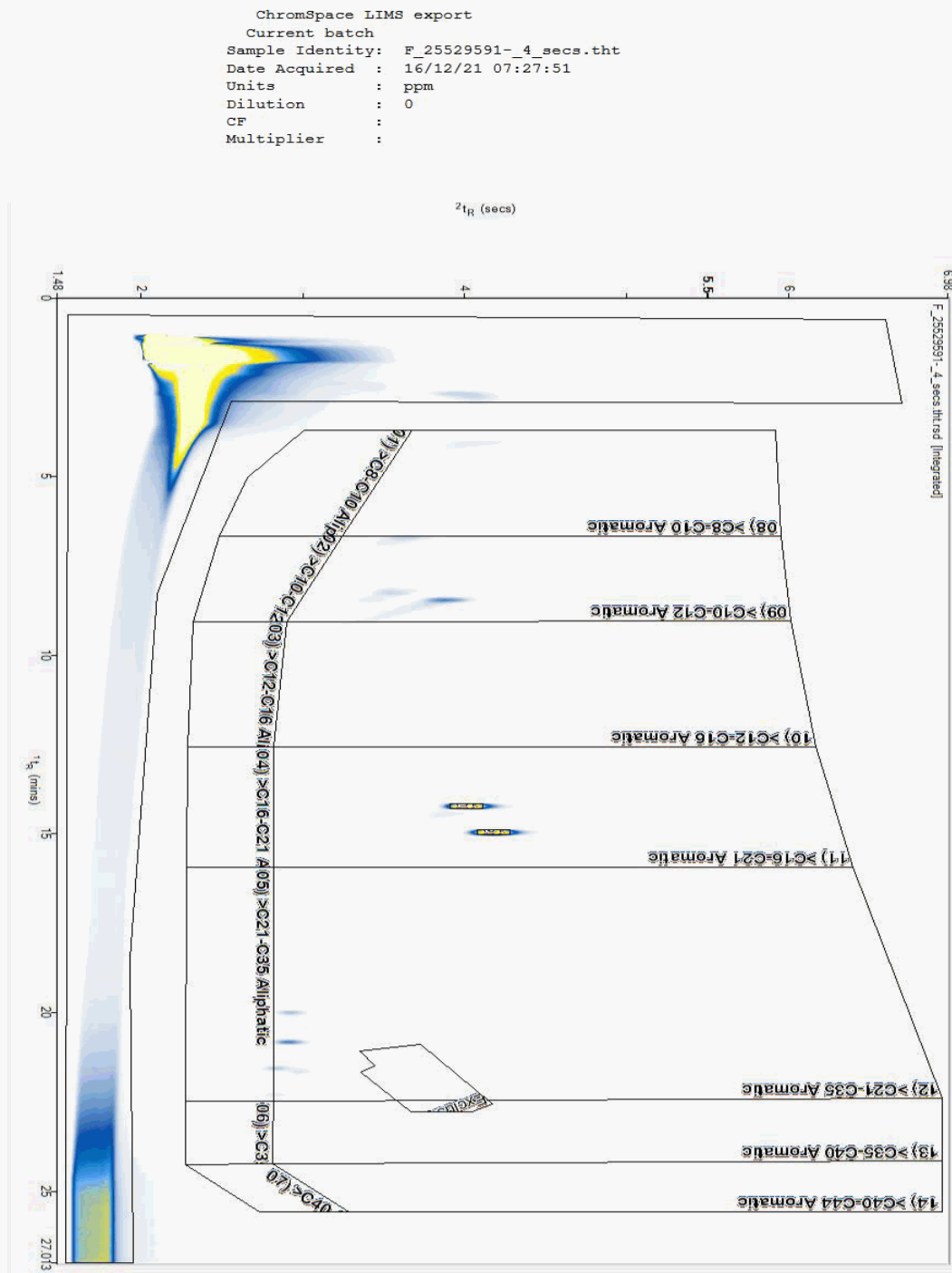
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25529591
Sample ID : BH308

Depth : 3.00 - 3.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

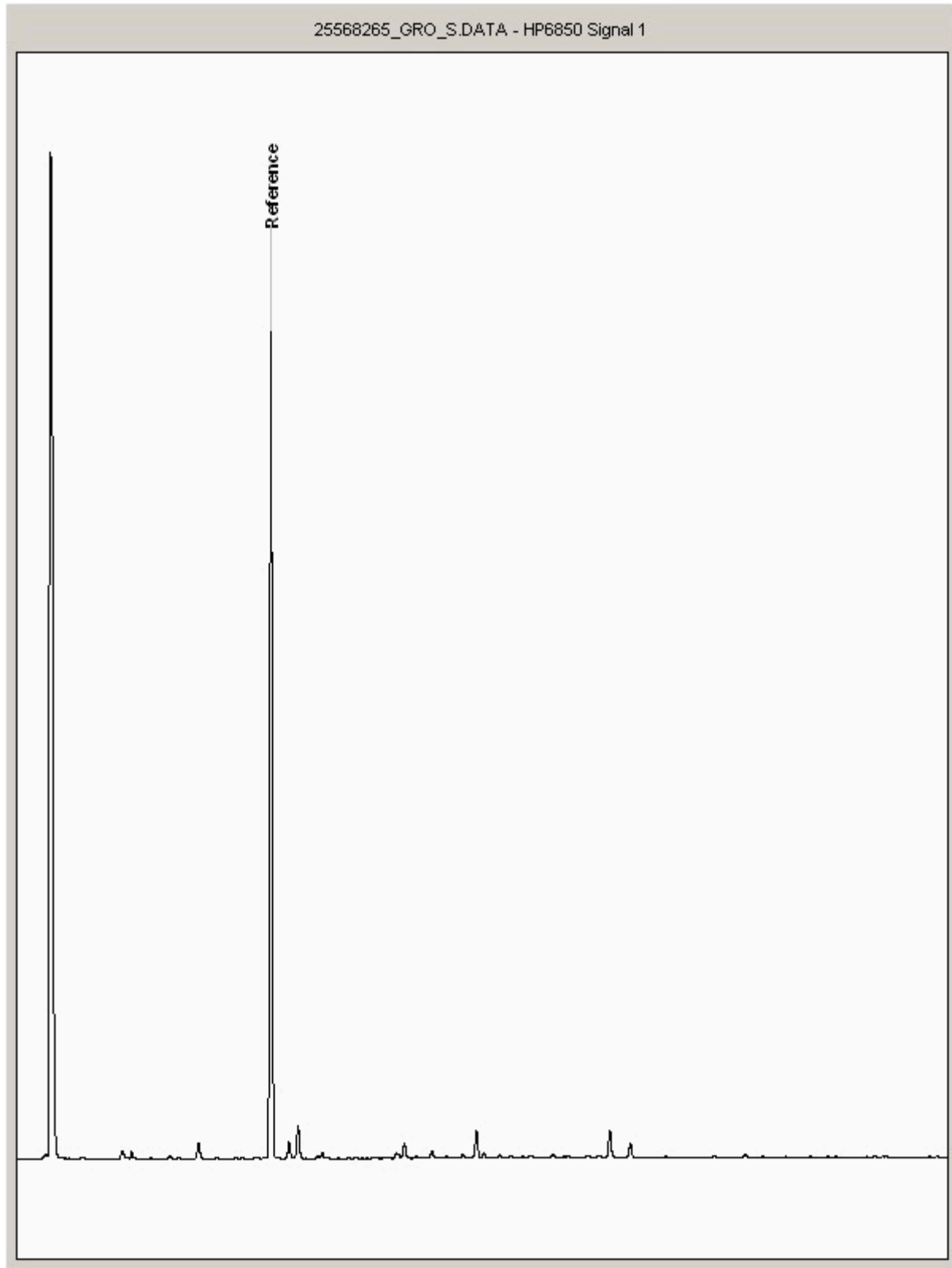
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25568265
Sample ID : BH308

Depth : 3.00 - 3.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

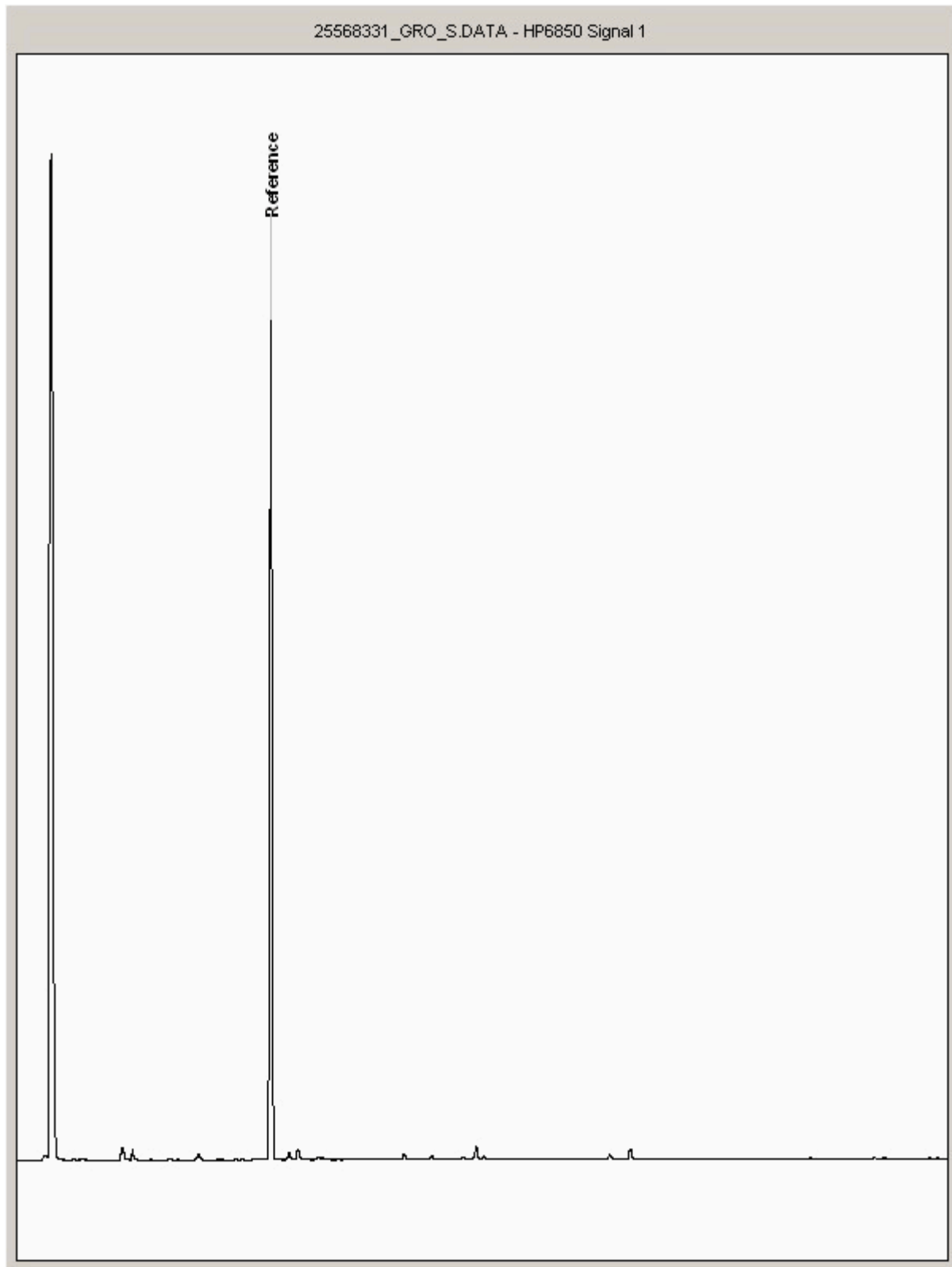
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25568331
Sample ID : BH309

Depth : 4.70 - 4.70





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

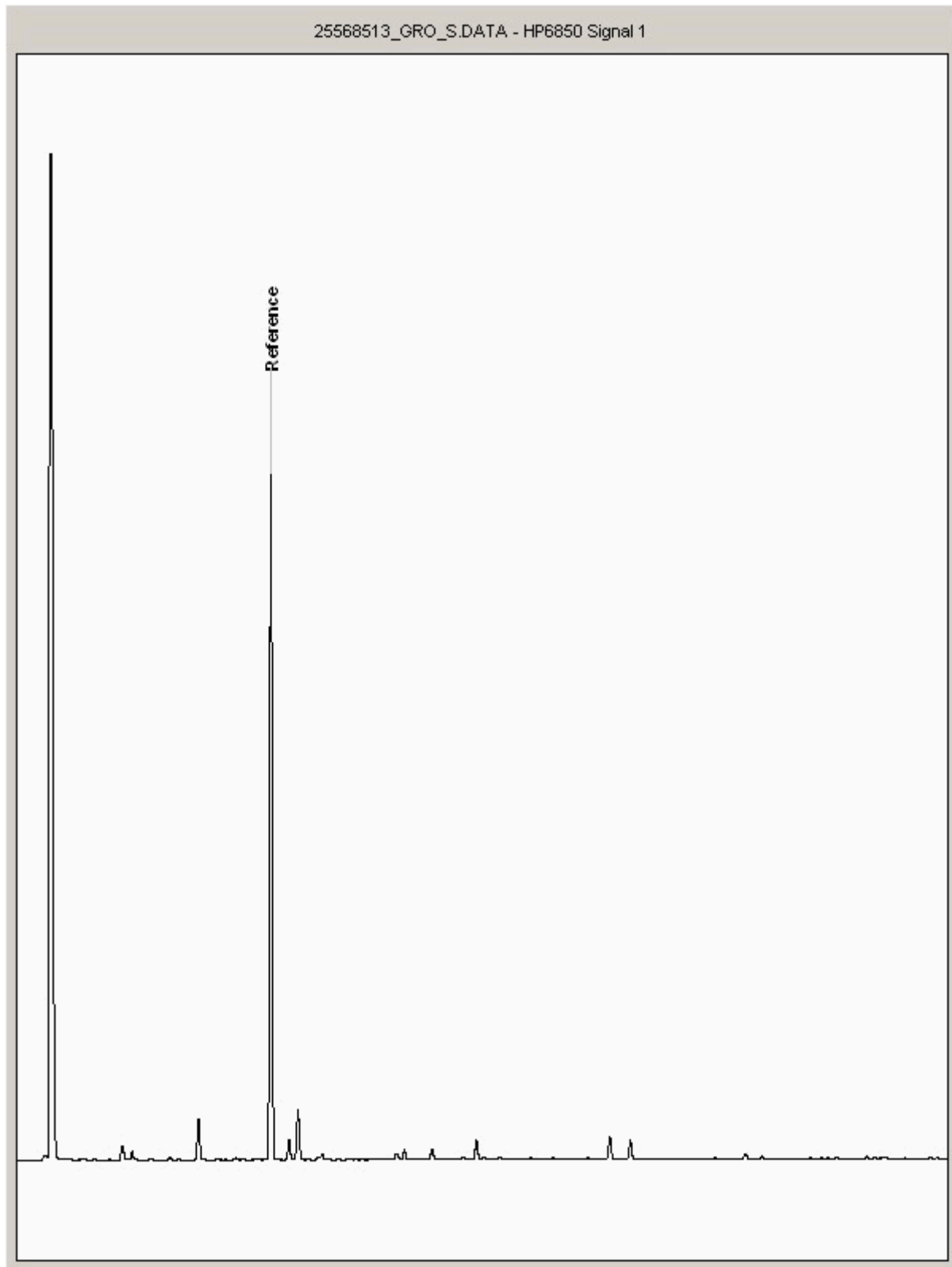
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25568513
Sample ID : BH308

Depth : 0.40 - 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-73
Client Ref.: 70057278

Report Number: 626817
Location: Port Talbot Harbourside

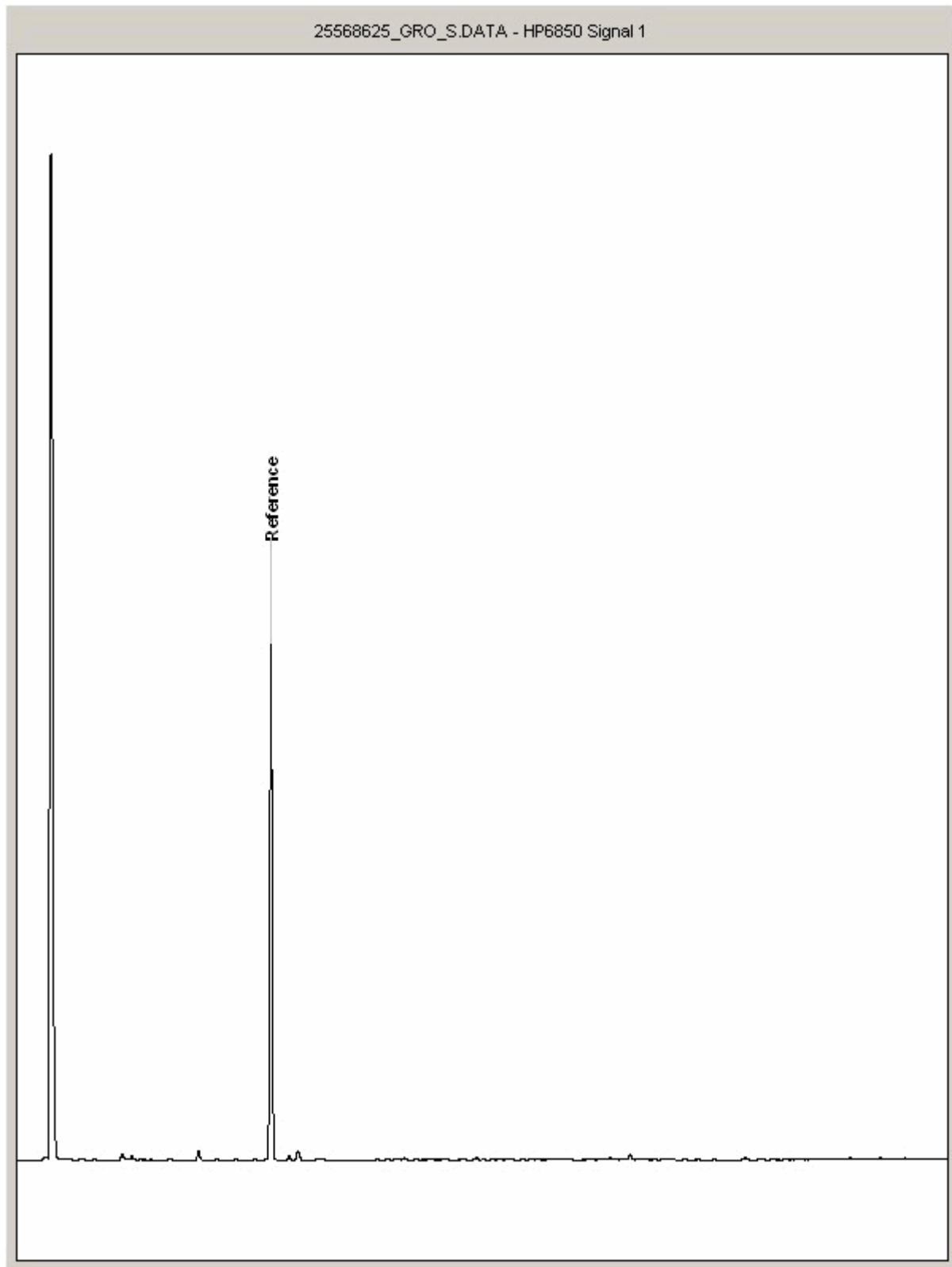
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25568625
Sample ID : BH309

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

SDG:	211211-73	Client Reference:	70057278	Report Number:	626817
Location:	Port Talbot Harbourside	Order Number:	70057278	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. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. 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

20. 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.

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.

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.



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

Attention: Rhys Evans

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

CERTIFICATE OF ANALYSIS

Date of report Generation:	21 December 2021
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	211211-136
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	626819
Order Number:	70057278

We received 3 samples on Saturday December 11, 2021 and 3 of these samples were scheduled for analysis which was completed on Tuesday December 21, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

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: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25510084	BH304	ES	0.50 - 0.50	10/12/2021
25510091	BH304	ES	4.00 - 4.00	10/12/2021
25510096	BH306	ES	0.00 - 0.60	10/12/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

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)

Customer Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X					X		
Boron Water Soluble	All	NDPs: 0 Tests: 2		X					X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3		X		X			X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 3		X		X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3			X		X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3		X		X			X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X					X	
PAH by GCMS	All	NDPs: 0 Tests: 3		X		X			X	
pH	All	NDPs: 0 Tests: 2		X					X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X		X			X	
Sample description	All	NDPs: 0 Tests: 3		X		X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 2		X					X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 3		X		X			X	
VOC MS (S)	All	NDPs: 0 Tests: 3			X		X			X



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

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
25510084	BH304	0.50 - 0.50	Dark Brown	Loamy Sand	Stones	None
25510091	BH304	4.00 - 4.00	Black	Loamy Sand	Stones	None
25510096	BH306	0.00 - 0.60	Dark Brown	Loamy Sand	Stones	Vegetation

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278Report Number: 626819
Location: Port Talbot Harbourside

Superseded Report:

PAH by GCMS

Results Legend			Customer Sample Ref.	BH304	BH304	BH306			
#	ISO17025 accredited.								
M	mCERTS accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50 Soil/Solid (S) 10/12/2021 11/12/2021 211211-136 25510084 ES	4.00 - 4.00 Soil/Solid (S) 10/12/2021 11/12/2021 211211-136 25510091 ES	0.00 - 0.60 Soil/Solid (S) 10/12/2021 11/12/2021 211211-136 25510096 ES			
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4*5@	Sample deviation (see appendix)								
Component		LOD/Units	Method						
Naphthalene-d8 % recovery**		%	TM218	87.1	95.3	88.1			
Acenaphthene-d10 % recovery**		%	TM218	85.4	92.6	84.8			
Phenanthrene-d10 % recovery**		%	TM218	86.7	93.1	87			
Chrysene-d12 % recovery**		%	TM218	83.5	86.4	76.4			
Perylene-d12 % recovery**		%	TM218	79.7	84.7	70.9			
Naphthalene		<0.009 mg/kg	TM218	0.18 M	0.94 M	0.0799 M			
Acenaphthylene		<0.012 mg/kg	TM218	<0.024 M	<0.012 M	0.0835 M			
Acenaphthene		<0.008 mg/kg	TM218	0.0356 M	0.204 M	0.0131 M			
Fluorene		<0.01 mg/kg	TM218	0.0516 M	0.0611 M	0.0287 M			
Phenanthrene		<0.015 mg/kg	TM218	0.377 M	0.0963 M	0.452 M			
Anthracene		<0.016 mg/kg	TM218	0.0937 M	0.0663 M	0.138 M			
Fluoranthene		<0.017 mg/kg	TM218	0.528 M	0.0906 M	1.23 M			
Pyrene		<0.015 mg/kg	TM218	0.399 M	0.0604 M	1.08 M			
Benz(a)anthracene		<0.014 mg/kg	TM218	0.256 M	0.0385 M	0.949 M			
Chrysene		<0.01 mg/kg	TM218	0.293 M	0.0469 M	0.853 M			
Benzo(b)fluoranthene		<0.015 mg/kg	TM218	0.316 M	0.0399 M	1.5 M			
Benzo(k)fluoranthene		<0.014 mg/kg	TM218	0.134 M	0.016 M	0.489 M			
Benzo(a)pyrene		<0.015 mg/kg	TM218	0.206 M	0.0236 M	1.02 M			
Indeno(1,2,3-cd)pyrene		<0.018 mg/kg	TM218	0.153 M	<0.018 M	0.853 M			
Dibenzo(a,h)anthracene		<0.023 mg/kg	TM218	<0.046 M	<0.023 M	0.152 M			
Benzo(g,h,i)perylene		<0.024 mg/kg	TM218	0.159 M	<0.024 M	0.892 M			
PAH, Total Detected USEPA 16		<0.118 mg/kg	TM218	3.18	1.68	9.82			



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278Report Number: 626819
Location: Port Talbot Harbourside

Superseded Report:

TPH CWG (S)

Results Legend			Customer Sample Ref.	BH304	BH304	BH306		
#	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					
GRO Surrogate % recovery**		%	TM089	93	107	63		
Aliphatics >C5-C6 (HS_1D_AL)		<0.01 mg/kg	TM089	0.0339	<0.01	0.0137		
Aliphatics >C6-C8 (HS_1D_AL)		<0.01 mg/kg	TM089	0.106	0.044	0.0467		
Aliphatics >C8-C10 (HS_1D_AL)		<0.01 mg/kg	TM089	0.154	0.413	0.211		
Aliphatics >C10-C12 (EH_2D_AL_#1)		<1 mg/kg	TM414	<1 #	<1 #	<1 #		
Aliphatics >C12-C16 (EH_2D_AL_#1)		<1 mg/kg	TM414	<1 #	<1 #	<1 #		
Aliphatics >C16-C21 (EH_2D_AL_#1)		<1 mg/kg	TM414	<1 #	<1 #	6.02 #		
Aliphatics >C21-C35 (EH_2D_AL_#1)		<1 mg/kg	TM414	4.1 #	<1 #	2.52 #		
Aliphatics >C35-C44 (EH_2D_AL_#1)		<1 mg/kg	TM414	4.04	<1	2.1		
Total Aliphatics >C10-C44 (EH_2D_AR_#1)		<5 mg/kg	TM414	8.14	<5	10.8		
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)		<10 mg/kg	TM414	15.7	<10	93.8		
Aromatics >EC5-EC7 (HS_1D_AR)		<0.01 mg/kg	TM089	0.0599	0.076	0.0114		
Aromatics >EC7-EC8 (HS_1D_AR)		<0.01 mg/kg	TM089	0.0735	0.104	0.065		
Aromatics >EC8-EC10 (HS_1D_AR)		<0.01 mg/kg	TM089	0.103	0.275	0.14		
Aromatics > EC10-EC12 (EH_2D_AR_#1)		<1 mg/kg	TM414	<1 #	4.21 #	<1 #		
Aromatics > EC12-EC16 (EH_2D_AR_#1)		<1 mg/kg	TM414	<1 #	<1 #	1.25 #		
Aromatics > EC16-EC21 (EH_2D_AR_#1)		<1 mg/kg	TM414	1.08 #	<1 #	12.3 #		
Aromatics > EC21-EC35 (EH_2D_AR_#1)		<1 mg/kg	TM414	4.77 #	2.48 #	63 #		
Aromatics >EC35-EC44 (EH_2D_AR_#1)		<1 mg/kg	TM414	1.1	<1	6.42		
Aromatics > EC40-EC44 (EH_2D_AR_#1)		<1 mg/kg	TM414	<1	<1	<1		
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)		<5 mg/kg	TM414	7.54	8.82	82.9		
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)		<10 mg/kg	TM414	16.2	<10	94.2		
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)		<0.05 mg/kg	TM089	0.294	0.457	0.271		
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)		<0.05 mg/kg	TM089	0.236	0.455	0.217		
GRO >C5-C10 (HS_1D_TOTAL)		<0.02 mg/kg	TM089	0.53	0.912	0.488		



CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

Superseded Report:

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	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH304ES 0.50 - 0.50 SOLID 10/12/2021 00:00:00 11/12/2021 05:00:00 211211-136 25510084 TM048	20/12/2021	James Richards	-	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	BH306ES 0.00 - 0.60 SOLID 10/12/2021 00:00:00 11/12/2021 05:00:00 211211-136 25510096 TM048	20/12/2021	Agnieszka Chelmonska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

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SDG: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

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
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
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

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SDG: 211211-136
Client Ref.: 70057278

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Location: Port Talbot Harbourside

Superseded Report:

Test Completion Dates

Lab Sample No(s)	25510084	25510091	25510096
Customer Sample Ref.	BH304	BH304	BH306
AGS Ref.	ES	ES	ES
Depth	0.50 - 0.50	4.00 - 4.00	0.00 - 0.60
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)

Asbestos ID in Solid Samples	20-Dec-2021		20-Dec-2021
Boron Water Soluble	17-Dec-2021		17-Dec-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Dec-2021	20-Dec-2021	20-Dec-2021
EPH CWG GC (S)	20-Dec-2021	20-Dec-2021	20-Dec-2021
GRO by GC-FID (S)	21-Dec-2021	21-Dec-2021	21-Dec-2021
Hexavalent Chromium (s)	16-Dec-2021	20-Dec-2021	20-Dec-2021
Metals in solid samples by OES	16-Dec-2021		16-Dec-2021
PAH by GCMS	20-Dec-2021	17-Dec-2021	17-Dec-2021
pH	16-Dec-2021		16-Dec-2021
Phenols by HPLC (S)	17-Dec-2021	16-Dec-2021	16-Dec-2021
Sample description	14-Dec-2021	15-Dec-2021	15-Dec-2021
Total Organic Carbon	17-Dec-2021		20-Dec-2021
TPH CWG GC (S)	21-Dec-2021	21-Dec-2021	21-Dec-2021
VOC MS (S)	20-Dec-2021	20-Dec-2021	20-Dec-2021



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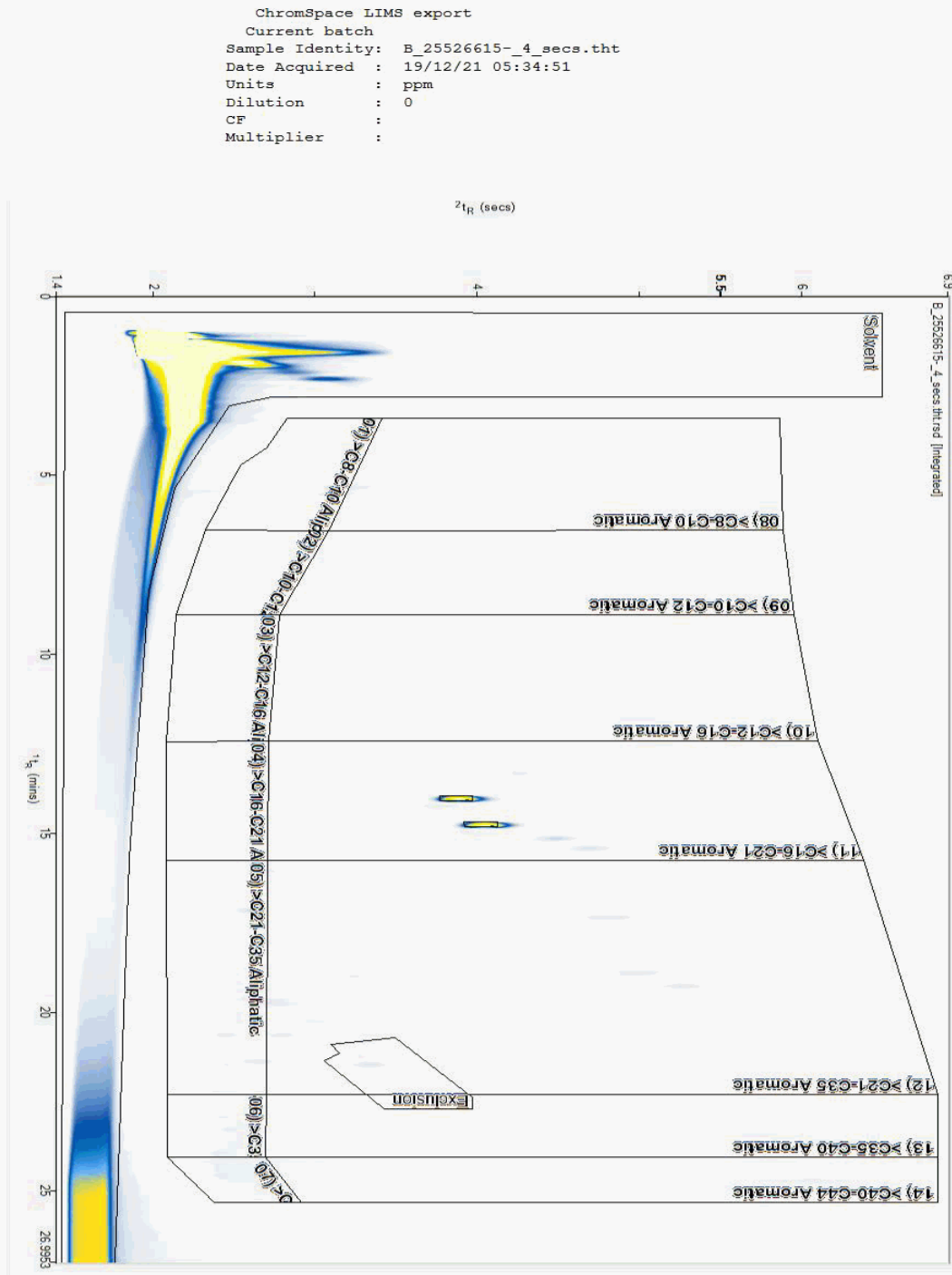
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25526615
Sample ID : BH304

Depth : 0.50 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

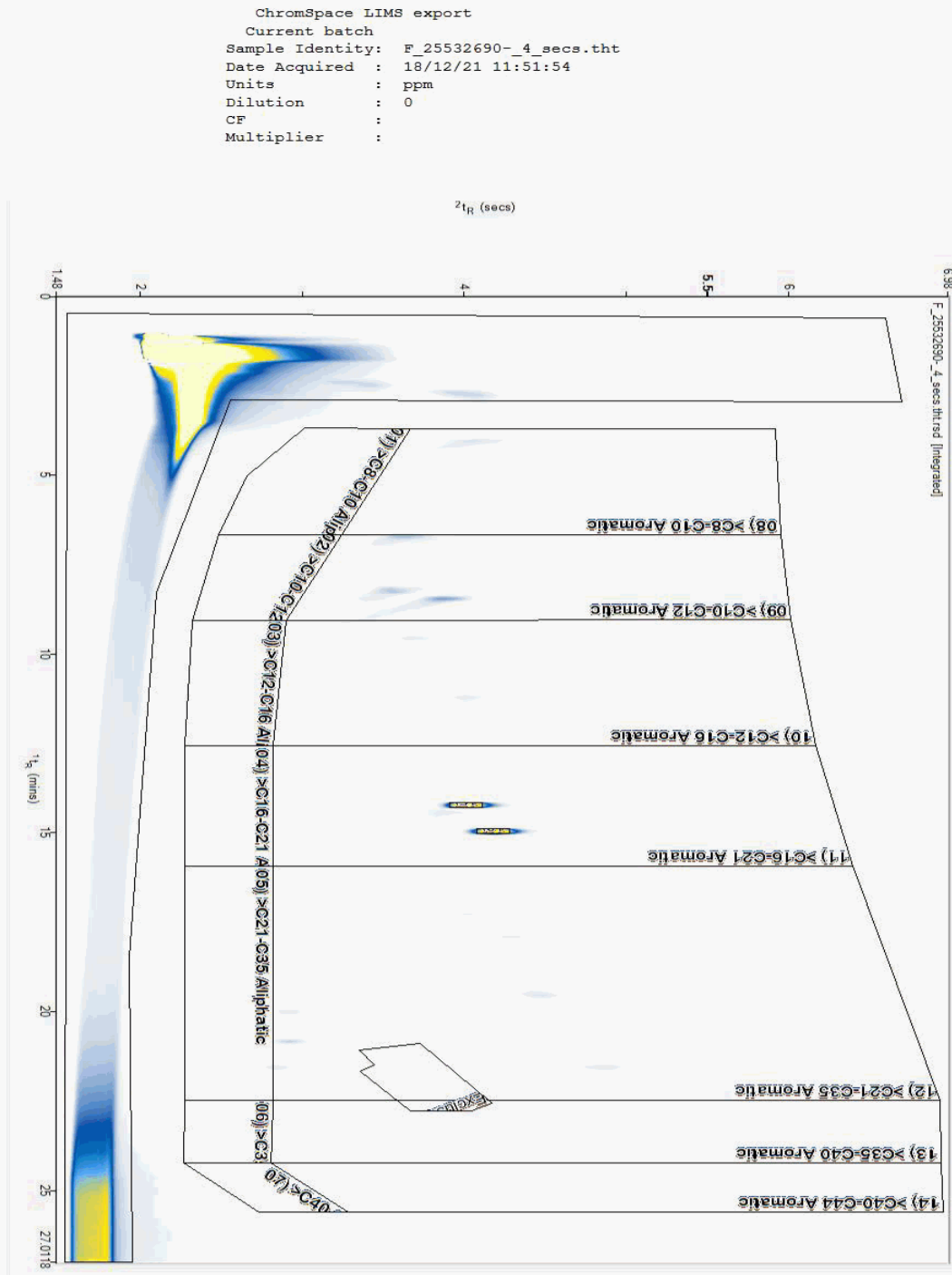
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25532690
Sample ID : BH304

Depth : 4.00 - 4.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
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Location: Port Talbot Harbourside

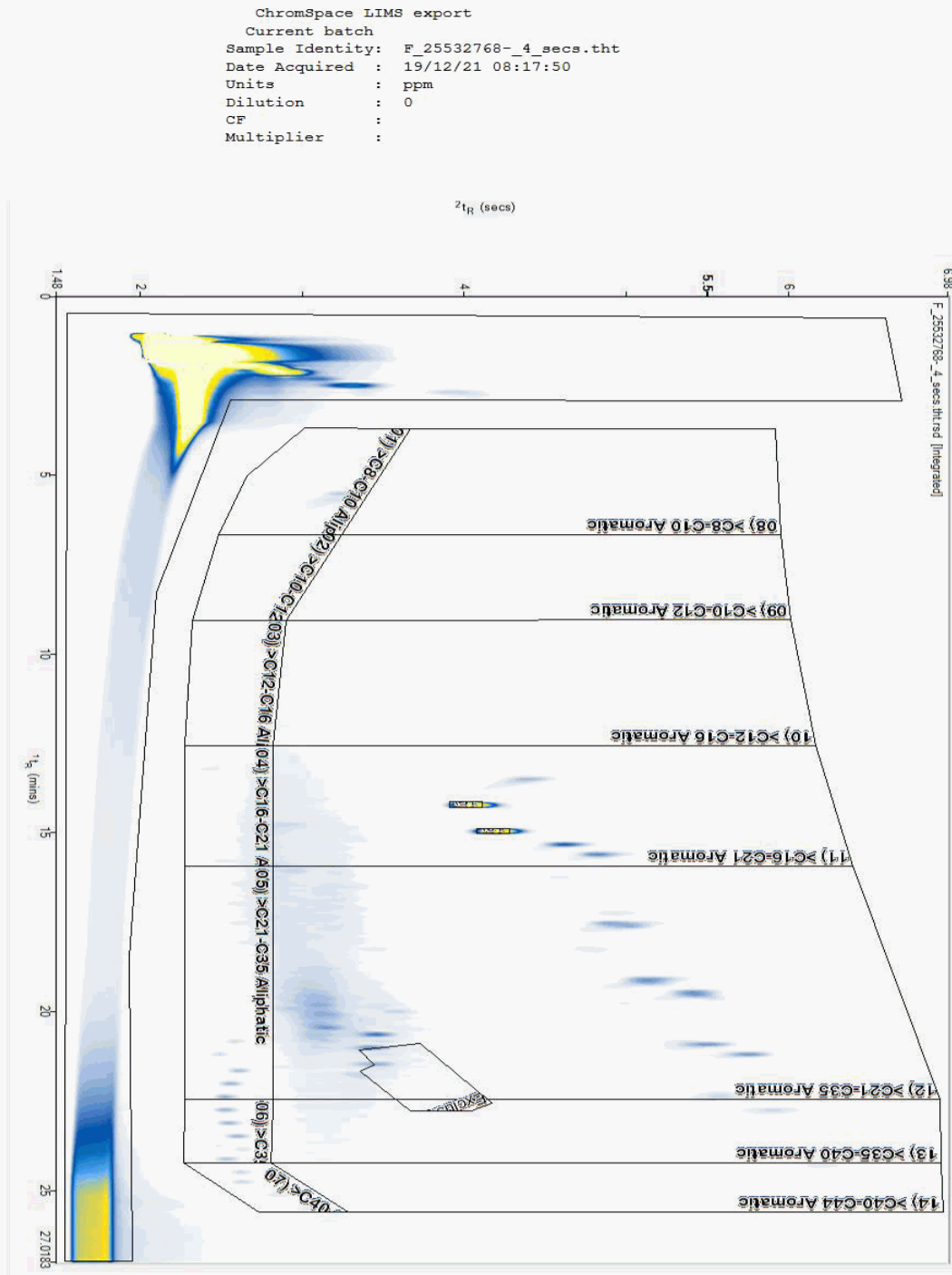
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25532768
Sample ID : BH306

Depth : 0.00 - 0.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
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Report Number: 626819
Location: Port Talbot Harbourside

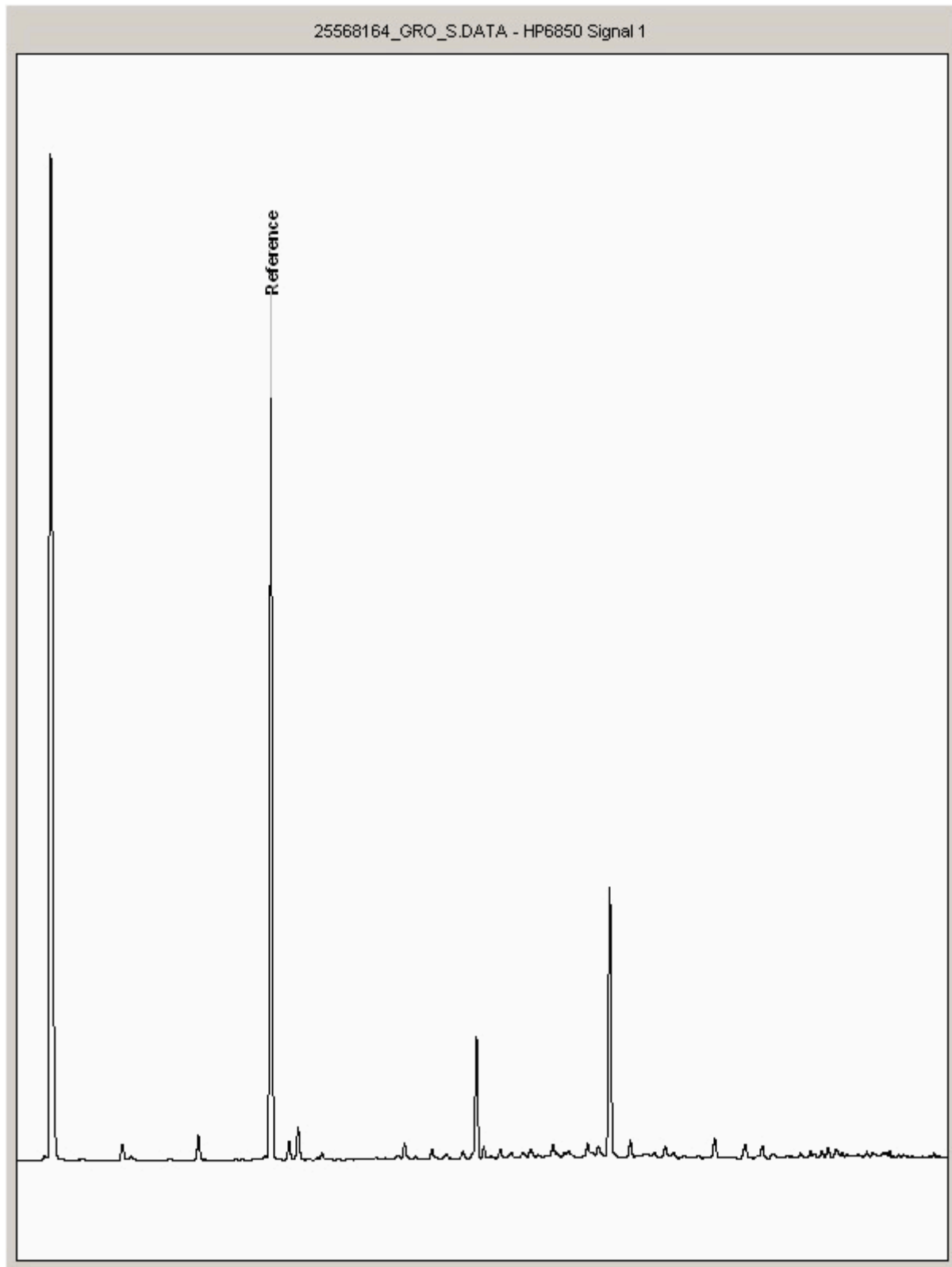
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25568164
Sample ID : BH304

Depth : 4.00 - 4.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

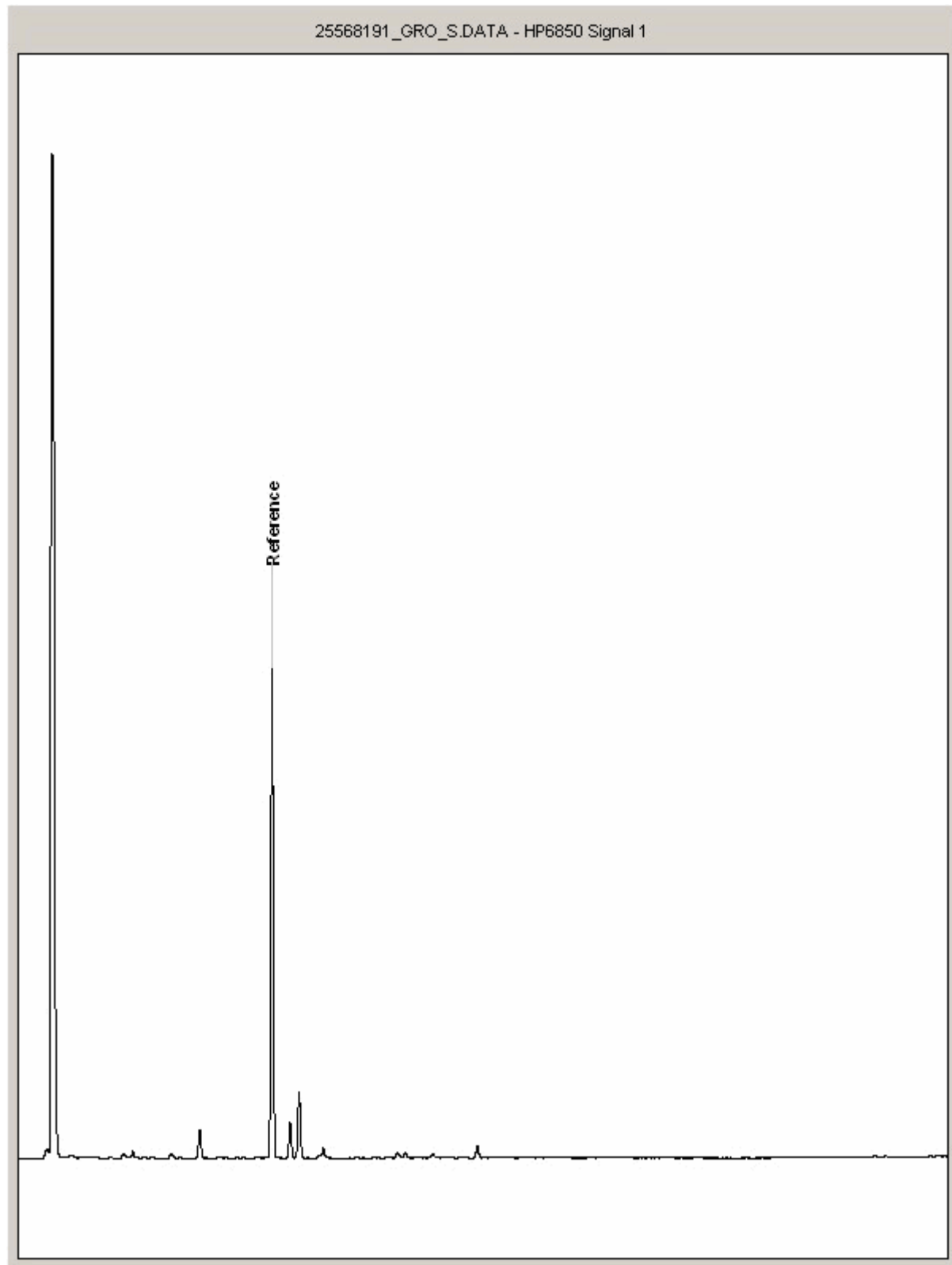
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25568191
Sample ID : BH306

Depth : 0.00 - 0.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211211-136
Client Ref.: 70057278

Report Number: 626819
Location: Port Talbot Harbourside

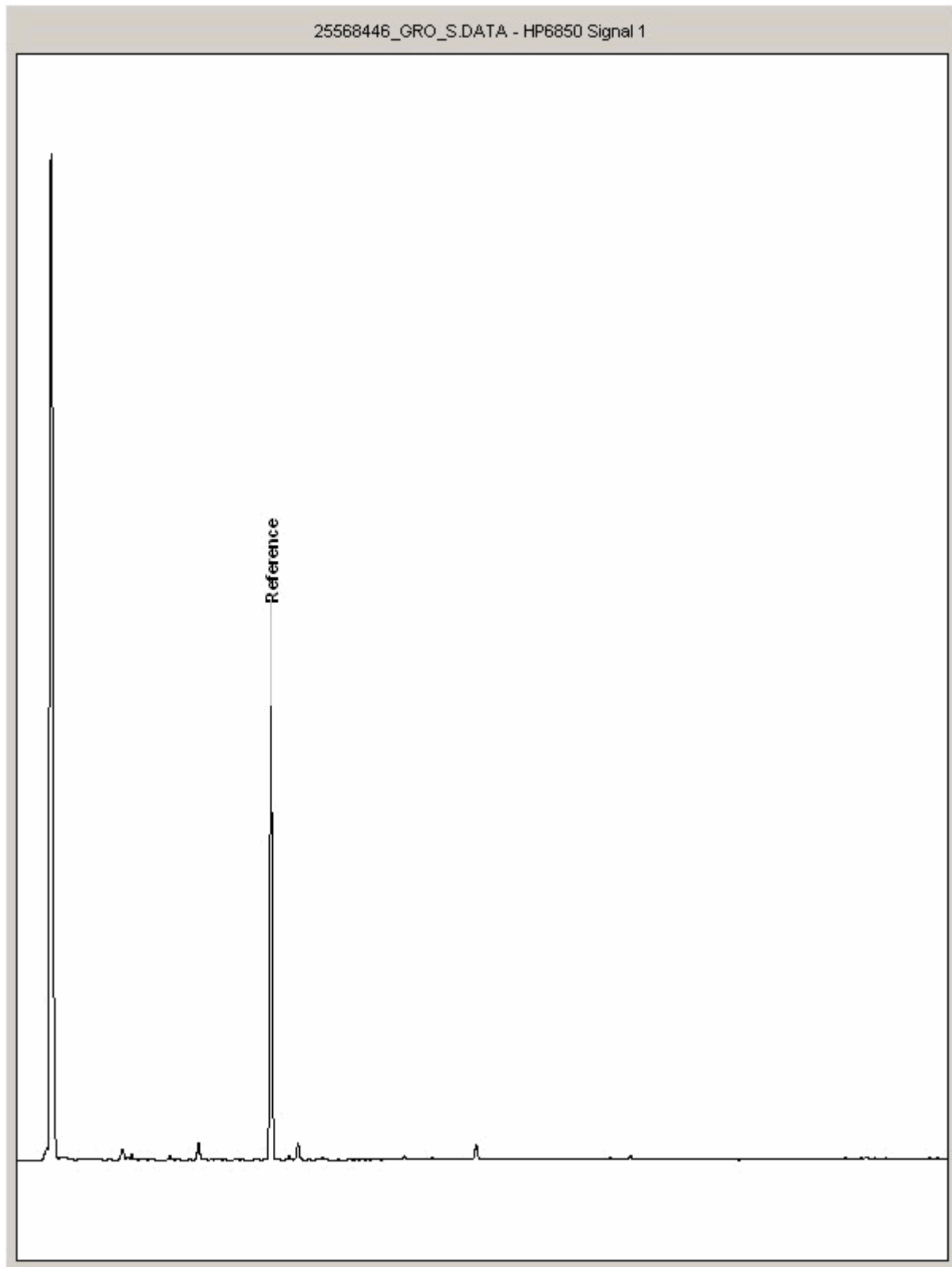
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25568446
Sample ID : BH304

Depth : 0.50 - 0.50





CERTIFICATE OF ANALYSIS

SDG:	211211-136	Client Reference:	70057278	Report Number:	626819
Location:	Port Talbot Harbourside	Order Number:	70057278	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. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. 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

20. 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.

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.

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

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



Unit 7-8 Hawarden Business Park

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Hawarden

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Website: www.alsenvironmental.co.uk

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

Attention: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation:	06 January 2022
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	211218-104
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	628613
Order Number:	70057278-RW2

We received 8 samples on Saturday December 18, 2021 and 8 of these samples were scheduled for analysis which was completed on Thursday January 06, 2022. 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.

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: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25564589	BH301	ES	2.50 - 3.00	17/12/2021
25564594	BH302	ES	0.50 - 0.60	17/12/2021
25564600	BH303	ES	2.50 - 3.00	17/12/2021
25564605	BH305	ES	2.00 - 2.50	17/12/2021
25564613	BH307	ES	0.50 - 0.60	17/12/2021
25564620	BH307	ES	2.50 - 3.00	17/12/2021
25564625	BH308	ES	0.40 - 0.50	17/12/2021
25564631	BH308	ES	3.00 - 3.50	17/12/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

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)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
25564631	BH308	ES	3.00 - 3.50	60g VOC (ALE215)	S
25564625	BH308	ES	0.40 - 0.50	250g Amber Jar (ALE215)	S
25564620	BH307	ES	2.50 - 3.00	1kg Cardboard Container (ALE215)	S
25564613	BH307	ES	0.50 - 0.60	250g Amber Jar (ALE215)	S
25564605	BH305	ES	2.00 - 2.50	250g Amber Jar (ALE215)	S
25564600	BH303	ES	2.50 - 3.00	250g Amber Jar (ALE215)	S
25564594	BH302	ES	0.50 - 0.60	250g Amber Jar (ALE215)	S
25564589	BH301	ES	2.50 - 3.00	250g Amber Jar (ALE215)	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3			
Boron Water Soluble	All	NDPs: 0 Tests: 3			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 8			
EPH CWG GC (S)	All	NDPs: 0 Tests: 8			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 8			
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 8			
Metals in solid samples by OES	All	NDPs: 0 Tests: 3			
PAH by GCMS	All	NDPs: 0 Tests: 8			
pH	All	NDPs: 0 Tests: 3			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 8			
Sample description	All	NDPs: 0 Tests: 8			
Total Organic Carbon	All	NDPs: 0 Tests: 3			
TPH CWG GC (S)	All	NDPs: 0 Tests: 8			
VOC MS (S)	All	NDPs: 0 Tests: 8			



CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

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
25564589	BH301	2.50 - 3.00	Dark Brown	Loamy Sand	Stones	None
25564594	BH302	0.50 - 0.60	Dark Brown	Loamy Sand	Stones	None
25564600	BH303	2.50 - 3.00	Dark Brown	Loamy Sand	Stones	None
25564605	BH305	2.00 - 2.50	Dark Brown	Sandy Clay Loam	Stones	None
25564613	BH307	0.50 - 0.60	Dark Brown	Loamy Sand	Stones	Concrete/Aggregate
25564620	BH307	2.50 - 3.00	Dark Brown	Sandy Clay Loam	Stones	None
25564625	BH308	0.40 - 0.50	Dark Brown	Loamy Sand	Stones	Concrete/Aggregate
25564631	BH308	3.00 - 3.50	Dark Brown	Loamy Sand	Stones	None

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample Ref.	BH301	BH302	BH303	BH305	BH307	BH307
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH301	BH302	BH303	BH305	BH307	BH307
M	mCERTS accredited.		2.50 - 3.00	0.50 - 0.60	2.50 - 3.00	2.00 - 2.50	0.50 - 0.60	2.50 - 3.00
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
diss.filt	Dissolved / filtered sample.		17/12/2021	17/12/2021	17/12/2021	17/12/2021	17/12/2021	17/12/2021
tot.unfilt	Total / unfiltered sample.		18/12/2021	18/12/2021	18/12/2021	18/12/2021	18/12/2021	18/12/2021
*	Subcontracted - refer to subcontractor report for accreditation status.		211218-104	211218-104	211218-104	211218-104	211218-104	211218-104
**	% 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		25564589	25564594	25564600	25564605	25564613	25564620
(F)	Trigger breach confirmed		ES	ES	ES	ES	ES	ES
1-4+5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	112	92.9	111	84.6	129	80.6
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089	0.0829	0.035	0.0503	0.0283	0.0466	0.0176
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089	0.441	0.103	0.109	0.0566	0.424	0.282
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089	4.89	0.807	0.139	0.0625	2.51	1.34
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414	2.3	<1	<1	<1	2.54	<1
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414	6.4	5.44	<1	<1	3.42	<1
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414	14.9	7.58	<1	<1	6.51	<1
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	11.9	9.84	5.55	1.59	45.9	2.98
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414	2.51	4.42	2.16	1.83	6.82	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414	38	27.5	8.19	<5	65.2	<5
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414	69.4	78.6	29.5	23.8	93.8	14.4
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089	0.44	0.326	0.041	0.026	0.45	0.208
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089	0.772	0.452	0.055	0.0212	1.07	0.472
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089	3.26	0.539	0.0924	0.0425	1.68	0.895
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414	7.86	4.97	<1	<1	5.47	2.98
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414	4.89	7.3	<1	<1	3.09	<1
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414	3.4	5.57	1.9	2.91	3.87	1.77
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	14.2	30.6	15.4	13.6	14.8	4.32
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	2.62	3.74	3.41	<1	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	1.53	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414	31.4	51	21.3	20	28.6	10.9
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414	79.3	80.9	29.9	20.1	100	17.6
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089	5.41	0.945	0.298	0.148	2.98	1.64
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089	4.47	1.32	0.188	0.0897	3.2	1.57
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089	9.89	2.26	0.487	0.237	6.18	3.22



CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278Report Number: 628613
Location: Port Talbot Harbourside

Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample Ref.	BH308	BH308				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH308	BH308				
M	mCERTS accredited.		0.40 - 0.50	3.00 - 3.50				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
diss.filt	Dissolved / filtered sample.		17/12/2021	17/12/2021				
tot.unfilt	Total / unfiltered sample.		18/12/2021	18/12/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		211218-104	211218-104				
**	% 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		25564625	25564631				
(F)	Trigger breach confirmed		ES	ES				
1-4*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	99	111				
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089	0.0328	0.0271				
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089	0.0904	0.102				
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089	0.46	0.216				
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1				
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1				
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414	1.47	<1				
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	11.9	<1				
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414	6.36	<1				
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414	20	<5				
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414	40.7	<10				
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089	0.0768	<0.01				
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089	0.229	0.0661				
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089	0.307	0.144				
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1				
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1				
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414	2.24	<1				
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	13.1	<1				
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	3.84	<1				
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	1.04	<1				
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414	20.7	<5				
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414	41.9	<10				
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089	0.583	0.344				
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089	0.614	0.21				
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089	1.2	0.554				



CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

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

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH302ES 0.50 - 0.60 SOLID 17/12/2021 00:00:00 18/12/2021 05:00:00 211218-104 25564594 TM048	29/12/2021	James Richards	-	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	BH307ES 0.50 - 0.60 SOLID 17/12/2021 00:00:00 18/12/2021 05:00:00 211218-104 25564613 TM048	29/12/2021	Agnieszka Chelmonska	-	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	BH308ES 0.40 - 0.50 SOLID 17/12/2021 00:00:00 18/12/2021 05:00:00 211218-104 25564625 TM048	29/12/2021	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

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
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
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: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

Superseded Report:

Test Completion Dates

Lab Sample No(s)	25564589	25564594	25564600	25564605	25564613	25564620	25564625	25564631
Customer Sample Ref.	BH301	BH302	BH303	BH305	BH307	BH307	BH308	BH308
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES
Depth	2.50 - 3.00	0.50 - 0.60	2.50 - 3.00	2.00 - 2.50	0.50 - 0.60	2.50 - 3.00	0.40 - 0.50	3.00 - 3.50
Type	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		29-Dec-2021			29-Dec-2021		29-Dec-2021	
Boron Water Soluble		23-Dec-2021			23-Dec-2021		24-Dec-2021	
Cyanide Comp/Free/Total/Thiocyanate	23-Dec-2021	23-Dec-2021	23-Dec-2021	24-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021
EPH CWG GC (S)	24-Dec-2021	24-Dec-2021	24-Dec-2021	24-Dec-2021	24-Dec-2021	24-Dec-2021	24-Dec-2021	24-Dec-2021
GRO by GC-FID (S)	04-Jan-2022	04-Jan-2022	04-Jan-2022	04-Jan-2022	04-Jan-2022	06-Jan-2022	04-Jan-2022	04-Jan-2022
Hexavalent Chromium (s)	23-Dec-2021	24-Dec-2021	24-Dec-2021	24-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021
Metals in solid samples by OES		24-Dec-2021			23-Dec-2021		29-Dec-2021	
PAH by GCMS	24-Dec-2021	24-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021	23-Dec-2021
pH		29-Dec-2021			29-Dec-2021		29-Dec-2021	
Phenols by HPLC (S)	23-Dec-2021	23-Dec-2021	23-Dec-2021	24-Dec-2021	23-Dec-2021	23-Dec-2021	24-Dec-2021	23-Dec-2021
Sample description	21-Dec-2021	21-Dec-2021	21-Dec-2021	21-Dec-2021	21-Dec-2021	21-Dec-2021	21-Dec-2021	21-Dec-2021
Total Organic Carbon		29-Dec-2021			29-Dec-2021		29-Dec-2021	
TPH CWG GC (S)	04-Jan-2022	04-Jan-2022	04-Jan-2022	04-Jan-2022	04-Jan-2022	06-Jan-2022	04-Jan-2022	04-Jan-2022
VOC MS (S)	31-Dec-2021	31-Dec-2021	31-Dec-2021	31-Dec-2021	31-Dec-2021	31-Dec-2021	31-Dec-2021	31-Dec-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

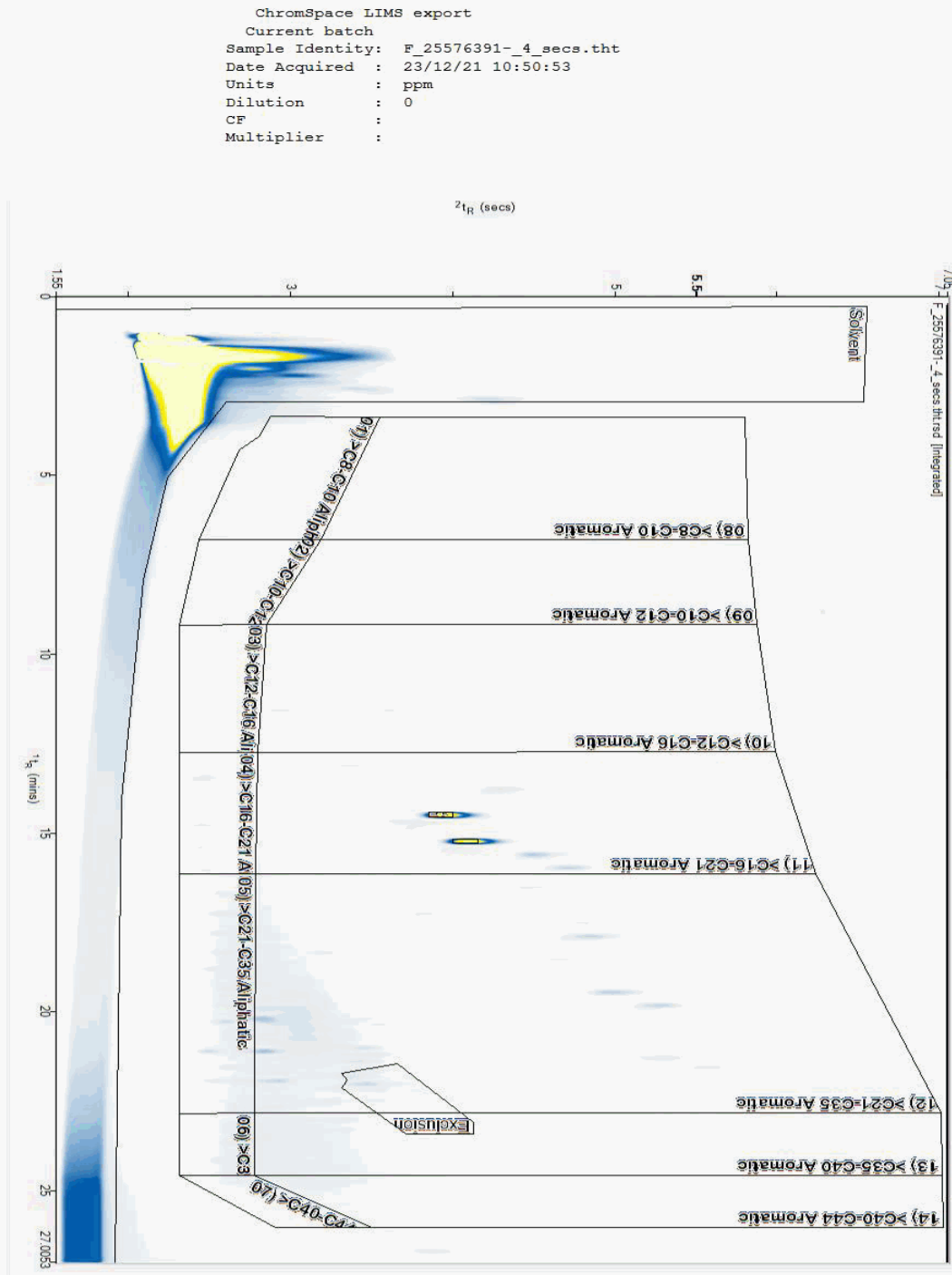
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25576391
Sample ID : BH303

Depth : 2.50 - 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

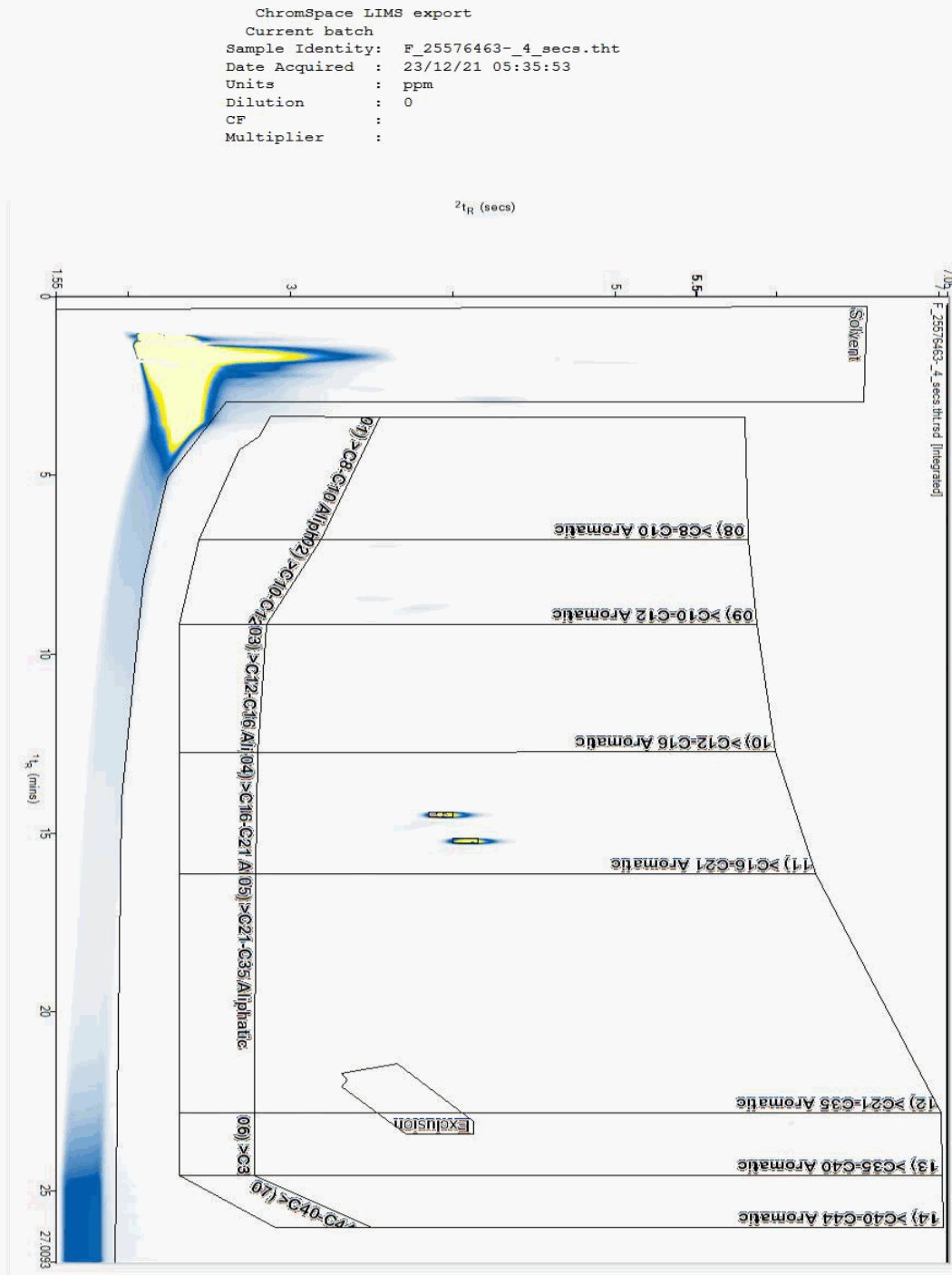
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25576463
Sample ID : BH308

Depth : 3.00 - 3.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

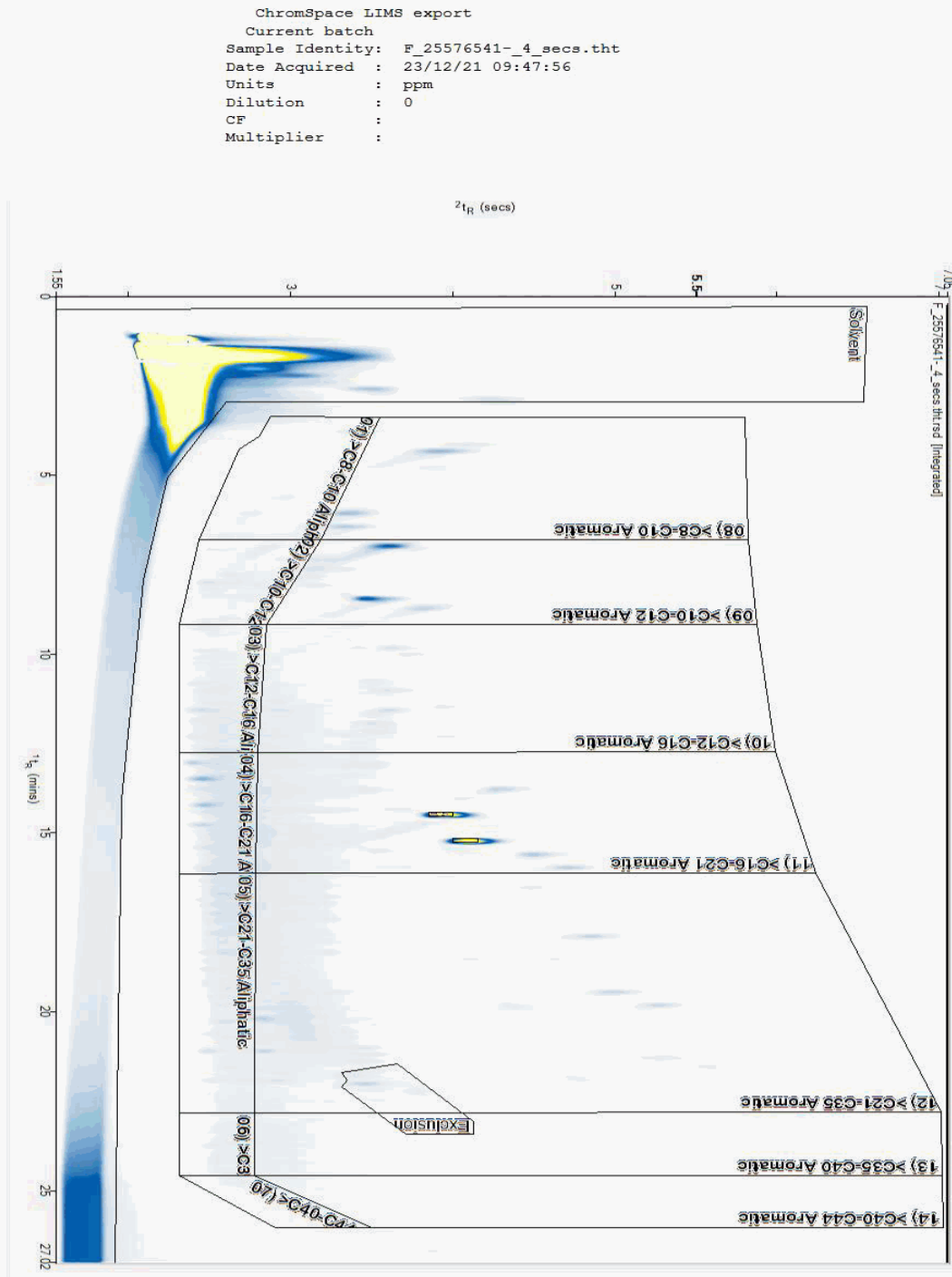
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25576541
Sample ID : BH301

Depth : 2.50 - 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

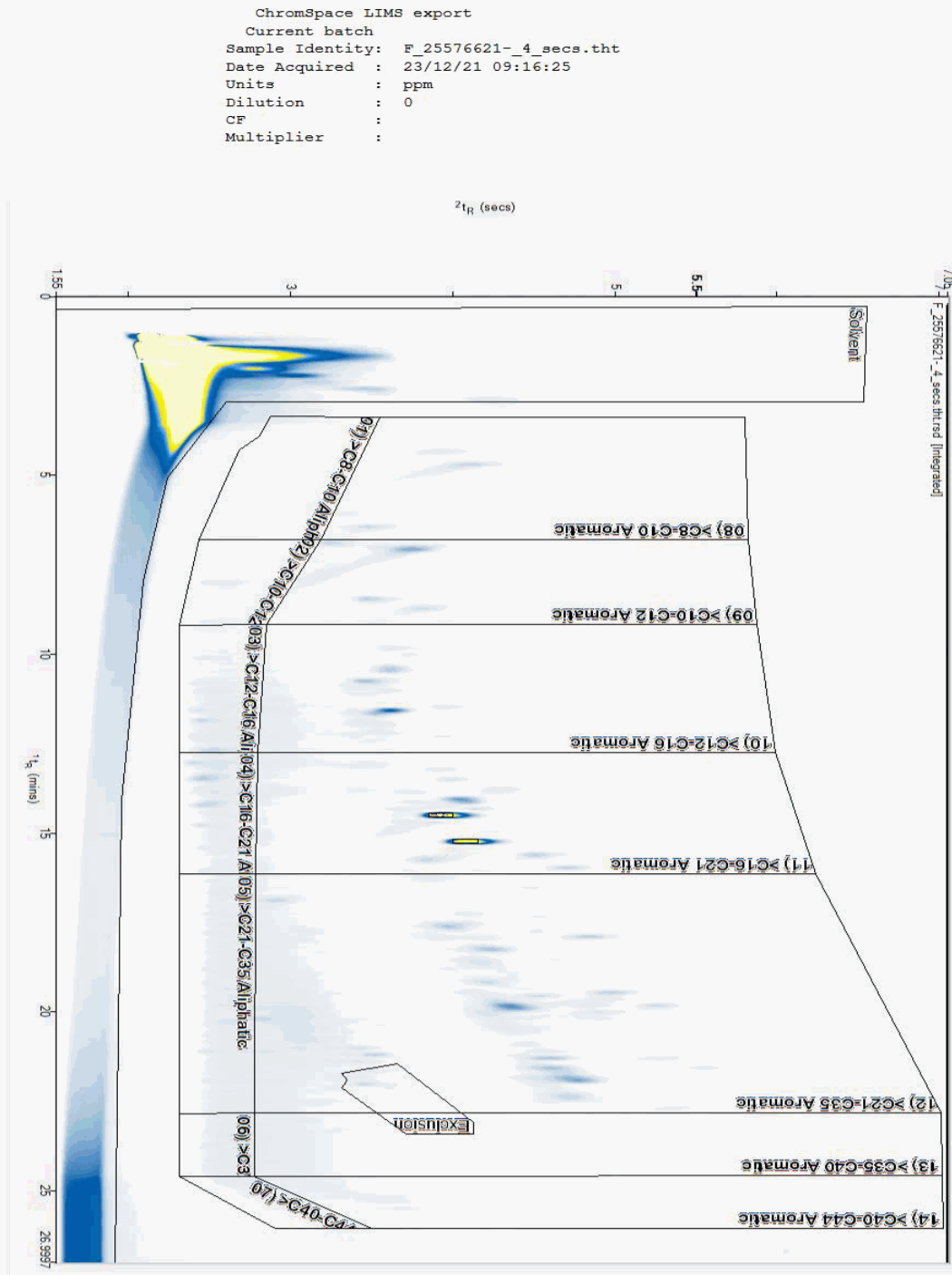
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25576621
Sample ID : BH302

Depth : 0.50 - 0.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

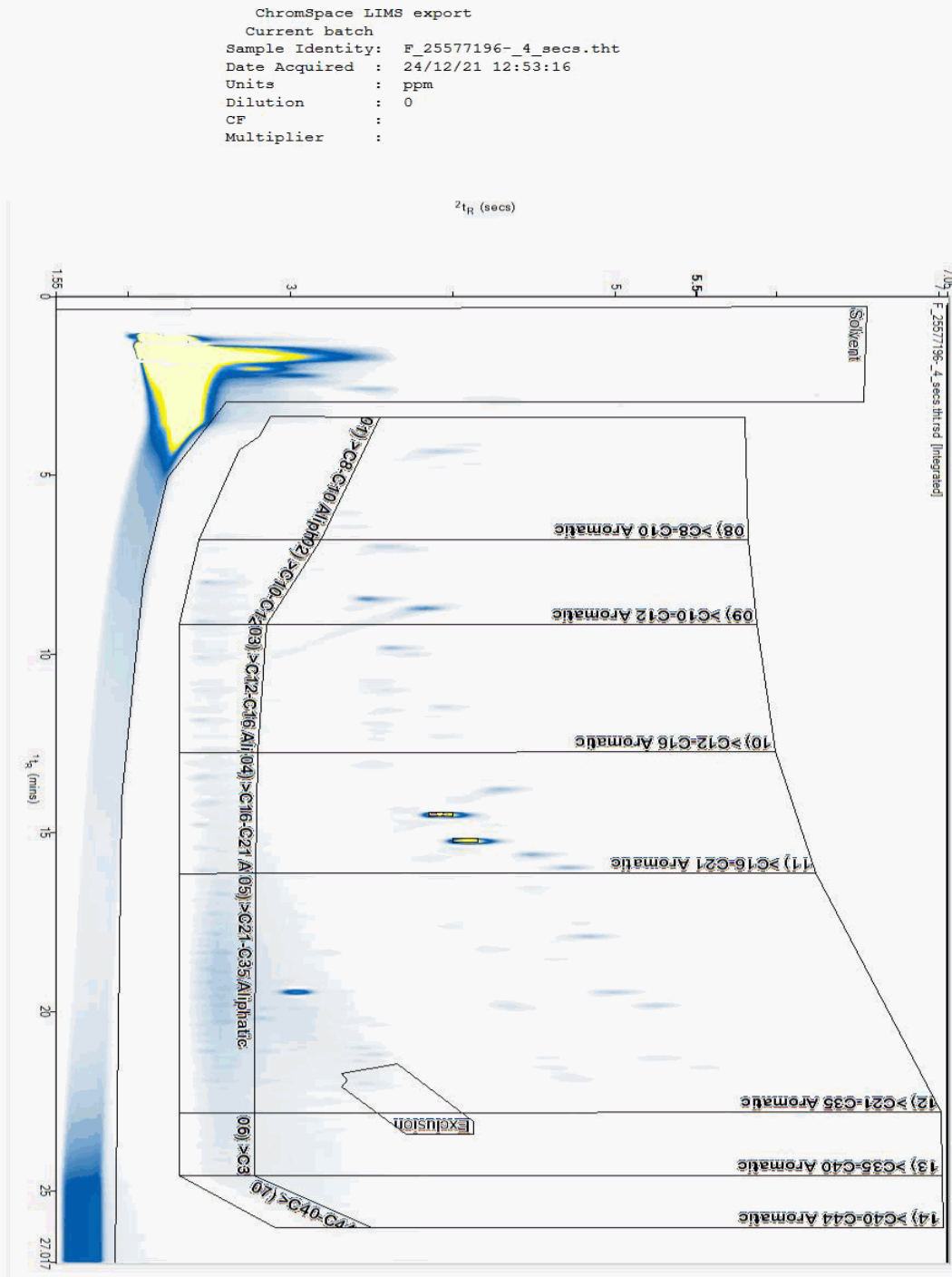
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25577196
Sample ID : BH307

Depth : 0.50 - 0.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

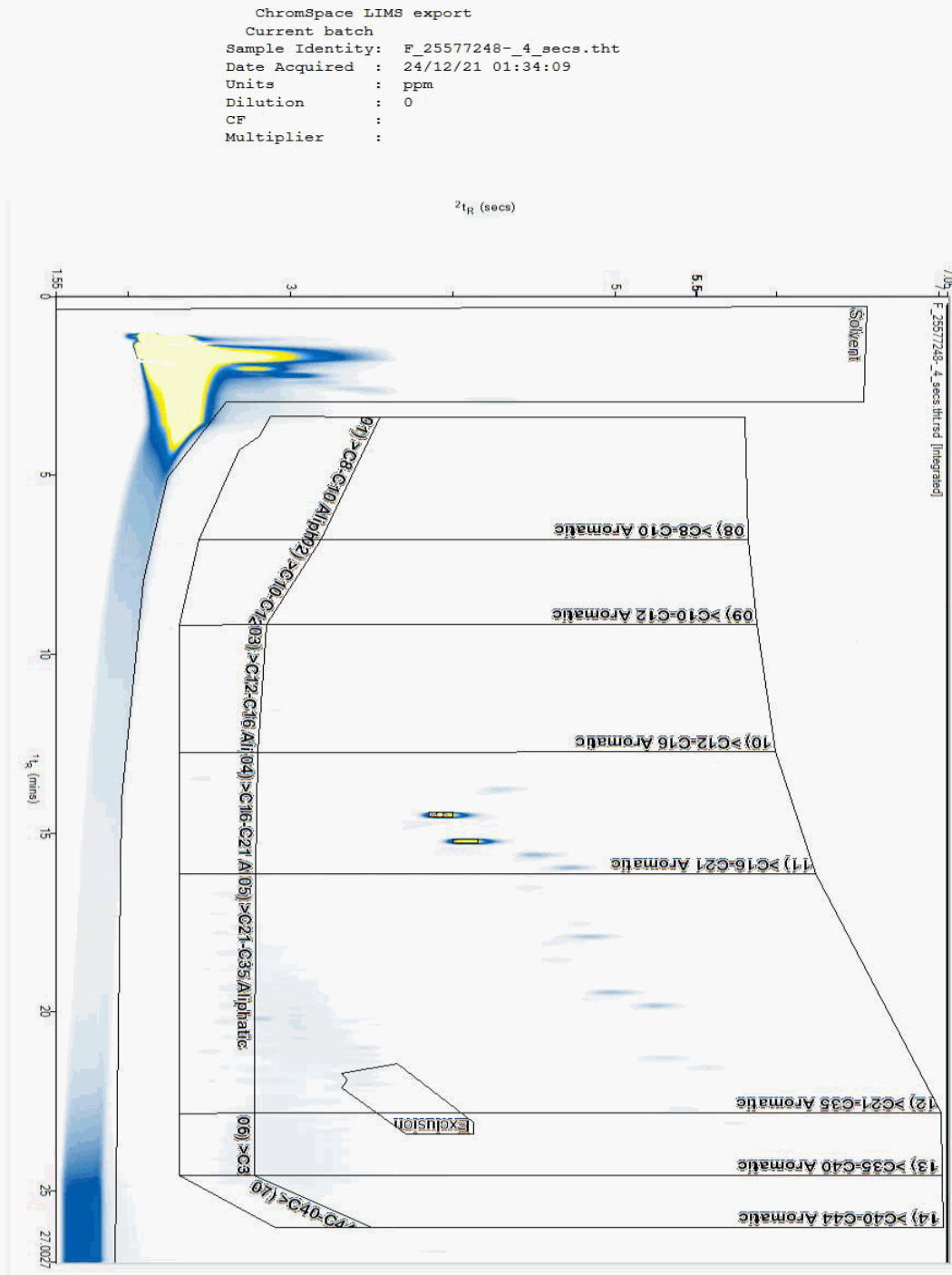
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25577248
Sample ID : BH305

Depth : 2.00 - 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

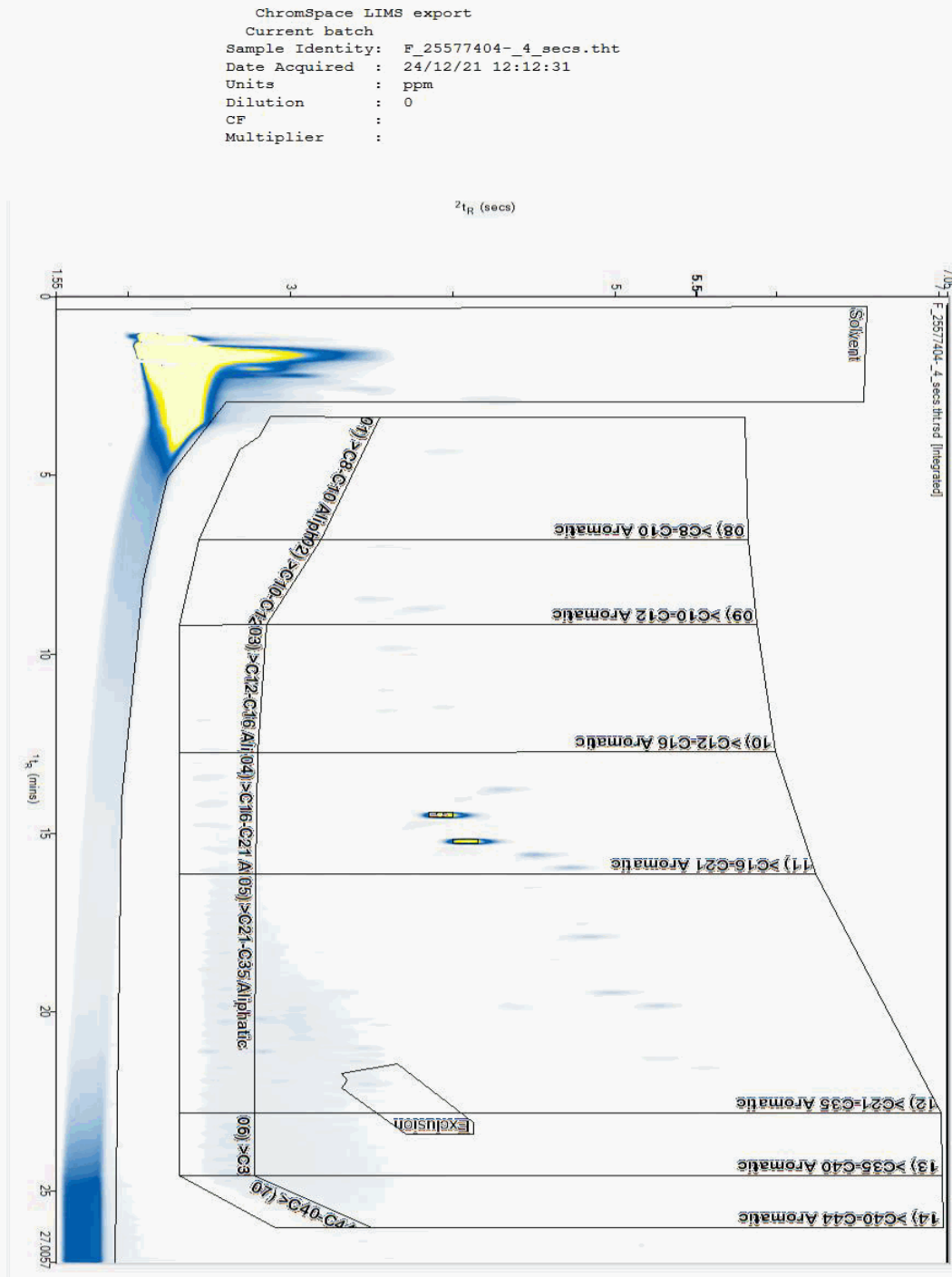
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25577404
Sample ID : BH308

Depth : 0.40 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

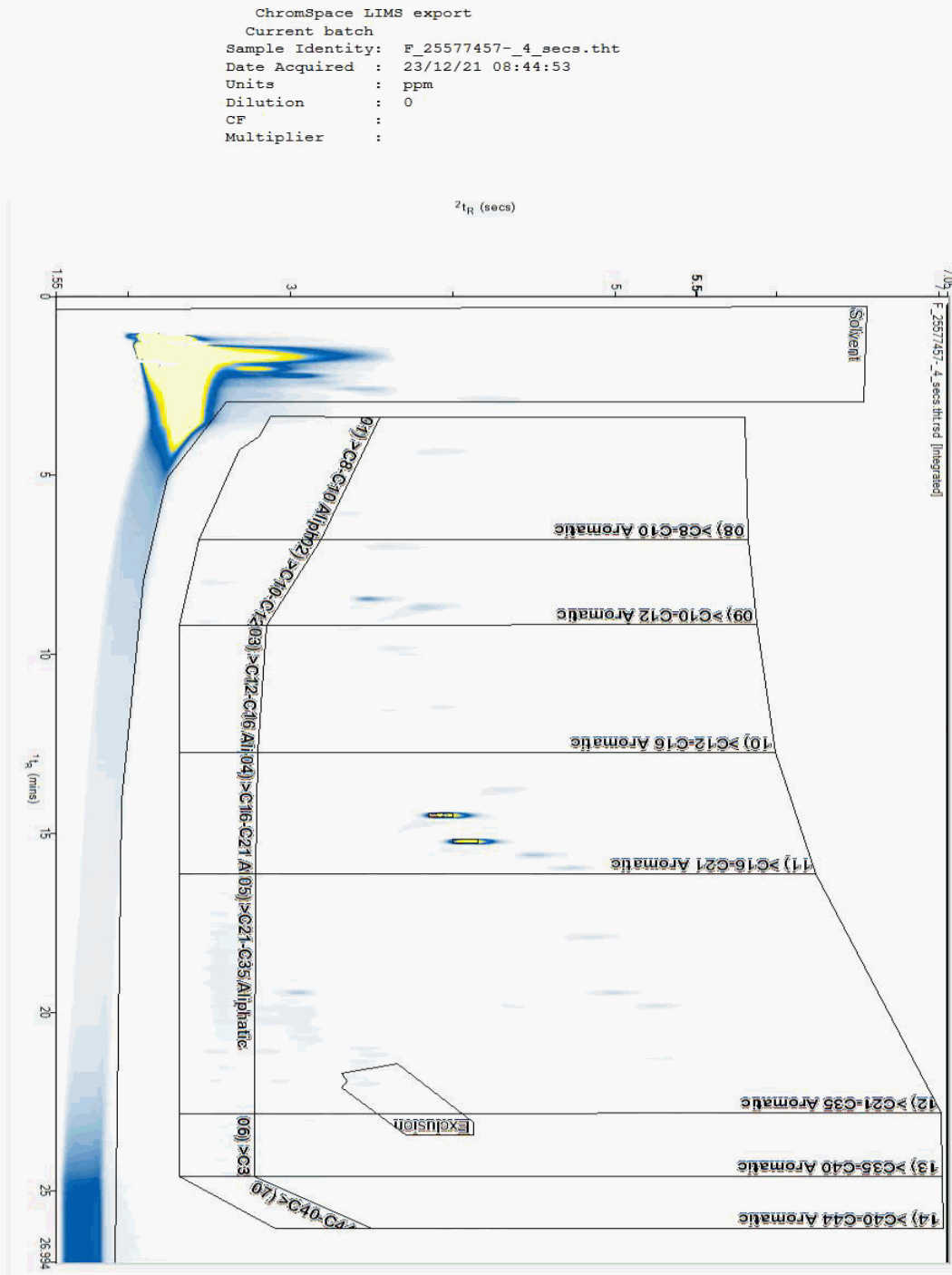
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25577457
Sample ID : BH307

Depth : 2.50 - 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

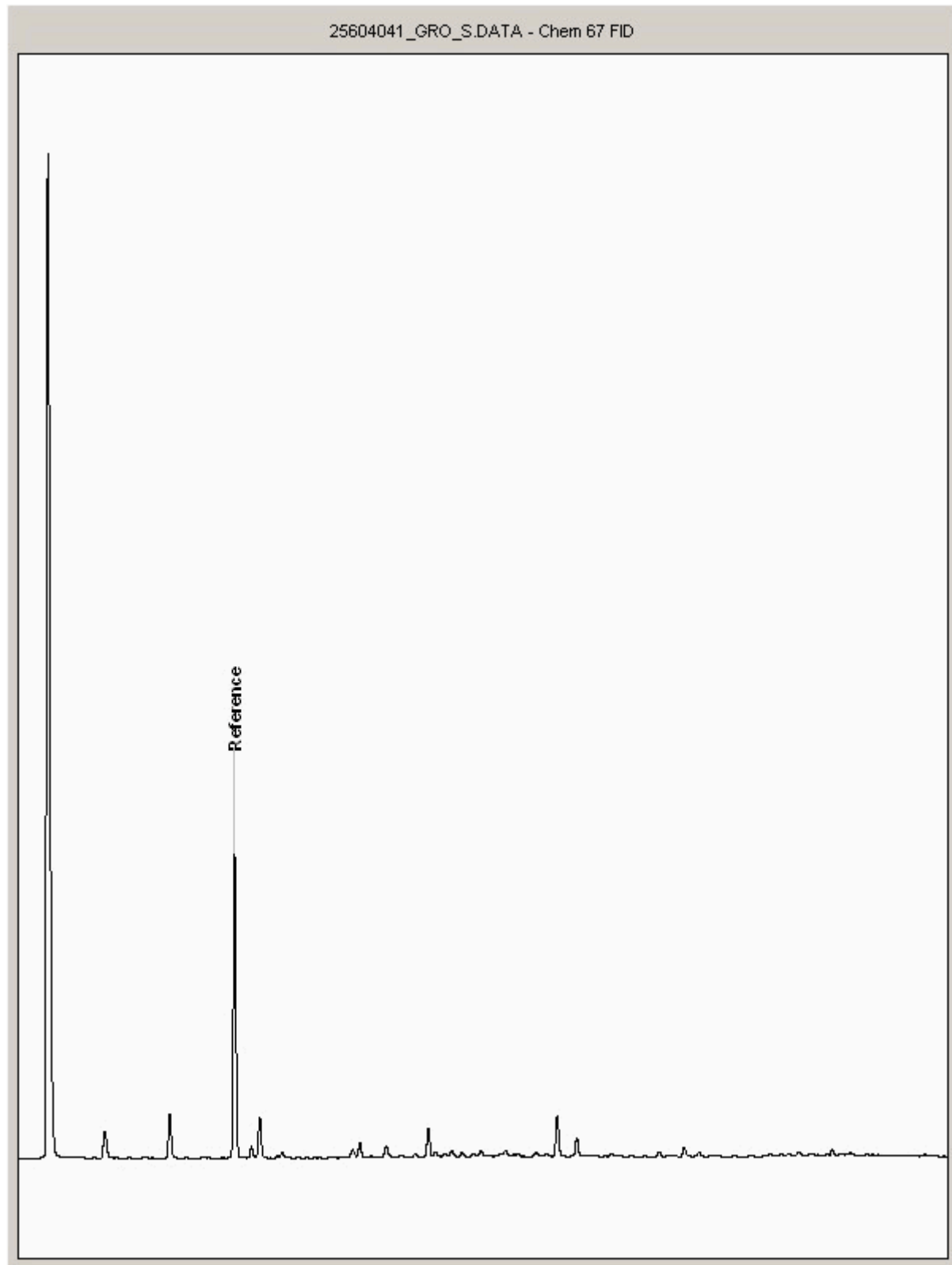
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25604041
Sample ID : BH302

Depth : 0.50 - 0.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

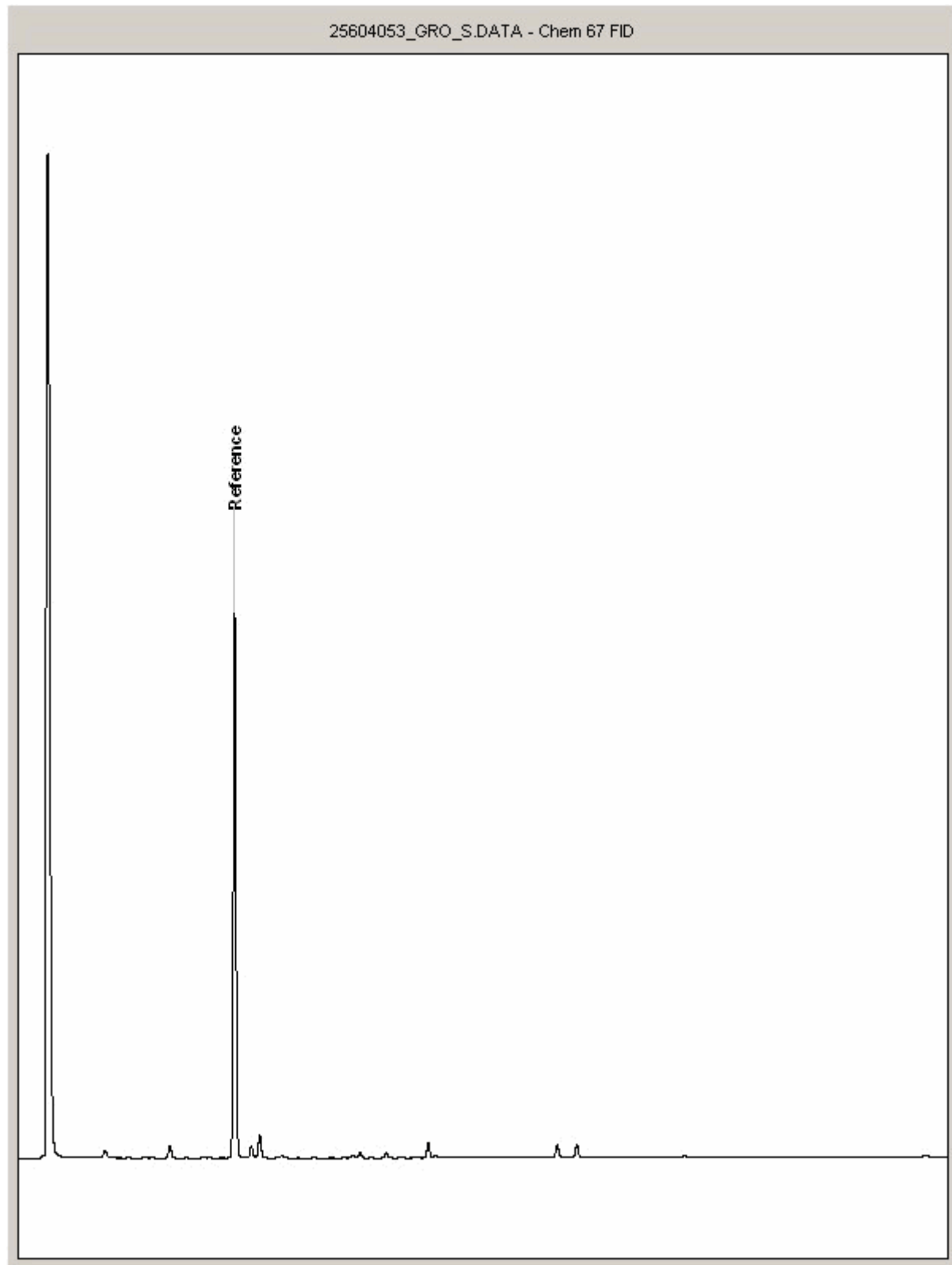
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25604053
Sample ID : BH308

Depth : 3.00 - 3.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

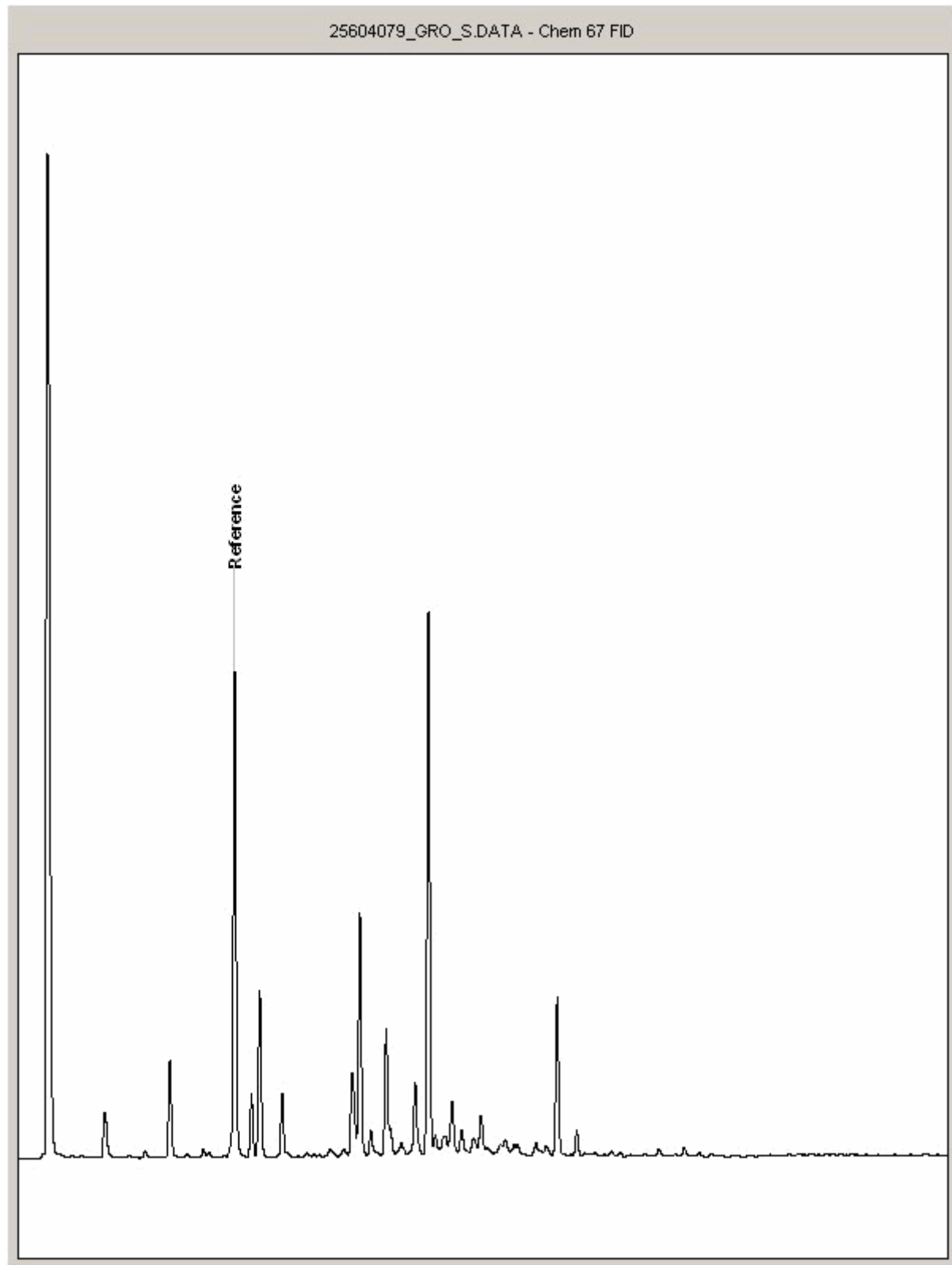
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25604079
Sample ID : BH301

Depth : 2.50 - 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

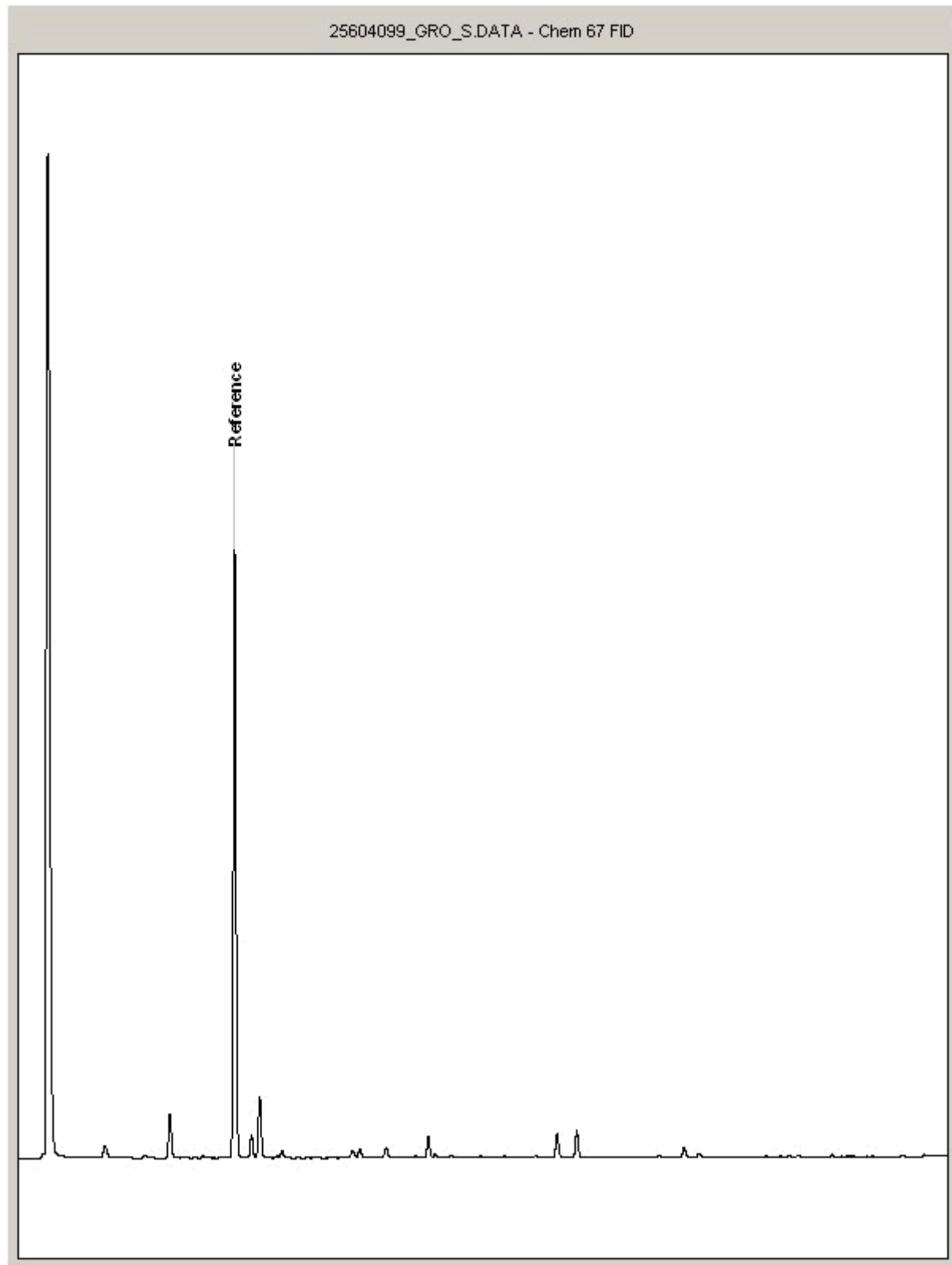
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25604099
Sample ID : BH308

Depth : 0.40 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

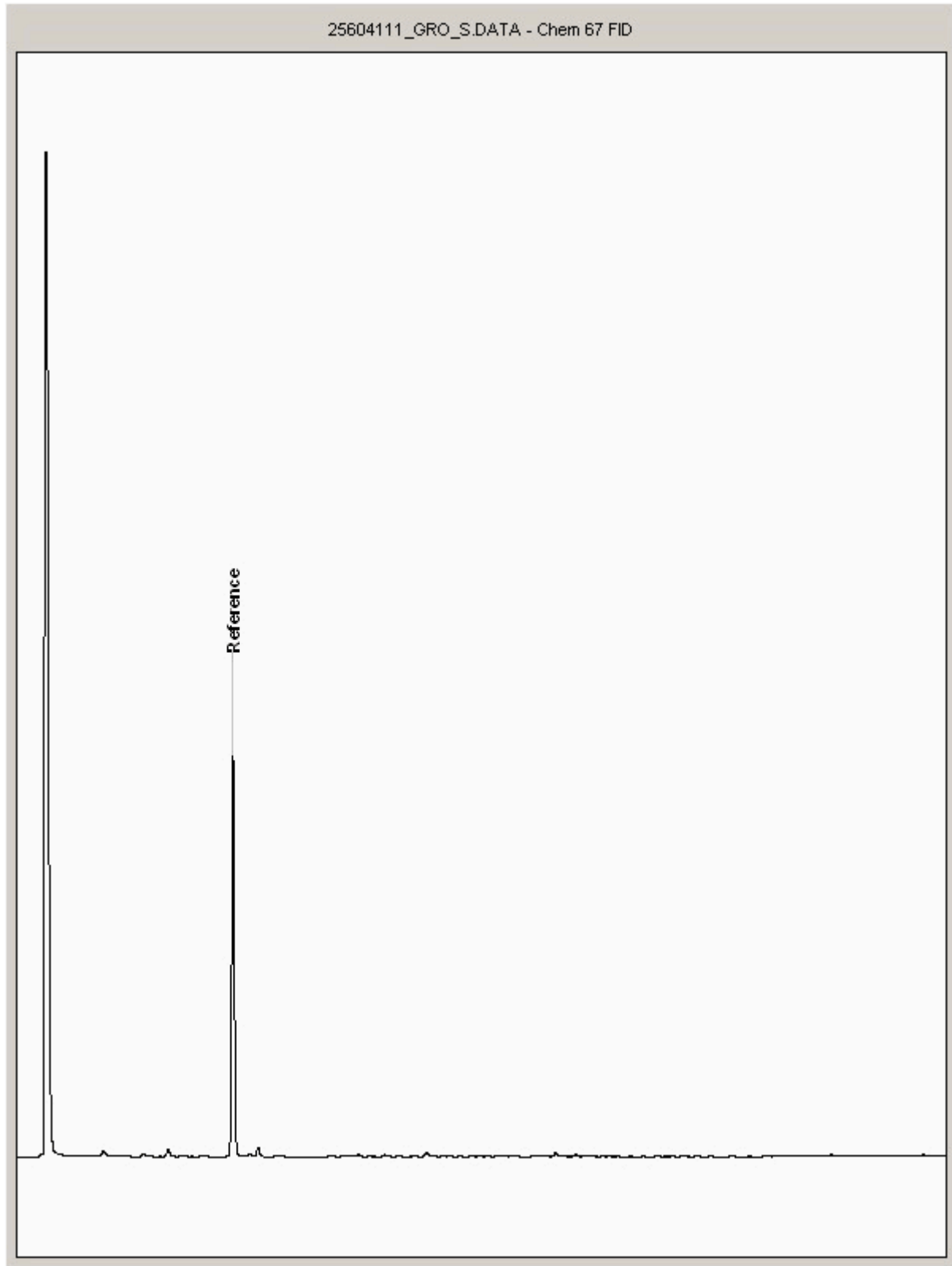
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25604111
Sample ID : BH303

Depth : 2.50 - 3.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

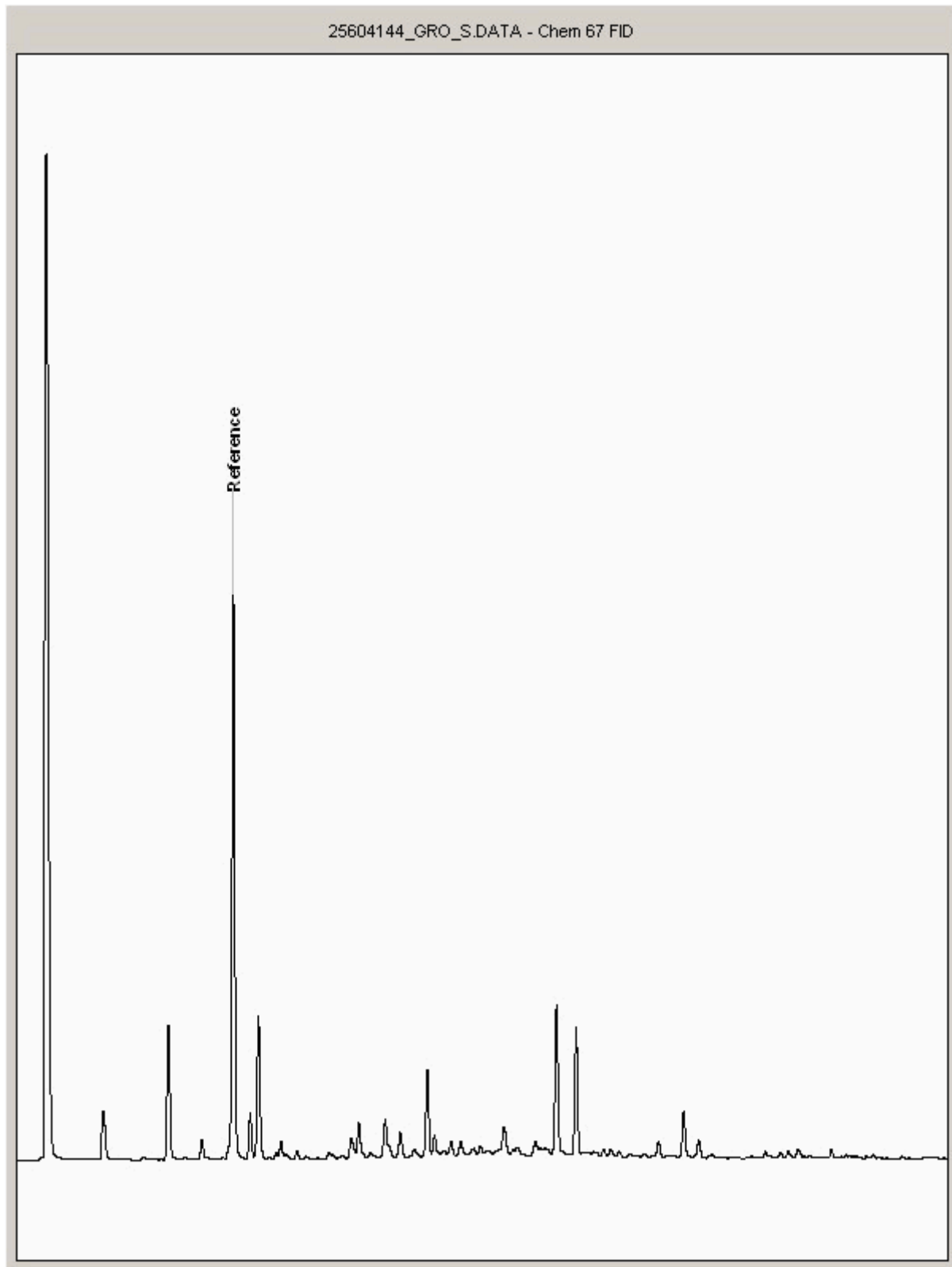
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25604144
Sample ID : BH307

Depth : 0.50 - 0.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

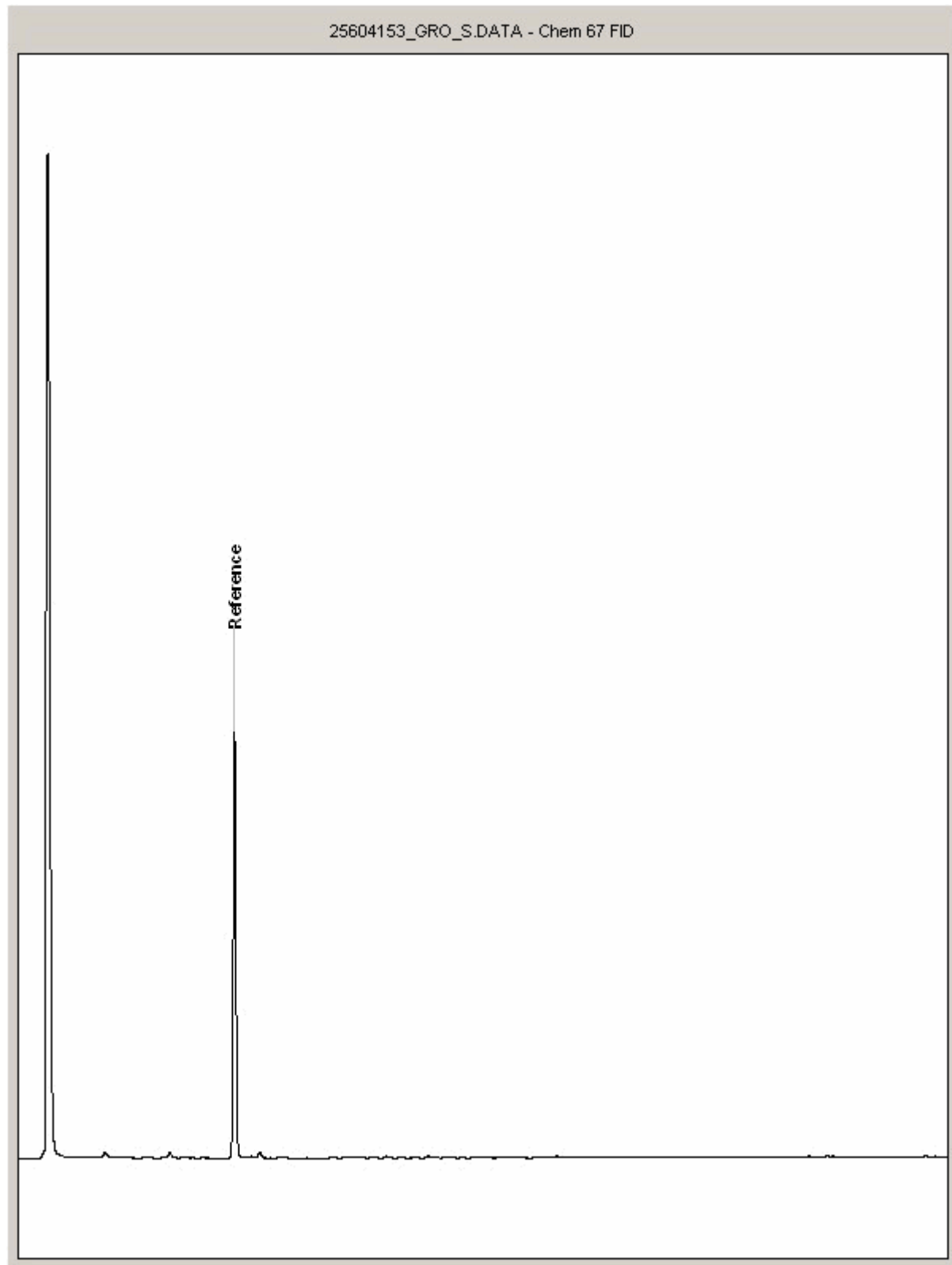
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25604153
Sample ID : BH305

Depth : 2.00 - 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211218-104
Client Ref.: 70057278

Report Number: 628613
Location: Port Talbot Harbourside

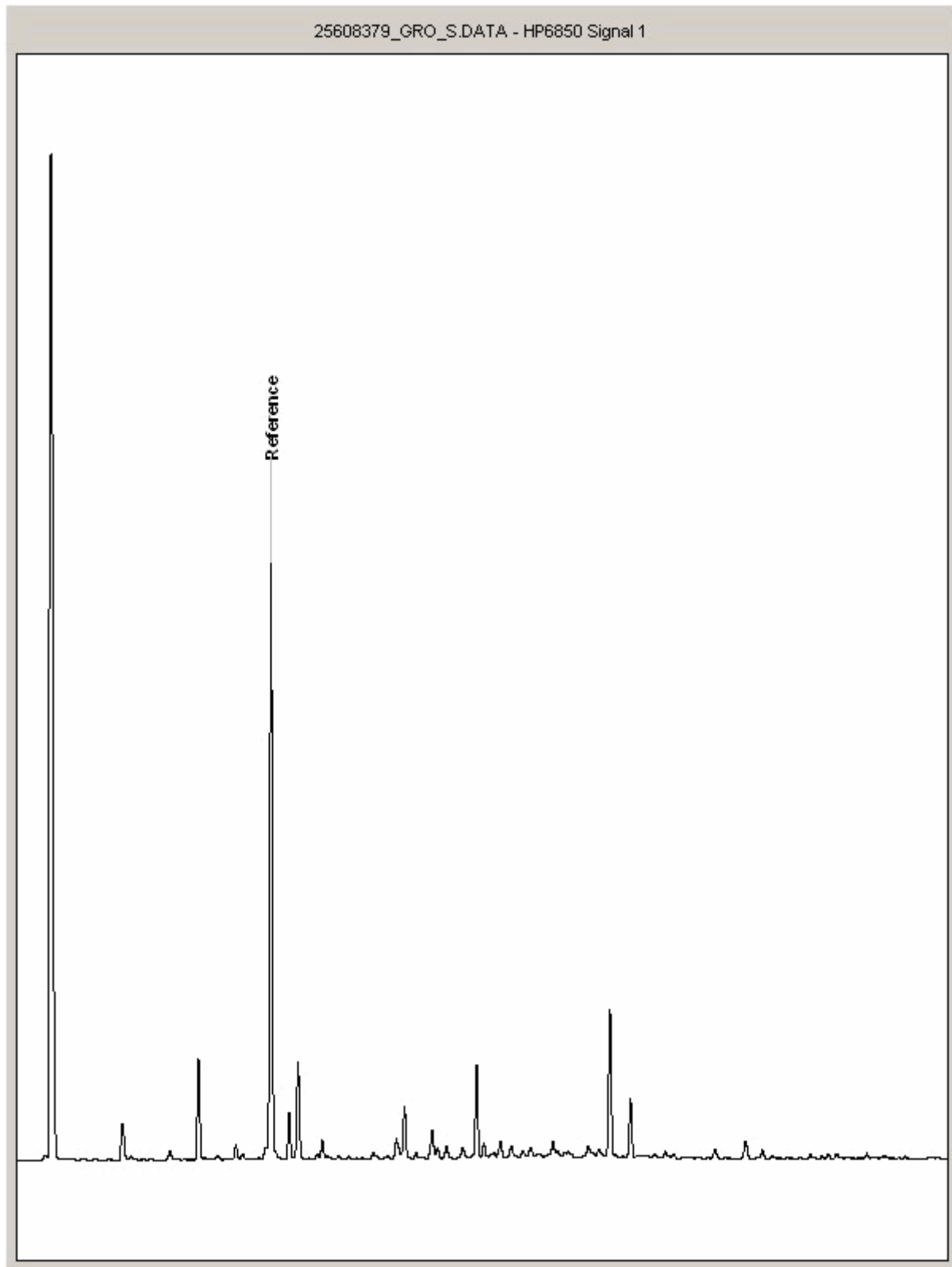
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25608379
Sample ID : BH307

Depth : 2.50 - 3.00





CERTIFICATE OF ANALYSIS

SDG:	211218-104	Client Reference:	70057278	Report Number:	628613
Location:	Port Talbot Harbourside	Order Number:	70057278-RW2	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. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. 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

20. 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.

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.

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

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



Unit 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

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

Attention: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation:	16 December 2021
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	211208-67
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	626211
Order Number:	70057278

We received 4 samples on Wednesday December 08, 2021 and 4 of these samples were scheduled for analysis which was completed on Thursday December 16, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

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: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25478654	BH307	ES	0.00 - 0.50	07/12/2021
25478664	BH307	ES	4.00 - 4.50	07/12/2021
25478672	BH310	ES	0.20 - 0.50	07/12/2021
25478678	BH310	ES	3.00 - 3.50	07/12/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

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)

Customer Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

Asbestos ID in Solid Samples

All

NDPs: 0
Tests: 2

X

X

Boron Water Soluble

All

NDPs: 0
Tests: 2

X

X

Cyanide
Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 4

X

X

X

X

EPH CWG GC (S)

All

NDPs: 0
Tests: 4

X

X

X

X

GRO by GC-FID (S)

All

NDPs: 0
Tests: 4

X

X

X

X

Hexavalent Chromium (s)

All

NDPs: 0
Tests: 4

X

X

X

X

Metals in solid samples by OES

All

NDPs: 0
Tests: 2

X

X

PAH by GCMS

All

NDPs: 0
Tests: 4

X

X

X

X

pH

All

NDPs: 0
Tests: 2

X

X

Phenols by HPLC (S)

All

NDPs: 0
Tests: 4

X

X

X

X

Sample description

All

NDPs: 0
Tests: 4

X

X

X

X

Total Organic Carbon

All

NDPs: 0
Tests: 2

X

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 4

X

X

X

X

VOC MS (S)

All

NDPs: 0
Tests: 4

X

X

X

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

Superseded Report:

Sample Descriptions

Grain Sizes

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

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
25478654	BH307	0.00 - 0.50	Dark Brown	Loamy Sand	Stones	None
25478664	BH307	4.00 - 4.50	Dark Brown	Loamy Sand	Stones	None
25478672	BH310	0.20 - 0.50	Light Brown	Loamy Sand	Stones	None
25478678	BH310	3.00 - 3.50	Dark Brown	Loamy Sand	Stones	None

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

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

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

Superseded Report:

Location: Port Talbot Harbourside

PAH by GCMS

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

Superseded Report:

TPH CWG (S)

Results Legend			Customer Sample Ref.		BH307	BH307	BH310	BH310		
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH307	BH307	BH307	BH310	BH310		
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.fit	Dissolved / filtered sample.									
tot.unfit	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								
GRO Surrogate % recovery**	%	TM089								
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089	129	104	98.6	113				
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089	0.0246	0.0137	0.0101	0.0137				
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089	5.01	0.295	0.281	1.02				
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414	3.57	<1	<1	2.14				
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414	2.88	<1	<1	<1				
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414	4.08	<1	2.12	<1				
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	30.1	<1	12.8	<1				
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414	5.26	<1	4.33	<1				
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414	45.9	<5	19.6	<5				
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414	91.5	<10	35.8	13.7				
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089	0.375	0.329	0.0638	0.0389				
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089	1.22	0.132	0.104	0.11				
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089	3.34	0.197	0.187	0.68				
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414	18.1	1.04	<1	5.06				
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414	6.99	<1	<1	2.33				
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414	4.57	<1	1.89	<1				
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	15	<1	10.7	2.2				
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	2.62	<1				
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	<1	<1				
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414	45.7	<5	16.1	11				
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414	102	<10	36.5	11.8				
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089	5.57	0.369	0.362	1.21				
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089	4.93	0.659	0.355	0.829				
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089	10.5	1.03	0.717	2.04				



CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

Superseded Report:

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	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH307ES 0.00 - 0.50 SOLID 07/12/2021 00:00:00 08/12/2021 05:00:00 211208-67 25478654 TM048	15/12/2021	Agnieszka Chelmowska	-	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	BH310ES 0.20 - 0.50 SOLID 07/12/2021 00:00:00 08/12/2021 05:00:00 211208-67 25478672 TM048	15/12/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

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
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
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: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

Superseded Report:

Test Completion Dates

Lab Sample No(s)	25478654	25478664	25478672	25478678
Customer Sample Ref.	BH307	BH307	BH310	BH310
AGS Ref.	ES	ES	ES	ES
Depth	0.00 - 0.50	4.00 - 4.50	0.20 - 0.50	3.00 - 3.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)

Asbestos ID in Solid Samples	15-Dec-2021		15-Dec-2021	
Boron Water Soluble	14-Dec-2021		15-Dec-2021	
Cyanide Comp/Free/Total/Thiocyanate	10-Dec-2021	13-Dec-2021	10-Dec-2021	10-Dec-2021
EPH CWG GC (S)	10-Dec-2021	10-Dec-2021	10-Dec-2021	10-Dec-2021
GRO by GC-FID (S)	16-Dec-2021	16-Dec-2021	14-Dec-2021	16-Dec-2021
Hexavalent Chromium (s)	15-Dec-2021	15-Dec-2021	15-Dec-2021	13-Dec-2021
Metals in solid samples by OES	13-Dec-2021		13-Dec-2021	
PAH by GCMS	13-Dec-2021	13-Dec-2021	13-Dec-2021	13-Dec-2021
pH	10-Dec-2021		10-Dec-2021	
Phenols by HPLC (S)	14-Dec-2021	13-Dec-2021	13-Dec-2021	14-Dec-2021
Sample description	09-Dec-2021	09-Dec-2021	09-Dec-2021	09-Dec-2021
Total Organic Carbon	14-Dec-2021		14-Dec-2021	
TPH CWG GC (S)	16-Dec-2021	16-Dec-2021	14-Dec-2021	16-Dec-2021
VOC MS (S)	16-Dec-2021	16-Dec-2021	15-Dec-2021	16-Dec-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

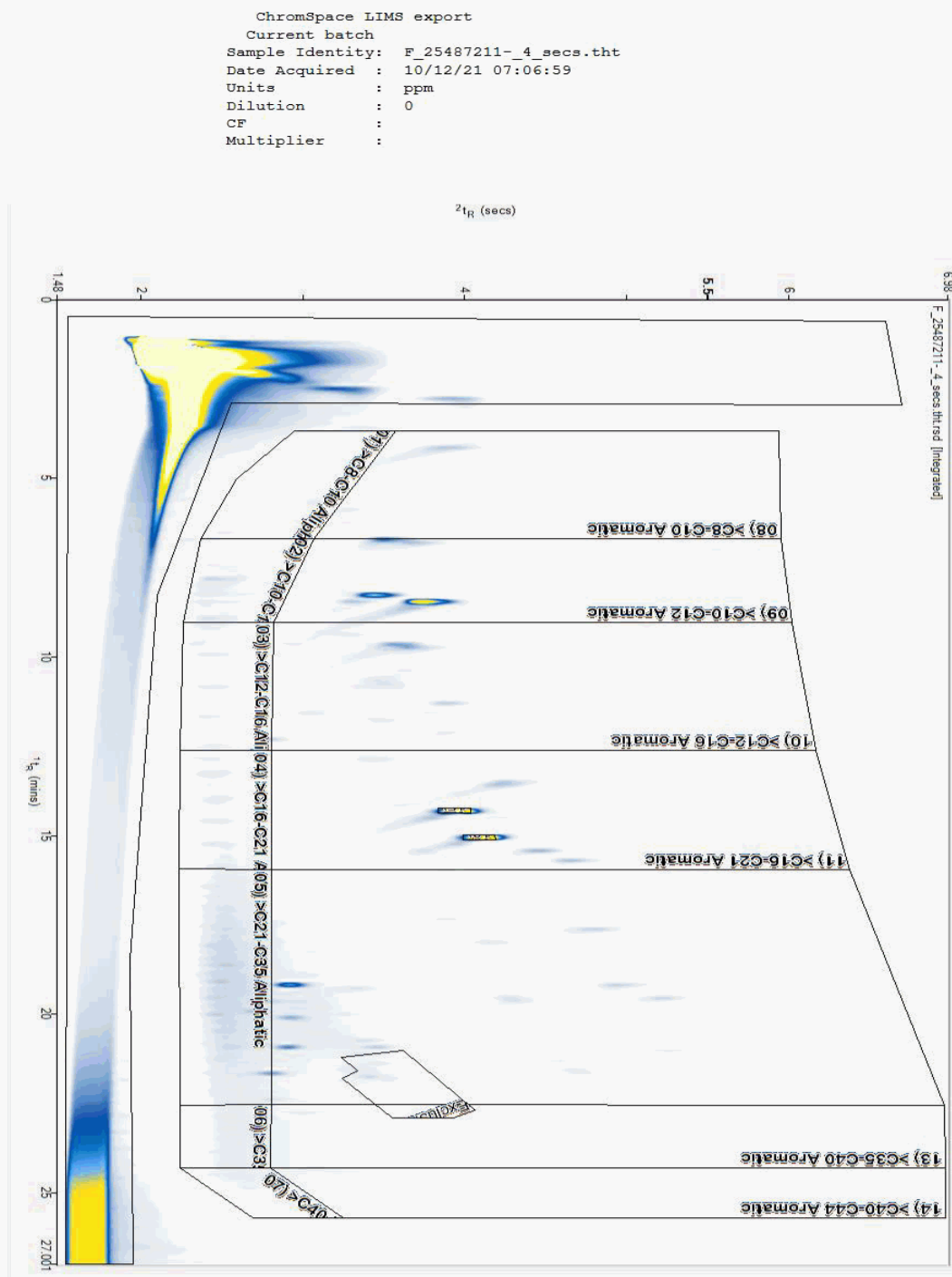
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25487211
Sample ID : BH307

Depth : 0.00 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

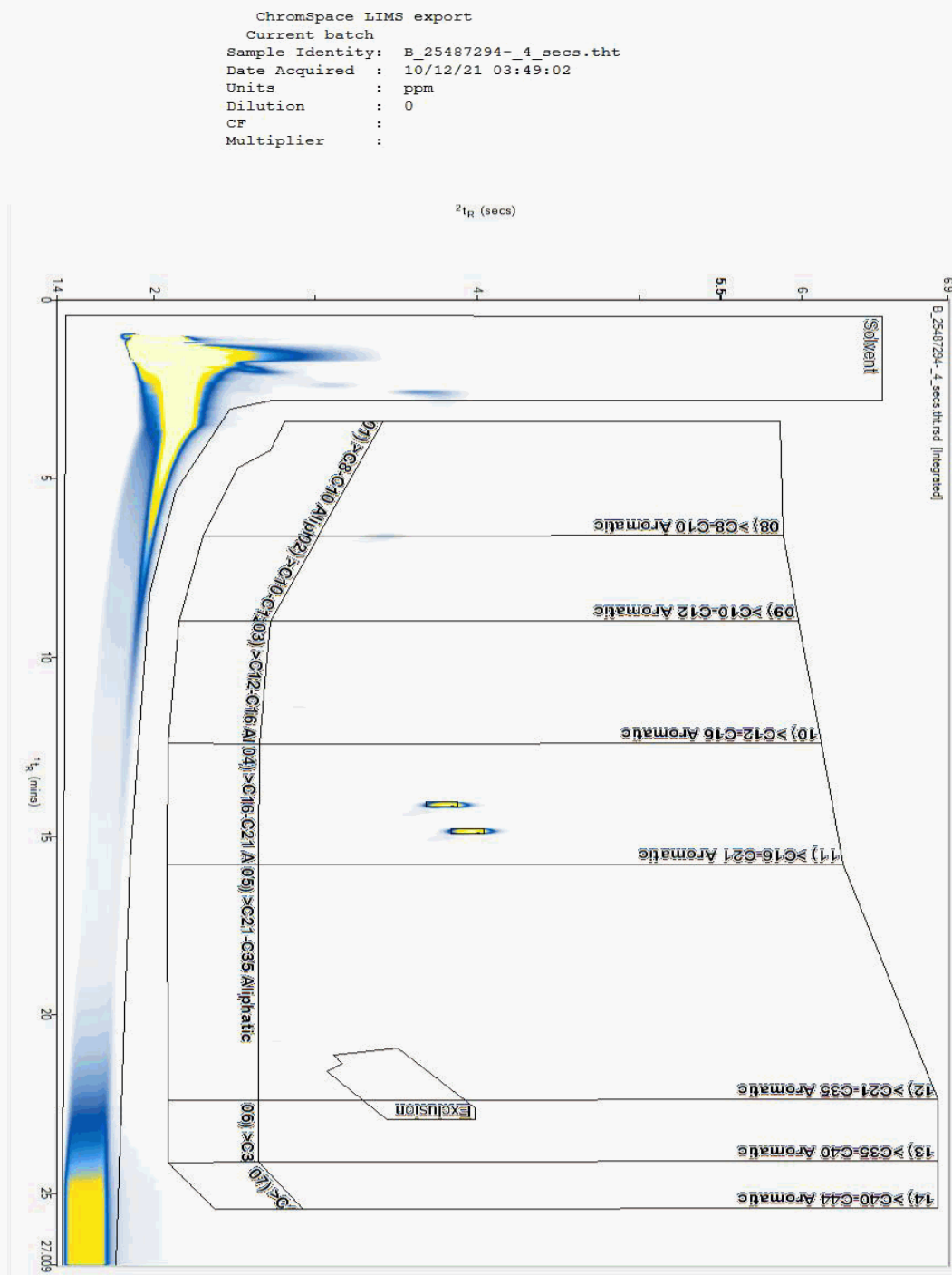
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25487294
Sample ID : BH307

Depth : 4.00 - 4.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

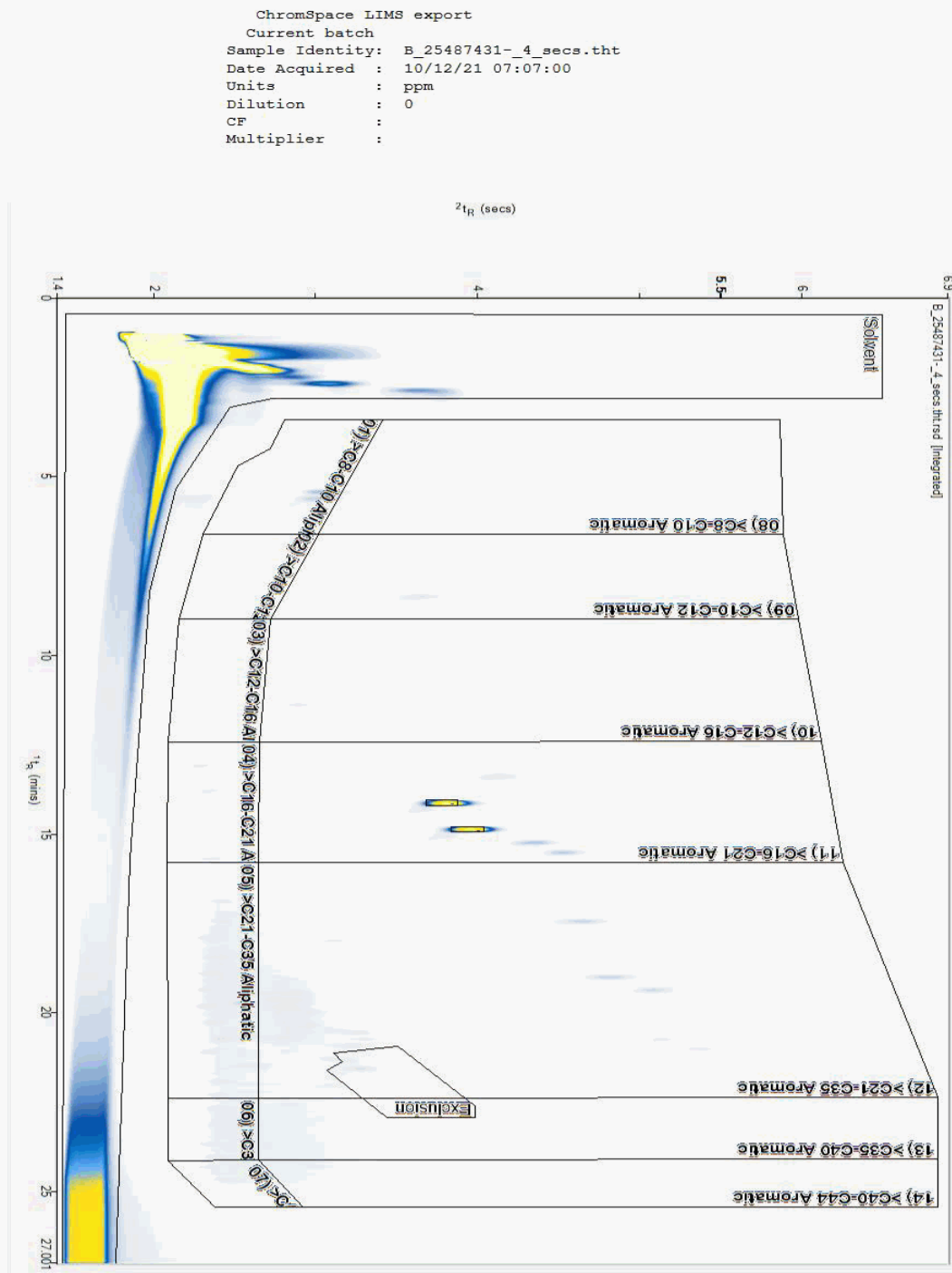
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25487431
Sample ID : BH310

Depth : 0.20 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

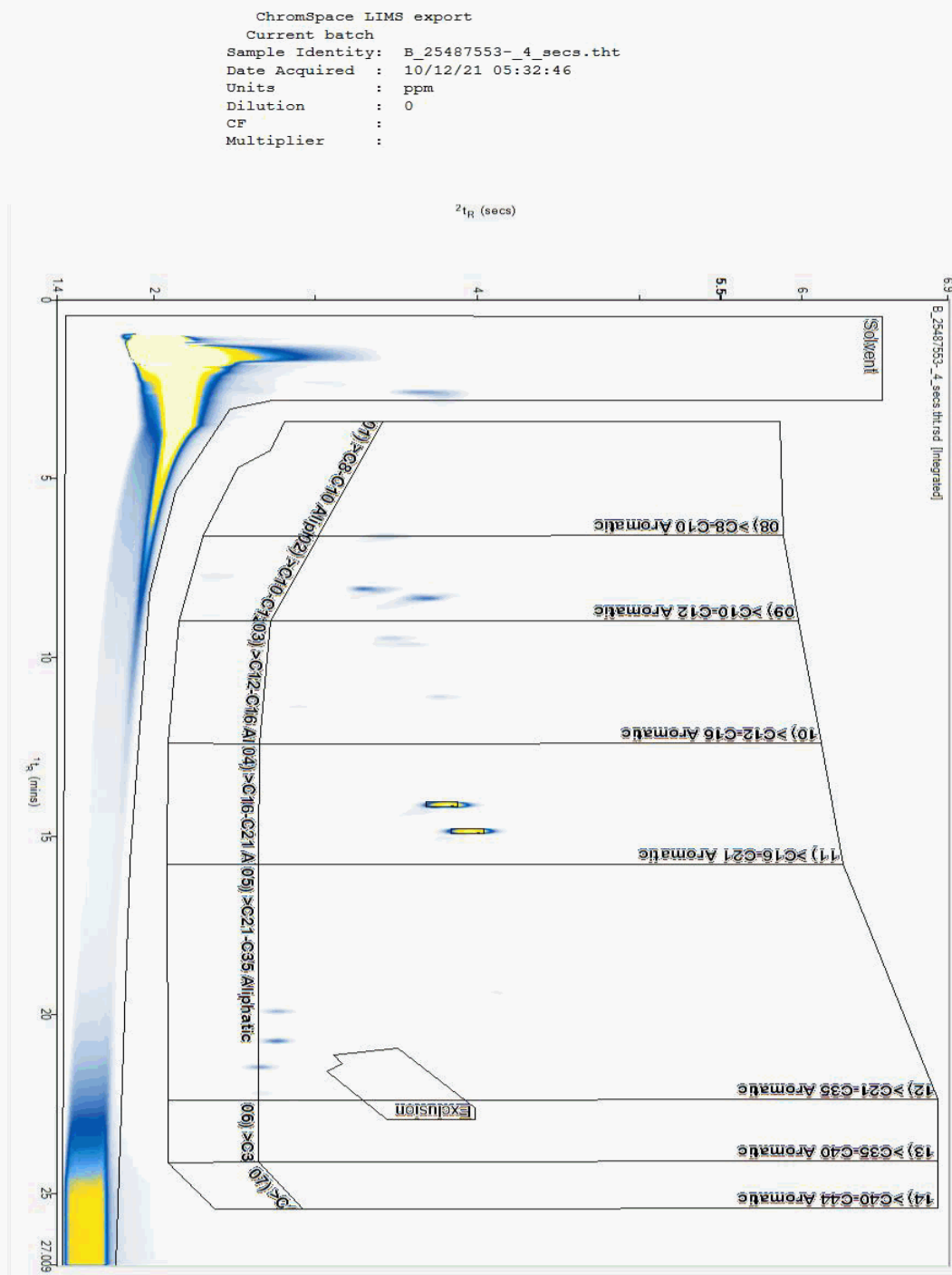
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 25487553
Sample ID : BH310

Depth : 3.00 - 3.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

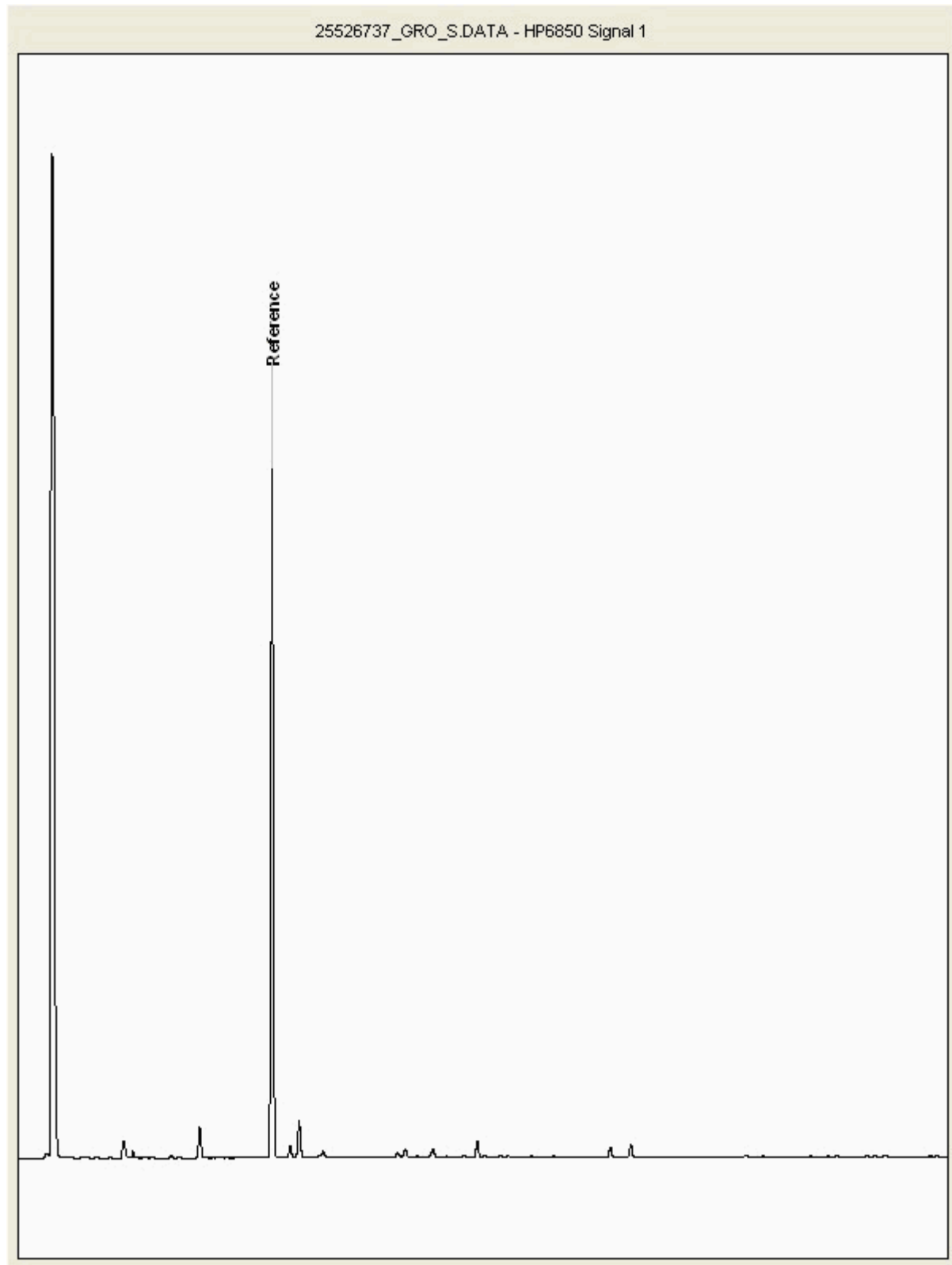
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25526737
Sample ID : BH310

Depth : 0.20 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

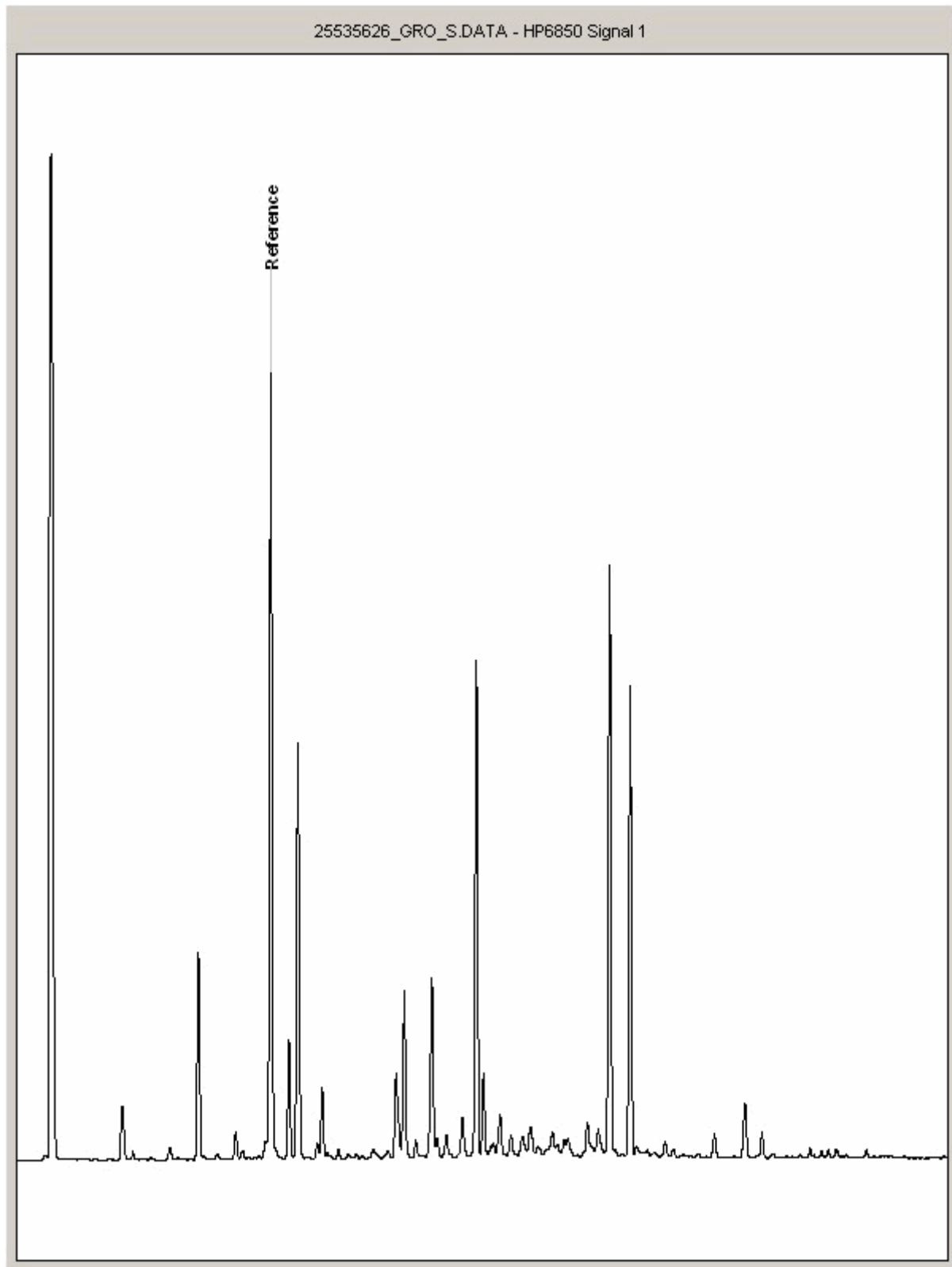
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25535626
Sample ID : BH307

Depth : 0.00 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

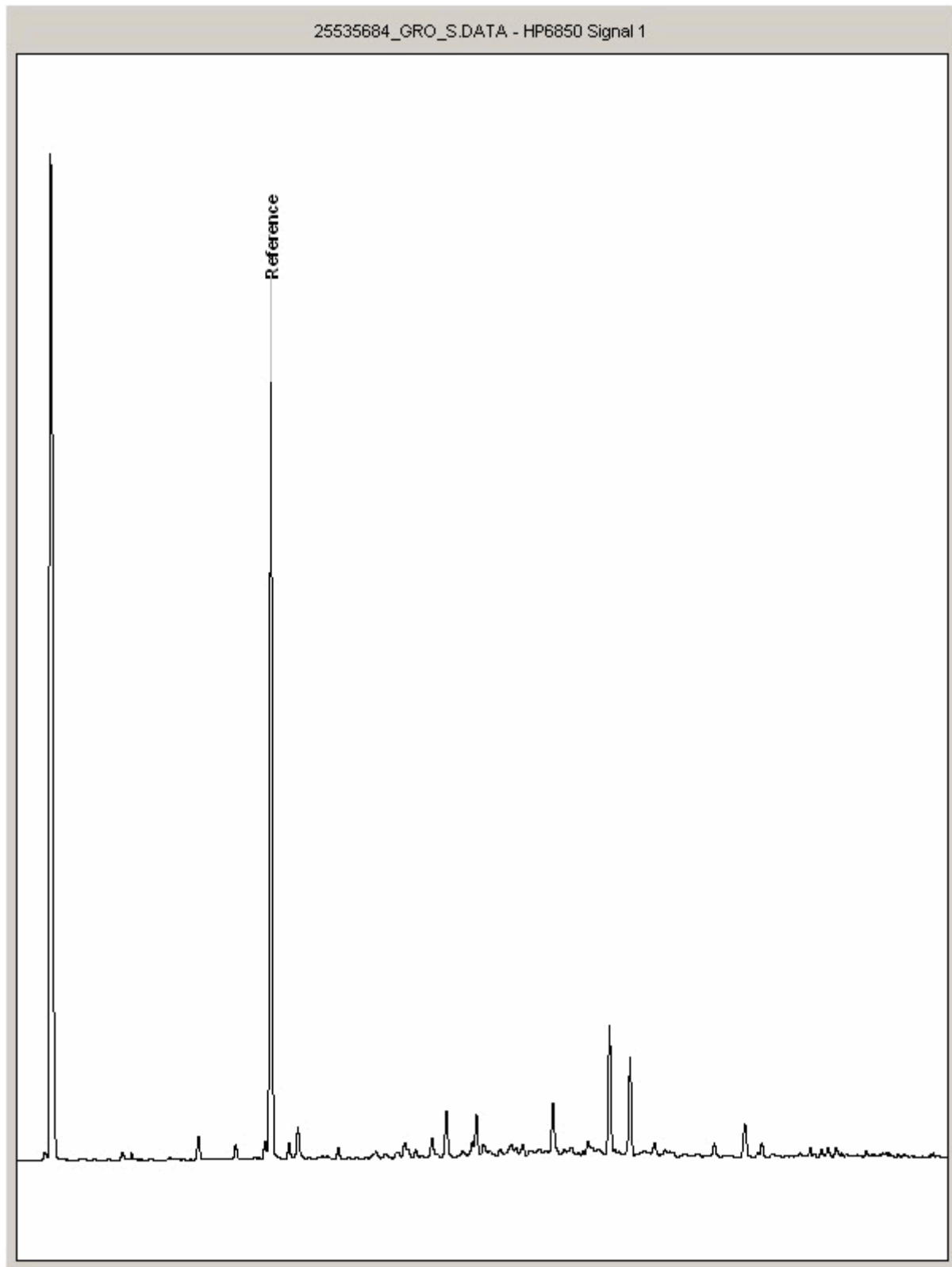
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25535684
Sample ID : BH310

Depth : 3.00 - 3.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 211208-67
Client Ref.: 70057278

Report Number: 626211
Location: Port Talbot Harbourside

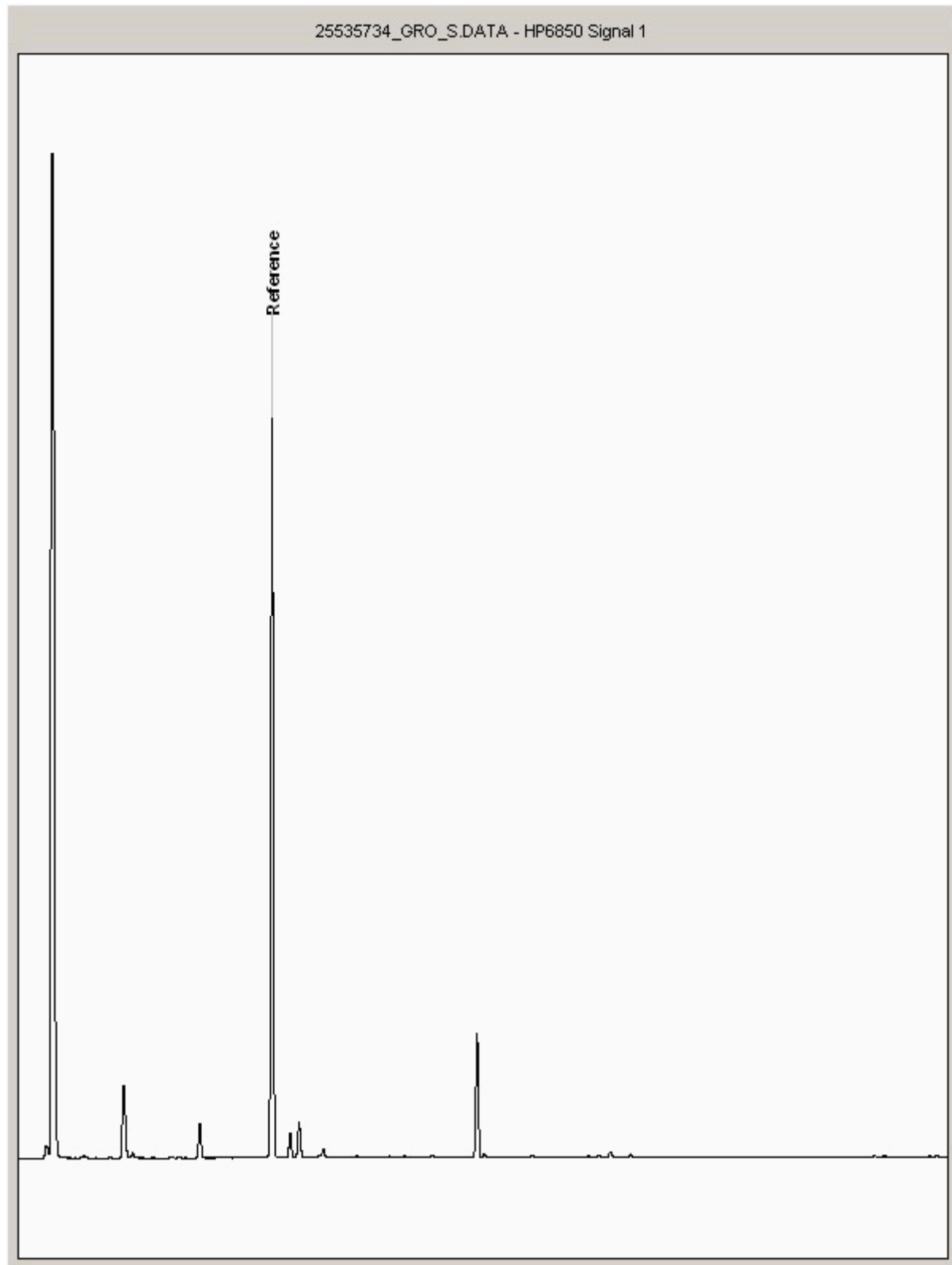
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 25535734
Sample ID : BH307

Depth : 4.00 - 4.50





CERTIFICATE OF ANALYSIS

SDG:	211208-67	Client Reference:	70057278	Report Number:	626211
Location:	Port Talbot Harbourside	Order Number:	70057278	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. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. 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

20. 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.

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.

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 D.5

VALIDATION BOREHOLES -
GROUNDWATER





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: Rhys Evans

CERTIFICATE OF ANALYSIS

Date of report Generation:	24 March 2022
Customer:	WSP PB BBC
Sample Delivery Group (SDG):	220314-8
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	639183
Order Number:	70057278-RW2

We received 10 samples on Friday March 11, 2022 and 10 of these samples were scheduled for analysis which was completed on Thursday March 24, 2022. 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.

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.

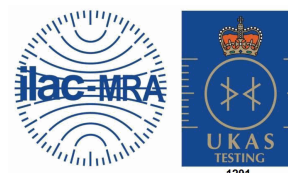
Incorrect sampling dates and/or sample information will affect the validity of results.

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: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
25964393	BH301	ES	0.00 - 0.00	10/03/2022
25964414	BH302	ES	0.00 - 0.00	10/03/2022
25964422	BH303	ES	0.00 - 0.00	10/03/2022
25964428	BH304	ES	0.00 - 0.00	10/03/2022
25964436	BH305	ES	0.00 - 0.00	10/03/2022
25964448	BH306	ES	0.00 - 0.00	10/03/2022
25964466	BH307	ES	0.00 - 0.00	10/03/2022
25964477	BH308	ES	0.00 - 0.00	10/03/2022
25964402	BH309	ES	0.00 - 0.00	10/03/2022
25964408	BH310	ES	0.00 - 0.00	10/03/2022

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

25964408	BH310	ES	0.00 - 0.00	Vial (ALE297)	GW				X									X	
25964402	BH309	ES	0.00 - 0.00	H2SO4 (ALE244)	GW									X					
				0.5l glass bottle (ALE227)	GW					X									
				Vial (ALE297)	GW				X									X	
				H2SO4 (ALE244)	GW									X					
				0.5l glass bottle (ALE227)	GW					X									
				Vial (ALE297)	GW						X								
25964477	BH308	ES	0.00 - 0.00	H2SO4 (ALE244)	GW									X				X	
				0.5l glass bottle (ALE227)	GW									X					
				Vial (ALE297)	GW					X									

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

VOC MS (W)[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
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
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Test Completion Dates

Lab Sample No(s)	25964393	25964414	25964422	25964428	25964436	25964448	25964466	25964477	25964402	25964408
Customer Sample Ref.	BH301	BH302	BH303	BH304	BH305	BH306	BH307	BH308	BH309	BH310
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
EPH CWG (Aliphatic) Aqueous GC (W)	24-Mar-2022	17-Mar-2022	21-Mar-2022	21-Mar-2022	24-Mar-2022	24-Mar-2022	24-Mar-2022	21-Mar-2022	24-Mar-2022	17-Mar-2022
EPH CWG (Aromatic) Aqueous GC (W)	24-Mar-2022	17-Mar-2022	21-Mar-2022	21-Mar-2022	24-Mar-2022	24-Mar-2022	24-Mar-2022	21-Mar-2022	24-Mar-2022	17-Mar-2022
GRO by GC-FID (W)	18-Mar-2022	18-Mar-2022	21-Mar-2022	18-Mar-2022	18-Mar-2022	18-Mar-2022	21-Mar-2022	18-Mar-2022	18-Mar-2022	18-Mar-2022
PAH Spec MS - Aqueous (W)	17-Mar-2022	16-Mar-2022	18-Mar-2022	17-Mar-2022	17-Mar-2022	17-Mar-2022	18-Mar-2022	17-Mar-2022	18-Mar-2022	16-Mar-2022
Phenols by HPLC (W)	16-Mar-2022	16-Mar-2022	16-Mar-2022	16-Mar-2022	16-Mar-2022	16-Mar-2022	16-Mar-2022	16-Mar-2022	16-Mar-2022	16-Mar-2022
TPH CWG (W)	24-Mar-2022	18-Mar-2022	21-Mar-2022	22-Mar-2022	22-Mar-2022	24-Mar-2022	24-Mar-2022	21-Mar-2022	24-Mar-2022	18-Mar-2022
VOC MS (W)	18-Mar-2022	18-Mar-2022	21-Mar-2022	18-Mar-2022	21-Mar-2022	18-Mar-2022	21-Mar-2022	21-Mar-2022	18-Mar-2022	21-Mar-2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

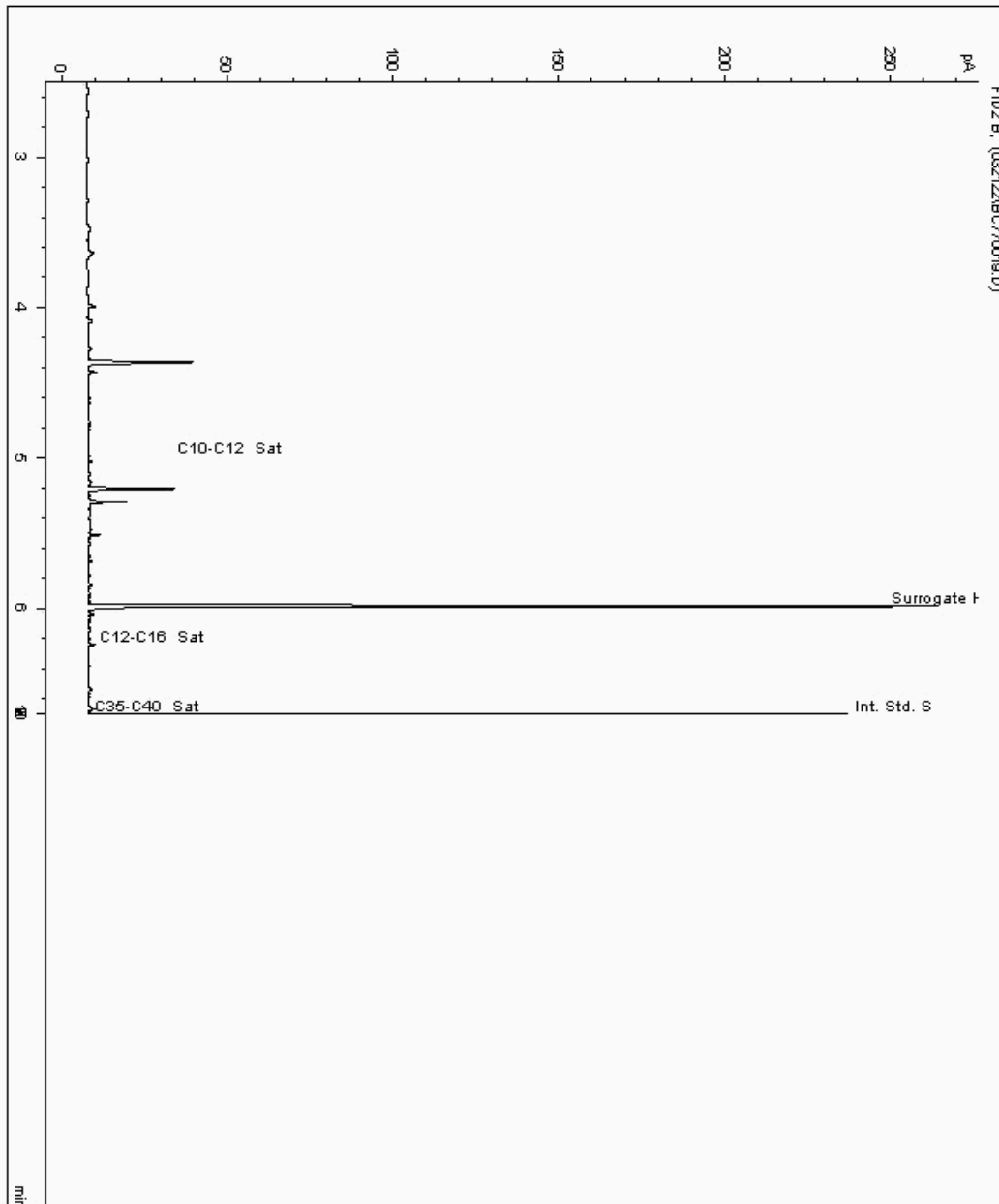
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 25968552
Sample ID : BH308

Depth : 0.00 - 0.00

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

Sample Identity: 24233924-
Date Acquired : 3/21/2022 6:21:13 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

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

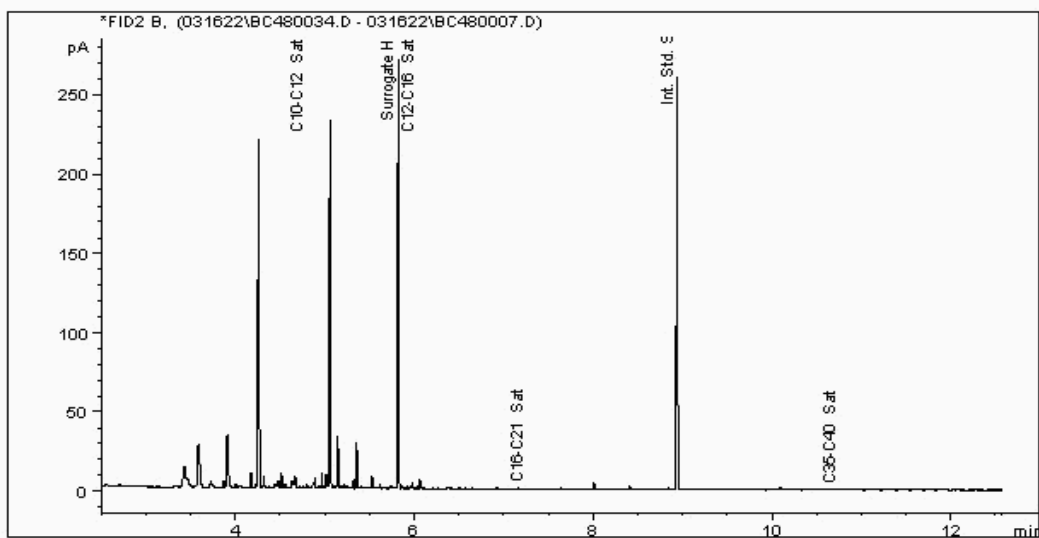
Sample No : 25968579
Sample ID : BH310

Depth : 0.00 - 0.00

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

Sample Identity: 24233848-
Date Acquired : 17/03/2022 03:25:46 PM
Units : ppb
Dilution : SE BH310[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	477.8	0.608
2	Surrogate H	205.8	0.274
3	C12-C16 Sat	39.4	0.050
4	C16-C21 Sat	5.5	0.007
5	Int. Std. S	209.4	0.266
6	C21-C35 Sat	23.6	0.031
7	C35-C40 Sat	3.7	0.006
Total Peak Area		965.2	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

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

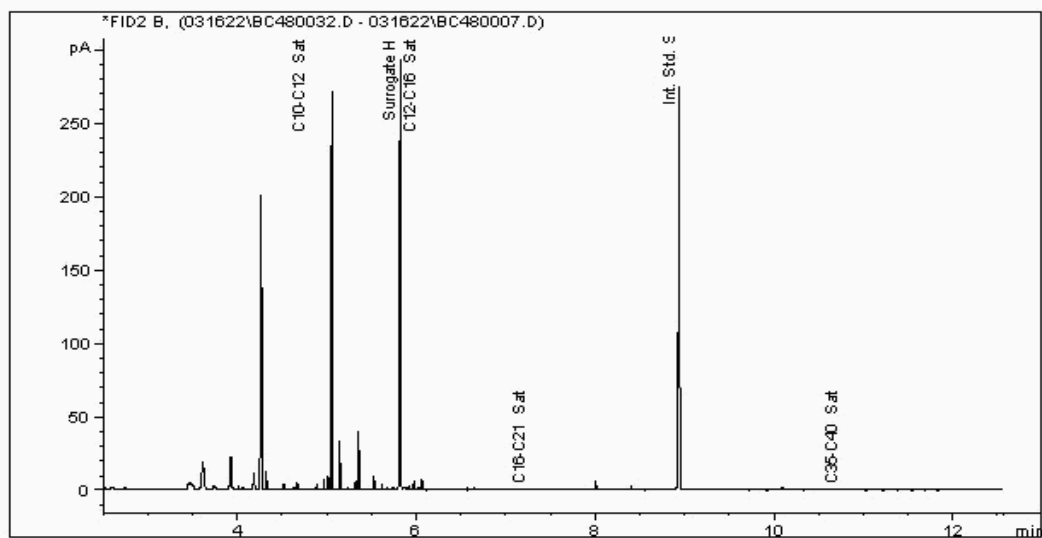
Sample No : 25968583
Sample ID : BH302

Depth : 0.00 - 0.00

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

Sample Identity: 24233857-
Date Acquired : 17/03/2022 02:39:19 PM
Units : ppb
Dilution : SE BH302[0.00 - 0.00] ->
CF : 1
Multiplier : 0.026

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	450.1	0.513
2	Surrogate H	244.3	0.292
3	C12-C16 Sat	56.8	0.065
4	C16-C21 Sat	18.5	0.020
5	Int. Std. S	231.2	0.263
6	C21-C35 Sat	42.1	0.049
7	C35-C40 Sat	0.2	0.000
Total Peak Area		1043.1	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

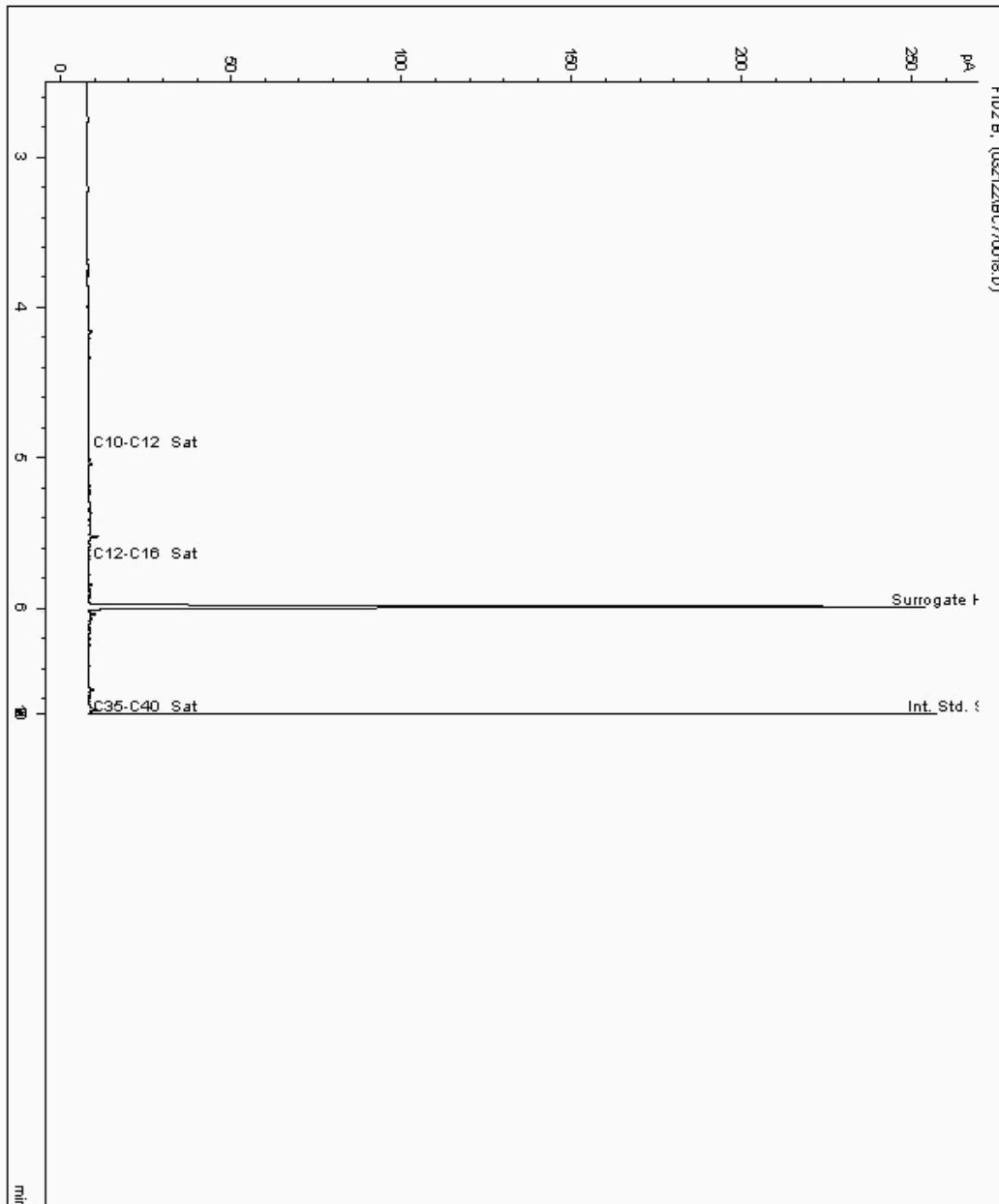
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 25968589
Sample ID : BH304

Depth : 0.00 - 0.00

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

Sample Identity: 24233882-
Date Acquired : 3/21/2022 6:01:00 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

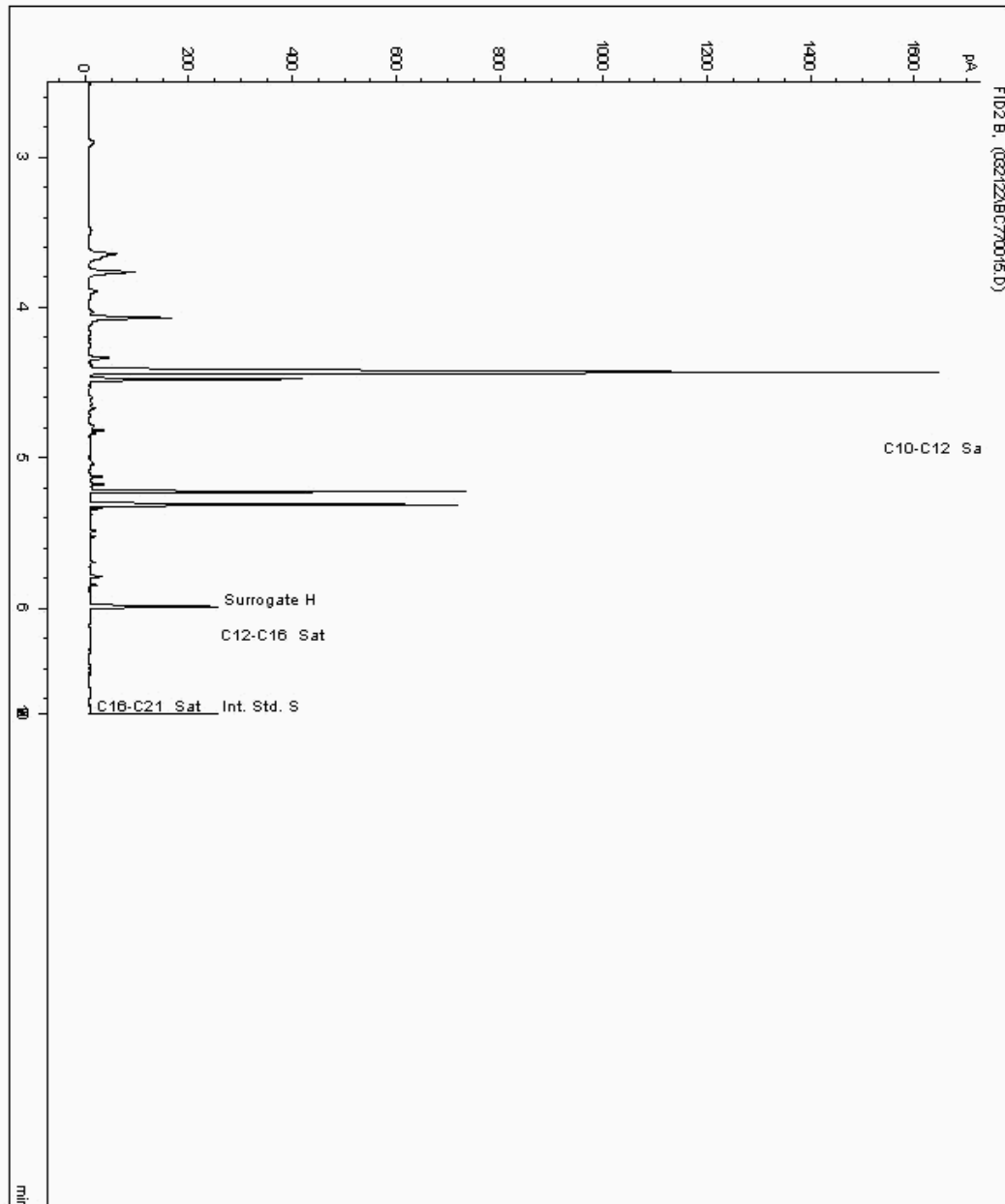
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 25968606
Sample ID : BH303

Depth : 0.00 - 0.00

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

Sample Identity: 24233866-
Date Acquired : 3/21/2022 4:52:18 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

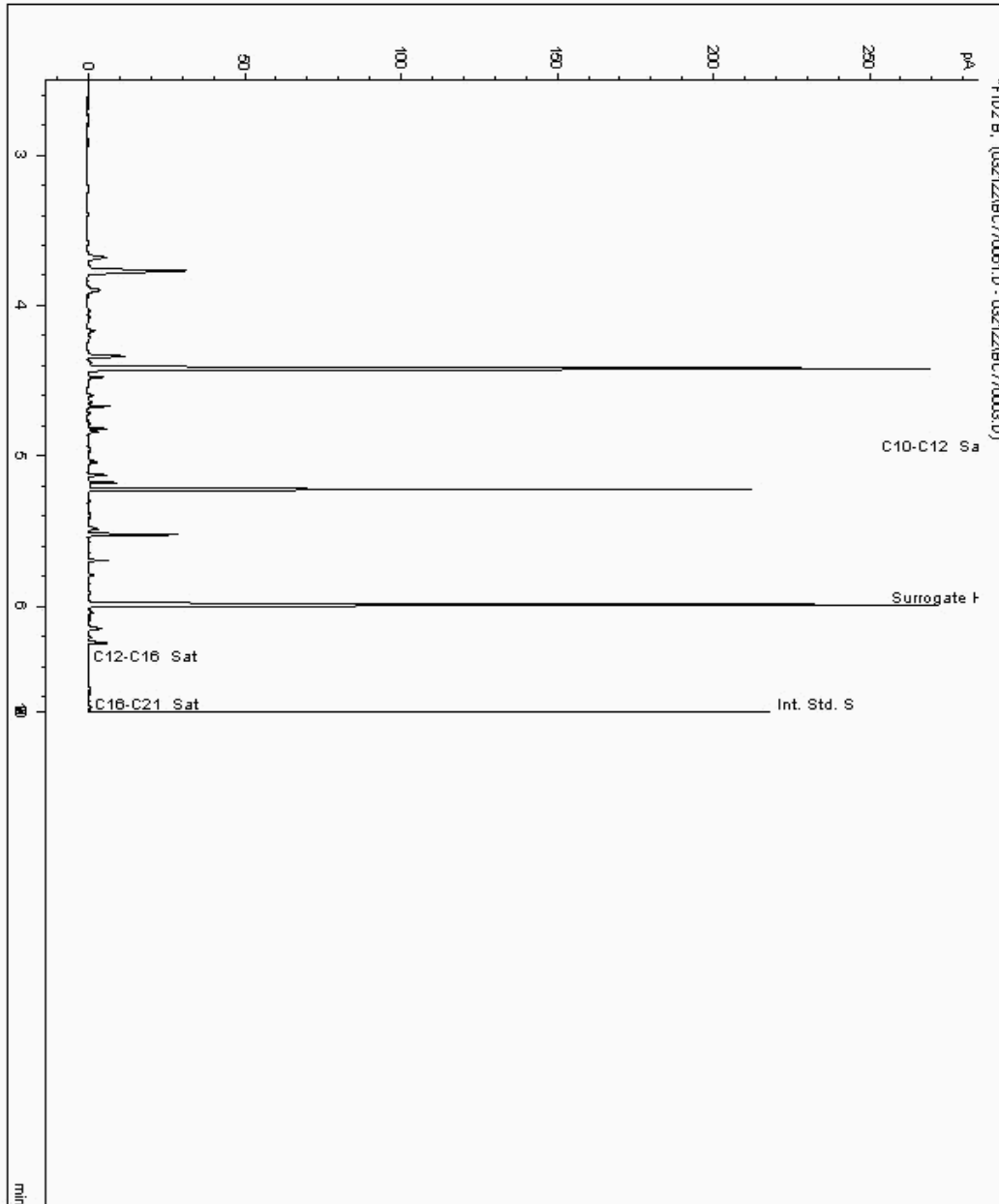
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26003497
Sample ID : BH305

Depth : 0.00 - 0.00

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

Sample Identity: 24268542-
Date Acquired : 3/22/2022 10:57:08 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

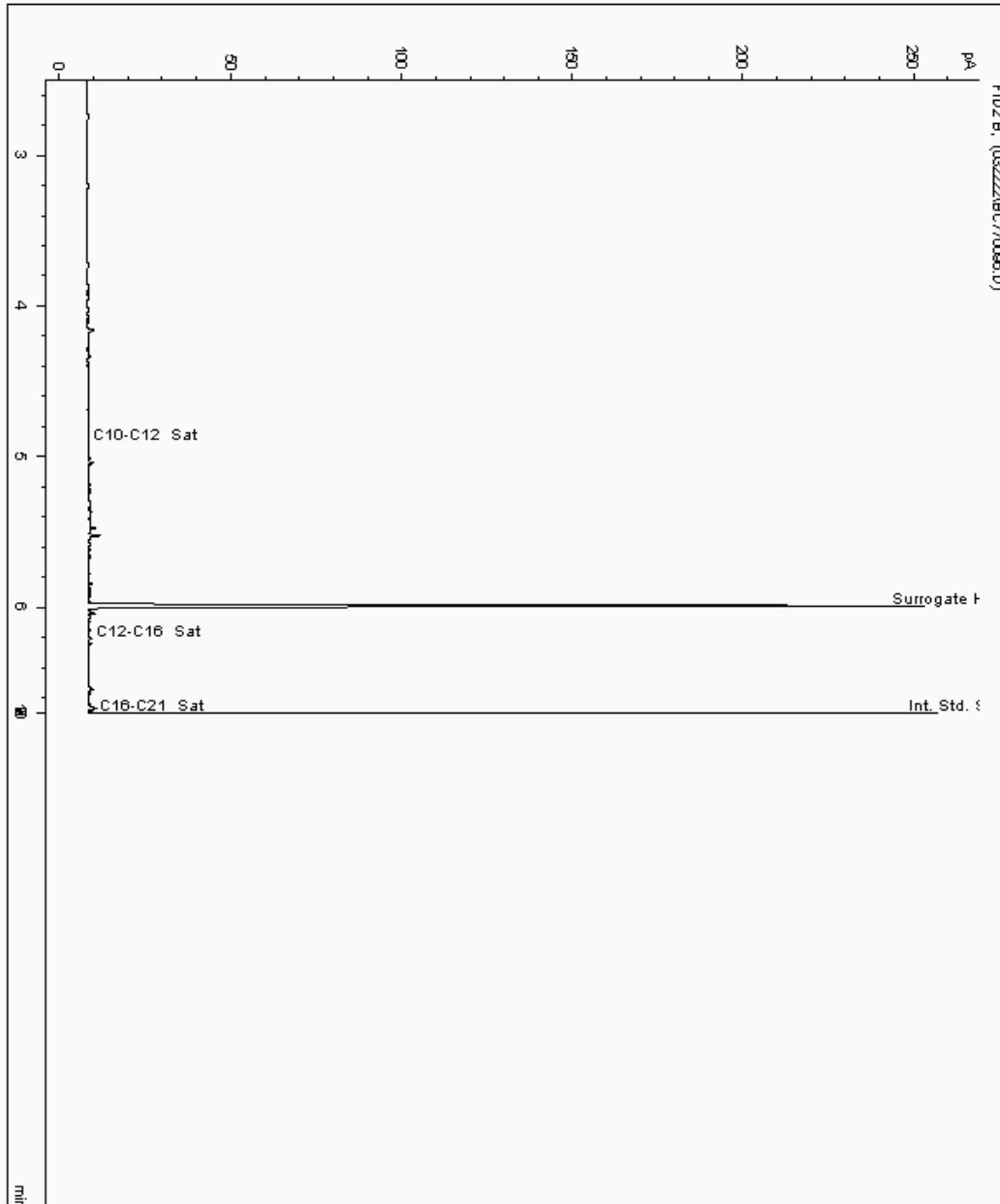
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26009026
Sample ID : BH301

Depth : 0.00 - 0.00

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

Sample Identity: 24272617-
Date Acquired : 3/24/2022 3:01:32 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

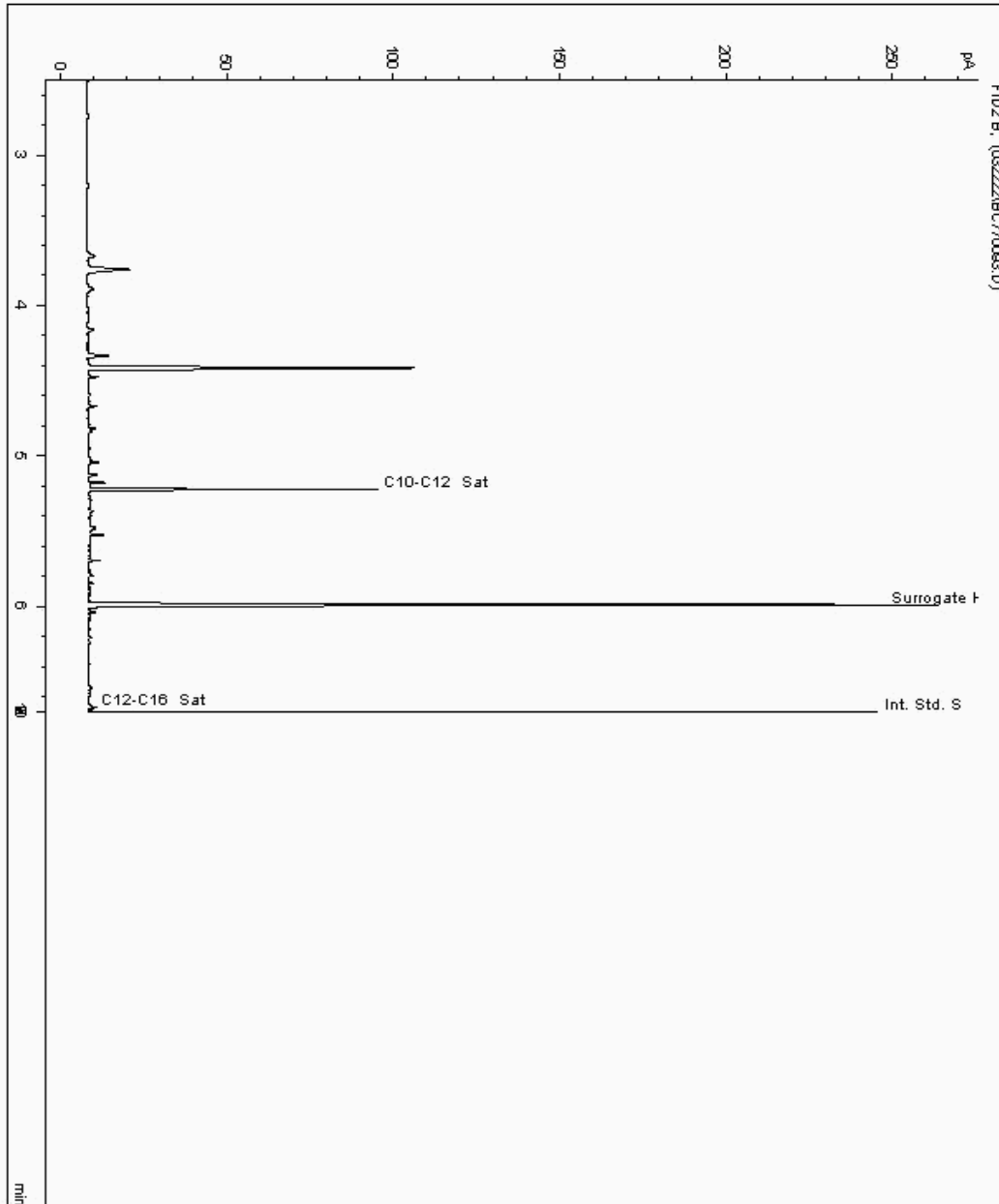
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26009031
Sample ID : BH305

Depth : 0.00 - 0.00

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

Sample Identity: 24272626-
Date Acquired : 3/24/2022 1:49:14 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

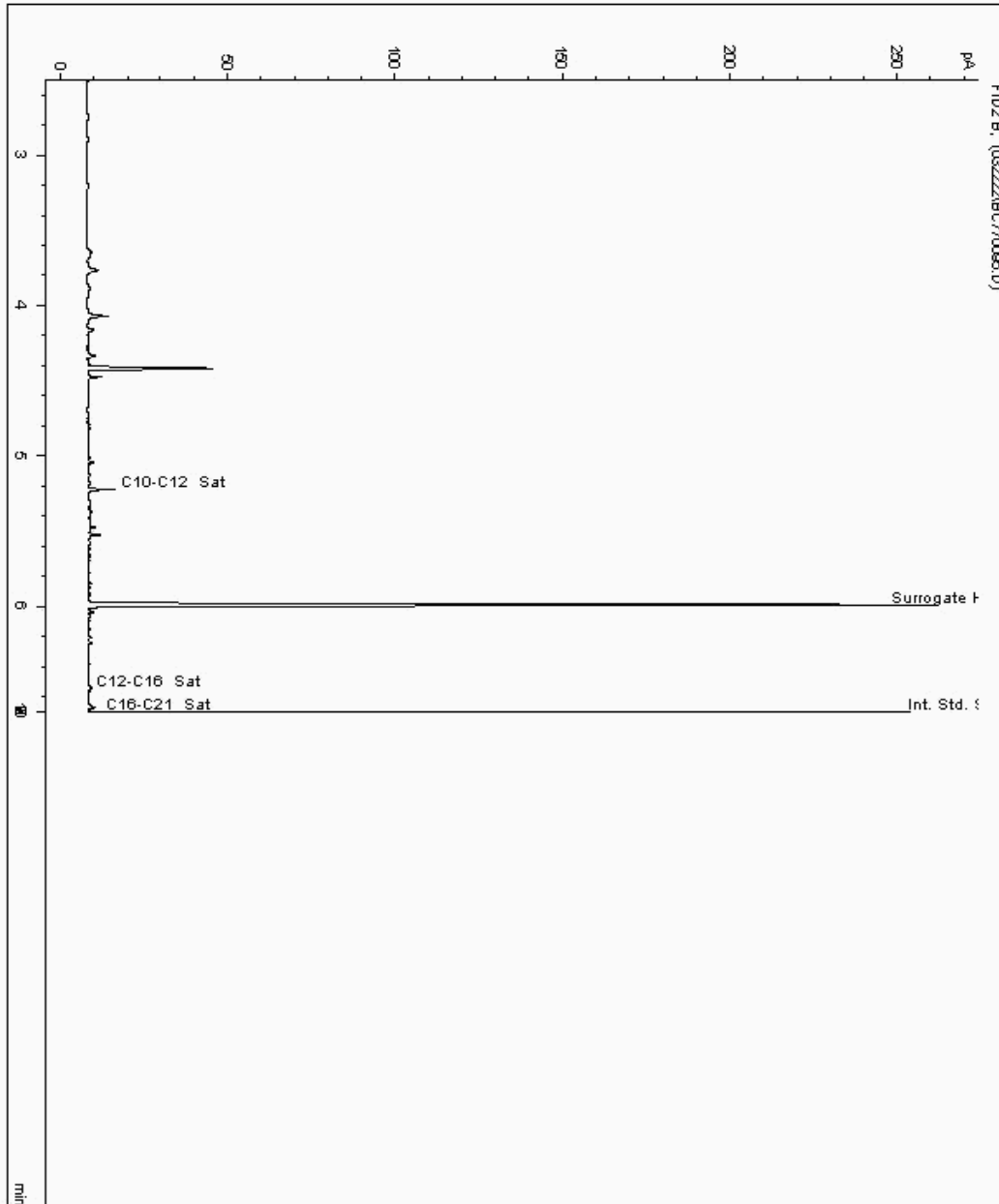
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26009036
Sample ID : BH309

Depth : 0.00 - 0.00

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

Sample Identity: 24272632-
Date Acquired : 3/24/2022 2:37:29 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

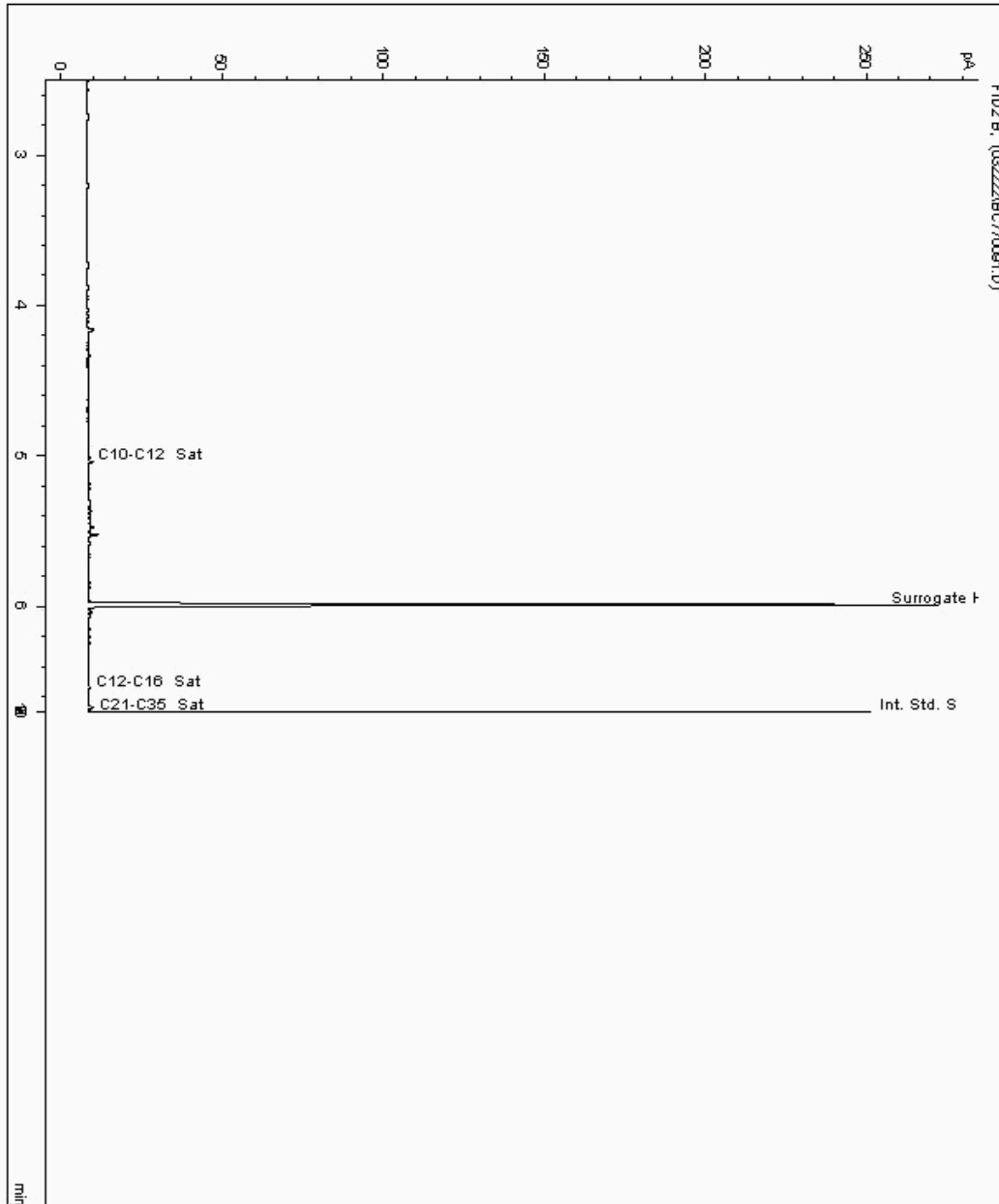
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26009042
Sample ID : BH306

Depth : 0.00 - 0.00

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

Sample Identity: 24272623-
Date Acquired : 3/24/2022 1:01:09 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

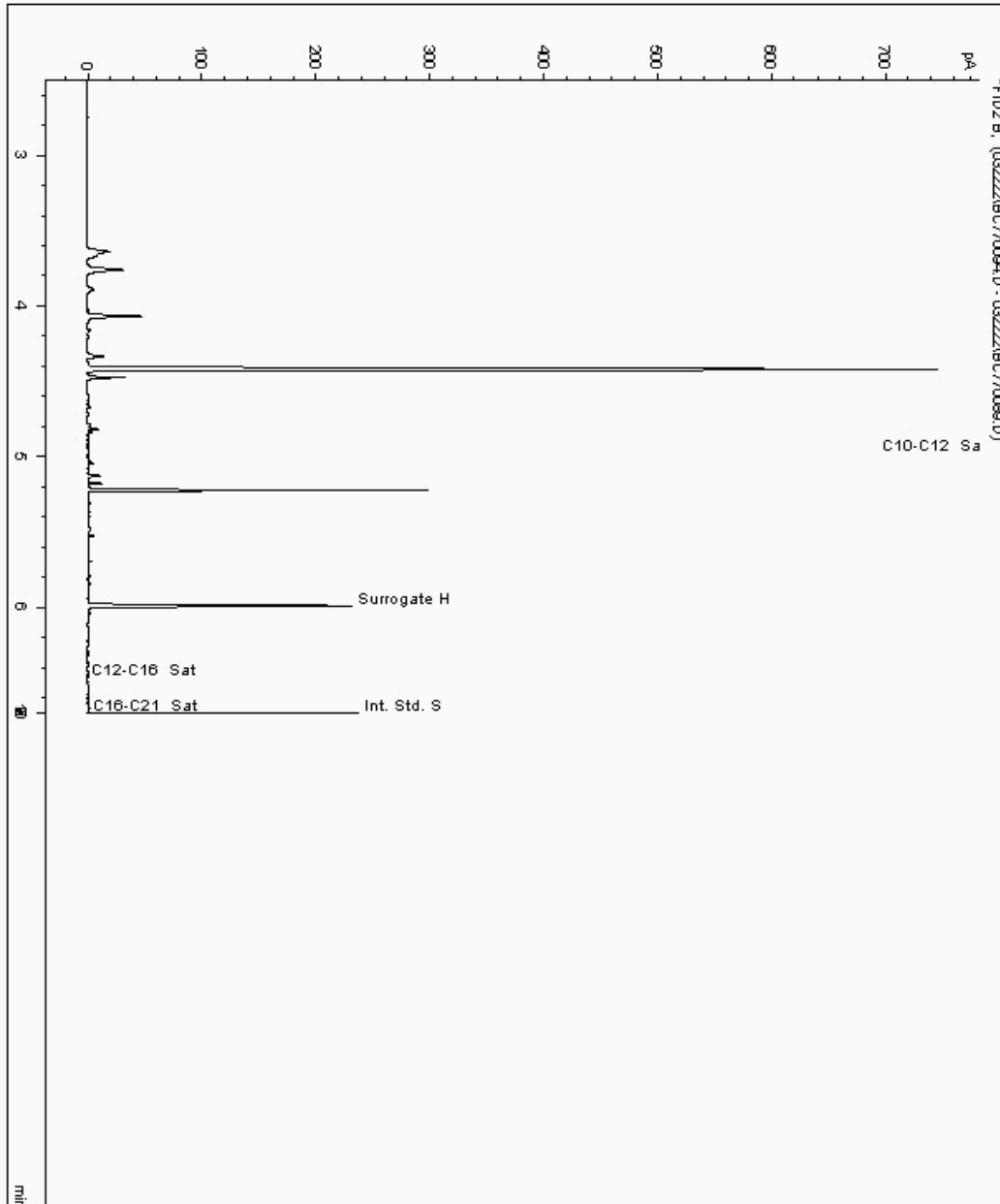
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26009046
Sample ID : BH307

Depth : 0.00 - 0.00

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

Sample Identity: 24272629-
Date Acquired : 3/24/2022 2:13:24 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

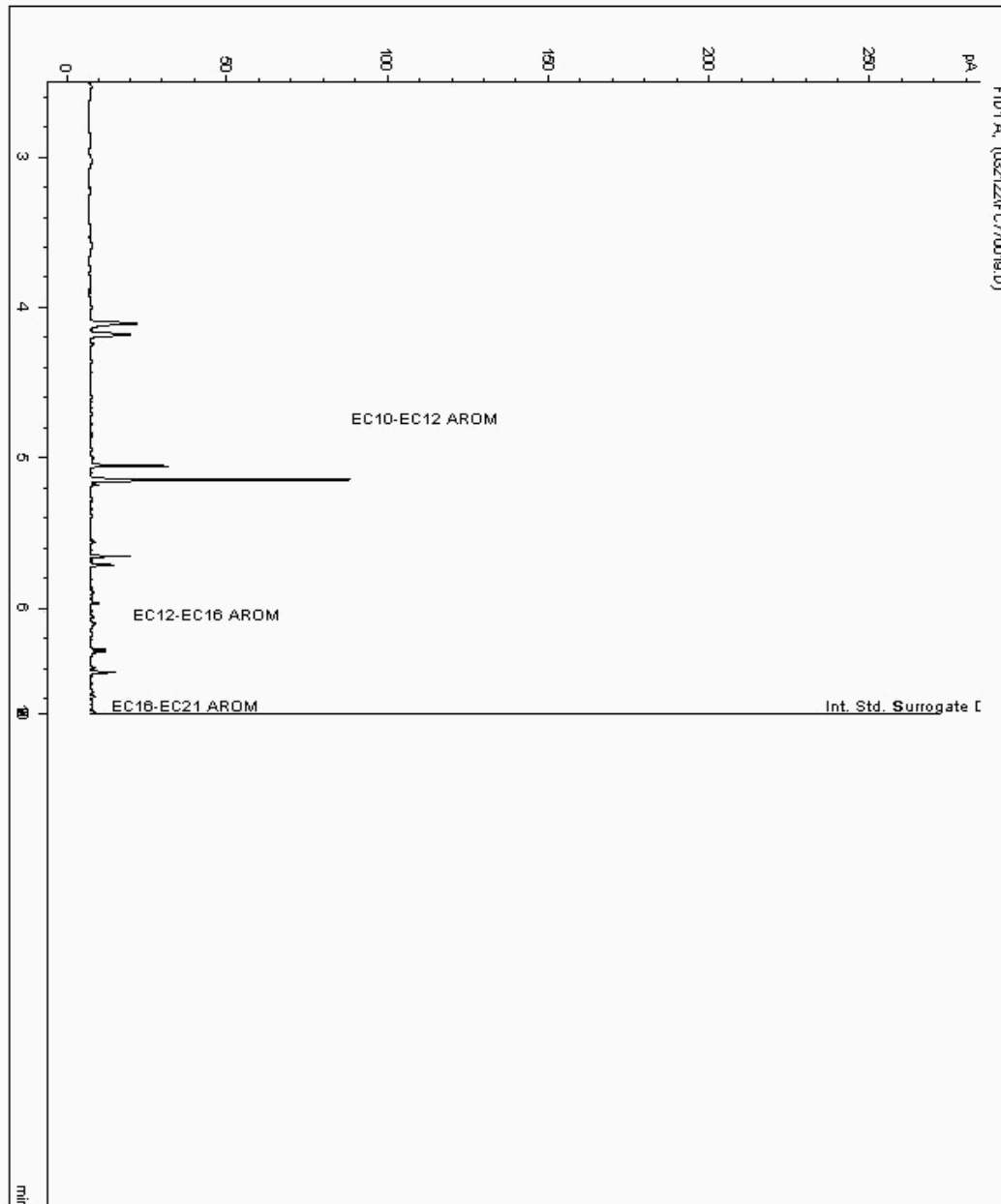
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 25968552
Sample ID : BH308

Depth : 0.00 - 0.00

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

Sample Identity: 24233925-
Date Acquired : 3/21/2022 6:21:13 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

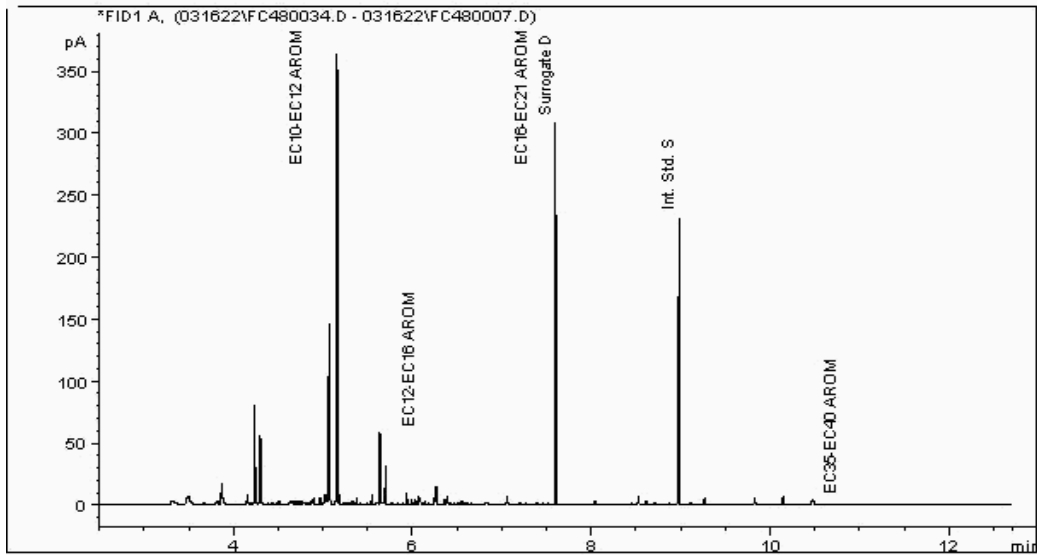
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 25968579
Sample ID : BH310

Depth : 0.00 - 0.00

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

Sample Identity: 24233849-
Date Acquired : 17/03/2022 03:25:46 PM
Units : ppb
Dilution : SE BH310[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

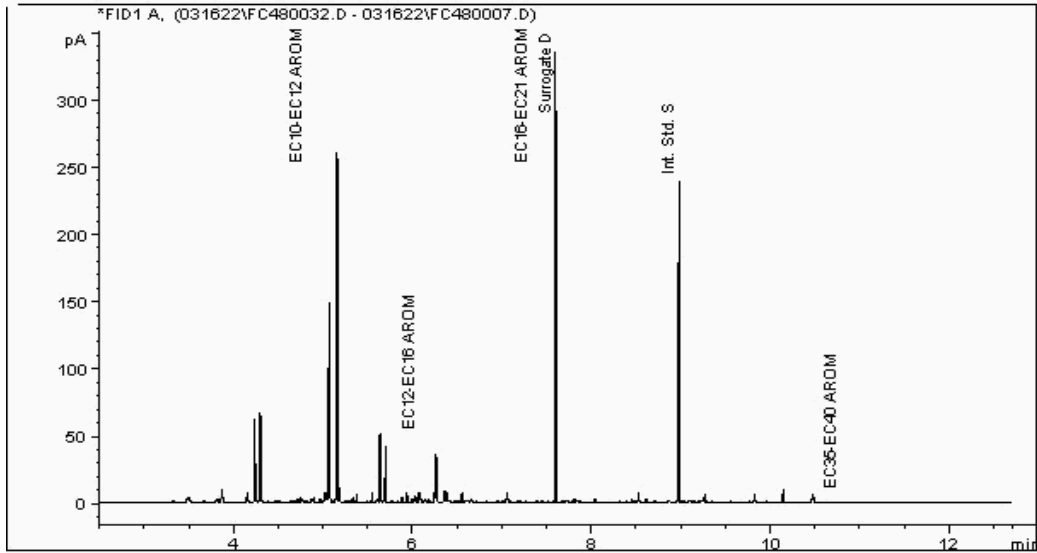
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 25968583
Sample ID : BH302

Depth : 0.00 - 0.00

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

Sample Identity: 24233858-
Date Acquired : 17/03/2022 02:39:19 PM
Units : ppb
Dilution : SE BH302[0.00 - 0.00] ->
CF : 1
Multiplier : 0.026





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

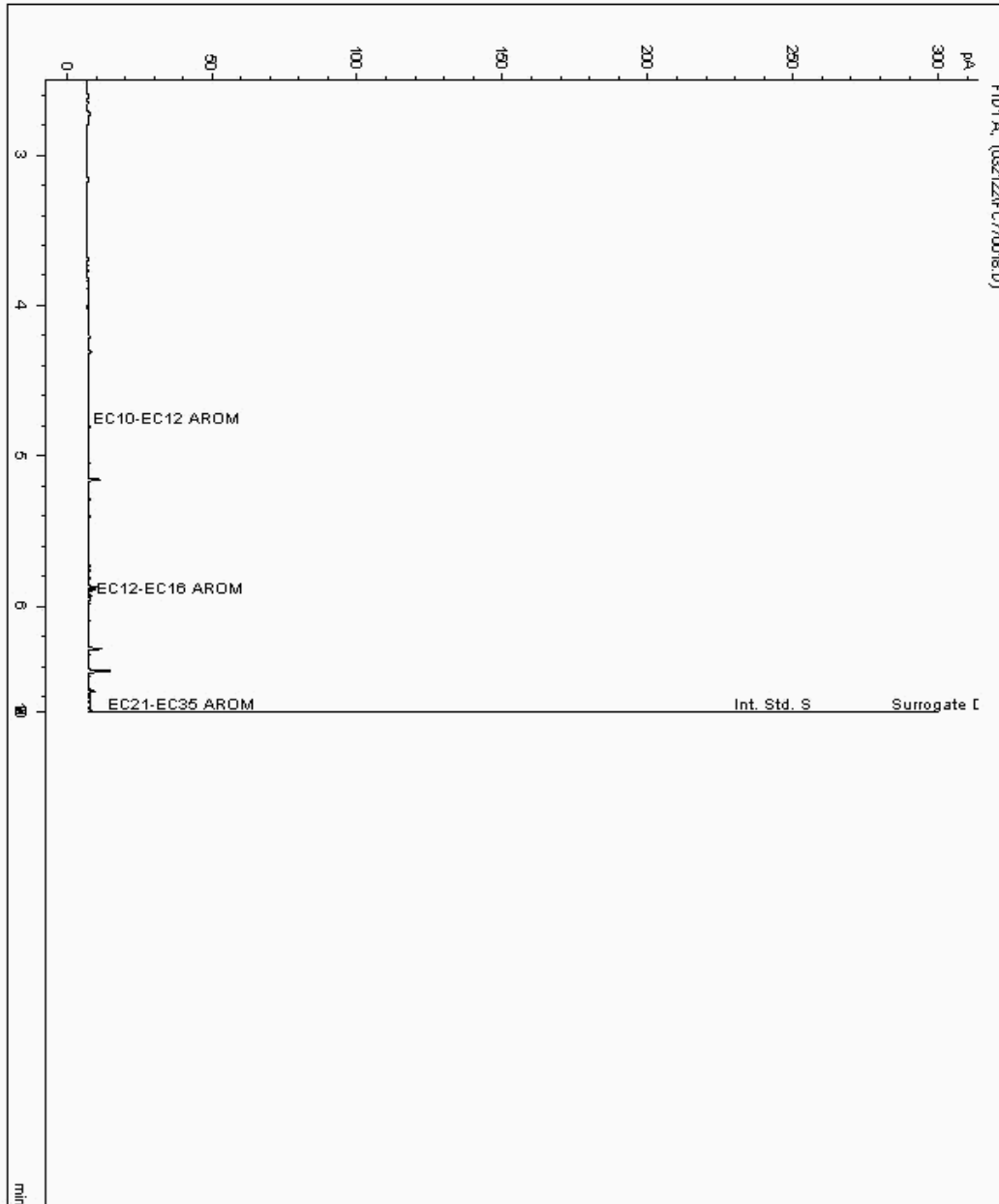
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 25968589
Sample ID : BH304

Depth : 0.00 - 0.00

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

Sample Identity: 24233883-
Date Acquired : 3/21/2022 6:01:00 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

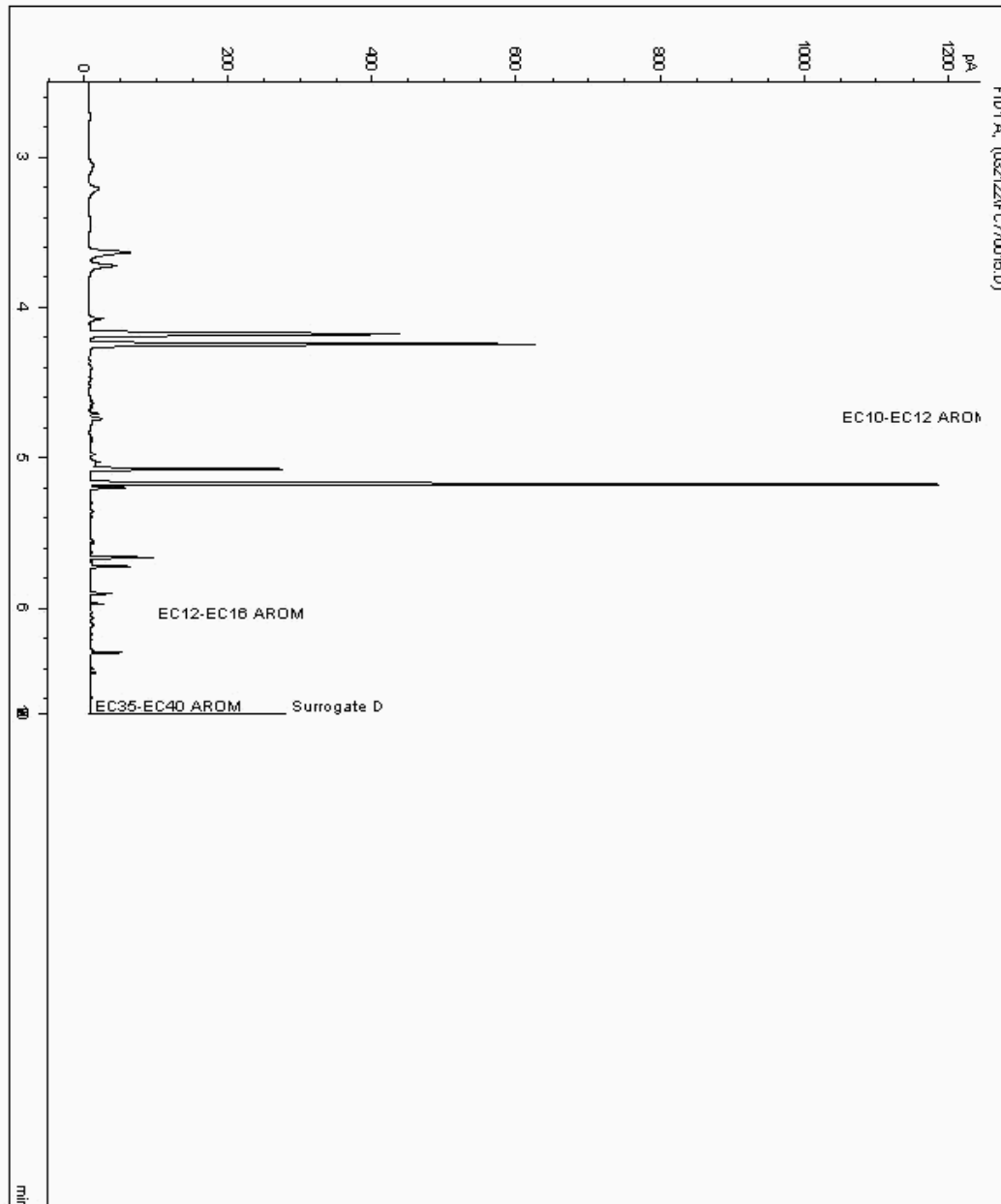
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 25968606
Sample ID : BH303

Depth : 0.00 - 0.00

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

Sample Identity: 24233867-
Date Acquired : 3/21/2022 4:52:18 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

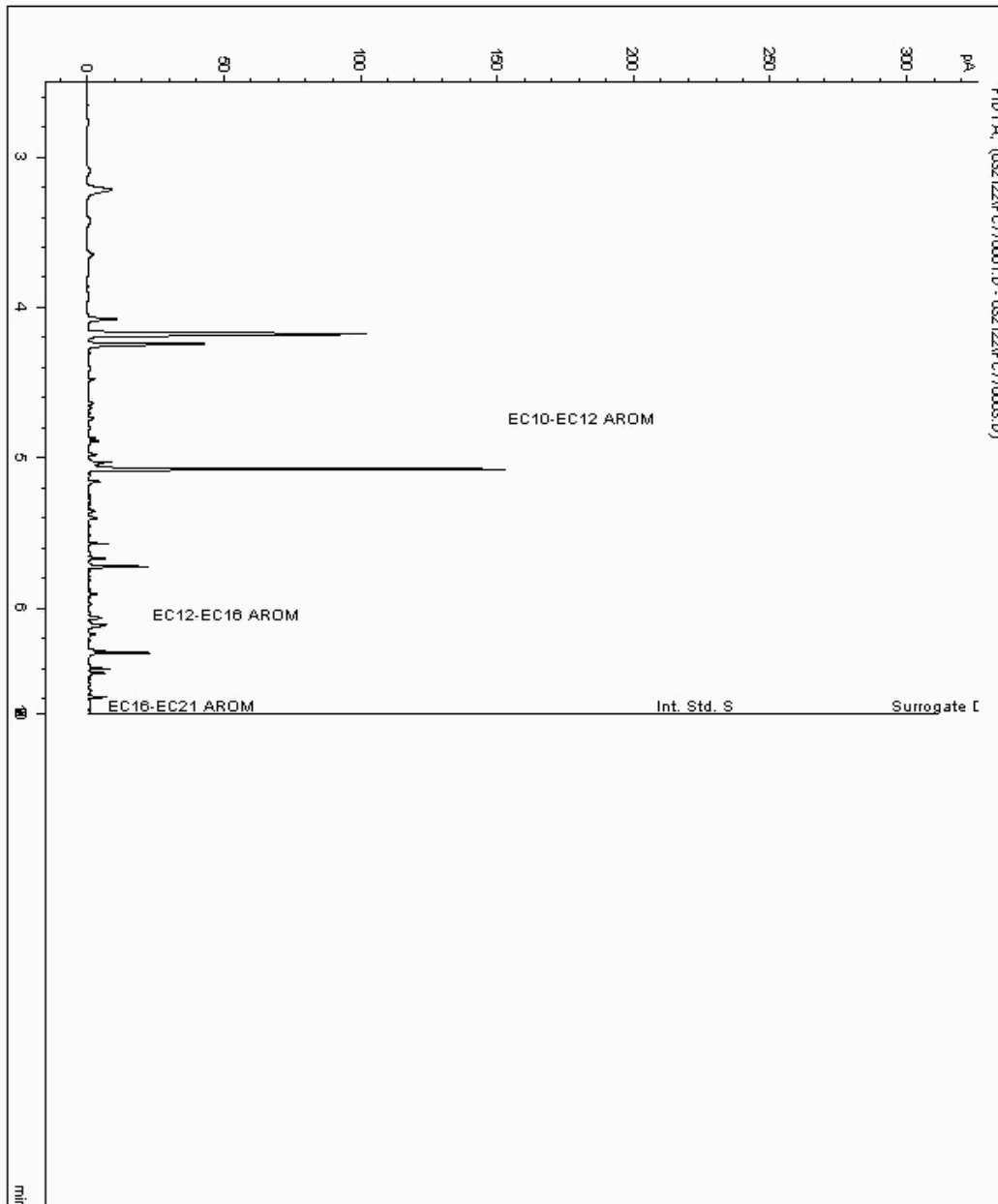
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26003497
Sample ID : BH305

Depth : 0.00 - 0.00

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

Sample Identity: 24268543-
Date Acquired : 3/22/2022 10:57:07 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

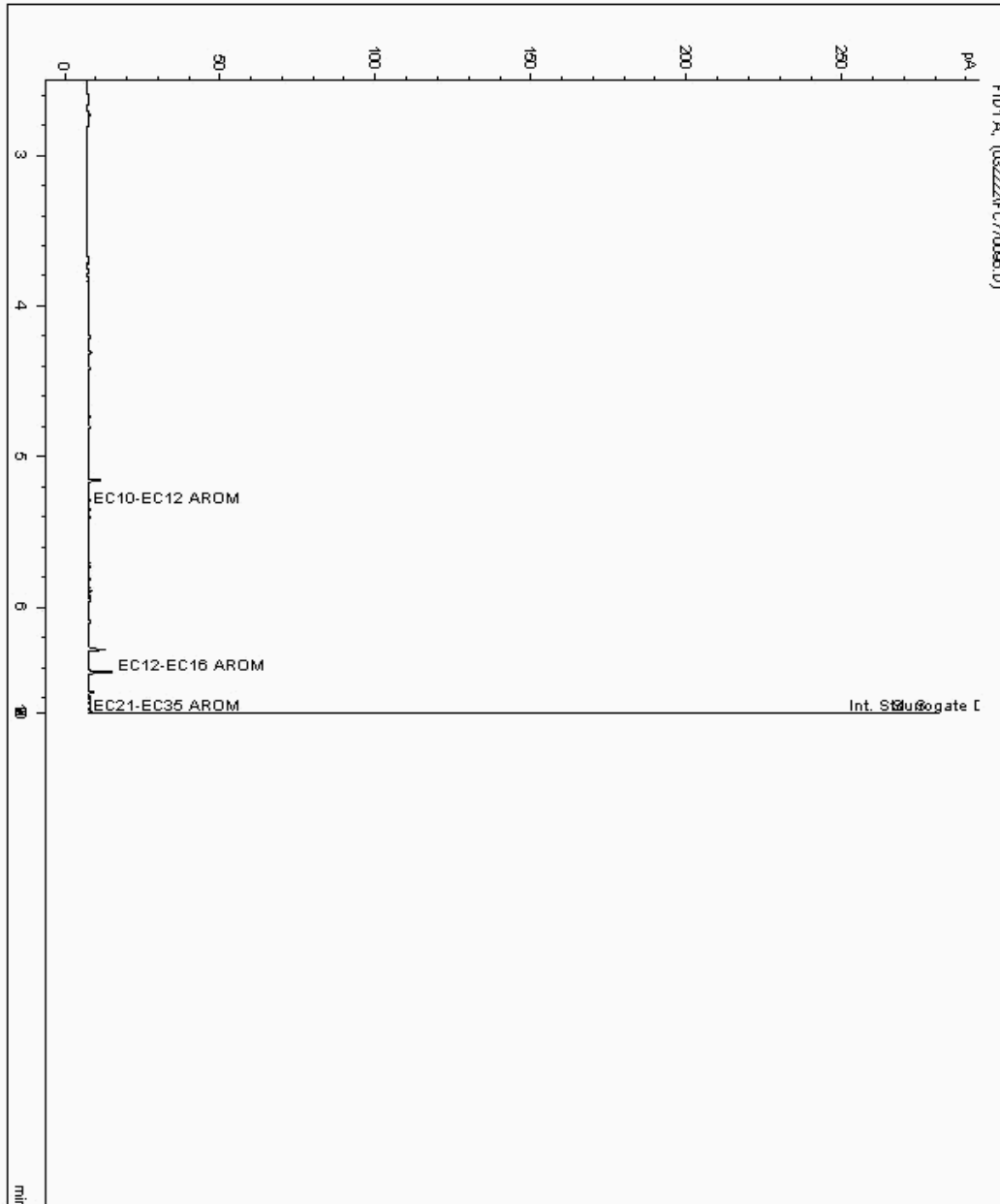
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26009026
Sample ID : BH301

Depth : 0.00 - 0.00

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

Sample Identity: 24272616-
Date Acquired : 3/24/2022 3:01:32 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

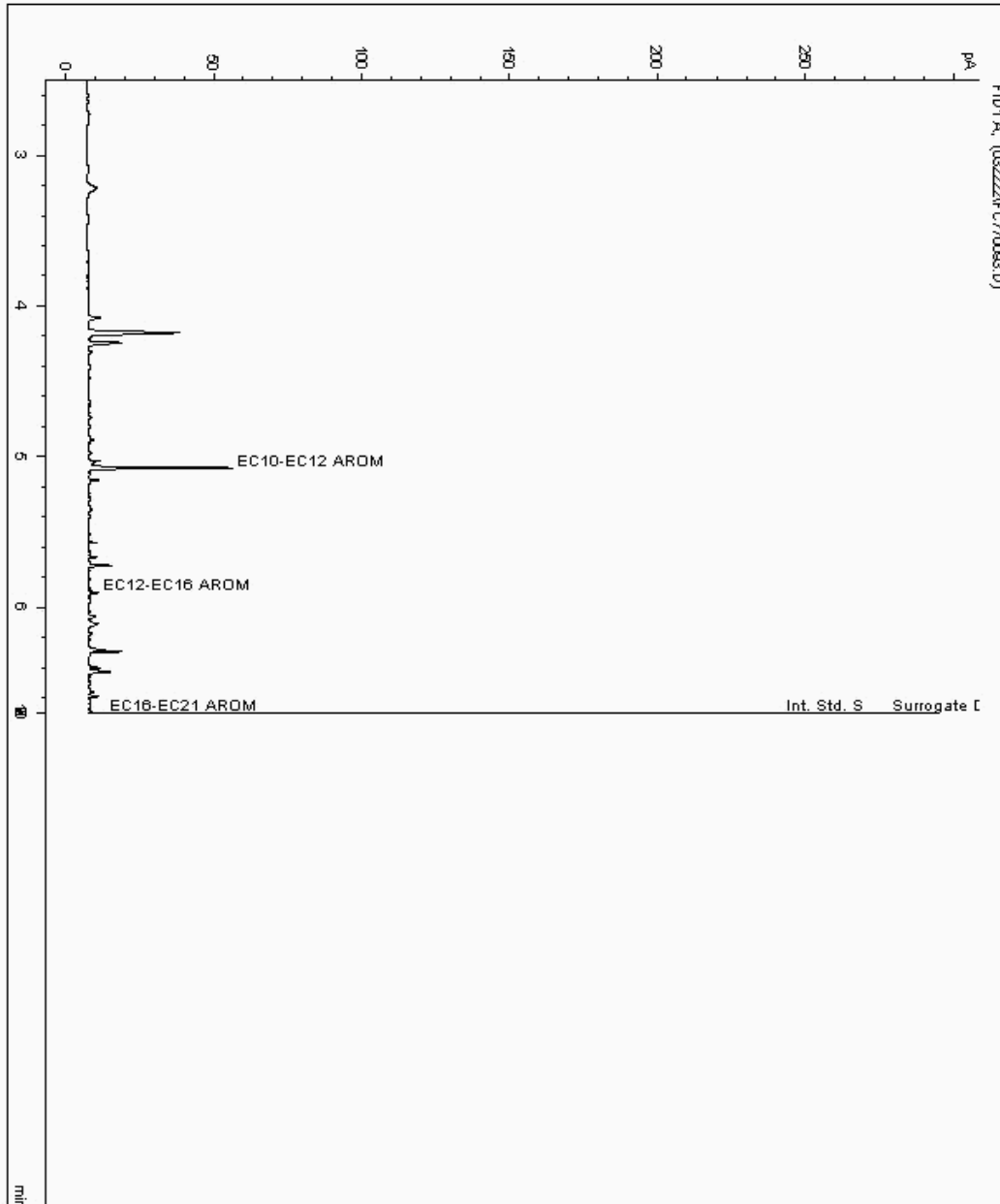
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26009031
Sample ID : BH305

Depth : 0.00 - 0.00

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

Sample Identity: 24272625-
Date Acquired : 3/24/2022 1:49:14 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

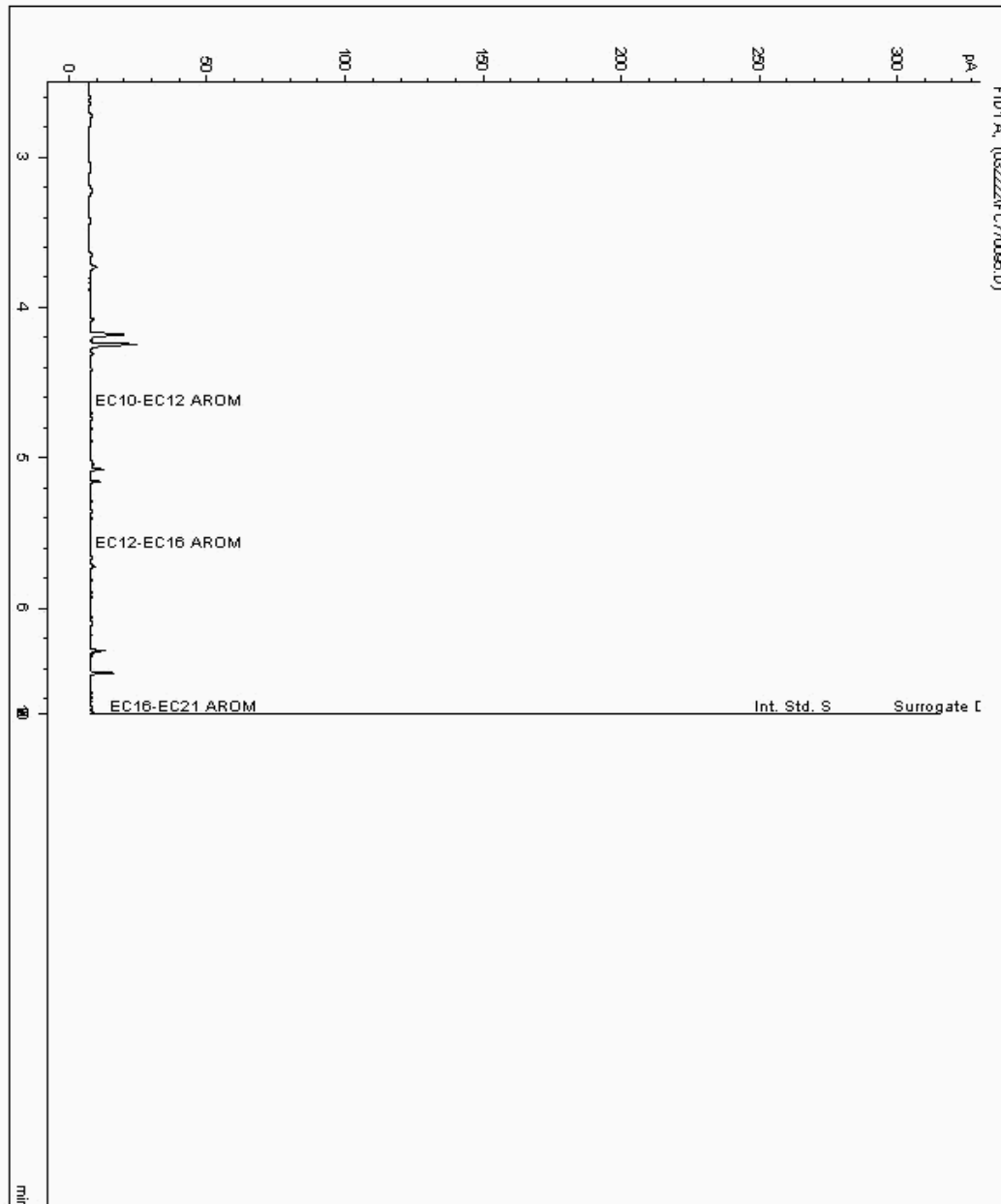
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26009036
Sample ID : BH309

Depth : 0.00 - 0.00

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

Sample Identity: 24272631-
Date Acquired : 3/24/2022 2:37:28 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

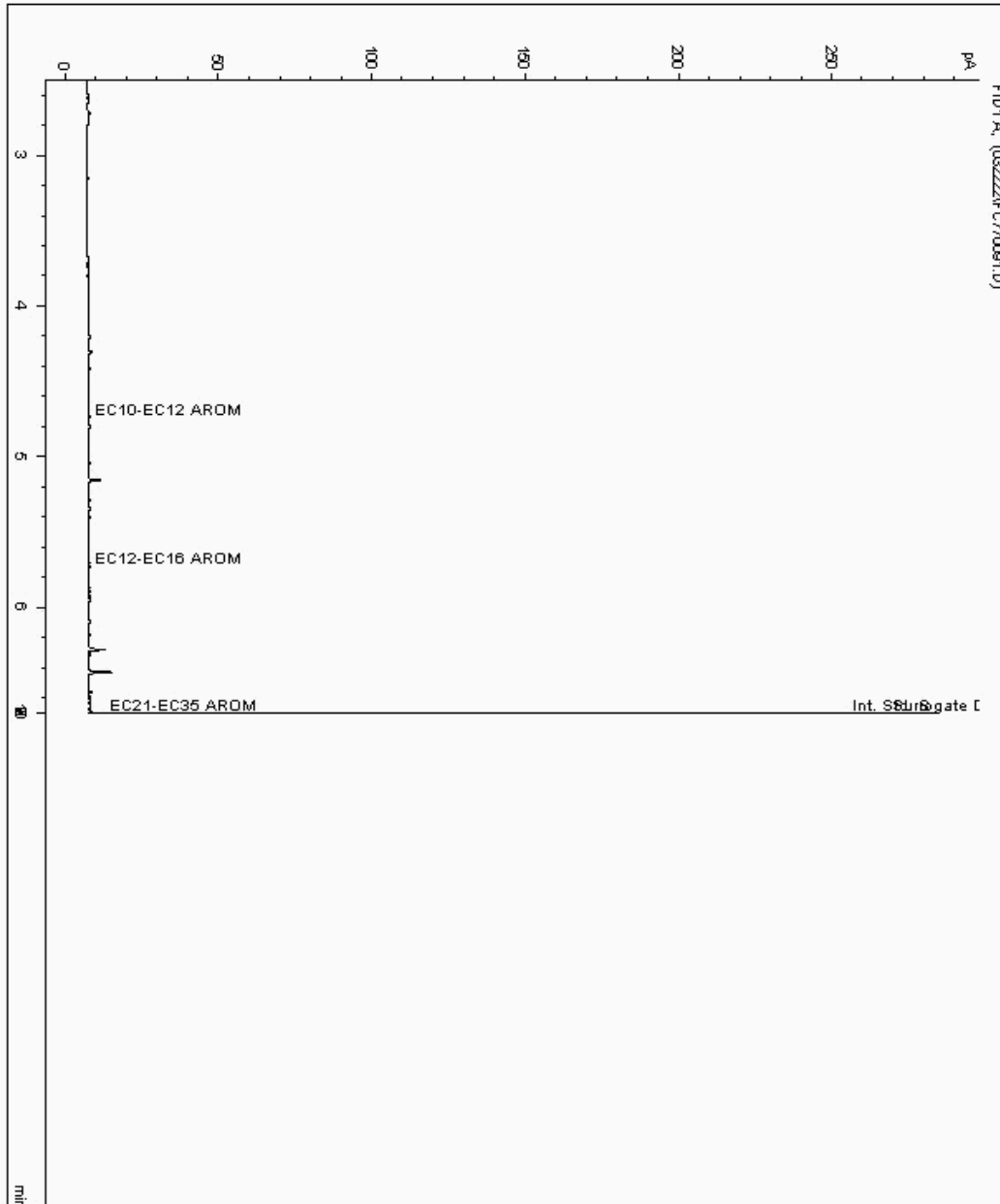
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26009042
Sample ID : BH306

Depth : 0.00 - 0.00

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

Sample Identity: 24272619-
Date Acquired : 3/24/2022 1:01:09 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

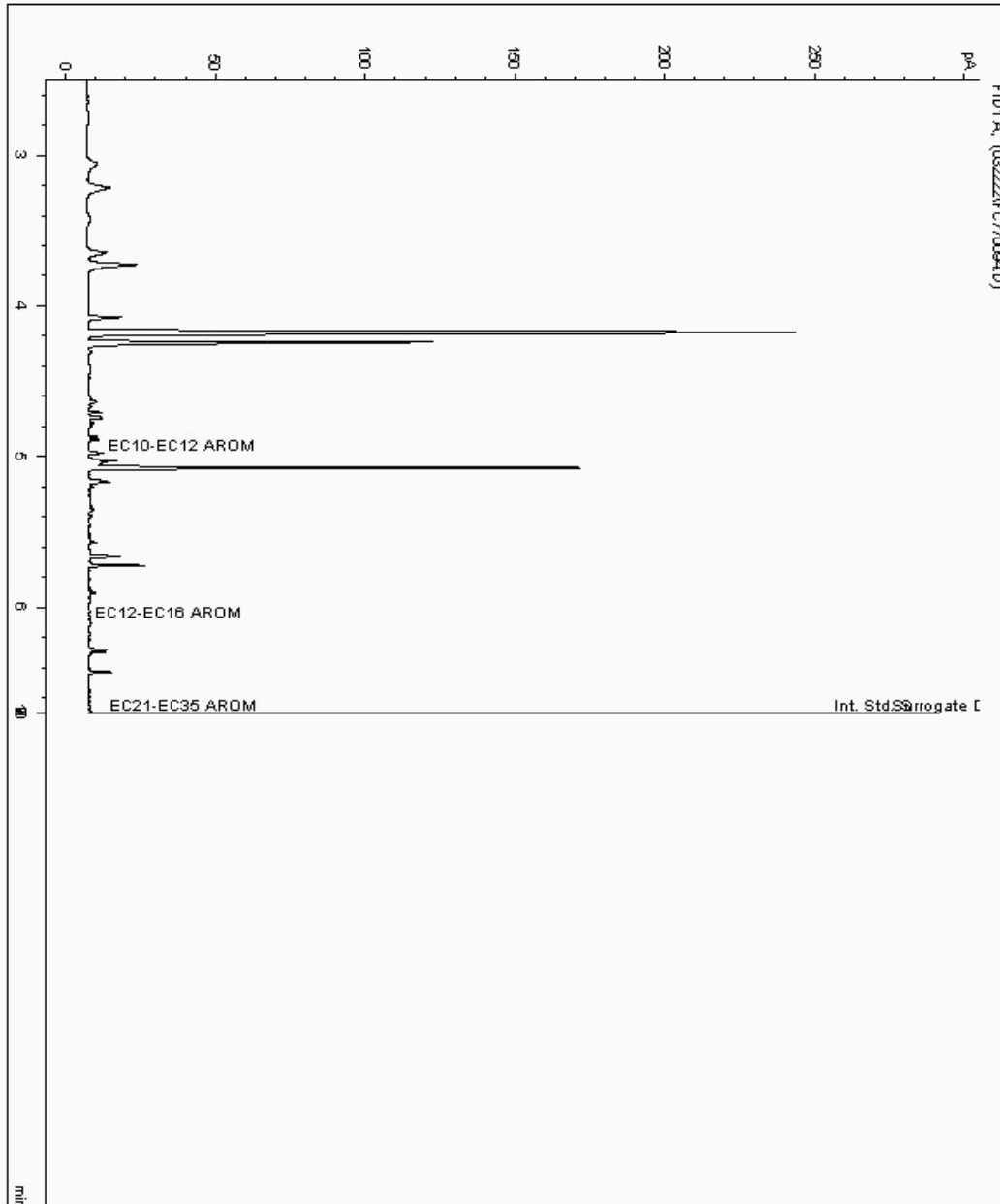
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26009046
Sample ID : BH307

Depth : 0.00 - 0.00

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

Sample Identity: 24272628-
Date Acquired : 3/24/2022 2:13:24 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.050





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

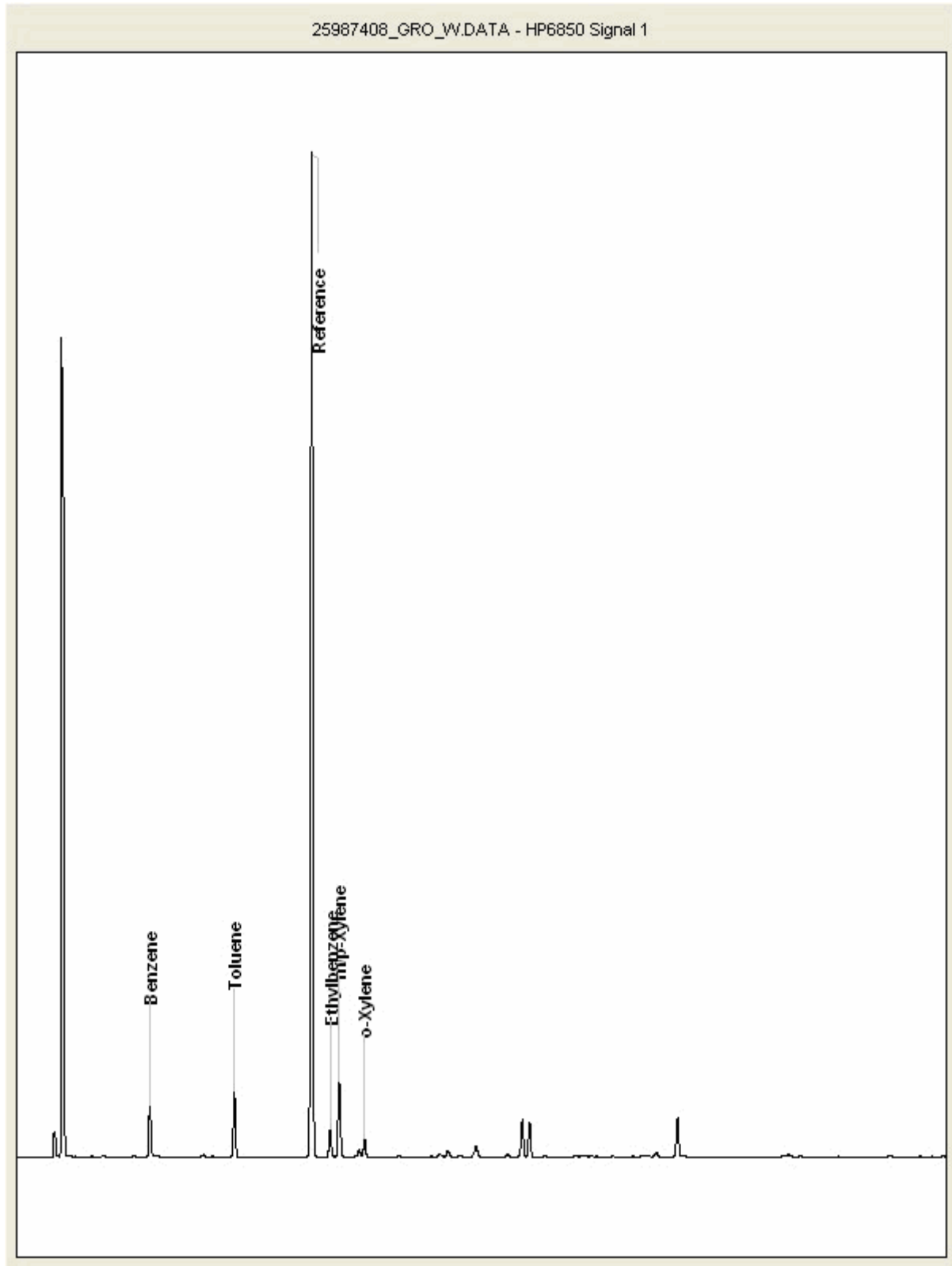
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987408
Sample ID : BH309

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

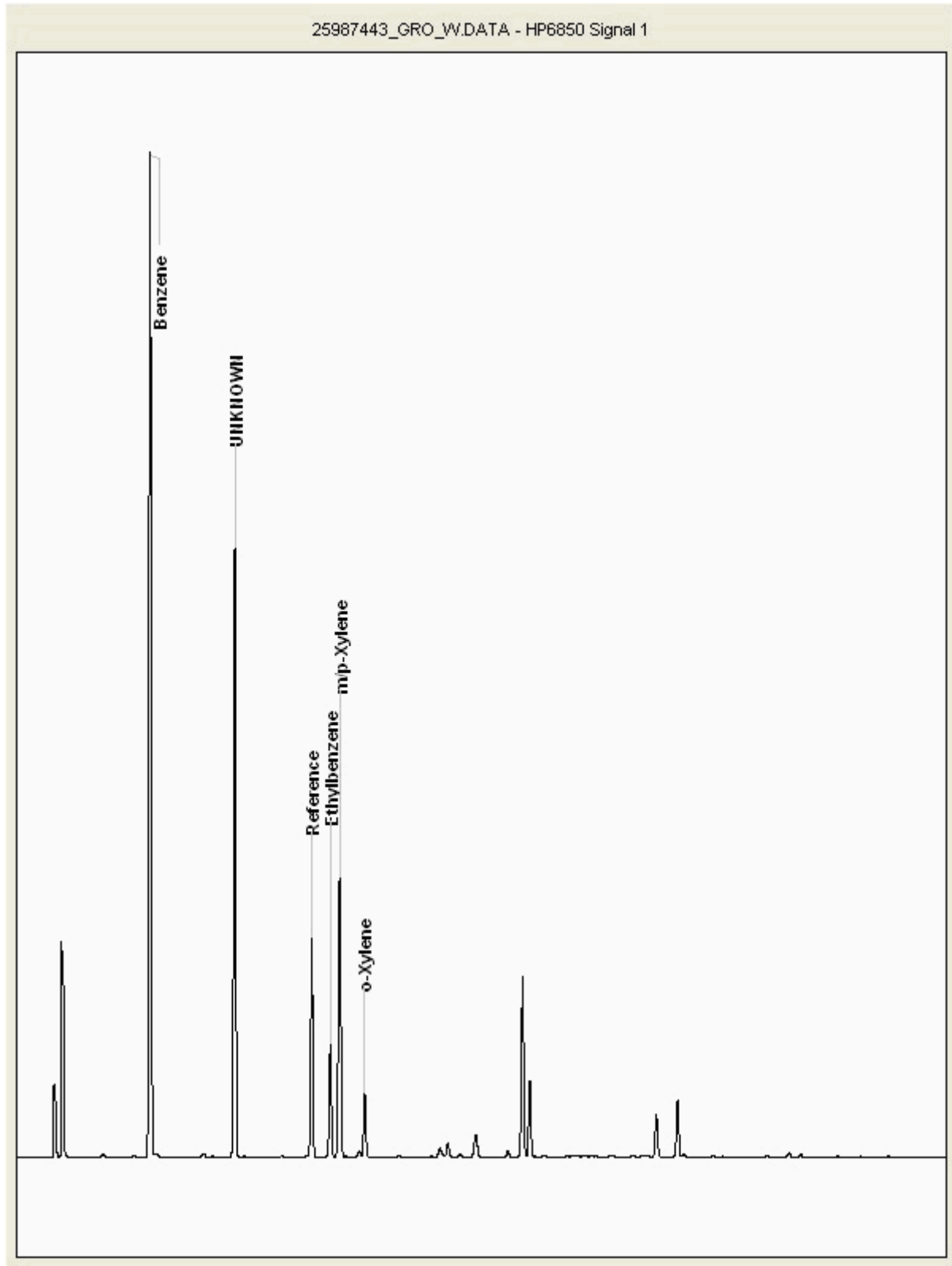
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987443
Sample ID : BH303

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

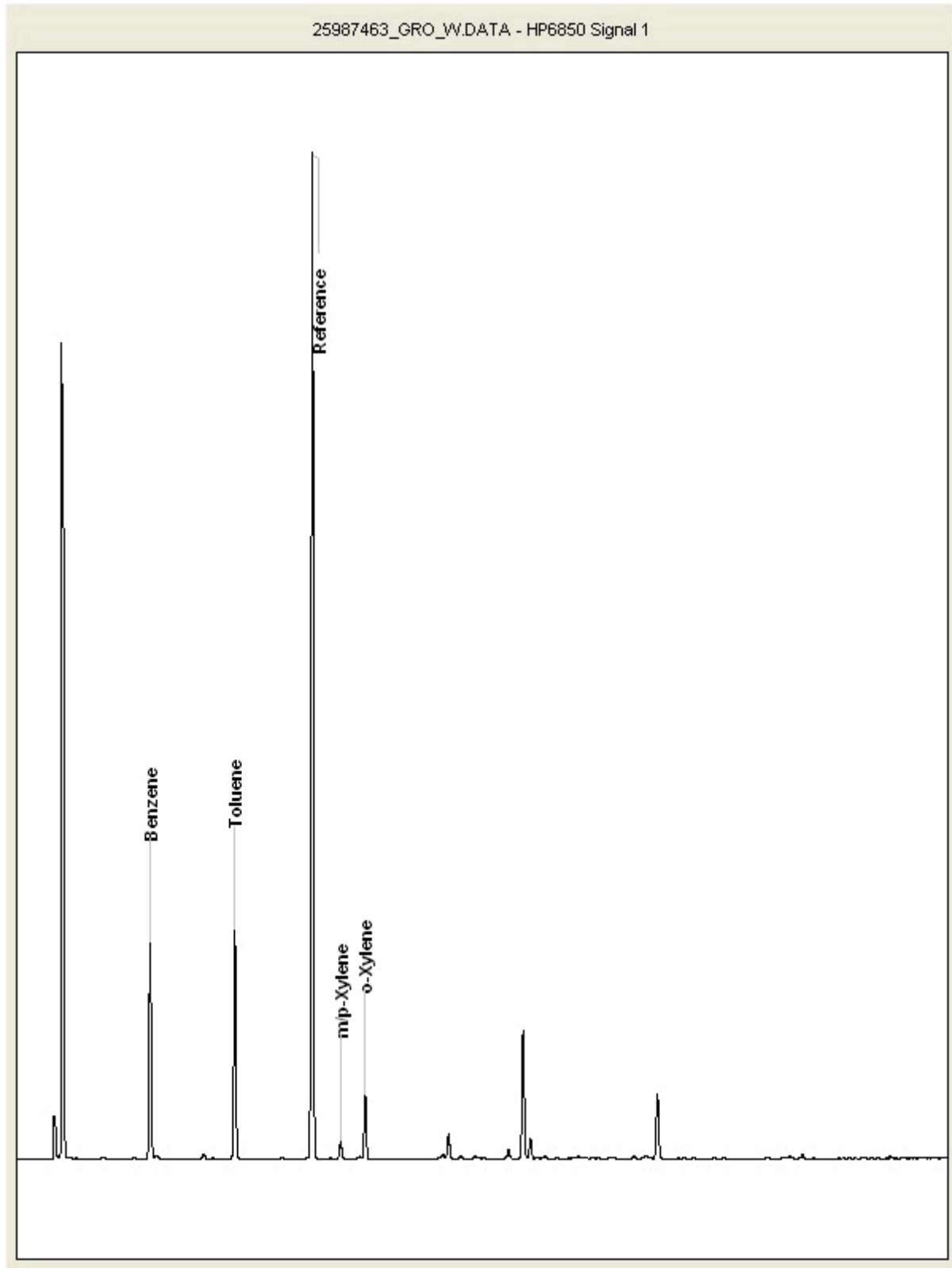
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987463
Sample ID : BH305

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

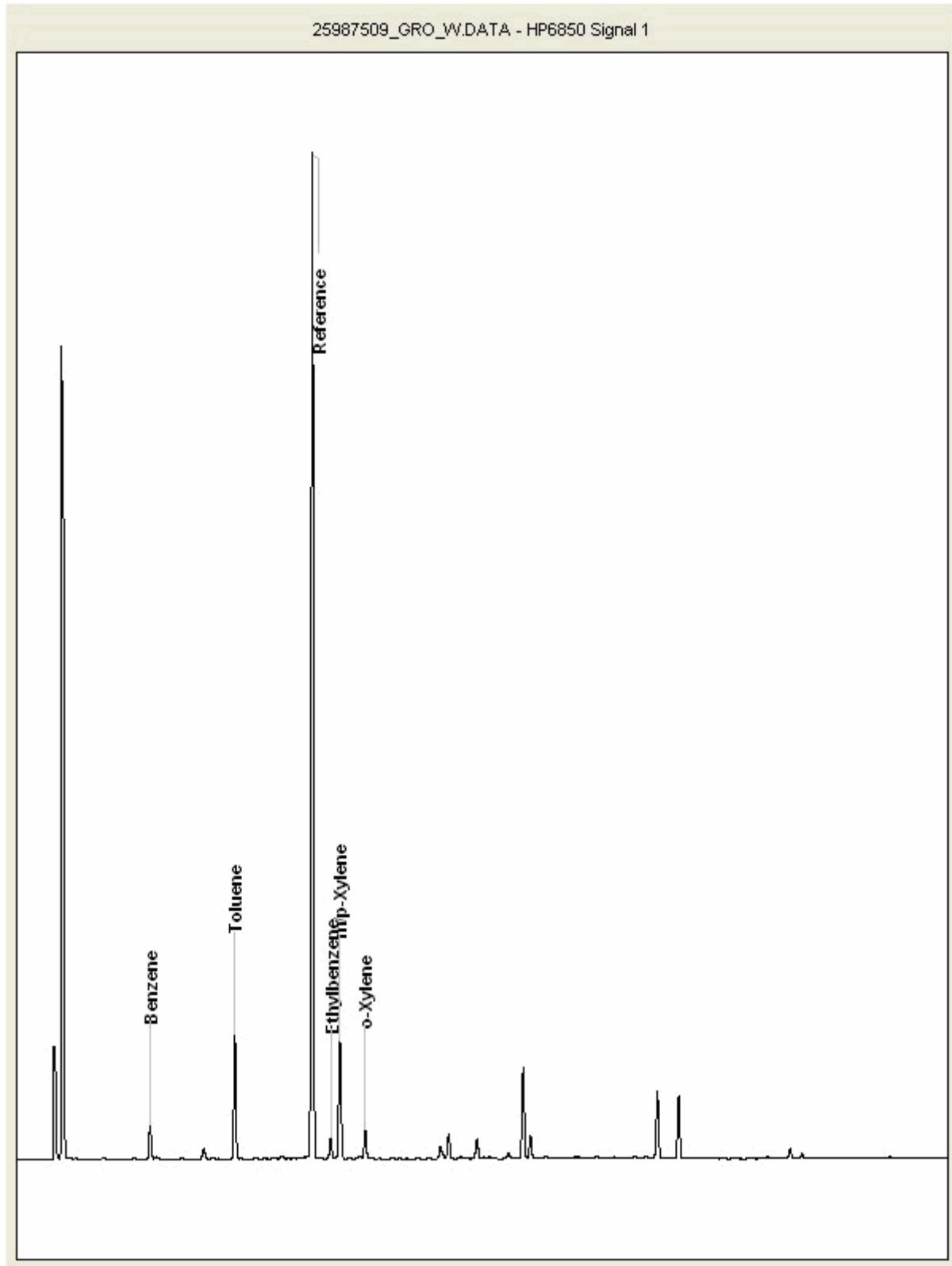
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987509
Sample ID : BH310

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

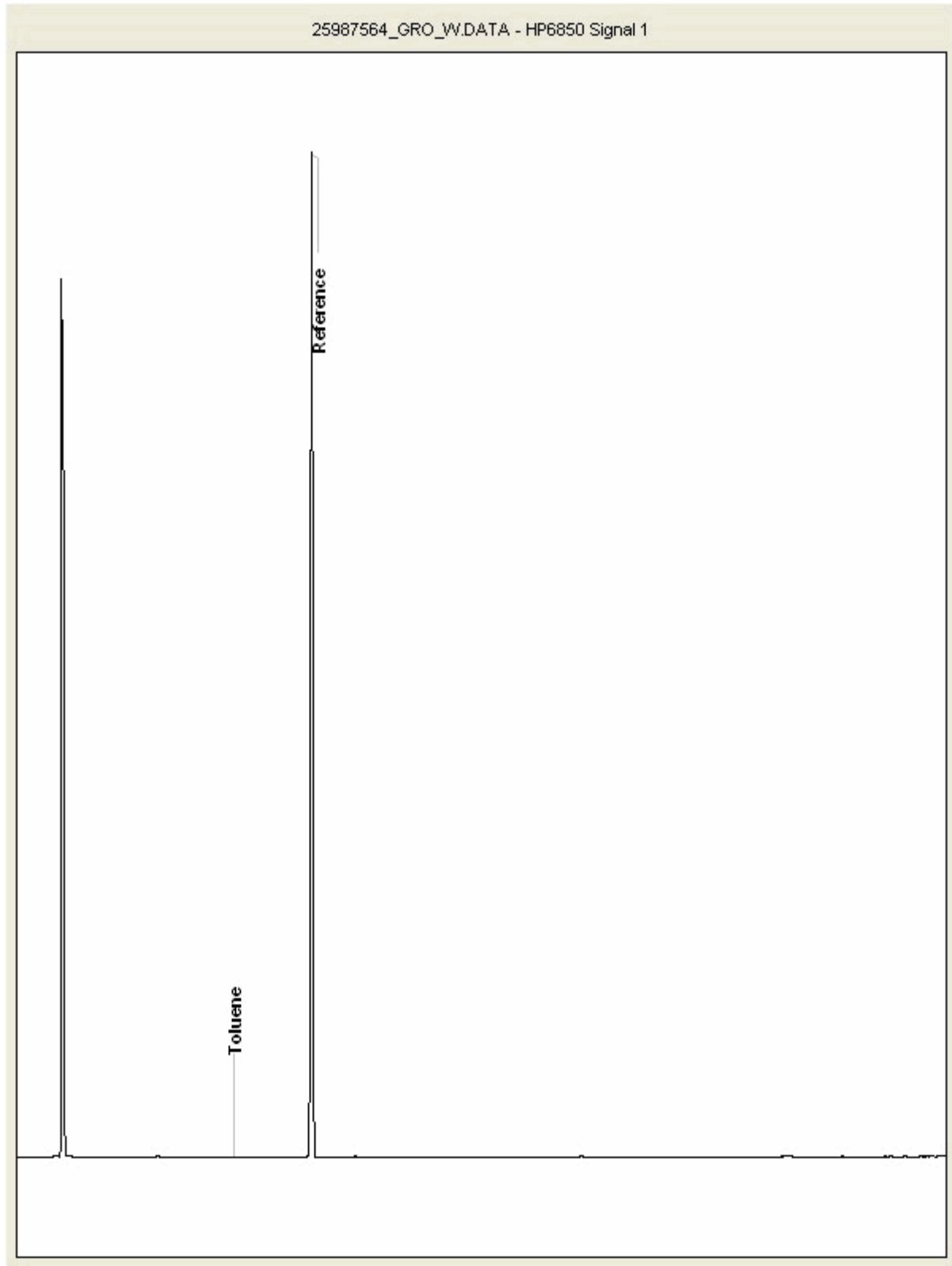
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987564
Sample ID : BH304

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

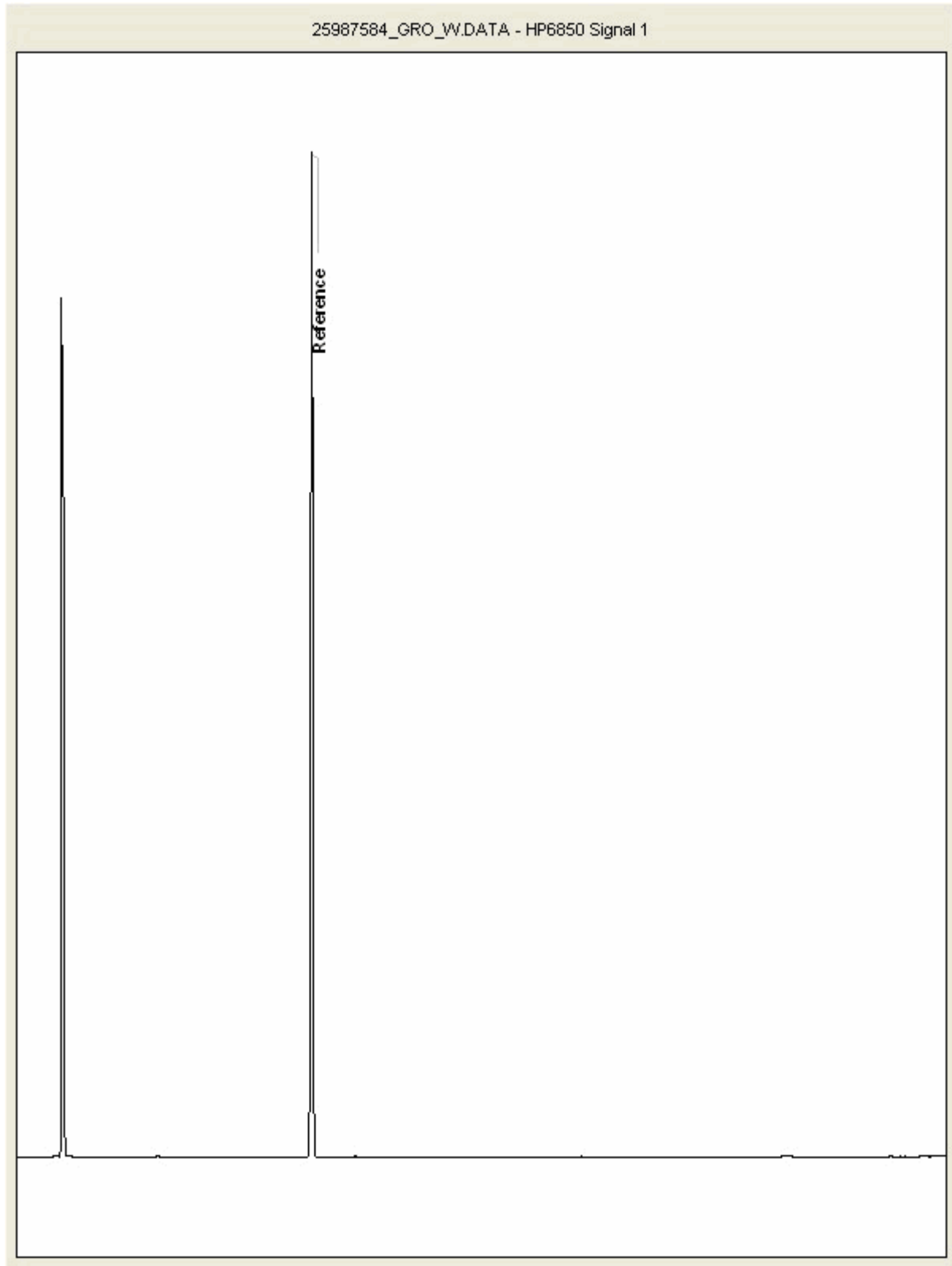
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987584
Sample ID : BH301

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

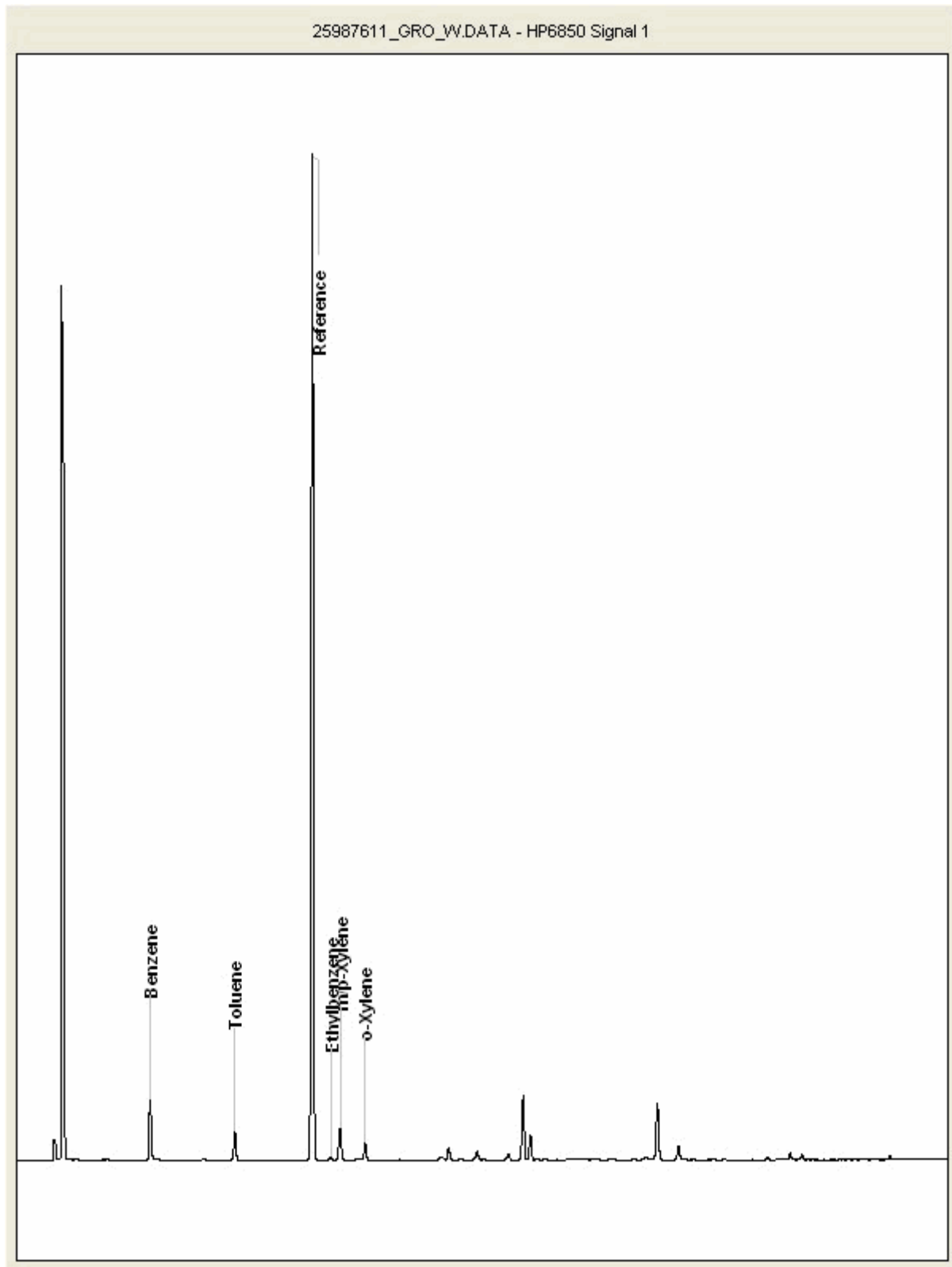
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987611
Sample ID : BH302

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

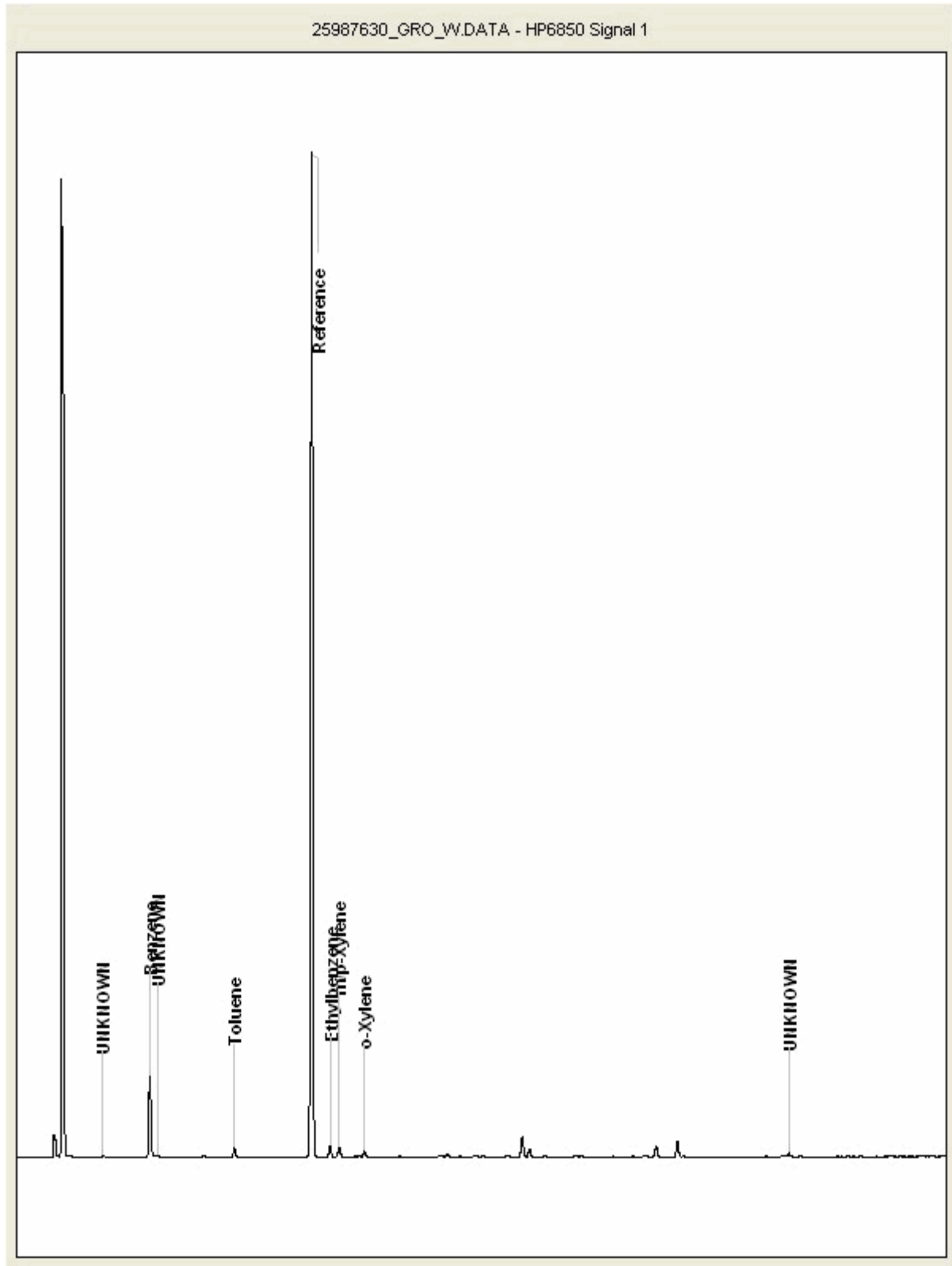
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987630
Sample ID : BH308

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

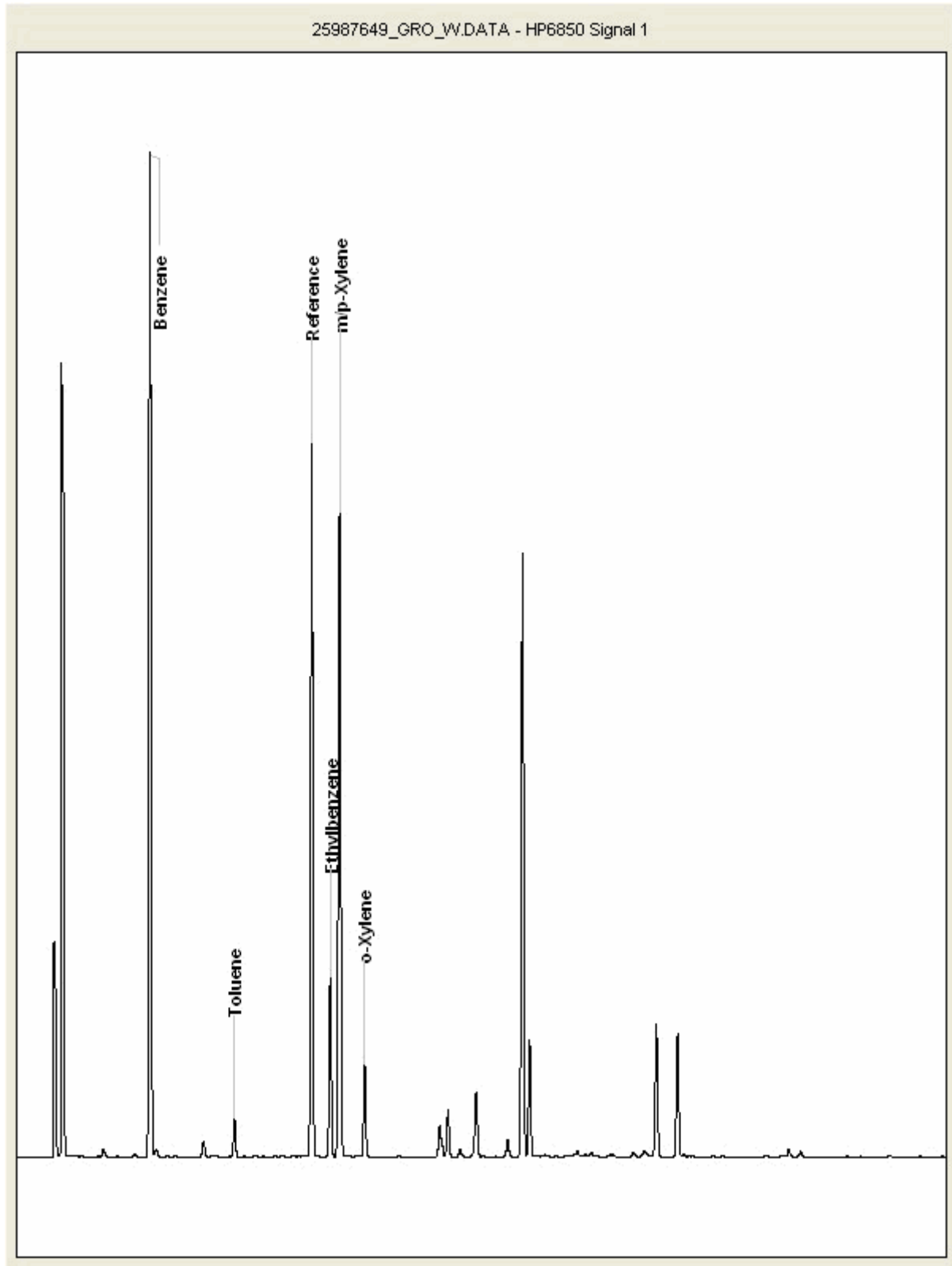
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987649
Sample ID : BH307

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

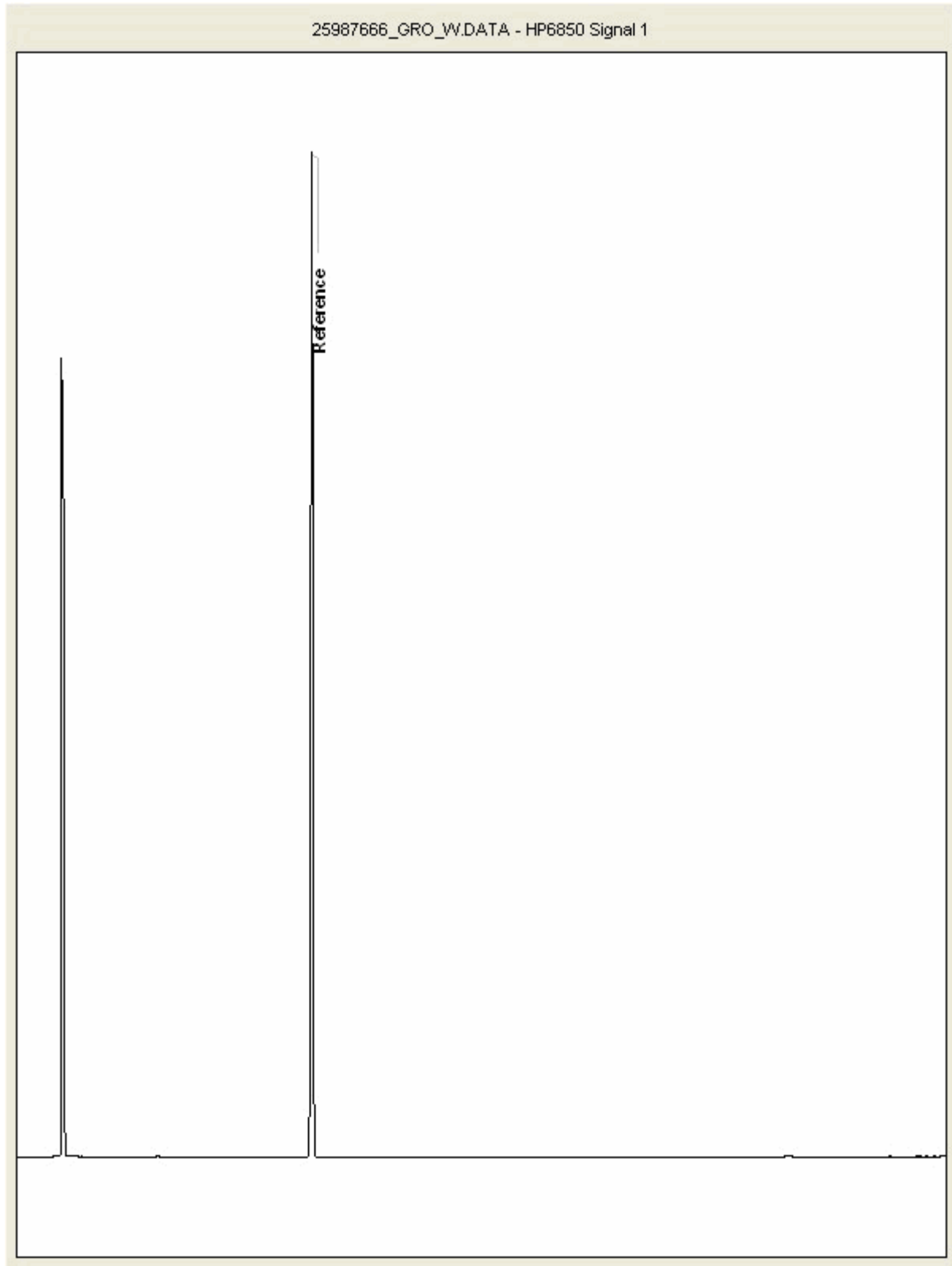
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25987666
Sample ID : BH306

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

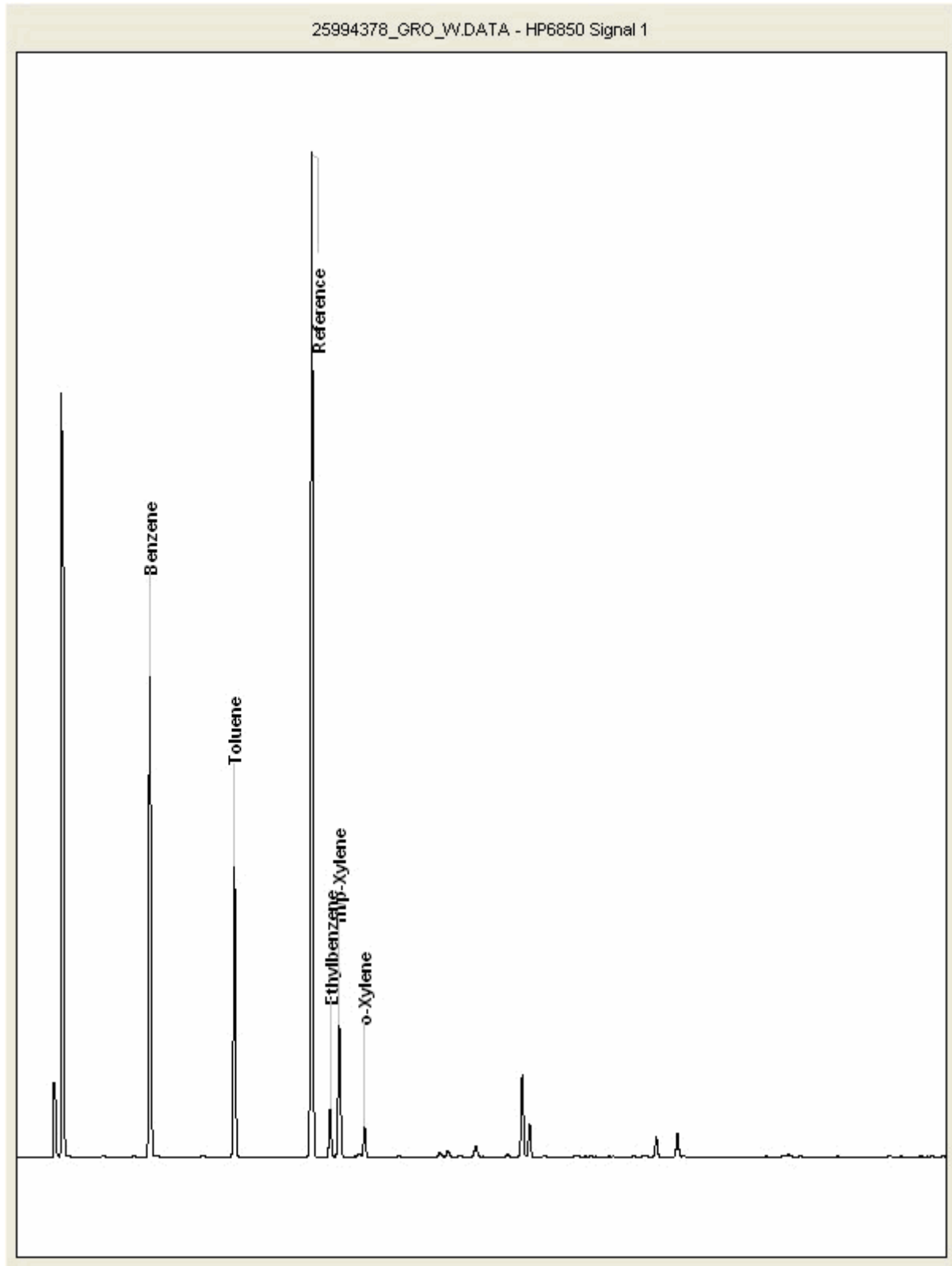
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 25994378
Sample ID : BH303

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220314-8
Client Ref.: 70057278

Report Number: 639183
Location: Port Talbot Harbourside

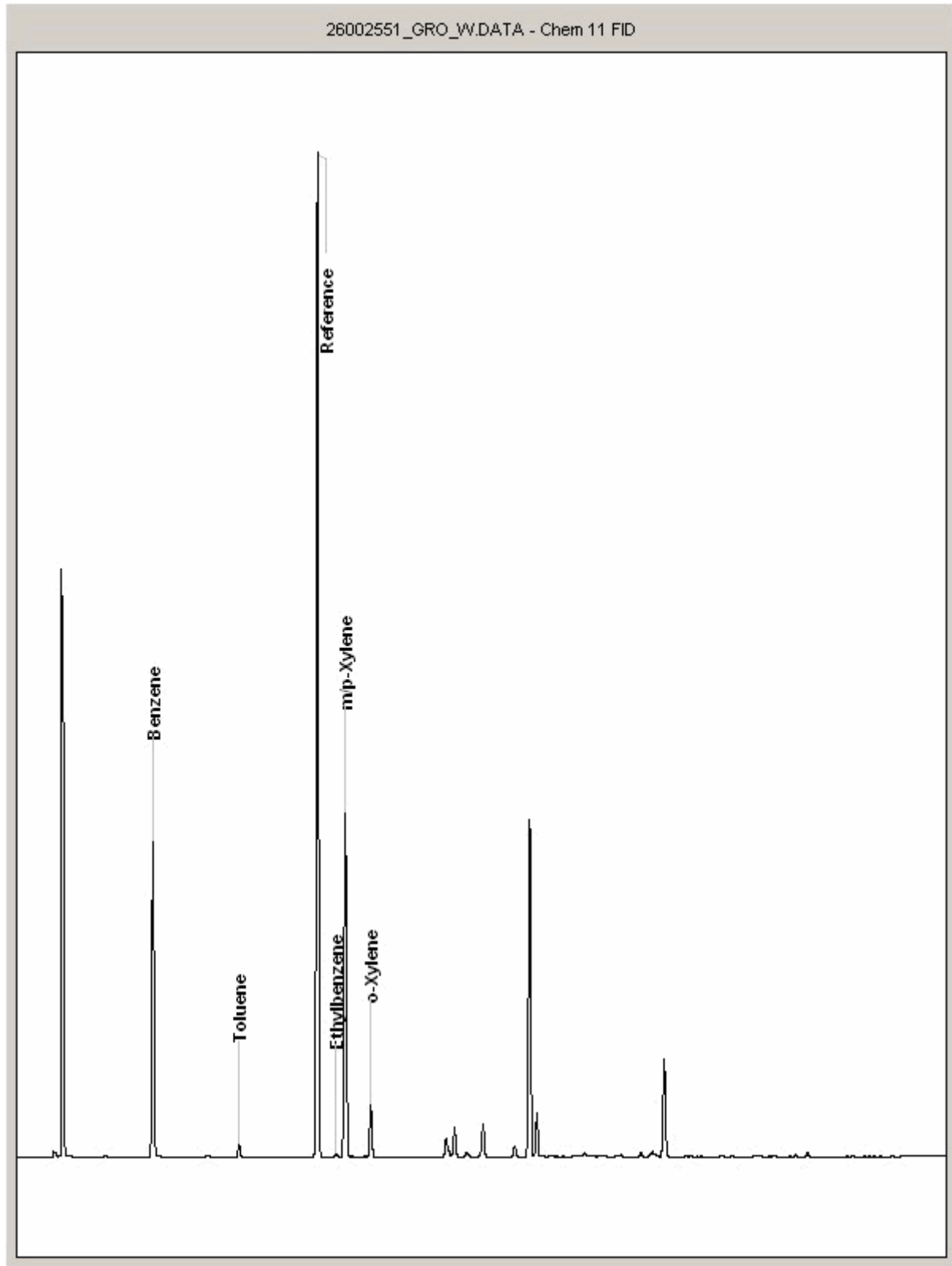
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26002551
Sample ID : BH307

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

SDG:	220314-8	Client Reference:	70057278	Report Number:	639183
Location:	Port Talbot Harbourside	Order Number:	70057278-RW2	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. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. 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

20. 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 (2021), 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 and soils are obtained from supplied bulk materials and soils 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 (2021).

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

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.

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

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



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

WSP UK Limited
8 First Street
Manchester
Lancashire
M15 4RP

Attention: Sarah Richards

CERTIFICATE OF ANALYSIS

Date of report Generation:	14 April 2022
Customer:	WSP UK Limited
Sample Delivery Group (SDG):	220407-70
Your Reference:	70057278
Location:	Port Talbot Harbourside
Report No:	642459
Order Number:	70057278

We received 10 samples on Thursday April 07, 2022 and 9 of these samples were scheduled for analysis which was completed on Thursday April 14, 2022. 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.

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: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26096559	BH301	ES	0.00 - 0.00	05/04/2022
26096575	BH302	ES	0.00 - 0.00	05/04/2022
26096585	BH304	ES	0.00 - 0.00	05/04/2022
26096591	BH305	ES	0.00 - 0.00	05/04/2022
26096600	BH306	ES	0.00 - 0.00	05/04/2022
26096607	BH307	ES	0.00 - 0.00	05/04/2022
26096628	BH308	ES	0.00 - 0.00	05/04/2022
26096634	BH309	ES	0.00 - 0.00	05/04/2022
26096567	BH310	ES	0.00 - 0.00	05/04/2022
26096615	Duplicate	ES	0.00 - 0.00	05/04/2022

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

260966567	BH310	ES	0.00 - 0.00	Vial (ALE297)	GW			X				X
				H2SO4 (ALE244)	GW					X		
				0.5l glass bottle (ALE227)	GW	X	X		X		X	
26096634	BH309	ES	0.00 - 0.00	Vial (ALE297)	GW			X				X
				H2SO4 (ALE244)	GW				X			
				0.5l glass bottle (ALE227)	GW	X	X		X		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
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
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26096559	26096575	26096585	26096591	26096600	26096607	26096628	26096634	26096567
Customer Sample Ref.	BH301	BH302	BH304	BH305	BH306	BH307	BH308	BH309	BH310
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES	ES
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
EPH CWG (Aliphatic) Aqueous GC (W)	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022
EPH CWG (Aromatic) Aqueous GC (W)	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022
GRO by GC-FID (W)	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022
PAH Spec MS - Aqueous (W)	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022
Phenols by HPLC (W)	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022
TPH CWG (W)	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022
VOC MS (W)	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	13-Apr-2022	12-Apr-2022	13-Apr-2022	12-Apr-2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

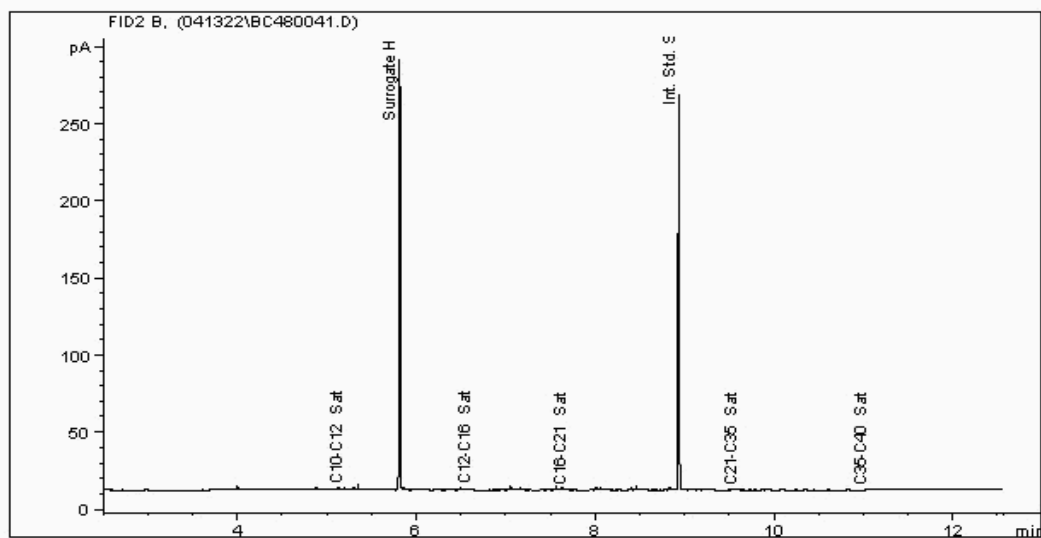
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26114471
Sample ID : BH304

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)Sample Identity: 24350174-
Date Acquired : 14/04/2022 03:06:35 PM
Units : ppb
Dilution : SE BH304[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	Surrogate H	210.8	0.227
3	C12-C16 Sat	0.0	0.000
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	210.2	0.267
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		421.0	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

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

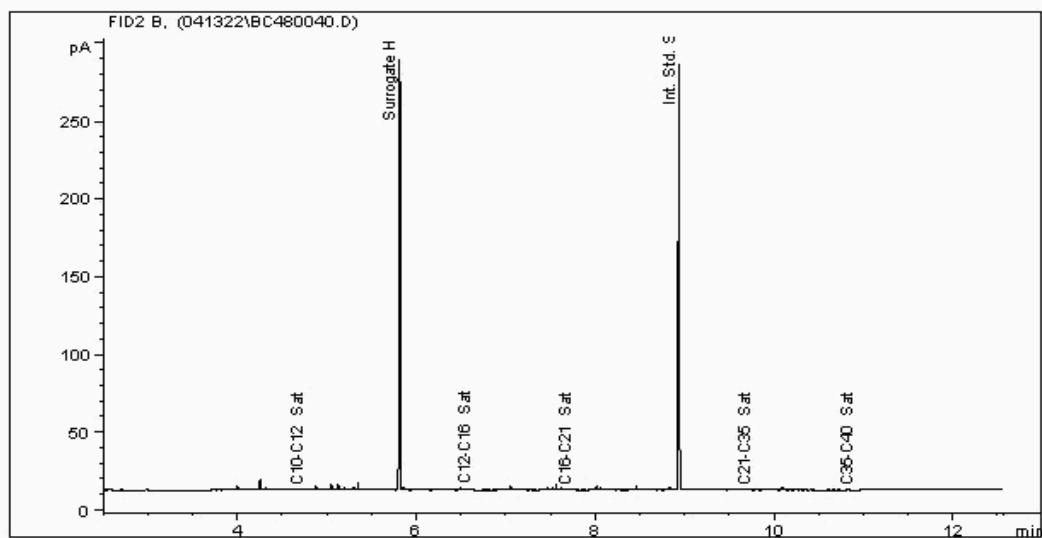
Sample No : 26114475
Sample ID : BH306

Depth : 0.00 - 0.00

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

Sample Identity: 24350196-
Date Acquired : 14/04/2022 02:43:02 PM
Units : ppb
Dilution : SE BH306[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	Surrogate H	223.1	0.224
3	C12-C16 Sat	0.0	0.000
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	224.2	0.266
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		447.3	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

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

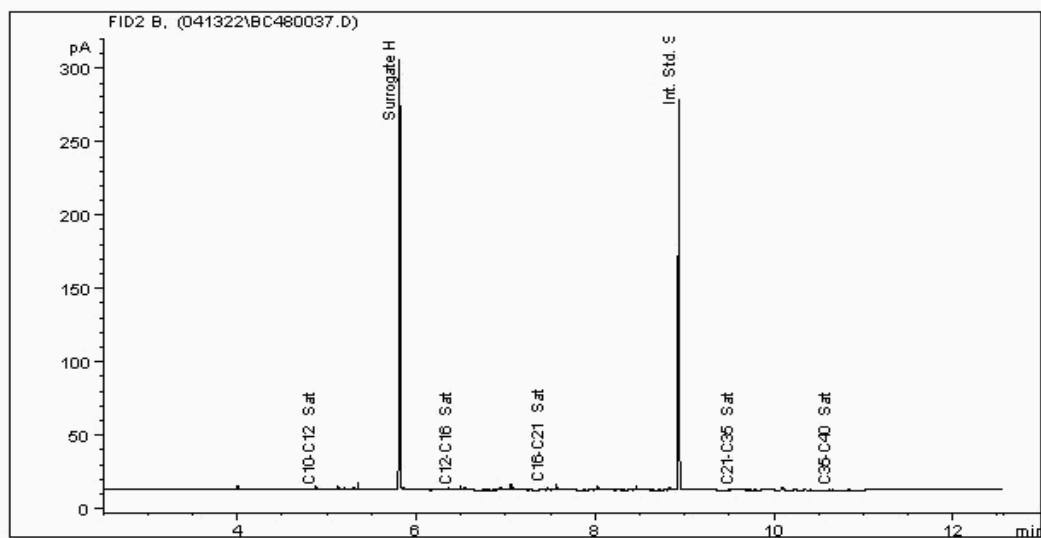
Sample No : 26114476
Sample ID : BH305

Depth : 0.00 - 0.00

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

Sample Identity: 24350184-
Date Acquired : 14/04/2022 01:32:08 PM
Units : ppb
Dilution : SE BH305[0.00 - 0.00] ->
CF : 1
Multiplier : 0.028

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	Surrogate H	230.7	0.240
3	C12-C16 Sat	0.0	0.000
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	227.6	0.279
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		458.3	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

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

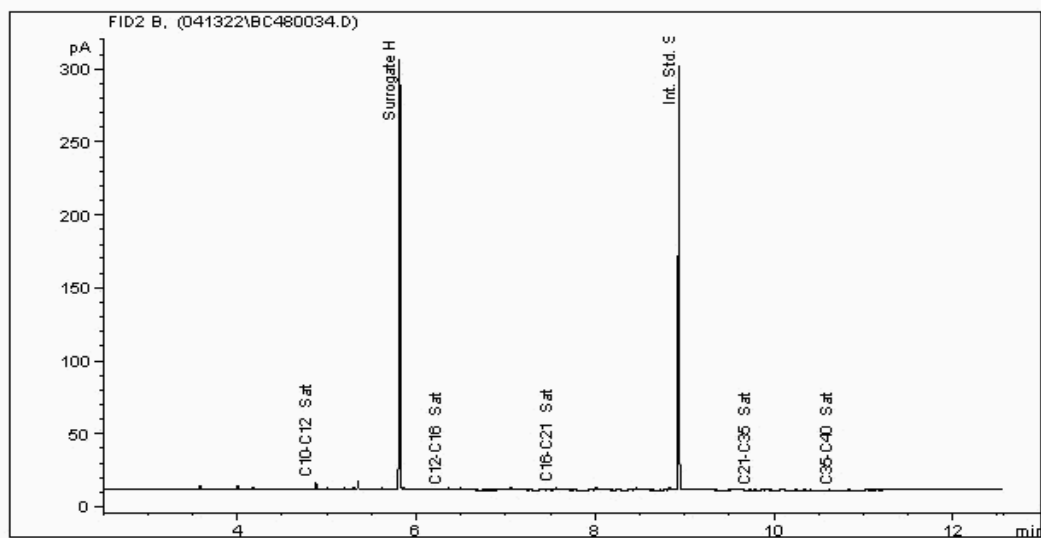
Sample No : 26114479
Sample ID : BH302

Depth : 0.00 - 0.00

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

Sample Identity: 24350163-
Date Acquired : 14/04/2022 00:21:11 PM
Units : ppb
Dilution : SE BH302[0.00 - 0.00] ->
CF : 1
Multiplier : 0.028

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	Surrogate H	232.9	0.252
3	C12-C16 Sat	0.0	0.000
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	219.3	0.281
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		452.1	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

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

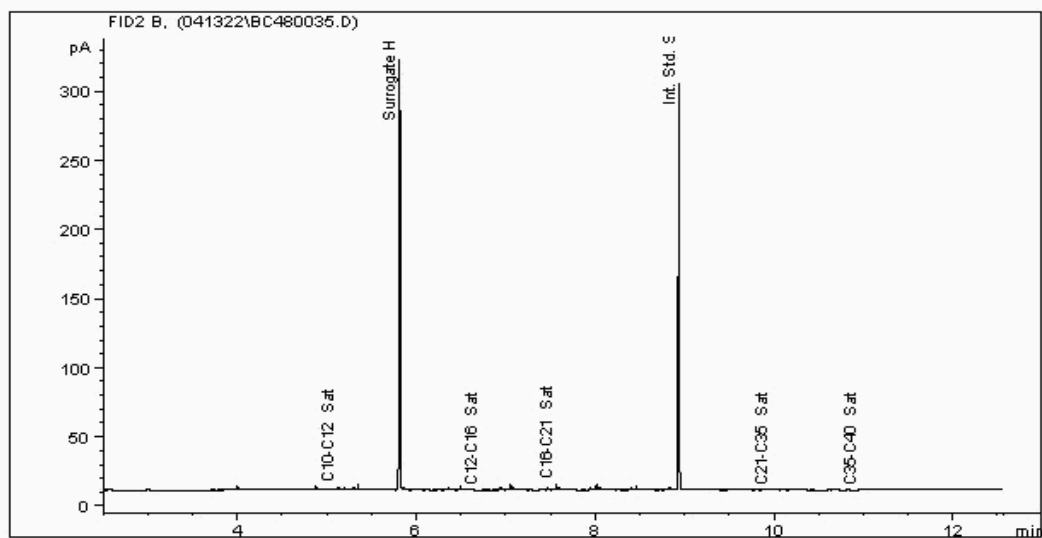
Sample No : 26114480
Sample ID : BH301

Depth : 0.00 - 0.00

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

Sample Identity: 24350143-
Date Acquired : 14/04/2022 00:44:47 PM
Units : ppb
Dilution : SE BH301[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	0.0	0.000
2	Surrogate H	238.2	0.244
3	C12-C16 Sat	0.0	0.000
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	222.3	0.269
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		460.4	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

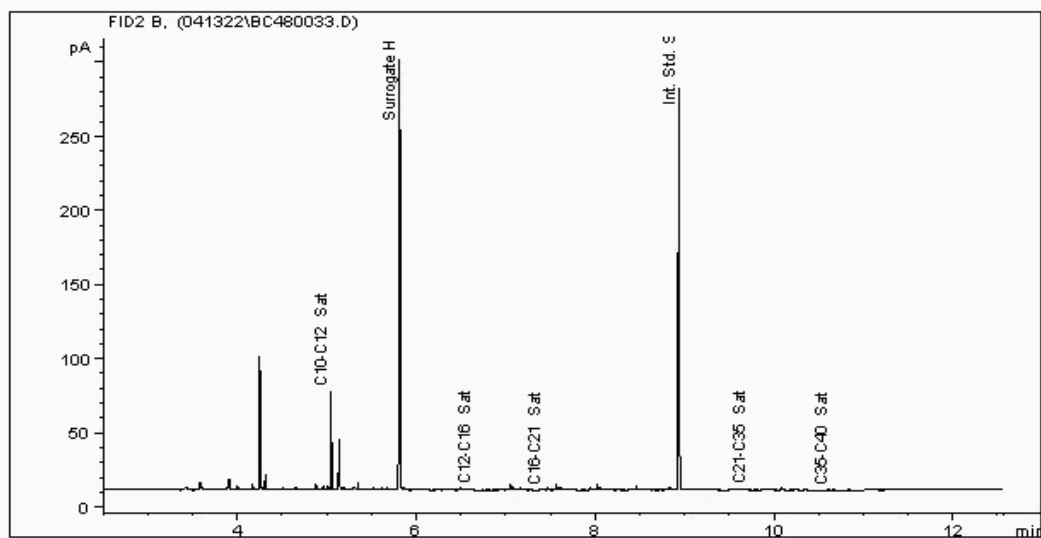
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26114484
Sample ID : BH308

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)Sample Identity: 24350240-
Date Acquired : 13/04/2022 23:57:30 PM
Units : ppb
Dilution : SE BH308[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	166.5	0.155
2	Surrogate H	228.2	0.216
3	C12-C16 Sat	0.0	0.000
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	223.9	0.250
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		618.6	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

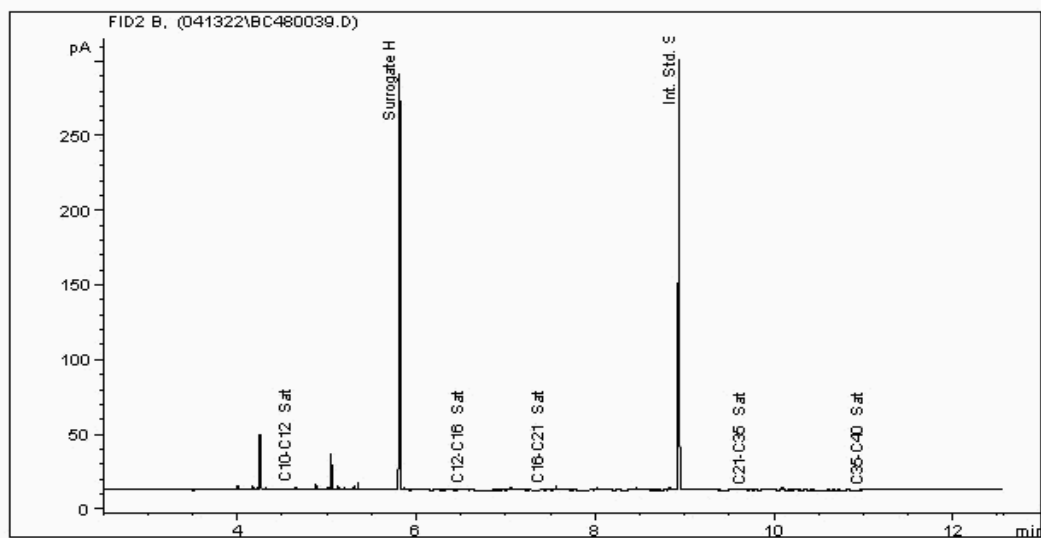
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26114487
Sample ID : BH309

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)Sample Identity: 24350253-
Date Acquired : 14/04/2022 02:19:21 PM
Units : ppb
Dilution : SE BH309[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	56.3	0.052
2	Surrogate H	226.0	0.210
3	C12-C16 Sat	0.0	0.000
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	228.1	0.250
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		510.4	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

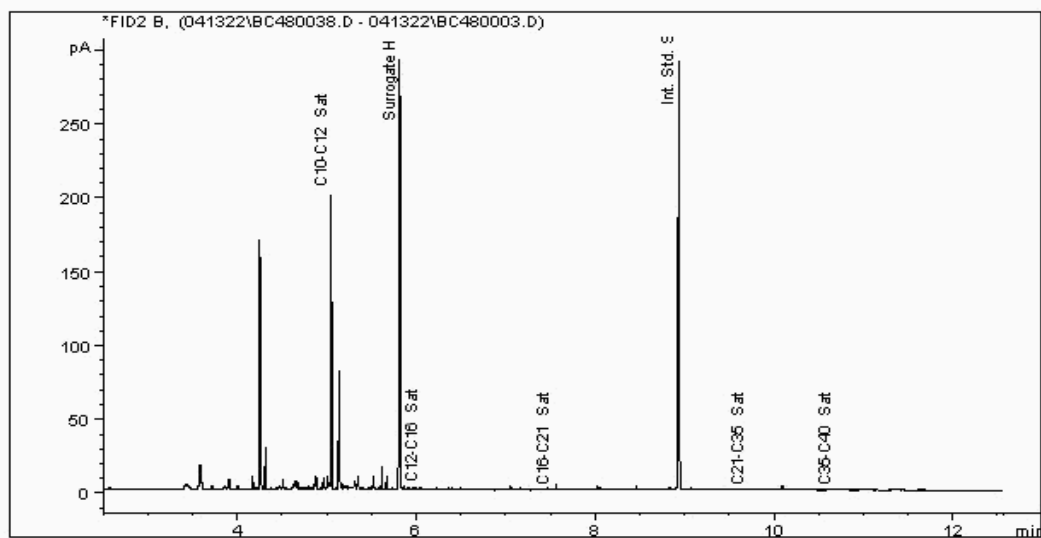
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26114489
Sample ID : BH310

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)Sample Identity: 24350153-
Date Acquired : 14/04/2022 01:55:41 PM
Units : ppb
Dilution : SE BH310[0.00 - 0.00] ->
CF : 1
Multiplier : 0.028

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	439.4	0.447
2	Surrogate H	225.0	0.232
3	C12-C16 Sat	54.2	0.056
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	233.2	0.284
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		951.8	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

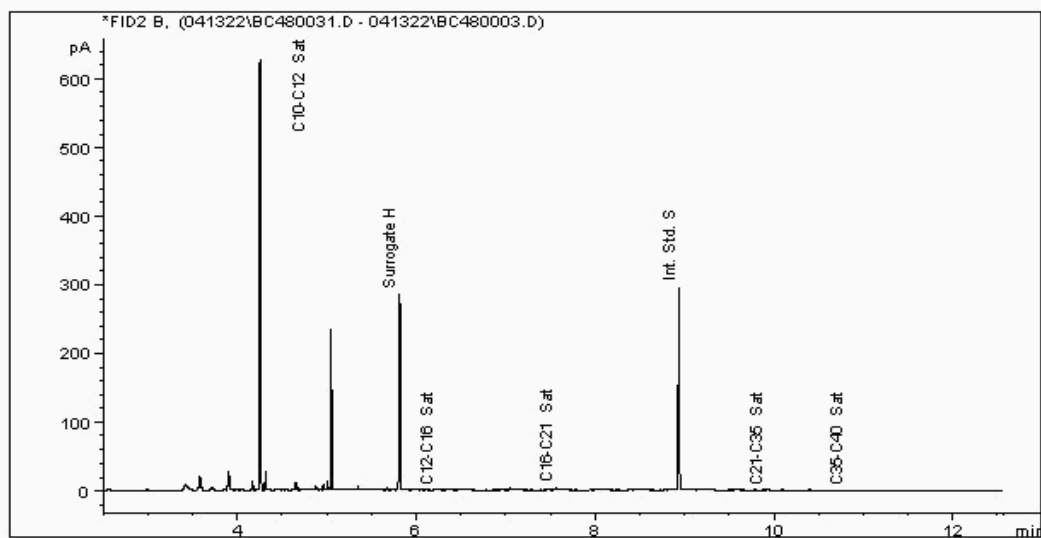
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26114490
Sample ID : BH307

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)Sample Identity: 24350210-
Date Acquired : 13/04/2022 23:10:18 PM
Units : ppb
Dilution : SE BH307[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	830.6	0.750
2	Surrogate H	225.1	0.206
3	C12-C16 Sat	8.4	0.008
4	C16-C21 Sat	0.0	0.000
5	Int. Std. S	231.5	0.250
6	C21-C35 Sat	0.0	0.000
7	C35-C40 Sat	0.0	0.000
Total Peak Area		1295.6	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

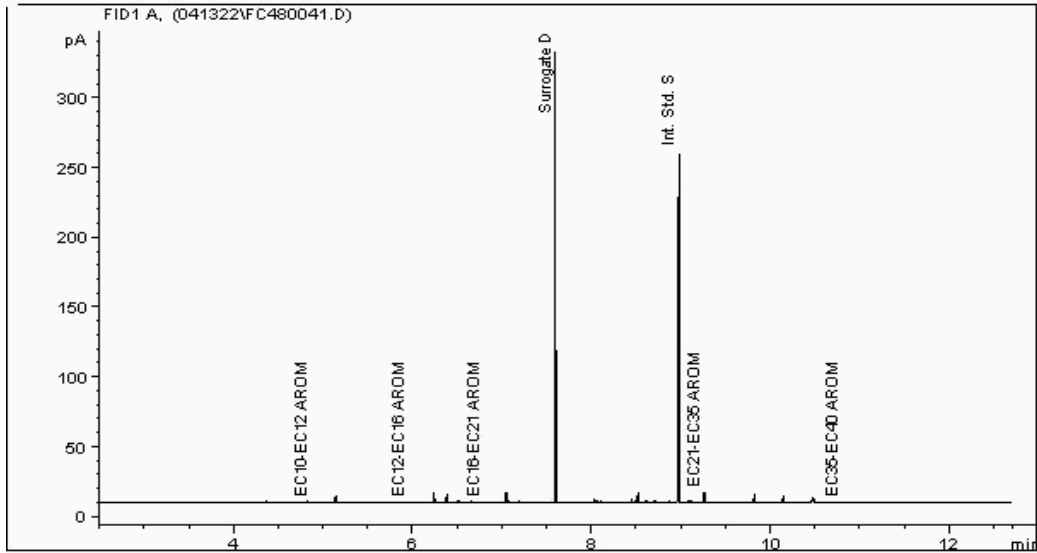
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114471
Sample ID : BH304

Depth : 0.00 - 0.00

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

Sample Identity: 24350175-
Date Acquired : 14/04/2022 03:06:35 PM
Units : ppb
Dilution : SE BH304[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

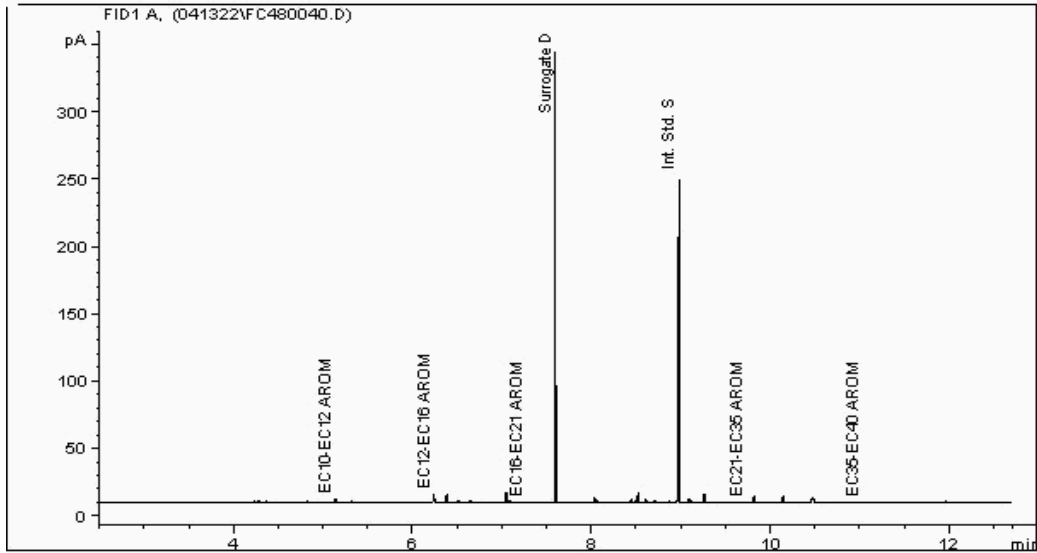
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114475
Sample ID : BH306

Depth : 0.00 - 0.00

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

Sample Identity: 24350197-
Date Acquired : 14/04/2022 02:43:02 PM
Units : ppb
Dilution : SE BH306[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

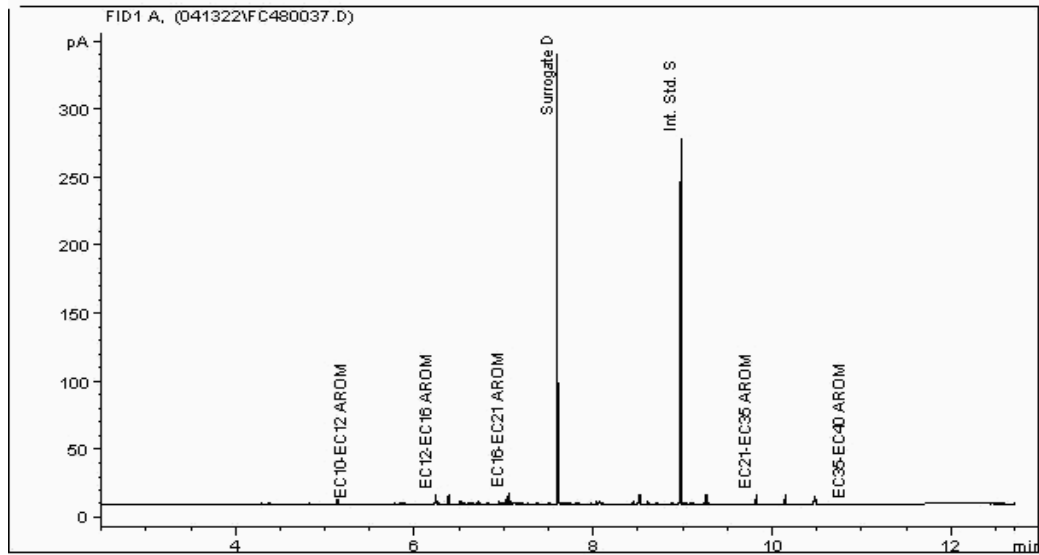
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114476
Sample ID : BH305

Depth : 0.00 - 0.00

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

Sample Identity: 24350185-
Date Acquired : 14/04/2022 01:32:08 PM
Units : ppb
Dilution : SE BH305[0.00 - 0.00] ->
CF : 1
Multiplier : 0.028





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

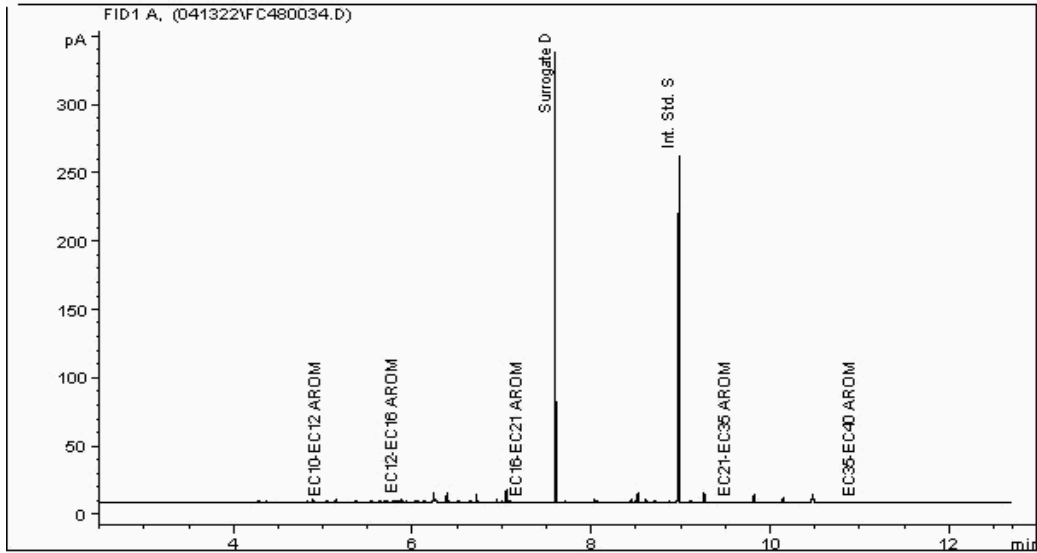
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114479
Sample ID : BH302

Depth : 0.00 - 0.00

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

Sample Identity: 24350164-
Date Acquired : 14/04/2022 00:21:11 PM
Units : ppb
Dilution : SE BH302[0.00 - 0.00] ->
CF : 1
Multiplier : 0.028





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

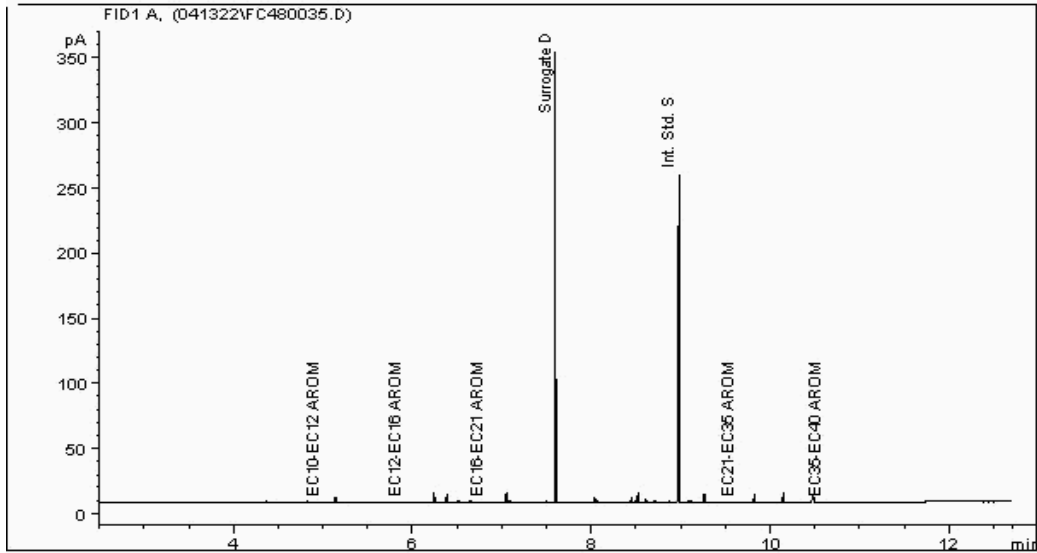
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114480
Sample ID : BH301

Depth : 0.00 - 0.00

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

Sample Identity: 24350144-
Date Acquired : 14/04/2022 00:44:47 PM
Units : ppb
Dilution : SE BH301[0.00 - 0.00] ->
CF : 1
Multiplier : 0.027





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

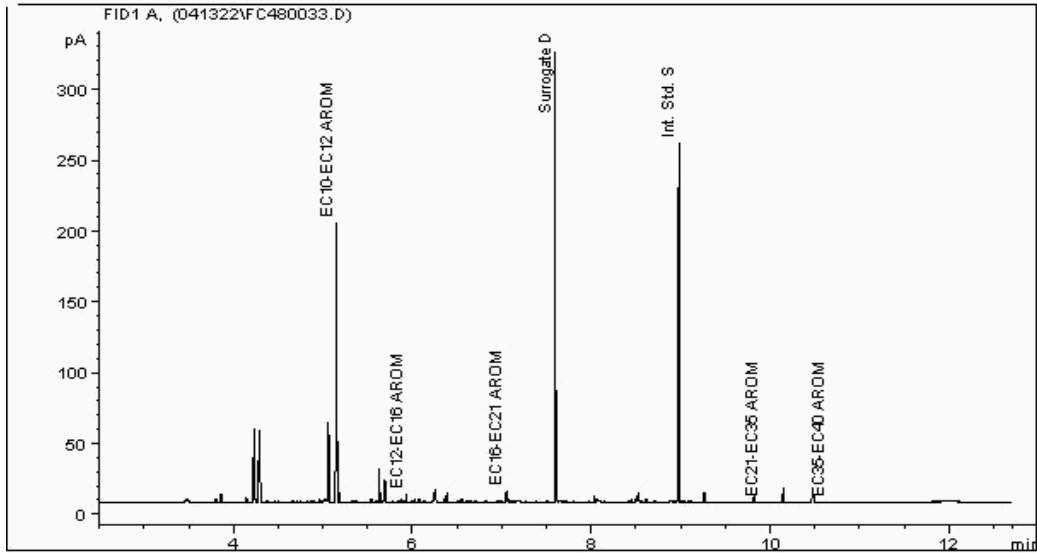
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114484
Sample ID : BH308

Depth : 0.00 - 0.00

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

Sample Identity: 24350241-
Date Acquired : 13/04/2022 23:57:30 PM
Units : ppb
Dilution : SE BH308[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

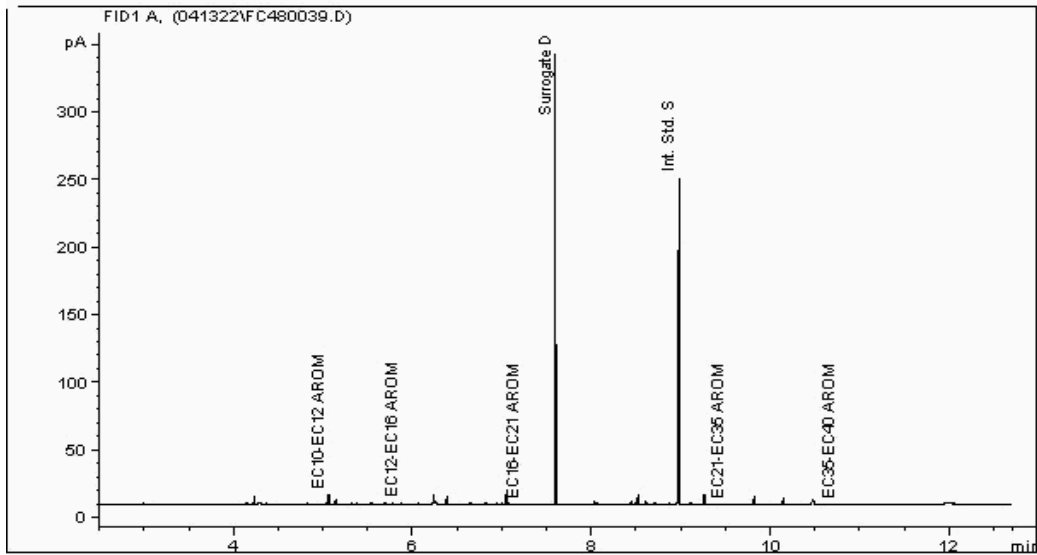
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114487
Sample ID : BH309

Depth : 0.00 - 0.00

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

Sample Identity: 24350254-
Date Acquired : 14/04/2022 02:19:21 PM
Units : ppb
Dilution : SE BH309[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

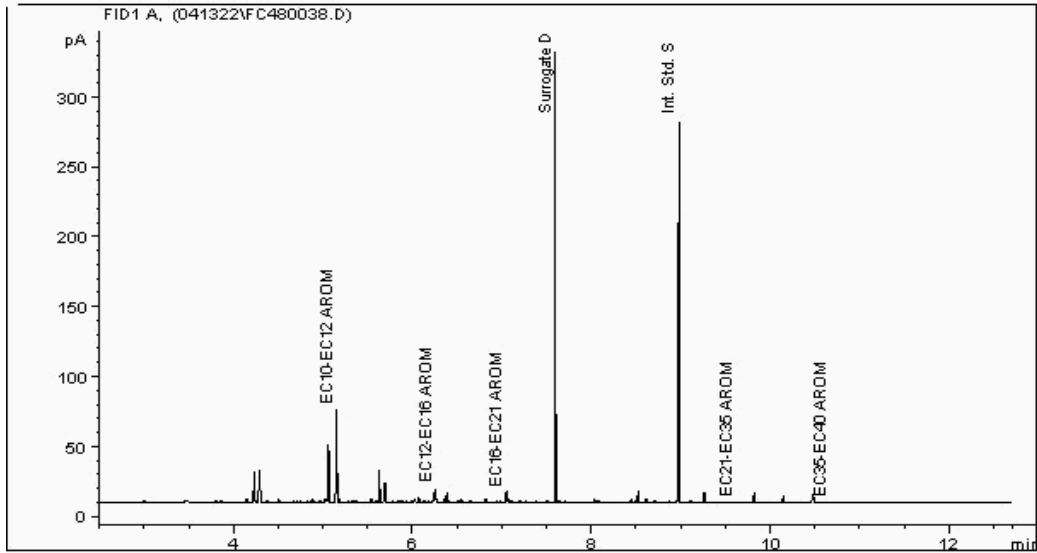
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114489
Sample ID : BH310

Depth : 0.00 - 0.00

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

Sample Identity: 24350154-
Date Acquired : 14/04/2022 01:55:41 PM
Units : ppb
Dilution : SE BH310[0.00 - 0.00] ->
CF : 1
Multiplier : 0.028





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

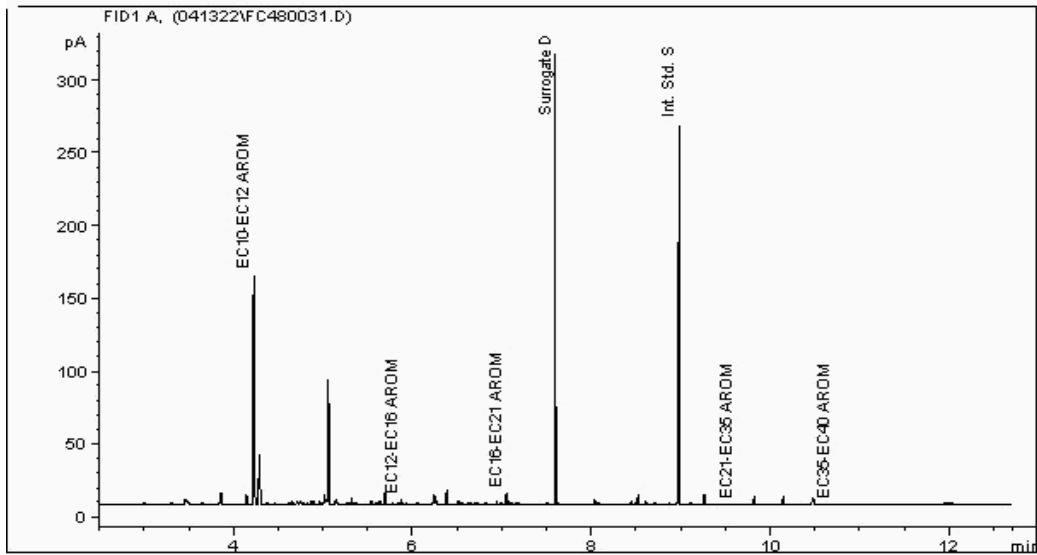
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26114490
Sample ID : BH307

Depth : 0.00 - 0.00

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

Sample Identity: 24350211-
Date Acquired : 13/04/2022 23:10:18 PM
Units : ppb
Dilution : SE BH307[0.00 - 0.00] ->
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

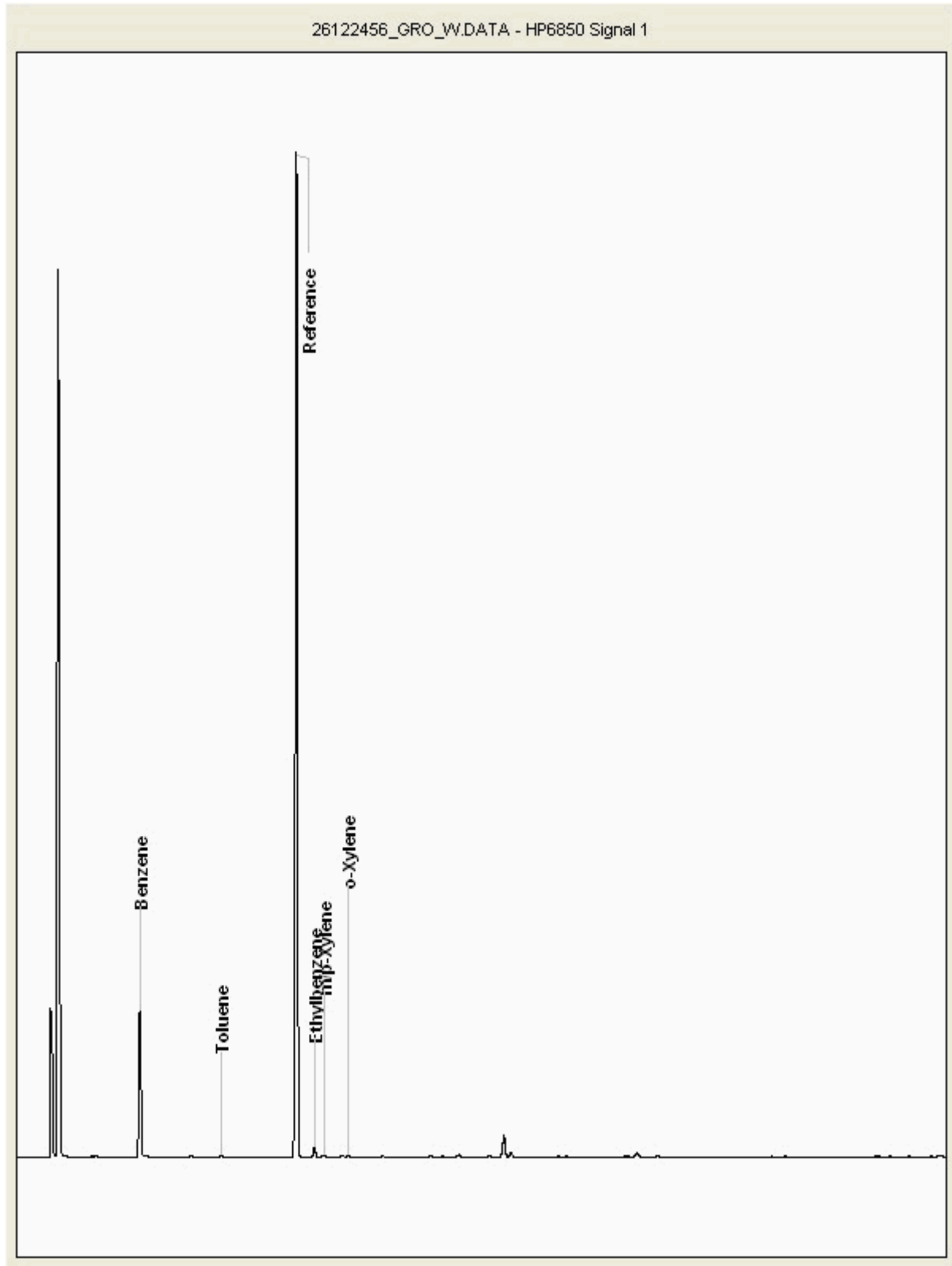
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26122456
Sample ID : BH309

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

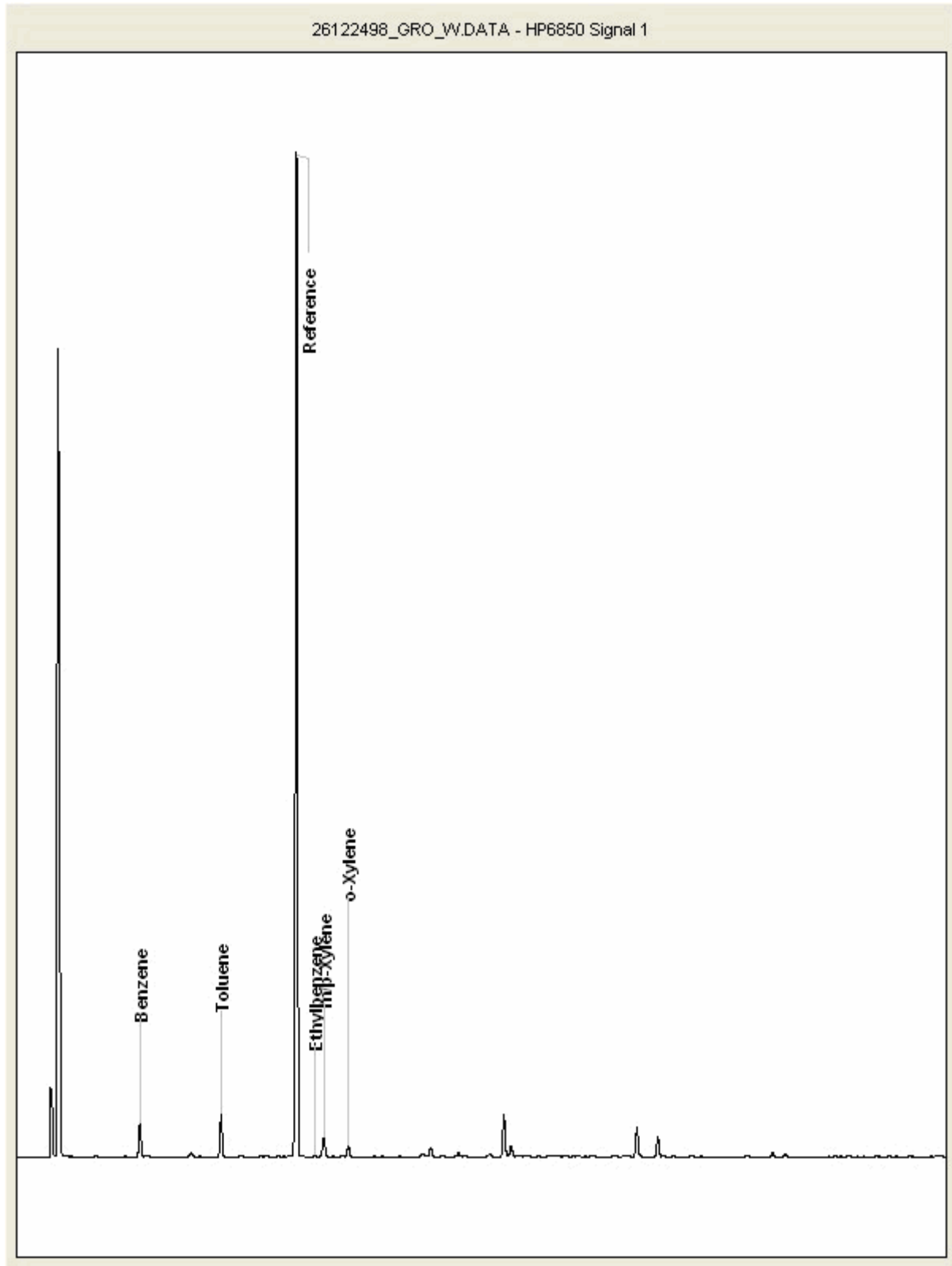
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26122498
Sample ID : BH310

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

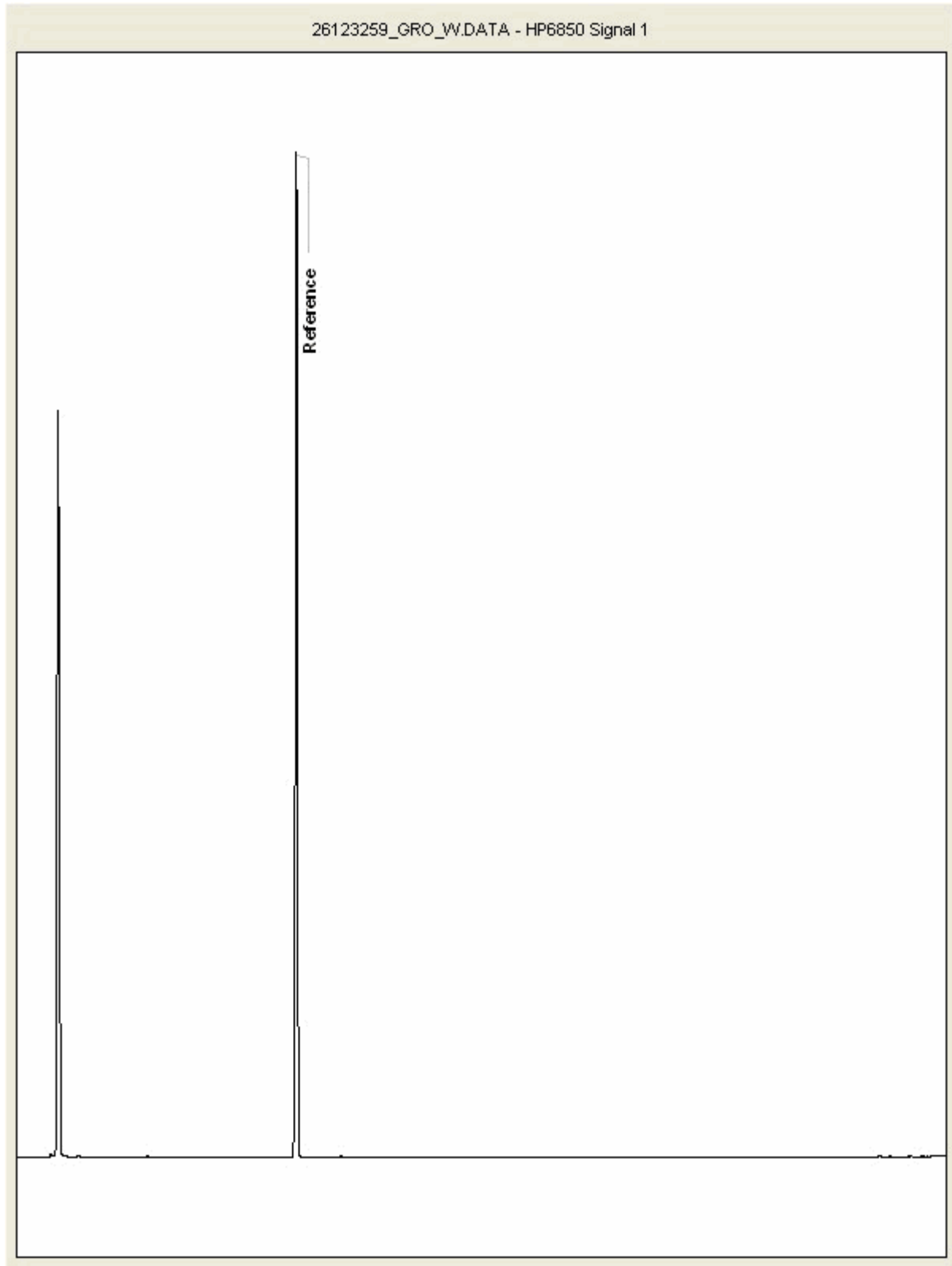
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26123259
Sample ID : BH301

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

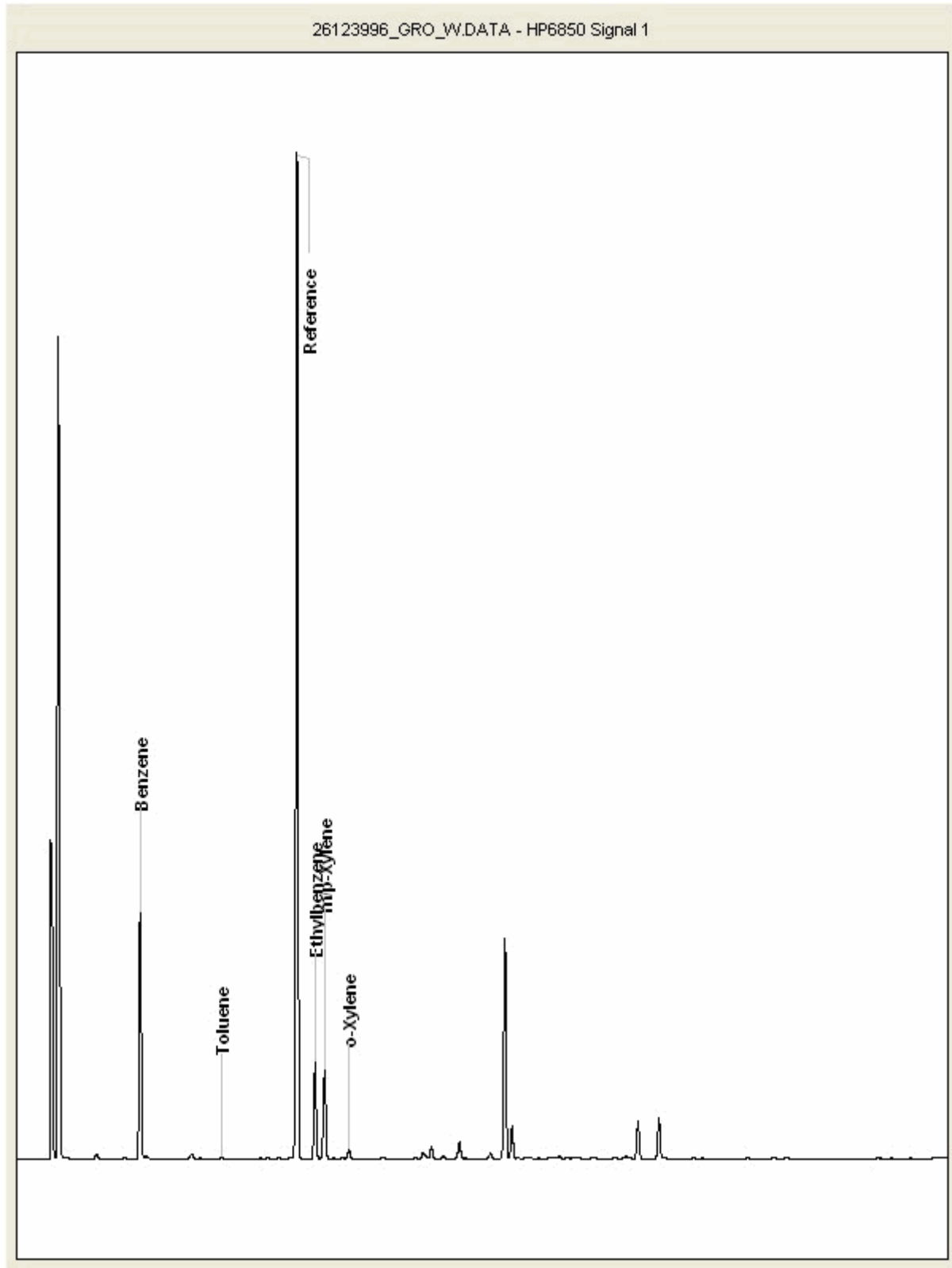
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26123996
Sample ID : BH307

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

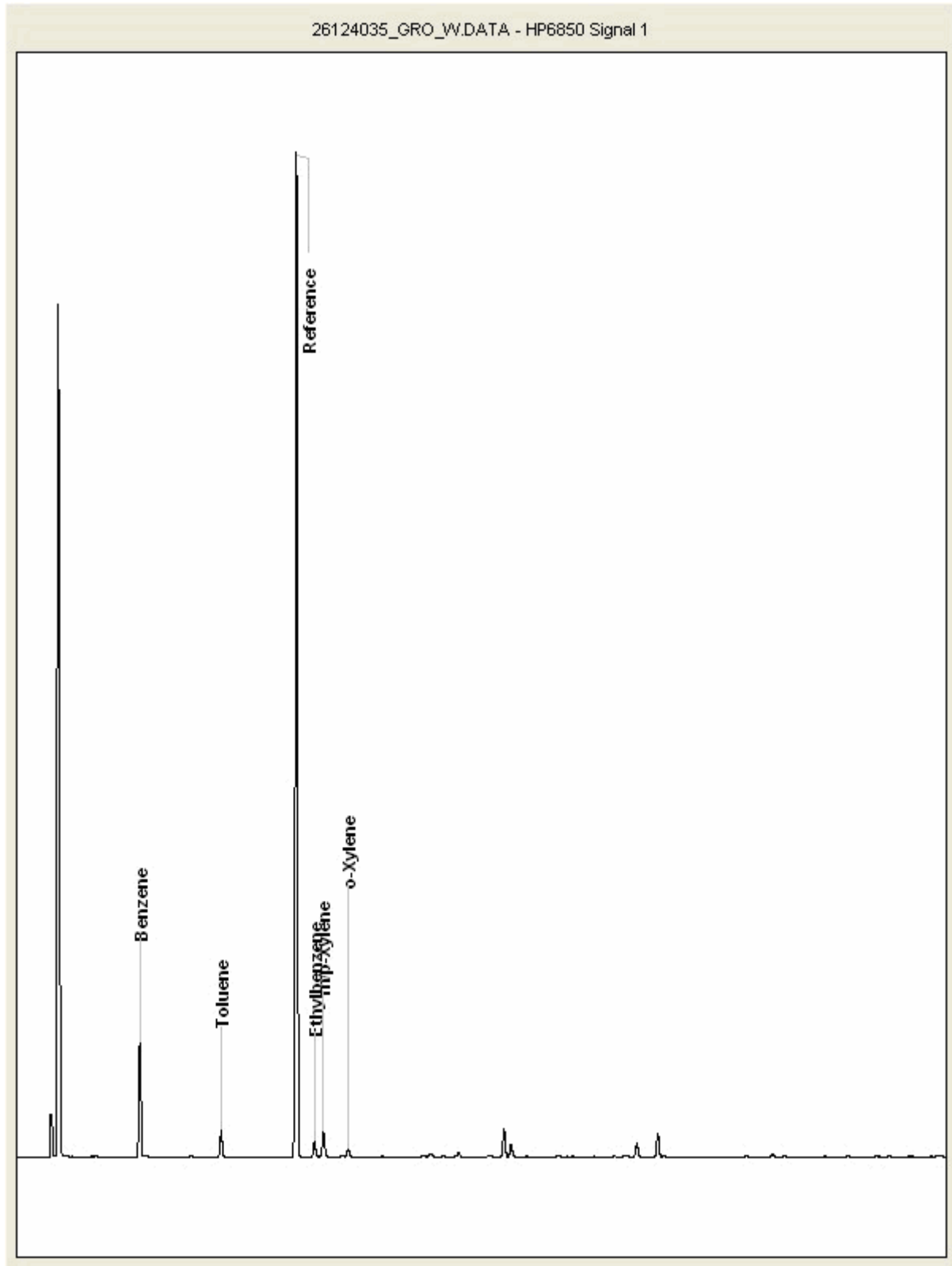
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26124035
Sample ID : BH308

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

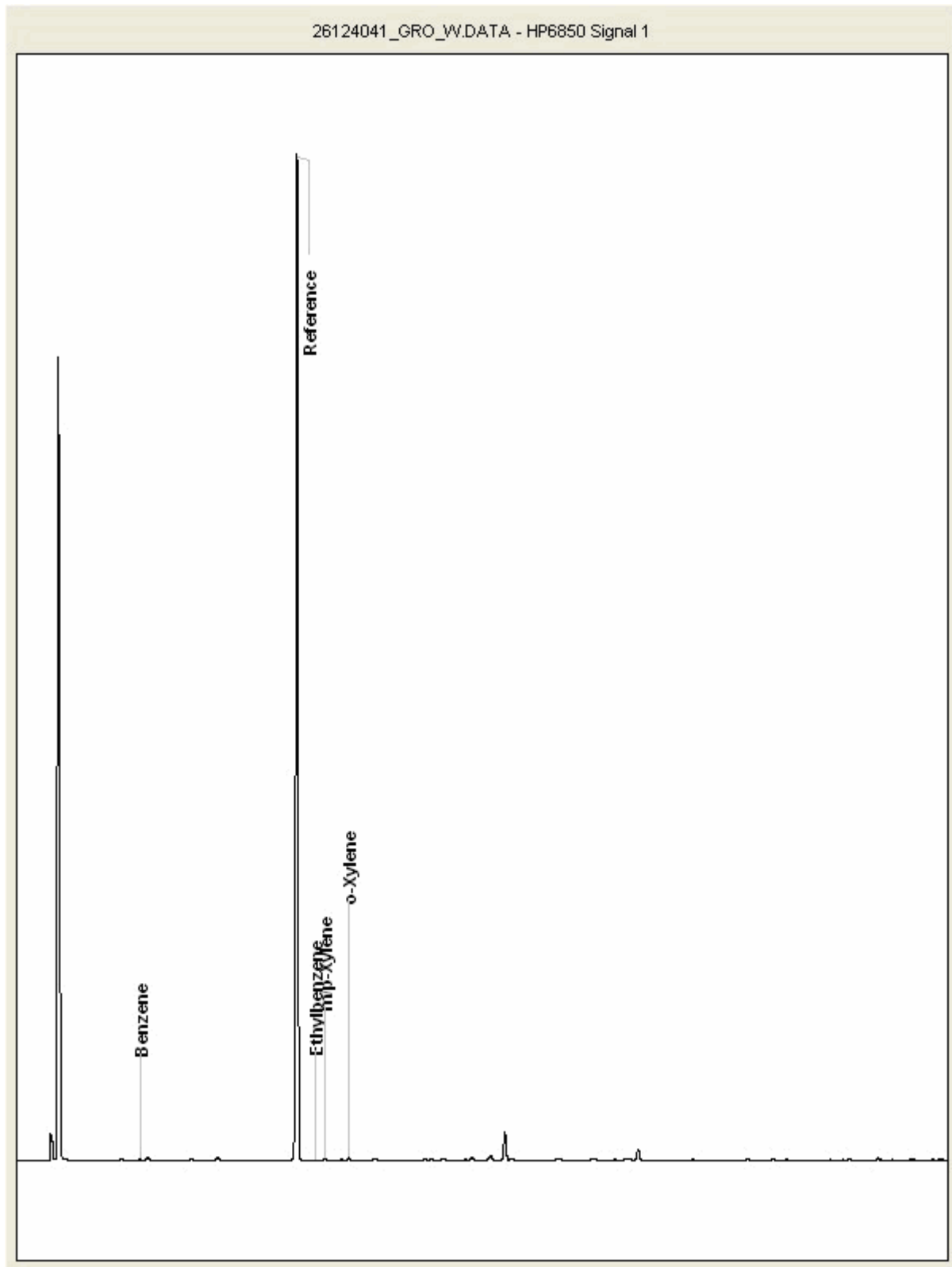
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26124041
Sample ID : BH302

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

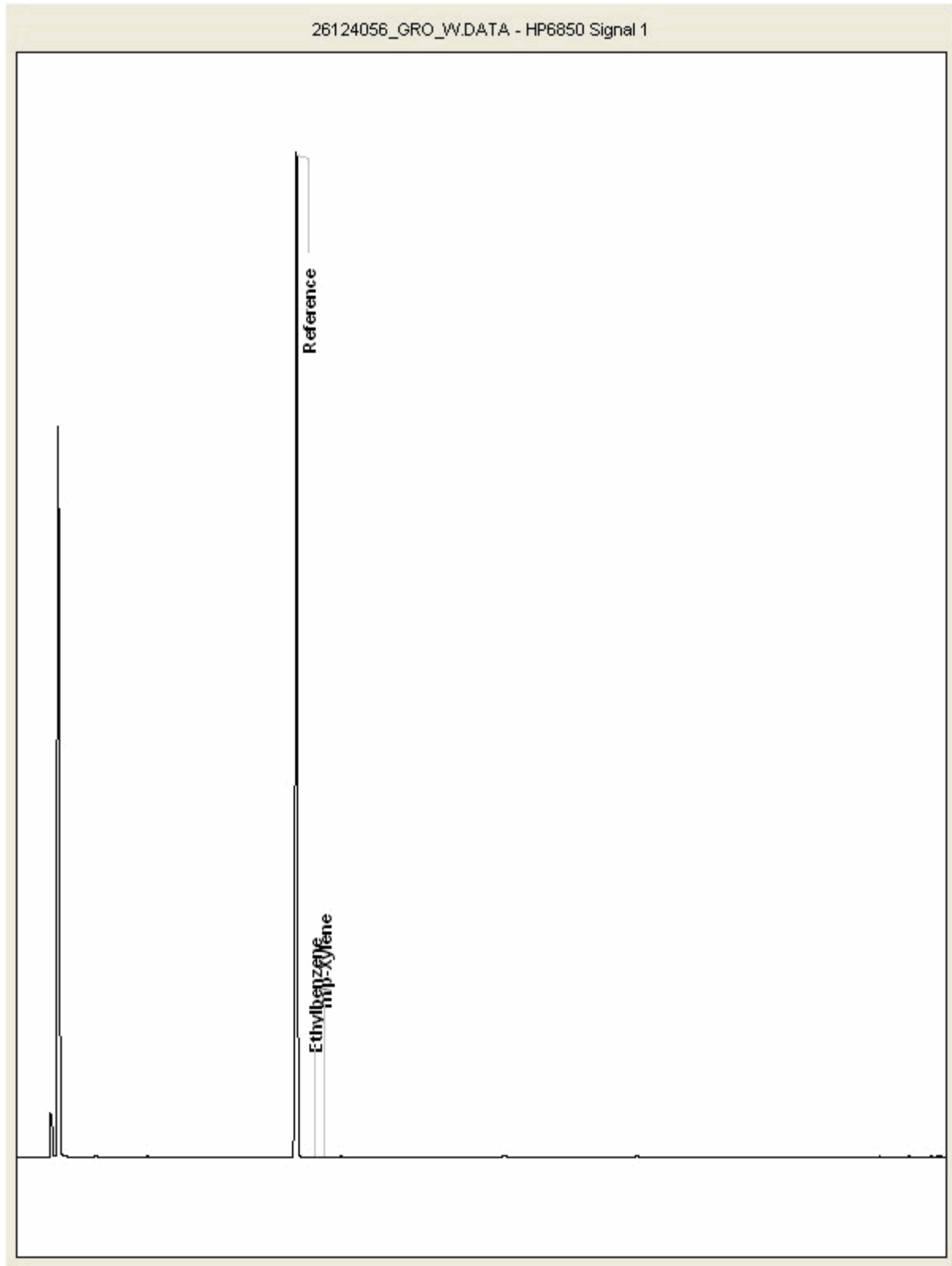
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26124056
Sample ID : BH306

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

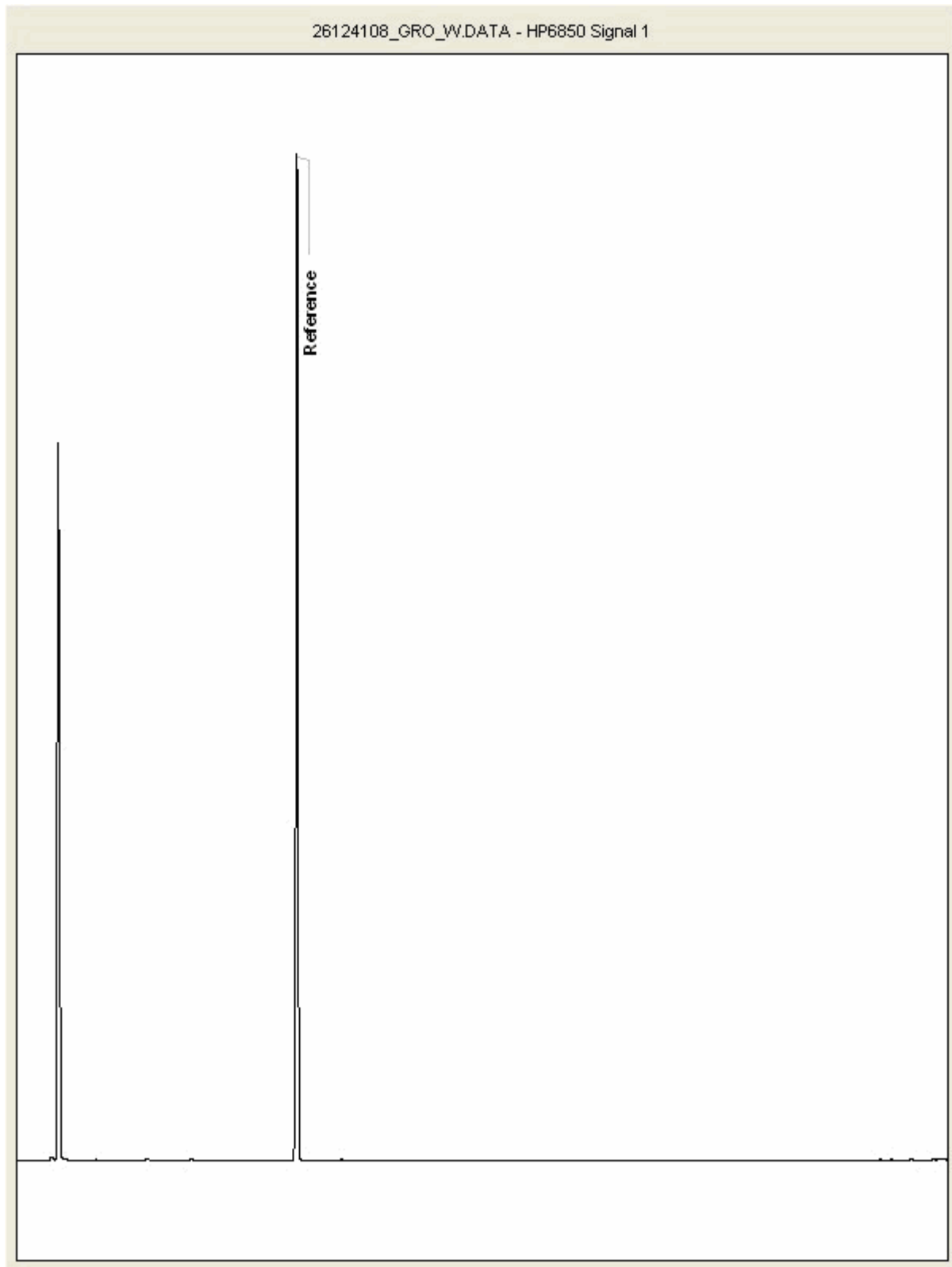
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26124108
Sample ID : BH305

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-70
Client Ref.: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

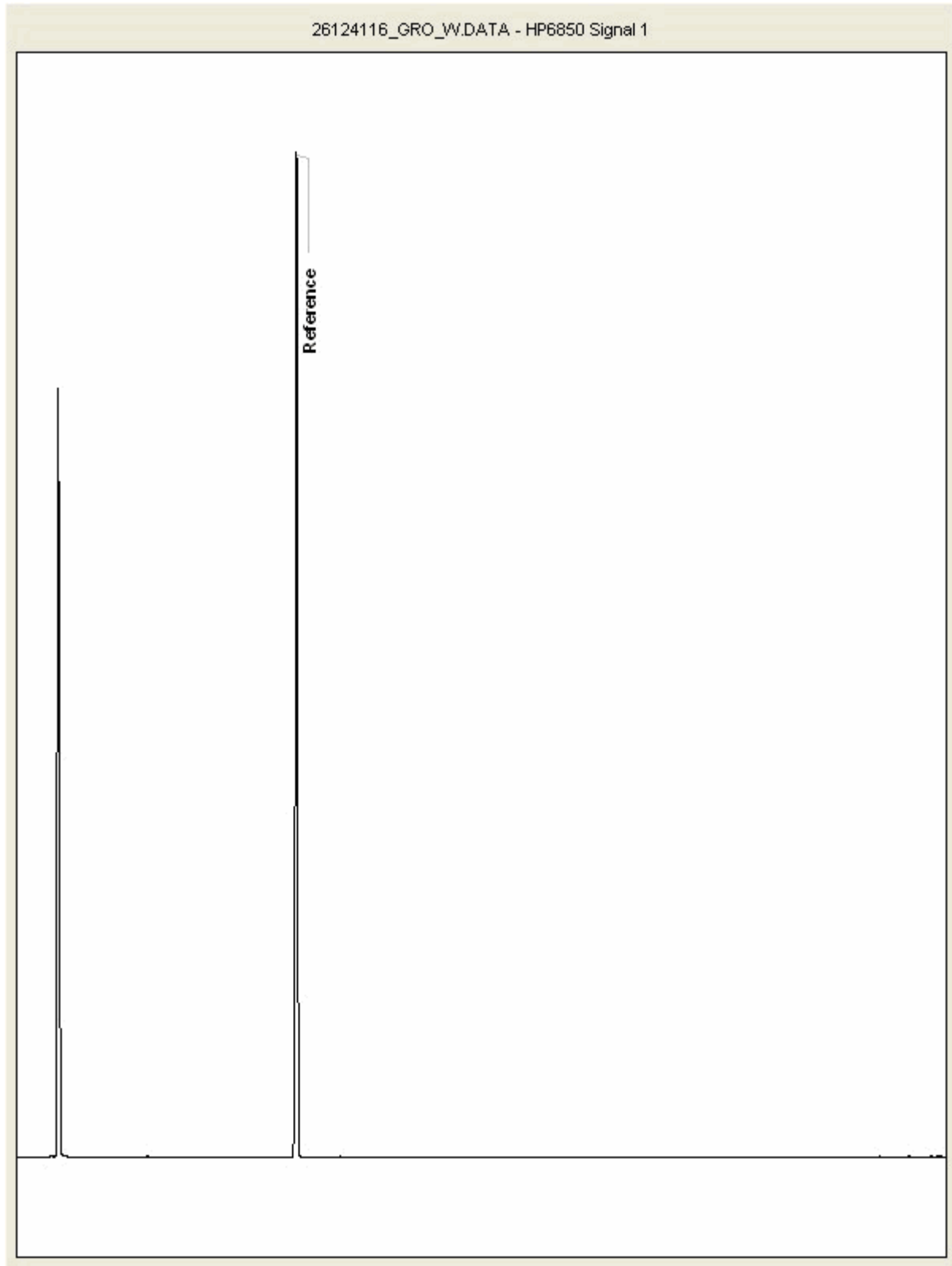
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26124116
Sample ID : BH304

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

SDG: 220407-70
Client Ref: 70057278

Report Number: 642459
Location: Port Talbot Harbourside

Superseded Report:

Appendix

General

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. 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

20. 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 (2021), 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 and soils are obtained from supplied bulk materials and soils 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 (2021).

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

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.

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

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



Unit 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

WSP UK Limited

8 First Street

Manchester

Lancashire

M15 4RP

Attention: Sarah Richards

CERTIFICATE OF ANALYSIS

Date of report Generation: 16 April 2022
Customer: WSP UK Limited
Sample Delivery Group (SDG): 220409-56
Your Reference: 70057278
Location: Port Talbot Harbourside
Report No: 642627
Order Number: 70057278

We received 1 sample on Saturday April 09, 2022 and 1 of these samples were scheduled for analysis which was completed on Saturday April 16, 2022. 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.

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: 220409-56
Client Ref.: 70057278

Report Number: 642627
Location: Port Talbot Harbourside

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26112212	BH303	EW	2.60 - 2.80	08/04/2022

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 220409-56
Client Ref.: 70057278

Report Number: 642627
Location: Port Talbot Harbourside

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)

26112212

Customer
Sample Reference

BH303

AGS Reference

EW

Depth (m)

2.60 - 2.80

Container

0.5l glass bottle
(ALE227)
H2SO4
(ALE244)
Vial (ALE297)

Sample Type

GW

GW

GW

EPH CWG (Aliphatic) Aqueous GC
(W)

All

NDPs: 0
Tests: 1

X

EPH CWG (Aromatic) Aqueous GC
(W)

All

NDPs: 0
Tests: 1

X

GRO by GC-FID (W)

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

TPH CWG (W)

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 220409-56
Client Ref.: 70057278

Report Number: 642627
Location: Port Talbot Harbourside

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
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
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 220409-56
Client Ref.: 70057278

Report Number: 642627
Location: Port Talbot Harbourside

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26112212
Customer Sample Ref.	BH303
AGS Ref.	EW
Depth	2.60 - 2.80
Type	Ground Water

EPH CWG (Aliphatic) Aqueous GC (W)	16-Apr-2022
EPH CWG (Aromatic) Aqueous GC (W)	16-Apr-2022
GRO by GC-FID (W)	14-Apr-2022
PAH Spec MS - Aqueous (W)	14-Apr-2022
Phenols by HPLC (W)	13-Apr-2022
TPH CWG (W)	16-Apr-2022
VOC MS (W)	13-Apr-2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220409-56
Client Ref.: 70057278Report Number: 642627
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

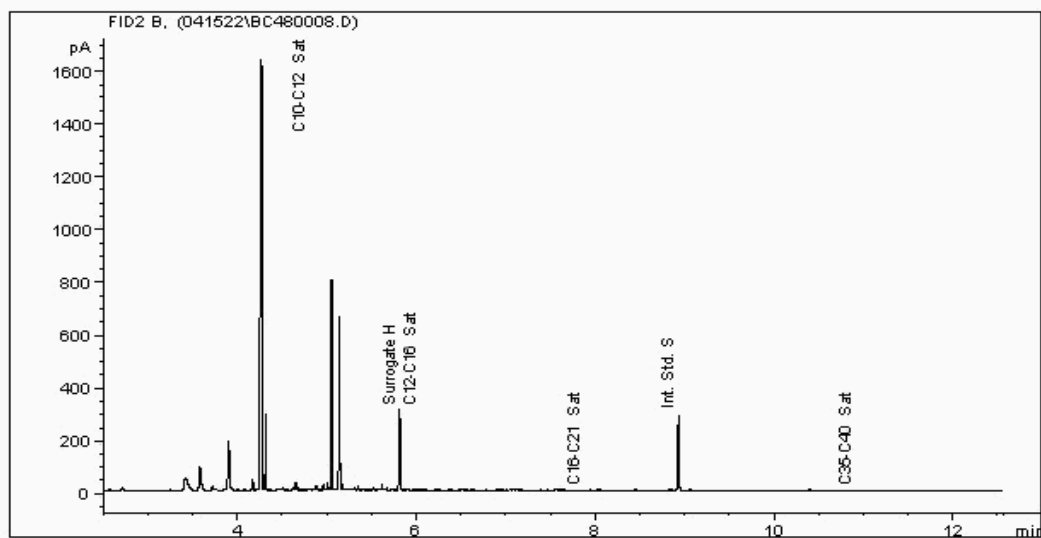
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26124819
Sample ID : BH303

Depth : 2.60 - 2.80

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)Sample Identity: 24365970-
Date Acquired : 15/04/2022 14:00:05 PM
Units : ppb
Dilution : SE BH303[2.60 - 2.80] ->
CF : 1
Multiplier : 0.030

#	Compound Name	Main Peak Area	Amount
1	C10-C12 Sat	3353.0	3.421
2	Surrogate H	243.9	0.252
3	C12-C16 Sat	155.6	0.160
4	C16-C21 Sat	0.2	0.000
5	Int. Std. S	245.3	0.299
6	C21-C35 Sat	68.3	0.086
7	C35-C40 Sat	0.0	0.000
Total Peak Area		4066.3	





CERTIFICATE OF ANALYSIS

Validated

SDG: 220409-56
Client Ref.: 70057278

Report Number: 642627
Location: Port Talbot Harbourside

Superseded Report:

Chromatogram

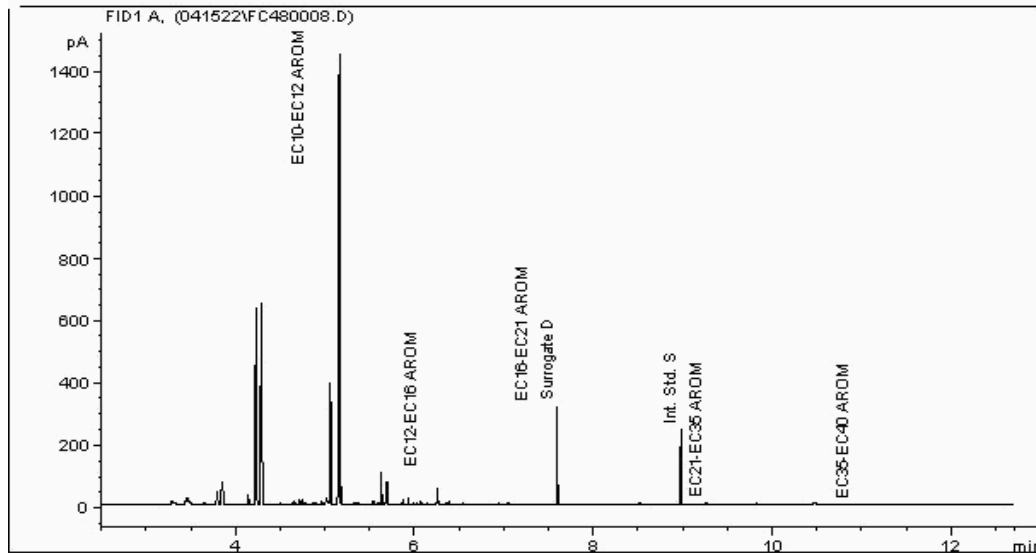
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26124819
Sample ID : BH303

Depth : 2.60 - 2.80

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

Sample Identity: 24365971-
Date Acquired : 15/04/2022 14:00:05 PM
Units : ppb
Dilution : SE BH303[2.60 - 2.80] ->
CF : 1
Multiplier : 0.030





CERTIFICATE OF ANALYSIS

Validated

SDG: 220409-56
Client Ref.: 70057278

Report Number: 642627
Location: Port Talbot Harbourside

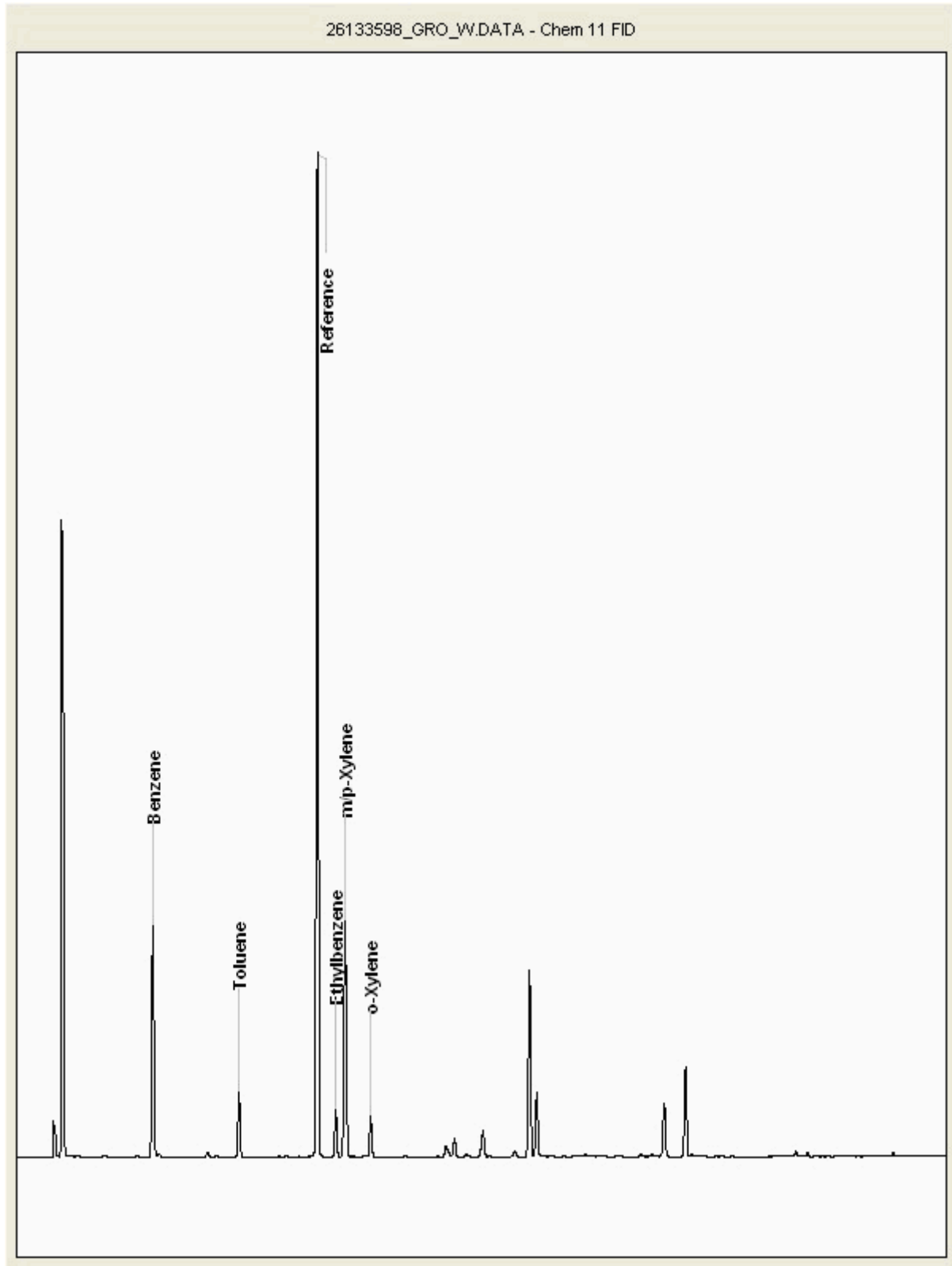
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26133598
Sample ID : BH303

Depth : 2.60 - 2.80





CERTIFICATE OF ANALYSIS

SDG: 220409-56
Client Ref: 70057278

Report Number: 642627
Location: Port Talbot Harbourside

Superseded Report:

Appendix

General

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **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.

19. 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

20. 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 (2021), 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 and soils are obtained from supplied bulk materials and soils 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 (2021).

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

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.

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

EXPLORATORY LOGS



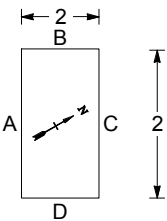
Appendix E.1

UPPER PLATEAU



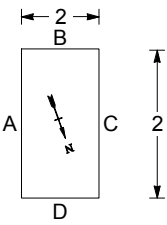
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	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 30-07-21 30-07-21
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By RE	Co-Ordinates (NGR) E 276521.56 N 189598.14	Ground Level (m AOD) 6.90

SAMPLES & TESTS							STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
0.50	ES	0					(0.90)	Grey slightly silty sandy fine to coarse subangular cubic GRAVEL of various lithologies including clinker, ash, concrete and brick with frequent cobbles of brick and concrete. (MADE GROUND)		MG	
1.50	ES	0				6.00	0.90	Light brown very sandy fine to coarse subrounded elongate GRAVEL of mudstone with frequent cobbles of mudstone.		RT	
						5.30	1.60				

	Length	2.00m	Shoring/Support: None	Water Strikes						
	Width	2.00m		Date	Time	Strike	Minutes	Standing	Remarks	
	Orientation	300 degrees from north	Stability: Stable throughout	General Remarks Hole terminated at 1.6m bgl. No groundwater encountered. No visual/olfactory evidence of contamination						
Scale 1:31.25		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.								

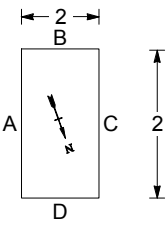
 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. UP-TP-03	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 30-07-21 30-07-21	
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By RE	Co-Ordinates (NGR) E 276500.81 N 189536.83	Ground Level (m AOD) 8.00

SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
2.00	ES	0				7.90	0.10	Grass over brown silty fine and medium SAND with occasional rootlets and gravels of concrete. (TOPSOIL)		TS	
								Reddish grey sandy fine to coarse subangular cubic GRAVEL of various lithologies including clinker, ash, concrete and brick with frequent cobbles of brick and concrete and rare metal fragments.		MG	
							(2.50)				
3.00	ES	0				5.40	2.60	Light brown very sandy fine to coarse subrounded elongate GRAVEL of mudstone with frequent cobbles of mudstone.		RT	
							(0.60)				

	Length	2.00m	Shoring/Support:	Water Strikes						
	Width	2.00m		None	Date	Time	Strike	Minutes	Standing	Remarks
	Orientation	200 degrees from north	Stability:	General Remarks Hole terminated at 3.2m bgl. No groundwater encountered. No visual/olfactory evidence of contamination. Concrete and brick structures on northern and southern extent.						
			Stable throughout							
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 Telephone: Fax:	TRIAL PIT LOG		Hole No. UP-TP-04	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 30-07-21 30-07-21	
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By RE	Co-Ordinates (NGR) E 276480.82 N 189506.41	Ground Level (m AOD) 8.00

SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
2.00	ES	0				7.90	0.10	Grass over brown silty fine and medium SAND with occasional rootlets and gravels of concrete. (TOPSOIL)		TS	
							(1.20)	Reddish grey sandy fine to coarse subangular cubic GRAVEL of various lithologies including clinker, ash, concrete and brick with frequent cobbles of brick and concrete and rare metal fragments.		MG	
						6.70	1.30	Light brown very sandy fine to coarse subrounded elongate GRAVEL of mudstone with frequent cobbles of mudstone.			
		(1.20)									
	3.00	ES	0				5.50	2.50	Soft dark grey slightly gravelly sandy SILT with occasional cobbles of mudstone and rare rootlets. Gravel is fine to coarse subrounded elongate of mudstone. Organic odour. (ALLUVIUM)		
					4.80	3.20					

	Length	2.00m	Shoring/Support:	Water Strikes					
	Width	2.00m		None	Date	Time	Strike	Minutes	Standing
	Orientation	200 degrees from north	Stability:	General Remarks Hole terminated at 3.2m bgl. Becoming wet at 3.0m bgl. No visual/olfactory evidence of contamination.					
			Stable throughout						

Scale 1:31.25

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

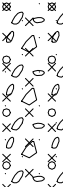
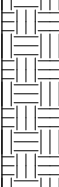
08 WSP TP LOG STANDARD 62253048 - PORT TALBOT HARBOURSIDE.GPJ - WSPTEMPLATE1.03.GDT 11/4/22

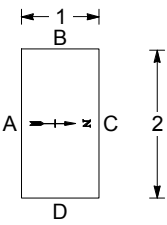
Appendix E.2

VALIDATION TRIAL PITS



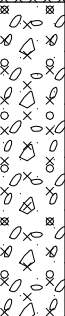
 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP01	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 28-10-21 28-10-21	
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276517.14 N 189492.23	Ground Level (m AOD) 7.50

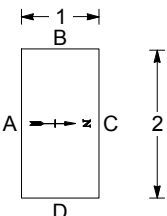
SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.20-1.30	ES					6.80	0.70	Soft dark greyish brown slightly sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		CMG	
							(0.80)	Dark greyish brown slightly silty sandy fine to coarse subrounded cubic GRAVEL of mudstone. 0.70 - 1.50 Organic odour throughout, brown scum on water table.		RT	
						6.00	1.50				

	Length	2.00m	Shoring/Support: None	Water Strikes					
	Width	1.00m		Stability:	Date	Time	Strike	Minutes	Standing
	Orientation	270 degrees from north			28-10-21		0.80		
General Remarks Hole terminated at 1.5m bgl. No visual/olfactory evidence of contamination.									

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

 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP02	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 28-10-21 28-10-21	
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276521.00 N 189501.00	Ground Level (m AOD) 7.50

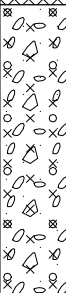
SAMPLES & TESTS							STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
						6.80	0.70	Soft dark greyish brown slightly sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		CMG	
							(1.30)	Dark greyish brown slightly silty sandy fine to coarse subrounded cubic GRAVEL of mudstone.			
						5.50	2.00				

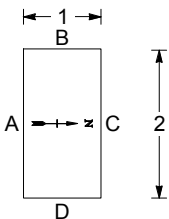
	Length	2.00m	Shoring/Support:	Water Strikes					
	Width	1.00m		Stability:	Date	Time	Strike	Minutes	Standing
	Orientation	270 degrees from north	None						
				Stable	General Remarks Hole terminated at 2.0m bgl. No visual/olfactory evidence of contamination.				

Scale 1:31.25

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

 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP03	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 28-10-21 28-10-21
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276515.79 N 189519.79	Ground Level (m AOD) 7.50

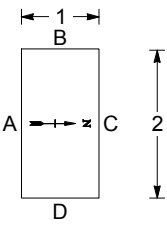
SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.50-1.60	ES				1	7.00	0.50	Soft light orangish brown slightly sandy GRAVEL with occasional Cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		CMG	
							(1.20)	Dark greyish brown slightly silty sandy medium and coarse angular cubic GRAVEL of mudstone. 0.50 - 1.70 Organic odour throughout, brown scum on water table. No hydrocarbon odour		RT	
						5.80	1.70				
										</	

	Length 2.00m	Shoring/Support: None	Water Strikes					
	Width 1.00m		Date 28-10-21	Time	Strike 1.40	Minutes	Standing	Remarks
	Orientation 270 degrees from north	Stability:	General Remarks Hole terminated at 1.7m bgl. No visual/olfactory evidence of contamination.					

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

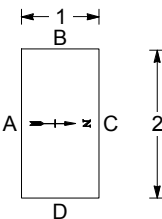
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	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 28-10-21 28-10-21	
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276522.11 N 189533.68	Ground Level (m AOD) 7.50

SAMPLES & TESTS					STRATA						Install / Backfill			
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology				
0.30-0.40	ES					6.90	0.60	Soft dark grey very sandy GRAVEL with frequent cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG				
							(0.70)	Grey sandy GRAVEL with occasional Concrete with cobbles. (MADE GROUND)					GMG RT	
						6.20	1.30	Dark greyish brown slightly silty sandy fine to coarse subrounded cubic GRAVEL of mudstone.						
2.30-2.40	ES				 		(1.20)	Soft dark grey gravelly slightly sandy SILT with occasional mudstone cobbles. Gravel is fine and medium subrounded of mudstone. 1.30 - 2.50 Organic odour throughout, brown scum on water table. No hydrocarbon odour		ALV				
						5.00	2.50							

	Length	2.00m	Shoring/Support: None	Water Strikes					
	Width	1.00m		Date	Time	Strike	Minutes	Standing	Remarks
	Orientation	270 degrees from north	Stability:	28-10-21		2.30	10	2.00	
				General Remarks Hole terminated at 2.5m bgl. No visual/olfactory evidence of contamination.					
Scale 1:31.25		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.							

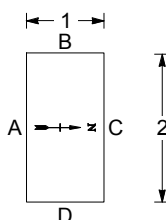
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	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 28-10-21 28-10-21
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276534.58 N 189548.92	Ground Level (m AOD) 7.50

SAMPLES & TESTS					STRATA							Install / Backfill	
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology			
0.40-0.50 0.50-0.60	ES ES						(0.60)	Soft dark grey very sandy GRAVEL with frequent cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG			
						6.90	0.60						
							(0.70)	Grey sandy GRAVEL with occasional Concrete with cobbles. (MADE GROUND)		GMG			
							(0.30)	Dark greyish brown slightly silty sandy fine to coarse subrounded cubic GRAVEL of mudstone.					RT
						6.20	1.30						
2.40-2.50	ES						(1.20)	Soft dark grey gravelly slightly sandy SILT with occasional Mudstone cobbles. Gravel is fine and medium subrounded of. 1.30 - 2.50 Moderate hydrocarbon odour with sheen on water.		ALV			

	Length	2.00m	Shoring/Support: None	Water Strikes					
	Width	1.00m		Stability:	Date	Time	Strike	Minutes	Standing
	Orientation	270 degrees from north			28-10-21		2.40	10	2.00
				General Remarks Hole terminated at 2.5m bgl.					
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 Telephone: Fax:		TRIAL PIT LOG		Hole No. VAL_TP06	
				Sheet 1 of 1	
Job No 62253048		Project Port Talbot Harbourside		Date 28-10-21 28-10-21	
Contractor / Driller Andrew Scott Ltd		Method/Plant Used 360 Excavator		Logged By JR	
				Co-Ordinates (NGR) E 276546.71 N 189540.84	
				Ground Level (m AOD) 7.50	

SAMPLES & TESTS						STRATA					Install Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
0.30-0.40	ES						(0.60)	Soft dark grey very sandy GRAVEL with frequent cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG	
0.50-0.60	ES					6.90	0.60	Grey sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular of various lithologies. (MADE GROUND)		GMG	
							(0.70)	Dark greyish brown slightly silty sandy fine to coarse subrounded cubic GRAVEL of mudstone.		RT	
						6.20	1.30	Soft dark grey gravelly slightly sandy SILT with occasional mudstone cobbles. Gravel is fine and medium subrounded of mudstone.		ALV	
							(1.20)	1.30 - 2.50 Organic odour throughout, brown scum on water table. No hydrocarbon odour			
2.40-2.50	ES					5.00	2.50				



Length 2.00m	Shoring/Support: None	Water Strikes					
		Date	Time	Strike	Minutes	Standing	Remarks
		28-10-21		2.40	10	2.00	
Width 1.00m	Stability:						
Orientation 270 degrees from north		General Remarks Hole terminated at 2.5m bgl. No visual/ofactory evidence of contamination.					

Scale 1:31 25

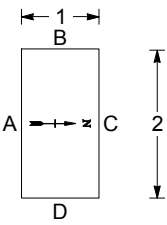
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	Project Port Talbot Harbourside			Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.			Date 28-10-21 28-10-21
Contractor / Driller Andrew Scott Ltd		Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276553.37 N 189543.90	Ground Level (m AOD) 7.50

SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
0.30-0.40	ES				1 1		(0.60)	Soft dark grey very sandy GRAVEL with frequent cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG	
0.50-0.60	ES					6.90	0.60	Grey sandy GRAVEL with occasional Concrete with cobbles. (MADE GROUND)			
						6.20	1.30	Dark greyish brown slightly silty sandy fine to coarse subrounded cubic GRAVEL of mudstone.			ALV
							(1.20)	Soft dark grey gravelly slightly sandy SILT with occasional mudstone cobbles. Gravel is fine and medium subrounded of mudstone.			
2.30-2.40	ES								1.30 - 2.50 Organic odour throughout, brown scum on water table. No hydrocarbon odour		
2.40-2.50	ES					5.00	2.50				

	Length 2.00m	Shoring/Support: None	Water Strikes					
	Width 1.00m		Date 28-10-21	Time	Strike 2.30	Minutes 10	Standing 2.00	Remarks
	Orientation 270 degrees from north	General Remarks Hole terminated at 2.5m bgl. No visual/olfactory evidence of contamination.						
Scale 1:31.25	Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.							

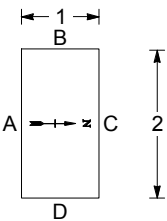
 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP08	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 28-10-21 28-10-21
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276555.59 N 189532.27	Ground Level (m AOD) 7.50

SAMPLES & TESTS							STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.50-1.60	ES						(0.60)	Soft light orangish brown slightly sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		CMG	
						6.90	0.60	Dark greyish brown slightly silty sandy medium and coarse angular cubic GRAVEL of mudstone.			
							(1.70)	0.60 - 2.20 Organic odour throughout, brown scum on water table. No hydrocarbon odour		RT	
						5.30	2.20				

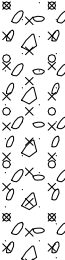
	Length	2.00m	Shoring/Support:	Water Strikes						
	Width	1.00m		Stability:	Date	Time	Strike	Minutes	Standing	Remarks
	Orientation	270 degrees from north	None		28-10-21		2.10			
				General Remarks Hole terminated at 2.2m bgl. No visual/olfactory evidence of contamination.						
Scale 1:31.25		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.								

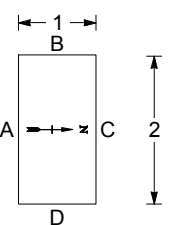
 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP09	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 28-10-21 28-10-21	
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276557.58 N 189528.70	Ground Level (m AOD) 7.50

SAMPLES & TESTS							STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.50-1.60	ES					6.90	0.60	Soft light orangish brown slightly sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG	
							(1.60)	Dark greyish brown slightly silty sandy medium and coarse angular cubic GRAVEL of mudstone. 0.60 - 2.20 Organic odour throughout, brown scum on water table. No hydrocarbon odour		RT	
						5.30	2.20				

	Length	2.00m	Shoring/Support:	Water Strikes						
	Width	1.00m		Stability:	Date	Time	Strike	Minutes	Standing	Remarks
	Orientation	270 degrees from north	None		28-10-21		2.10			
General Remarks Hole terminated at 2.2m bgl. No visual/olfactory evidence of contamination.										
Scale 1:31.25		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.								

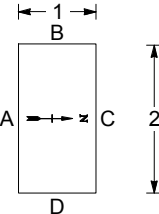
 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP10	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 28-10-21 28-10-21
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276556.18 N 189493.97	Ground Level (m AOD) 6.90

SAMPLES & TESTS							STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.50-1.70	ES					6.30	0.60	Soft light orangish brown slightly sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG	
							(1.10)	Dark brown slightly silty sandy medium and coarse angular cubic GRAVEL of mudstone.		RT	
						5.20	1.70				

	Length	2.00m	Shoring/Support:	Water Strikes						
	Width	1.00m		Stability:	Date	Time	Strike	Minutes	Standing	Remarks
	Orientation	270 degrees from north	None		28-10-21		1.40			
General Remarks Hole terminated at 1.7m bgl. No visual/olfactory evidence of contamination.										
Scale 1:31.25	Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP11	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 28-10-21 28-10-21
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276549.81 N 189494.76	Ground Level (m AOD) 6.90

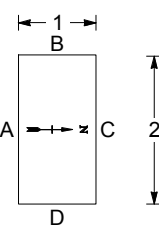
SAMPLES & TESTS						STRATA					Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.50-1.70	ES				1	6.40	0.50	Soft light orangish brown slightly sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG	
							(1.20)	Dark greyish brown slightly silty sandy medium and coarse angular cubic GRAVEL of mudstone.		RT	
						5.20	1.70				

	Length 2.00m	Shoring/Support: None	Water Strikes					
	Width 1.00m		Date 28-10-21	Time	Strike 1.40	Minutes	Standing	Remarks
	Orientation 270 degrees from north	Stability:	General Remarks Hole terminated at 1.7m bgl. No visual/olfactory evidence of contamination.					

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

 wsp Telephone: Fax:	TRIAL PIT LOG		Hole No. VAL_TP12	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 28-10-21 28-10-21	
Contractor / Driller Andrew Scott Ltd	Method/Plant Used 360 Excavator	Logged By JR	Co-Ordinates (NGR) E 276547.85 N 189474.38	Ground Level (m AOD) 6.90

SAMPLES & TESTS							STRATA				Install / Backfill
Depth	Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	
1.70-2.00	ES					6.30	0.60	Soft dark grey very sandy GRAVEL with frequent Cobbles of concrete. Gravel is fine to coarse subangular cubic of various lithologies. (ENGINEERED COVER - MADE GROUND)		GMG	
							(0.70)	Grey sandy GRAVEL with occasional cobbles of concrete. Gravel is fine to coarse subangular of various lithologies. (MADE GROUND)		GMG	
						5.60	1.30	Dark greyish brown slightly silty sandy fine to coarse subrounded cubic GRAVEL of mudstone.		RT	
							(0.70)	Soft dark grey gravelly slightly sandy SILT with occasional mudstone cobbles. Gravel is fine and medium subrounded of mudstone. 1.30 - 2.00 Moderate hydrocarbon odour with sheen on water		ALV	
						4.90	2.00				

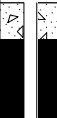
	Length	2.00m	Shoring/Support:	Water Strikes							
	Width	1.00m		Stability:	Date	Time	Strike	Minutes	Standing	Remarks	
	Orientation	270 degrees from north	None		28-10-21		2.00	10	1.80		
Scale 1:31.25			Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.								

Appendix E.3

VALIDATION BOREHOLES



 wsp Telephone:	BOREHOLE LOG		Hole No. BH301	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 15-12-21 16-12-21
Contractor / Driller C.J. Associates	Method/Plant Used Dando 2000	Logged By SR	Co-Ordinates (NGR) E 276539.07 N 189436.91	Ground Level (m AOD) 7.81

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. / Inst. / Backfill
2.50-3.00	ES						7.21	0.60	Brown sandy clayey imported stone		MG	
									Black sand with ash, gravel and brick fill		MG	
								(2.00)				
							5.21	2.60	Brown soft to firm clay		MG	
							4.81	3.00				
									Black sandy dense fine medium coarse gravel with occasional cobbles and boulders		RT	
								(1.50)				
							3.31	4.50				
								(0.50)	Black sandy dense fine to medium coarse gravel with occasional cobbles		RT	
							2.81	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Hole terminated at 5m. Geology taken from drillers logs. No visual / olfactory evidence of contamination.					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

wsp Telephone:	BOREHOLE LOG		Hole No. BH303		
	Project Port Talbot Harbourside		Sheet 1 of 1		
Job No 62253048		Client Andrew Scott Ltd.		Date 15-12-21 15-12-21	
Contractor / Driller C.J. Associates		Method/Plant Used Dando 2000		Logged By SR	
		Co-Ordinates (NGR) E 276538.68 N 189493.04		Ground Level (m AOD) 7.64	

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. / Inst. / Backfill
2.50-3.00	ES								Brown sandy clayey imported stone		MG	
							5.24	2.40				
								(0.60)	Black slay, ash, gravel and brick fill		MG	
							4.64	3.00				
		Grey black sandy contaminated fine medium coarse gravel with occasional cobbles and boulders		ALV								
	(1.60)	3.00 - 4.60 Hydrocarbon odour and staining present on water coming from borehole										
							3.04	4.60				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Hole terminated at 5m. Geology taken from drillers logs.					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

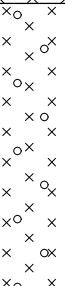
17 WSP BH LOG 62253048 - PORT TALBOT HARBOURSIDE.GPJ WSPTEMPLATE7.00.GDT 11/4/22

 wsp Telephone:	BOREHOLE LOG		Hole No. BH304	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 09-12-21 10-12-21
Contractor / Driller C.J. Associates	Method/Plant Used Dando 2000	Logged By SR	Co-Ordinates (NGR) E 276514.69 N 189489.53	Ground Level (m AOD) 7.45

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. / Install / Backfill
0.50	ES		23.6				6.85	0.60	Dark grey slightly gravelly sandy SILT. Gravel is fine and medium subangular of various lithologies with brick, clinker and slag fragments.		MG	
			42					(1.90)	Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse subangular of various lithologies. Rootlets present.		MG	
			17.4				4.95	2.50	Dark grey gravelly fine to coarse SAND with occasional cobbles. Gravel is fine to coarse subangular of various lithologies including brick, clinker and slag. Dark greyish brown sandy fine to coarse subrounded GRAVEL of various lithologies including mudstone and limestone with frequent cobbles sub-rounded.. Strong hydrocarbon odour. (ALLUVIUM) 2.80 - 4.50 Hydrocarbon odour and sheen on water		MG	
			516.8				4.75	2.70				
4.00	ES							(1.80)			ALV	
							2.95	4.50				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Hole terminated at 4.6m					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 wsp Telephone:	BOREHOLE LOG		Hole No. BH306	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 10-12-21 13-12-21
Contractor / Driller C.J. Associates	Method/Plant Used Dando 2000	Logged By SR	Co-Ordinates (NGR) E 276482.83 N 189508.24	Ground Level (m AOD) 7.35

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. / Backfill
0.00-0.60	ES		90.8				6.75	0.60	Yellowish brown slightly silty slightly gravelly fine to coarse SAND. Gravel is fine and medium subangular of various lithologies including fragments of brick and clinker.		MG	
								(2.40)	Dark grey slightly sandy gravelly SILT. Gravel is fine to coarse, sub-angular to sub-rounded mudstone		MG	
			125.6				4.35	3.00	Dense grey sandy fine to medium coarse GRAVEL with occasional cobbles		RT	
								(1.60)				
							2.75	4.60				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Hole terminated at 4.60m					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 wsp Telephone:	BOREHOLE LOG		Hole No. BH308	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 08-12-21 08-12-21
Contractor / Driller C.J. Associates	Method/Plant Used Dando 2000	Logged By SR	Co-Ordinates (NGR) E 276544.54 N 189537.39	Ground Level (m AOD) 7.73

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Ins. / Backfill
0.00-0.40	ES		0.3				7.33	0.40	Dark grey sandy slightly gravelly SILT. Gravel is fine subangular of various lithologies.		MG	
0.40-0.40	ES							Compact crushed slag concrete brick ash sand fill				
								(2.60)			MG	
							4.73	3.00				
3.00-3.50	ES	45							Dark greyish brown slightly silty sandy fine to coarse subrounded GRAVEL of various lithologies with occasional cobbles. 3.00 - 5.00 m bgl moderate hydrocarbon odour		ALV	
								(2.00)				
							2.73	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Hole terminated at 5m					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 wsp Telephone:	BOREHOLE LOG		Hole No. BH309	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048		Client Andrew Scott Ltd.		Date 09-12-21 09-12-21
Contractor / Driller C.J. Associates	Method/Plant Used Dando 2000	Logged By SR	Co-Ordinates (NGR) E 276554.10 N 189531.59	Ground Level (m AOD) 7.61

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. / Inst. / Backfill
0.30	ES		21.4				7.41	0.20	Light grey slightly silty slightly sandy fine to coarse subangular GRAVEL of brick and clinker.		MG	
							7.31	0.30				
								(1.50)	Greyish brown slightly gravelly sandy SILT. Gravel is fine and medium subangular of various lithologies.		MG	
							5.81	1.80	Dark brown slightly silty slightly gravelly fine and medium SAND with occasional cobbles of brick. Gravel is fine to coarse subrounded of various lithologies.			
							5.41	2.20	Dark brown slightly sandy slightly gravelly SILT with occasional cobbles. Gravel is fine to coarse subrounded of various lithologies.			
4.70	ES		2793					(0.60)	Dark grey gravelly coarse SAND. Gravel is fine to coarse subrounded of various lithologies. Potential fragments of slag present.		MG	
							4.81	2.80	2.70 - 5.00 m bgl Hydrocarbon odour			
								(2.20)	Dark grey sandy fine to coarse rounded GRAVEL of various lithologies predominantly mudstone and limestone with frequent cobbles and occasional boulders.		ALV	
							2.61	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Hole terminated at 5m					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 wsp Telephone:	BOREHOLE LOG		Hole No. BH310	
	Project Port Talbot Harbourside		Sheet 1 of 1	
Job No 62253048	Client Andrew Scott Ltd.		Date 07-12-21 08-12-21	
Contractor / Driller C.J. Associates	Method/Plant Used Dando 2000	Logged By SR	Co-Ordinates (NGR) E 276544.66 N 189554.30	Ground Level (m AOD) 7.82

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. / Inst. / Backfill
0.20-0.50	ES		0.1					(1.20)	Dark greyish brown slightly silty slightly sandy fine to coarse subrounded tabular GRAVEL of various lithologies with occasional Cobbles of brick, ash, and slag.		MG	
			107				6.62	1.20			MG	
							6.42	1.40	Black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of brick.		MG	
							6.22	1.60	Dark greyish brown slightly silty slightly sandy fine to coarse subrounded GRAVEL.		MG	
			46					(1.70)	Dark greyish brown slightly silty slightly sandy fine to coarse subrounded GRAVEL.		MG	
									Dark greyish brown slightly sandy slightly gravelly SILT with occasional subrounded cobbles.		MG	
3.00-3.50	ES		478				4.52	3.30				
3.50-4.00	ES							(1.70)	Black sandy fine to coarse subrounded GRAVEL with frequent subrounded cobbles.		ALV	
									3.50 - 5.00 m bgl Hydrocarbon odour			
							2.82	5.00				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Hole terminated at 5m					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

Appendix F

SCREENING EXERCISE



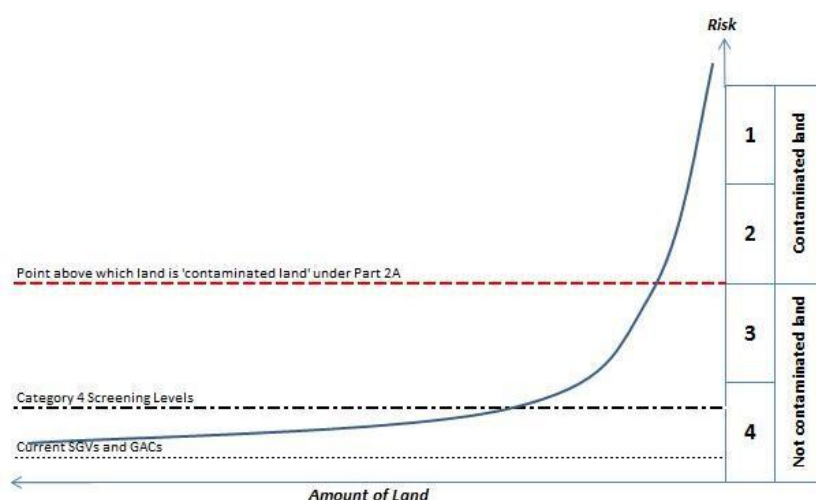
METHODOLOGY FOR THE DERIVATION OF GENERIC QUANTITATIVE ASSESSMENT CRITERIA TO EVALUATE RISKS TO HUMAN HEALTH FROM SOIL & GROUNDWATER CONTAMINATION

UK APPROACH

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

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

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



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

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

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

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

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

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

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

WSP APPROACH

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

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

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

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

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

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

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

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

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

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

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

EXPOSURE MODELS

LAND USES

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

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

Exceptions are described in the following Sections.

SOIL PROPERTIES

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

RECEPTOR CHARACTERISTICS AND BEHAVIOURS

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

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

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

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

HIGHWAYS EXPOSURE SCENARIOS

Human health GAC for a Highways exposure scenario have been derived. The site area is defined by publicly accessible land adjacent to highways, comprising both hard and soft landscaped areas. Exposure is considered to be largely transitory.

There are no publicly available GAC for this exposure scenario. Consequently, WSP have derived GAC for the following exposure scenarios:

- à Highways (surface soils); and
- à Highways (sub-surface soils).

Surface soils GAC are for soil at ground level and within 300mm of the surface. Conversely, subsurface GAC are for soils at a depth exceeding 0.3m bgl. These GAC are not to be used as import criteria.

The critical receptor is a young female child, CLEA age classes 4-9. This is consistent with the critical receptor for the POS(resi) exposure scenario, and considered to be appropriate for a child potentially playing outside without direct adult supervision.

For all GAC, a sandy loam soil and a soil organic matter content of 1% is assumed. There is no building on site.

Exposure scenarios for surface and subsurface soils are detailed below. These are considered to be conservative estimates, due to the mostly transitory use of publically accessible lands adjacent to highways.

HIGHWAYS GAC (SURFACE SOILS)

The relevant exposure pathways include direct soil and dust ingestion, dermal contact (outdoors) and the inhalation of outdoor dust and vapour.

The exposure frequency is 170 days per annum, and the occupancy period outdoors is 1 hour per day (as per the POS (resi) exposure scenario). The soil and dust ingestion rate has been set at 50 mg/day, consistent with a POS(park) exposure scenario.

HIGHWAYS GAC (SUBSURFACE SOILS)

The single relevant exposure pathway is the inhalation of outdoor vapour. Direct exposure pathways are not viable due to the depth of the soils below ground level.

The exposure frequency is 170 days per annum, and the occupancy period outdoors is 1 hour per day (as per the POS (resi) exposure scenario). The soil and dust ingestion rate has been set to zero, as direct exposure pathways to soils at this depth are not viable.

CHEMICAL DATA

PHYSICO-CHEMICAL PARAMETERS

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

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

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

TOXICOLOGICAL DATA

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

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

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

MEAN DAILY INTAKES

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

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

ORAL MEAN DAILY INTAKES

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

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

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

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

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

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

INHALATION MEAN DAILY INTAKES

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

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

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

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

PLANT UPTAKE

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

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

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

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

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

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

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

SOIL SATURATION LIMITS

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

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

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

CHEMICAL SPECIFIC ASSUMPTIONS

CYANIDES

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

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

LEAD

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

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

POLYCYCLIC AROMATIC HYDROCARBONS

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

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

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

TRIMETHYLBENZENES

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

CHEMICAL GROUPS

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

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

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

EXPOSURE TO VAPOURS

INHALATION OF MEASURED VAPOURS

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

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

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

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

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

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

Where:

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

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

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

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

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

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

INHALATION OF GROUNDWATER-DERIVED VAPOURS

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

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

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

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

Groundwater Vapour GAC. Commercial Exposure Scenario – Sand

Chemical	Sand					
	Target Concentration in Indoor Air (µg/m³)	Attenuation Factor (α)	Target Soil Vapour Concentration at Source Depth (µg/m³)	Air-Water Partition Coefficient (Kaw)	Groundwater Vapour GAC (µg/l) <i>bold where GAC > solubility limit</i>	Solubility Limit (µg/l)
Benzene*	22	0.00010065	223,400	0.116	19,259	1,780,000
Toluene*	22,464	0.00009557	235,057,601	0.115	20,439,791	590,000
Ethylbenzene*	1,189	0.00009127	13,027,175	0.139	937,207	180,000
Xylenes (total)*	940	0.00009128	10,295,880	0.112	919,275	173,000
Naphthalene	13	0.00008820	149,324	0.00662	22,556	19,000
Trimethylbenzenes**	255	0.00008744	2,915,361	0.0856	34,058	559,000
MTBE	11,550	0.00009586	120,481,945	0.016	7,530,122	48,000,000
n-hexane	3,212	0.00009461	33,951,820	35.9	946	18,800
TPH aromatic EC5-7*	22,439	0.00010065	222,943,865	0.116	19,219,299	1,780,000
TPH aromatic EC7-8*	22,370	0.00009557	234,078,074	0.115	20,354,615	590,000
TPH aromatic EC8-10*	482	0.00010610	4,541,305	0.253	179,498	64,600
TPH aromatic EC10-12*	482	0.00010612	4,540,480	0.0722	628,875	24,500
TPH aromatic EC12-16*	482	0.00010624	4,535,035	0.0126	3,599,234	5,750
TPH aliphatic EC5-6*	42,240	0.00010609	398,149,653	21	189,595	35,900
TPH aliphatic EC6-8*	42,240	0.00010609	398,149,733	27.3	145,842	5,370
TPH aliphatic EC8-10*	2,329	0.00010609	21,951,226	41.5	5,289	427
TPH aliphatic EC10-12*	2,329	0.00010609	21,951,230	64.4	3,409	33.9
TPH aliphatic EC12-16*	2,329	0.00010609	21,951,233	171	1,284	0.759
Carbon Disulphide	230	0.00010769	2,132,598	0.408	5,227	2,100,000
Isopropylbenzene	1,768	0.00008776	20,149,498	0.237	85,019	56,000
Propylbenzene	3,530	0.00008682	40,654,977	0.17	239,147	54,100
Styrene	3,853	0.00009220	41,792,637	0.0533	784,102	290,000
1,1,1,2-tetrachloroethane	93	0.00009043	1,025,021	0.048	21,355	1,110,000
1,1,1-trichloroethane	22,875	0.00009539	239,796,863	0.36	666,102	1,300,000
1,1,2,2-tetrachloroethane	93	0.00009025	1,027,076	0.00708	145,067	2,930,000
1,1,2-trichloroethane	78	0.00009453	821,578	0.0175	46,947	4,491,000
1,1-dichloroethene	915	0.00010255	8,925,820	0.593	15,052	3,100,000
1,2,3,4-tetrachlorobenzene	46	0.00008217	557,026	0.0158	35,255	7,800
1,2,3,5-tetrachlorobenzene	3.3	0.00008225	40,032	0.0661	606	3,500
1,2,3-trichlorobenzene	8.0	0.00008555	93,868	0.0307	3,058	21,000
1,2,4,5-tetrachlorobenzene	0.80	0.00008242	9,744	0.0138	706	600
1,2,4-trichlorobenzene	28	0.00008561	328,300	0.0365	8,995	41,400
1,2-dichlorobenzene	653	0.00008950	7,291,031	0.0338	215,711	133,000
1,2-dichloropropane	17	0.00009536	179,498	0.0719	2,496	2,050,000
1,3,5-trichlorobenzene	8.0	0.00008572	93,684	0.144	651	6,000
1,3-dichlorobenzene	16	0.00008960	179,247	0.0661	2,712	103,000
1,4-dichlorobenzene	256	0.00008961	2,859,956	0.047	60,850	51,200
Bromobenzene	55	0.00009234	596,555	0.031	19,244	388,040
Chlorobenzene	121	0.00009440	1,284,487	0.0831	15,457	387,000
Chloroethane	45,883	0.00010789	425,258,462	0.445105	955,412	5,742,000
Chloromethane	41	0.00011575	356,608	0.27078	1,317	5,350,000
Dichloromethane	2,077	0.00010599	19,592,133	0.0564	347,378	20,080,000
Pentachlorobenzene	8.0	0.00007954	100,158	0.0083	12,067	500
Trans-1,2-dichloroethene	272	0.00010215	2,659,440	0.176948	15,030	5,250,000
Trichloromethane (chloroform)	619	0.00009983	6,205,257	0.0765	81,114	8,950,000
2-chloronaphthalene	4.6	0.00008443	54,349	0.00378	14,378	11,700
Mercury, elemental	0.95	0.00008680	10,970	0.117	94	56
Hexachloro-1,3-butadiene	2.9	0.00007983	36,789	0.155	237	4,800
1,2-dichloroethane	1.9	0.00009988	19,296	0.0238	811	8,680,000
Tetrachloroethene (PCE)	131	0.00009163	1,427,205	0.316	4,516	225,000
Carbon Tetrachloride	447	0.00009506	4,706,352	0.582	8,087	846,000
Trichloroethene (TCE)	9.2	0.00009627	95,093	0.187	509	1,370,000
Vinyl Chloride	4.8	0.00011032	43,677	0.747	58	2,760,000

* Sub surface soil to indoor air correction factor of 10 applied as part of the GAC calculation, in accordance with best practice

** Trimethylbenzenes GAC can be used to screen individual TMB isomers, or a mixture of the three isomers

Groundwater Vapour GAC. Commercial Exposure Scenario – Sandy Loam

Chemical	Sandy Loam					
	Target Concentration in Indoor Air (µg/m³)	Attenuation Factor (α)	Target Soil Vapour Concentration at Source Depth (µg/m³)	Air-Water Partition Coefficient (Kaw)	Groundwater Vapour GAC (µg/l) <i>bold where GAC > solubility limit</i>	Solubility Limit (µg/l)
Benzene*	22	0.00003369	667,483	0.116	57,542	1,780,000
Toluene*	22,464	0.00003160	710,816,352	0.115	61,810,118	590,000
Ethylbenzene*	1,189	0.00002987	39,805,340	0.139	2,863,693	180,000
Xylenes (total)*	940	0.00002989	31,445,405	0.112	2,807,625	173,000
Naphthalene	13	0.00002956	445,514	0.00662	67,298	19,000
Trimethylbenzenes**	255	0.00002839	8,979,184	0.0856	104,897	559,000
MTBE	11,550	0.00003204	360,491,779	0.016	22,530,736	48,000,000
n-hexane	3,212	0.00003116	103,082,484	35.9	2,871	18,800
TPH aromatic EC5-7*	22,439	0.00003369	666,120,453	0.116	57,424,177	1,780,000
TPH aromatic EC7-8*	22,370	0.00003160	707,854,255	0.115	61,552,544	590,000
TPH aromatic EC8-10*	482	0.00003596	13,400,452	0.253	529,662	64,600
TPH aromatic EC10-12*	482	0.00003605	13,366,561	0.0722	1,851,324	24,500
TPH aromatic EC12-16*	482	0.00003664	13,150,842	0.0126	10,437,176	5,750
TPH aliphatic EC5-6*	42,240	0.00003592	1,175,953,649	21	559,978	35,900
TPH aliphatic EC6-8*	42,240	0.00003592	1,175,956,978	27.3	430,753	5,370
TPH aliphatic EC8-10*	2,329	0.00003592	64,834,339	41.5	15,623	427
TPH aliphatic EC10-12*	2,329	0.00003592	64,834,482	64.4	10,067	33.9
TPH aliphatic EC12-16*	2,329	0.00003592	64,834,644	171	3,791	0.759
Carbon Disulphide	230	0.00003662	6,271,384	0.408	15,371	2,100,000
Isopropylbenzene	1,768	0.00002847	62,113,608	0.237	262,083	56,000
Propylbenzene	3,530	0.00002811	125,553,586	0.17	738,551	54,100
Styrene	3,853	0.00003031	127,116,715	0.0533	2,384,929	290,000
1,1,1,2-tetrachloroethane	93	0.00002963	3,128,682	0.048	65,181	1,110,000
1,1,1-trichloroethane	22,875	0.00003150	726,294,317	0.36	2,017,484	1,300,000
1,1,2,2-tetrachloroethane	93	0.00003032	3,057,408	0.00708	431,837	2,930,000
1,1,2-trichloroethane	78	0.00003150	2,465,455	0.0175	140,883	4,491,000
1,1-dichloroethene	915	0.00003444	26,581,732	0.593	44,826	3,100,000
1,2,3,4-tetrachlorobenzene	46	0.00002669	1,714,989	0.0158	108,544	7,800
1,2,3,5-tetrachlorobenzene	3.3	0.00002641	124,648	0.0661	1,886	3,500
1,2,3-trichlorobenzene	8.0	0.00002779	288,922	0.0307	9,411	21,000
1,2,4,5-tetrachlorobenzene	0.80	0.00002684	29,923	0.0138	2,168	600
1,2,4-trichlorobenzene	28	0.00002778	1,011,574	0.0365	27,714	41,400
1,2-dichlorobenzene	653	0.00002932	22,258,208	0.0338	658,527	133,000
1,2-dichloropropane	17	0.00003155	542,485	0.0719	7,545	2,050,000
1,3,5-trichlorobenzene	8.0	0.00002769	289,962	0.144	2,014	6,000
1,3-dichlorobenzene	16	0.00002926	548,833	0.0661	8,303	103,000
1,4-dichlorobenzene	256	0.00002931	8,744,770	0.047	186,059	51,200
Bromobenzene	55	0.00003047	1,808,090	0.031	58,325	388,040
Chlorobenzene	121	0.00003116	3,892,024	0.0831	46,835	387,000
Chloroethane	45,883	0.00003670	1,250,038,526	0.445105	2,808,414	5,742,000
Chloromethane	41	0.00004016	1,027,909	0.27078	3,796	5,350,000
Dichloromethane	2,077	0.00003600	57,690,660	0.0564	1,022,884	20,080,000
Pentachlorobenzene	8.0	0.00002603	305,986	0.0083	36,866	500
Trans-1,2-dichloroethene	272	0.00003429	7,921,709	0.176948	44,769	5,250,000
Trichloromethane (chloroform)	619	0.00003338	18,558,683	0.0765	242,597	8,950,000
2-chloronaphthalene	4.6	0.00002877	159,486	0.00378	42,192	11,700
Mercury, elemental	0.95	0.00002829	33,663	0.117	288	56
Hexachloro-1,3-butadiene	2.9	0.00002544	115,430	0.155	745	4,800
1,2-dichloroethane	1.9	0.00003359	57,383	0.0238	2,411	8,680,000
Tetrachloroethene (PCE)	131	0.00002999	4,360,756	0.316	13,800	225,000
Carbon Tetrachloride	447	0.00003135	14,268,858	0.582	24,517	846,000
Trichloroethene (TCE)	9.2	0.00003187	287,262	0.187	1,536	1,370,000
Vinyl Chloride	4.8	0.00003775	127,646	0.747	171	2,760,000

* Sub surface soil to indoor air correction factor of 10 applied as part of the GAC calculation, in accordance with best practice

** Trimethylbenzenes GAC can be used to screen individual TMB isomers, or a mixture of the three isomers

Groundwater Vapour GAC. Commercial Exposure Scenario – Clay

Chemical	Clay					
	Target Concentration in Indoor Air (µg/m³)	Attenuation Factor (α)	Target Soil Vapour Concentration at Source Depth (µg/m³)	Air-Water Partition Coefficient (Kaw)	Groundwater Vapour GAC (µg/l) <i>bold where GAC > solubility limit</i>	Solubility Limit (µg/l)
Benzene*	22	0.00000606	3,712,016	0.116	320,001	1,780,000
Toluene*	22,464	0.00000563	3,989,775,806	0.115	346,937,027	590,000
Ethylbenzene*	1,189	0.00000525	226,591,948	0.139	16,301,579	180,000
Xylenes (total)*	940	0.00000532	176,711,192	0.112	15,777,785	173,000
Naphthalene	13	0.00000754	1,746,722	0.00662	263,855	19,000
Trimethylbenzenes**	255	0.00000505	50,500,072	0.0856	589,954	559,000
MTBE	11,550	0.00000671	1,720,114,560	0.016	107,507,160	48,000,000
n-hexane	3,212	0.00000534	601,051,815	35.9	16,742	18,800
TPH aromatic EC5-7*	22,439	0.00000606	3,704,440,775	0.116	319,348,343	1,780,000
TPH aromatic EC7-8*	22,370	0.00000563	3,973,149,702	0.115	345,491,278	590,000
TPH aromatic EC8-10*	482	0.00000645	74,667,842	0.253	2,951,298	64,600
TPH aromatic EC10-12*	482	0.00000677	71,143,581	0.0722	9,853,682	24,500
TPH aromatic EC12-16*	482	0.00000841	57,303,013	0.0126	45,478,582	5,750
TPH aliphatic EC5-6*	42,240	0.00000632	6,683,628,316	21	3,182,680	35,900
TPH aliphatic EC6-8*	42,240	0.00000632	6,684,030,260	27.3	2,448,363	5,370
TPH aliphatic EC8-10*	2,329	0.00000632	368,536,455	41.5	88,804	427
TPH aliphatic EC10-12*	2,329	0.00000632	368,553,741	64.4	57,229	33.9
TPH aliphatic EC12-16*	2,329	0.00000632	368,573,274	171	21,554	0.759
Carbon Disulphide	230	0.00000653	35,171,424	0.408	86,204	2,100,000
Isopropylbenzene	1,768	0.00000490	360,520,206	0.237	1,521,182	56,000
Propylbenzene	3,530	0.00000487	724,778,646	0.17	4,263,404	54,100
Styrene	3,853	0.00000559	689,773,887	0.0533	12,941,349	290,000
1,1,1,2-tetrachloroethane	93	0.00000550	16,845,667	0.048	350,951	1,110,000
1,1,1-trichloroethane	22,875	0.00000548	4,177,124,597	0.36	11,603,124	1,300,000
1,1,2,2-tetrachloroethane	93	0.00000759	12,205,762	0.00708	1,723,978	2,930,000
1,1,2-trichloroethane	78	0.00000660	11,759,106	0.0175	671,949	4,491,000
1,1-dichloroethene	915	0.00000605	151,283,270	0.593	255,115	3,100,000
1,2,3,4-tetrachlorobenzene	46	0.00000570	8,028,898	0.0158	508,158	7,800
1,2,3,5-tetrachlorobenzene	3.3	0.00000474	693,968	0.0661	10,499	3,500
1,2,3-trichlorobenzene	8.0	0.00000537	1,494,340	0.0307	48,676	21,000
1,2,4,5-tetrachlorobenzene	0.80	0.00000588	136,636	0.0138	9,901	600
1,2,4-trichlorobenzene	28	0.00000527	5,334,623	0.0365	146,154	41,400
1,2-dichlorobenzene	653	0.00000562	116,018,660	0.0338	3,432,505	133,000
1,2-dichloropropane	17	0.00000574	2,982,273	0.0719	41,478	2,050,000
1,3,5-trichlorobenzene	8.0	0.00000482	1,666,116	0.144	11,570	6,000
1,3-dichlorobenzene	16	0.00000531	3,024,694	0.0661	45,759	103,000
1,4-dichlorobenzene	256	0.00000545	47,025,502	0.047	1,000,543	51,200
Bromobenzene	55	0.00000593	9,288,397	0.031	299,626	388,040
Chlorobenzene	121	0.00000562	21,569,927	0.0831	259,566	387,000
Chloroethane	45,883	0.00000654	7,016,816,456	0.445105	15,764,415	5,742,000
Chloromethane	41	0.00000732	5,637,278	0.27078	20,819	5,350,000
Dichloromethane	2,077	0.00000677	306,831,542	0.0564	5,440,276	20,080,000
Pentachlorobenzene	8.0	0.00000640	1,243,956	0.0083	149,874	500
Trans-1,2-dichloroethene	272	0.00000612	44,400,807	0.176948	250,926	5,250,000
Trichloromethane (chloroform)	619	0.00000611	101,437,900	0.0765	1,325,986	8,950,000
2-chloronaphthalene	4.6	0.00000848	540,814	0.00378	143,072	11,700
Mercury, elemental	0.95	0.00000550	173,250	0.117	1,481	56
Hexachloro-1,3-butadiene	2.9	0.00000437	672,045	0.155	4,336	4,800
1,2-dichloroethane	1.9	0.00000676	285,073	0.0238	11,978	8,680,000
Tetrachloroethene (PCE)	131	0.00000519	25,219,131	0.316	79,807	225,000
Carbon Tetrachloride	447	0.00000542	82,490,851	0.582	141,737	846,000
Trichloroethene (TCE)	9.2	0.00000561	1,630,636	0.187	8,720	1,370,000
Vinyl Chloride	4.8	0.00000674	714,951	0.747	957	2,760,000

* Sub surface soil to indoor air correction factor of 10 applied as part of the GAC calculation, in accordance with best practice

** Trimethylbenzenes GAC can be used to screen individual TMB isomers, or a mixture of the three isomers

Target concentrations within indoor air are based upon the health criteria values for each substance (for benzene, the adult LLTC is equal to the HCV). They are a function of receptor inhalation rates and occupancy periods, as defined by the site conceptual exposure model (assuming standard CLEA 'commercial' occupancy periods, and an adult female receptor).

These target concentrations represent a risk level equivalent to the health criteria values for each substance. The commercial GAC assume a pre-1970 office and a source depth (groundwater depth) of 0.85m below the base of the building foundation (1m bgl).

Target soil vapour concentrations above the water table have been calculated by dividing the target concentration by the steady-state attenuation factor coefficient between soil and indoor air. The attenuation factor has been calculated in accordance with the Johnson & Ettinger model, as presented within Environment Agency Science Report SC050021/SR3, 2009. The air-water partition coefficient (K_{aw}) has been used to predict the partitioning behaviour of each chemical between soil pore water and air.

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

Where the calculated GAC exceeds the solubility limit for the chemical, the GAC has been highlighted using bold text.

Derivation of Target Concentrations within Indoor Air – Commercial Exposure Scenario

Target concentrations are based upon the health criteria values for each substance. They are a function of receptor inhalation rates and occupancy periods, as defined by the site conceptual model (assuming standard CLEA 'commercial' occupancy periods, and an adult female receptor). Target concentrations represent a minimal risk level, equivalent to the health criteria values for each substance.

Chemical	HCV (µg/kg bw/d)	ID or TDI	Inhalation MDI (adult) (µg/d)	Convert HCV to µg/d	HCV minus MDI (for threshold contaminants)	Target Concentration in Air (µg/m ³)	Revised Target Concentration in Air (µg/m ³)
Benzene (LLTC = 'old' HCV)	1.4	ID	n/a	98	98	4.9	22
Toluene	1,400	TDI	92	98,000	97,908	4,895	22,464
Ethylbenzene	74.3	TDI	18.6	5,201	5,182.4	259	1,189
Xylenes (total)	60	TDI	104	4,200	4,096	205	940
Naphthalene	0.86	TDI	2.8	60.2	57.4	2.9	13
Trimethylbenzenes	17.1	TDI	86	1,197	1,111	56	255
MTBE	722	TDI	200	50,540	50,340	2,517	11,550
n-hexane	200	TDI	assume neg.	14,000	14,000	700	3,212
TPH aromatic EC5-7	1,400	TDI	200	98,000	97,800	4,890	22,439
TPH aromatic EC7-8	1,400	TDI	500	98,000	97,500	4,875	22,370
TPH aromatic EC8-10	60	TDI	50% rule used	4,200	2,100	105	482
TPH aromatic EC10-12	60	TDI	50% rule used	4,200	2,100	105	482
TPH aromatic EC12-16	60	TDI	50% rule used	4,200	2,100	105	482
TPH aliphatic EC5-6	5,260	TDI	50% rule used	368,200	184,100	9,205	42,240
TPH aliphatic EC6-8	5,260	TDI	50% rule used	368,200	184,100	9,205	42,240
TPH aliphatic EC8-10	290	TDI	50% rule used	20,300	10,150	508	2,329
TPH aliphatic EC10-12	290	TDI	50% rule used	20,300	10,150	508	2,329
TPH aliphatic EC12-16	290	TDI	50% rule used	20,300	10,150	508	2,329
Carbon Disulphide	28.6	TDI	50% rule used	2,002	1,001	50	230
Isopropylbenzene	114.3	TDI	294	8,001	7,707	385	1,768
Propylbenzene	220	TDI	16.4	15,400	15,383.6	769	3,530
Styrene	240	TDI	5.6	16,800	16,794.4	840	3,853
1,1,1,2-tetrachloroethane	5.8	TDI	2	406	404	20	93
1,1,1-trichloroethane	1,429	TDI	330	100,030	99,700	4,985	22,875
1,1,2,2-tetrachloroethane	5.8	TDI	2	406	404	20	93
1,1,2-trichloroethane	4.85	TDI	1	339.5	338.5	17	78

Chemical	HCV (µg/kg bw/d)	ID or TDI	Inhalation MDI (adult) (µg/d)	Convert HCV to µg/d	HCV minus MDI (for threshold contaminants)	Target Concentration in Air (µg/m ³)	Revised Target Concentration in Air (µg/m ³)
1,1-dichloroethene	57	TDI	0.4	3,990	3,989.6	199	915
1,2,3,4-tetrachlorobenzene	3.4	TDI	38.5	238	199.5	10	46
1,2,3,5-tetrachlorobenzene (50% rule)	0.41	TDI	38.5	28.7	14.35	0.72	3.3
1,2,3-trichlorobenzene (50% rule)	1	TDI	38.5	70	35	1.8	8.0
1,2,4,5-tetrachlorobenzene (50% rule)	0.1	TDI	38.5	7	3.5	0.18	0.80
1,2,4-trichlorobenzene	2.3	TDI	38.5	161	122.5	6.1	28
1,2-dichlorobenzene	43	TDI	166	3,010	2,844	142	653
1,2-dichloropropane	1.14	TDI	5.2	79.8	74.6	3.7	17
1,3,5-trichlorobenzene (50% rule)	1	TDI	38.5	70	35	1.8	8.0
1,3-dichlorobenzene (50% rule)	2	TDI	74	140	70	3.5	16
1,4-dichlorobenzene	17	TDI	73	1,190	1,117	56	256
Bromobenzene	3.43	TDI	assume neg.	240.1	240.1	12	55
Chlorobenzene	8.1	TDI	38.5	567	528.5	26	121
Chloroethane	2,857	TDI	13.5	199,990	199,976.5	9,999	45,883
Chloromethane (50% rule)	5.14	TDI	212	359.8	179.9	9.0	41
Dichloromethane	134.3	TDI	350	9,401	9,051	453	2,077
Pentachlorobenzene	0.5	TDI	0.28	35	34.72	1.7	8.0
Trans-1,2-dichloroethene	17	TDI	6	1,190	1,184	59	272
Trichloromethane (chloroform)	40	TDI	100	2,800	2,700	135	619
2-chloronaphthalene	0.286	TDI	0.02	20.02	20	1.0	4.6
Mercury, elemental	0.06	TDI	0.05	4.2	4.15	0.21	0.95
Hexachloro-1,3-butadiene	0.2	TDI	1.2	14	12.8	0.64	2.9
1,2-dichloroethane	0.12	ID	n/a	8.4	8.4	0.42	1.9
Tetrachloroethene (PCE)	11	TDI	200	770	570	29	131
Carbon Tetrachloride	28.57	TDI	50	1,999.9	1,949.9	97	447
Trichloroethene (TCE)	0.57	ID	n/a	39.9	39.9	2.0	9.2
Vinyl Chloride	0.3	ID	n/a	21	21	1.1	4.8

Terminology

The health criteria value (HCV) for a chemical is a benchmark level of exposure to that chemical, derived from available toxicity data, for the purposes of safeguarding human health. For substances exhibiting threshold behaviour (such as naphthalene), the HCV is expressed as a tolerable daily intake (TDI). For substances exhibiting non-threshold behaviour (such as benzene), the HCV is expressed as an index dose (ID).

A TDI is the amount of a chemical that can be ingested / inhaled daily, over a lifetime, without appreciable health risk. An ID is the amount of a chemical that can be experienced over a lifetime with minimal cancer risk.

The MDI (mean daily intake) is the average daily intake of a soil contaminant from other, non-soil sources. It arises principally from exposure to the contaminant in food, water and air.

Methodology

The HCV for each potential contaminant of concern is converted to a target concentration within (indoor) air, as a function of receptor bodyweight, inhalation rate, exposure duration and background exposure (MDI).

Example 1 – Benzene (HCV is an index dose)

The HCV for benzene is 1.4 µg/kg bw/d. Background exposure is not taken into consideration for chemicals with an index dose.

The HCV is converted to a concentration in air by multiplying by the receptor bodyweight (70 kg) and then dividing by the daily inhalation rate (20 m³/d). The selected bodyweight and inhalation rate are based on UK best practice. This gives a concentration in air of 4.9 µg/m³.

The exposure duration and exposure frequency for a commercial exposure scenario are 8.3 hours per day, for 230 days per year. The concentration in air is therefore converted to a target concentration in air, accounting for exposure duration and frequency, by multiplying by 4.588, giving a value of **22.5 µg/m³**.

Example 2 – Naphthalene (HCV is a tolerable daily intake)

The HCV for naphthalene is 0.86 µg/kg bw/d. Background exposure needs to be accounted for, as the HCV is a TDI.

The HCV is multiplied by the receptor bodyweight (70 kg) to give a figure of 60.2 µg/d. The MDI (2.8 µg/d) is then subtracted from this figure, to account for background exposure. The resultant figure (57.4 µg/d) is divided by the daily inhalation rate (20 m³/d), to give a concentration in air of 2.87 µg/m³.

The exposure duration and exposure frequency for a commercial exposure scenario are 8.3 hours per day, for 230 days per year. The concentration in air is therefore converted to a target concentration in air, accounting for exposure duration and frequency, by multiplying by 4.588, giving a value of **13.2 µg/m³**.

Example 3 – the 50% rule (Chloromethane)

It could be possible for a high MDI (background exposure) to result in total exposure exceeding the TDI, even when exposure from soil or soil vapour is minimal. UK best practice therefore is that a minimum of 50% of the TDI is reserved for exposure from the land.

For example, the inhalation MDI for chloromethane (212 µg/d) is greater than 50% of the inhalation TDI (359.8µg/d). So, when the inhalation TDI is amended to account for background exposure, it is set at 50% of the full value. This ensures that a minimum of 50% of the TDI is reserved for exposure from the land.

Calculation of Attenuation Factors

Attenuation factors have been calculated using the Johnson & Ettinger Model, as contained within Appendix A of the Environment Agency report 'SC050021/SR3 Updated technical background to the CLEA model, 2009'.

The equation that governs soil gas volumetric flow rate into a building is as follows:

$$Q_{soil} = \frac{2\pi \Delta P k_v X_{crack} \times 10 \text{ g cm}^{-1} \text{ s}^{-2} \text{ Pa}^{-1}}{\mu_a \ln \left(\frac{2Z_{crack}}{r_{crack}} \right)}$$

Where Q_{soil} is the volumetric flow rate of soil gas entering the building, $\text{cm}^3 \text{ s}^{-1}$
 π [= 3.14159]
 ΔP is the pressure difference between soil air and the enclosed living space, Pa
 k_v is the effective air permeability, cm^2
 X_{crack} is the floor-wall seam perimeter, cm
 μ_a is the air viscosity at ambient temperature, $\text{g cm}^{-1} \text{ s}^{-1}$
 Z_{crack} is the depth below ground to bottom of floor, cm
 r_{crack} is the effective crack radius, cm

The output of the Johnson & Ettinger model is an attenuation factor (α), which represents a (dimensionless) steady-state attenuation coefficient between soil and indoor air. It is estimated using the following equation:

$$\alpha = \frac{\left[\frac{D_{eff} A_B}{Q_b L_T} \exp \left(\frac{Q_s L_{crack}}{D_{crack} A_{crack}} \right) \right]}{\left[\exp \left(\frac{Q_s L_{crack}}{D_{crack} A_{crack}} \right) + \frac{D_{eff} A_B}{Q_b L_T} + \frac{D_{eff} A_B}{Q_s L_T} \right] \left[\exp \left(\frac{Q_s L_{crack}}{D_{crack} A_{crack}} \right) - 1 \right]}$$

Where: α is the steady-state attenuation coefficient between soil and indoor air, dimensionless
 D_{eff} is the effective diffusion coefficient for unsaturated soils, $\text{cm}^2 \text{ s}^{-1}$
 A_B is the area of enclosed floor and walls below ground, cm^2
 Q_b is the building ventilation rate, $\text{cm}^3 \text{ s}^{-1}$
 L_T is the source-building separation, cm
 Q_s is the volumetric flow rate of soil gas into the enclosed space, $\text{cm}^3 \text{ s}^{-1}$ [25 to 150]
 L_{crack} is the foundation slab thickness, cm
 A_{crack} is the floor crack area, cm^2
 D_{crack} is the effective diffusion coefficient through the cracks, $\text{cm}^2 \text{ s}^{-1}$ [= D_{eff}]

Air-water partition coefficient (K_{aw})

This is the constant of proportionality between the concentrations of a chemical in air and in water, at low partial pressures, a specified temperature and pressure, and below the saturation limits in either air or water. It is calculated from Henry's Law constant, which is the constant of proportionality between water solubility and the partial pressure of the gas phase. The air-water partition coefficient is used by the CLEA model to predict the partitioning behaviour of an organic chemical between environmental compartments such as soil pore water and air. Consequently, K_{aw} has been used to back-calculate the target concentrations in groundwater (the groundwater vapour GAC).

Appendix F.1

GASHOLDER



0	Concentrations exceed GAC for the protection of Human Health
5	Concentrations exceed SSAC for the protection of controlled waters
<0.00	Concentrations are below the laboratory LOD

		Human Health		Controlled Waters		GHS	GHD	GHD	GHA
		Commercial GAC	# Exceedances	CW SSAC	# Exceedances	06/05/2021	06/05/2021	06/05/2021	06/05/2021
Sample Description		Units	LOD						
Colour		No units				Dark Brown	Dark Brown	Dark Brown	Dark Brown
Description		No units				Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
Inclusion 1)		No units				Stones	Stones	Stones	Stones
Inclusion 2)		No units				Vegetation	None	None	None
Moisture Content Ratio (% of an received sample)		%				6.9	6.2	8.8	7.1
Asbestos									
Date of Analysis		No units				11/05/2021	11/05/2021	11/05/2021	11/05/2021
Analyzed by		No units				Barbara Lethbridge Wright	Barbara Lethbridge Wright	Paul Poynton	Barbara Lethbridge Wright
Chrysotile (White) Asbestos		No units				Not Detected	Not Detected	Not Detected	Not Detected
Amosite (Brown) Asbestos		No units				Not Detected	Not Detected	Not Detected	Not Detected
Crocidolite (Blue) Asbestos		No units				Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Amphiboles		No units				Not Detected	Not Detected	Not Detected	Not Detected
Fibrous Anthophyllite		No units				Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Tremolite		No units				-	-	-	-
Fibrous Tremolite		No units				Not Detected	Not Detected	Not Detected	Not Detected
Asbestos Actinolite		No units				-	-	-	-
Fibrous Actinolite		No units				Not Detected	Not Detected	Not Detected	Not Detected
Non-Asbestos Fibre		No units				Not Detected	Not Detected	Not Detected	Not Detected
Comments		No units				-	-	-	-
Carbon									
Organic Carbon, Total		%	<0.2	-	-	3.49	14.9	4.32	4.82
Inorganics									
pH		pH Units	<1	-	-	10.2	10	10.5	10.3
Cyanide, Total		mg/kg	<1	-	-	<1.000	<1.000	<1.000	<1.000
Cyanide, Free		mg/kg	<1	78	0	-	-	-	-
Cyanide, Complex		mg/kg	<1	-	-	-	-	-	-
Metals - (Solids)									
Chromium, Hexavalent		mg/kg	<0.6	24	0	1.2	0	<0.600	<0.600
Bismuth		mg/kg	<1	-	-	-	-	-	-
Arsenic		mg/kg	<0.6	635	0	-	-	16.8	20.4
Barium		mg/kg	<0.6	-	-	-	-	0.501	1.19
Beryllium		mg/kg	<0.01	-	-	-	-	0.029	0.366
Cadmium		mg/kg	<0.02	223	0	-	-	30.4	30.4
Chromium		mg/kg	<0.9	9500	0	-	-	56.1	112
Copper		mg/kg	<1.4	69800	0	-	-	70.3	377
Lead		mg/kg	<0.7	1390	0	-	-	<0.100	<0.100
Mercury		mg/kg	<0.1	1110	0	-	-	19.3	21.7
Nickel		mg/kg	<0.2	1710	0	-	-	-	-
Selenium		mg/kg	<1	12500	0	-	-	-	-
Vanadium		mg/kg	<0.2	-	-	-	-	341	56.2
Zinc		mg/kg	<1.9	1050000	0	-	-	182	112
Pesticides									
Phenol		mg/kg	<0.01	760	0	2.9	0	<0.010	<0.010
Gasoline Range Organics (GRO)									
Total Aromatics >C8-C10		mg/kg	<50	-	-	-	-	<0.050	<0.050
Total Aromatics <EC5-EC10		mg/kg	<50	-	-	-	-	<0.050	<0.050
GRO >C8-C10		mg/kg	<50	-	-	-	-	<0.050	<0.050
TPH Criteria Working Group (TPH CWG)									
GRO Surrogate % recovery**		%	-	-	-	-	-	96.3	56.1
Aromatics <C5-C6		mg/kg	<50	9180	0	-	-	<0.010	<0.010
Aromatics <C6-C8		mg/kg	<10	7780	0	-	-	<0.010	<0.010
Aromatics <C8-C10		mg/kg	<10	2000	0	-	-	<0.010	<0.010
Aromatics <C10-C12		mg/kg	<1000	9690	0	-	-	<1.000	<1.000
Aromatics <C12-C16		mg/kg	<1000	59800	0	-	-	<1.000	<1.000
Aromatics <C16-C21		mg/kg	<1000	1010000	0	-	-	6.36	12.2
Aromatics <C21-C35		mg/kg	<1000	1010000	0	-	-	17.1	51.1
Aromatics <C35-C44		mg/kg	<1000	1010000	0	-	-	2.39	8.21
Total Aromatics <C10-C44		mg/kg	<1000	-	-	-	-	26.2	75.4
Total Aromatics <Aromatics <C10-C44		mg/kg	<1000	-	-	-	-	552	146
Aromatics <EC5-EC7		mg/kg	<10	26200	0	-	-	<0.010	<0.010
Aromatics <EC7-EC8		mg/kg	<10	56100	0	-	-	<0.010	<0.010
Aromatics <EC8-EC10		mg/kg	<10	3460	0	-	-	<0.010	<0.010
Aromatics > EC10-EC12		mg/kg	<1000	16200	0	-	-	<0.010	<0.010
Aromatics > EC12-EC16		mg/kg	<1000	36200	0	-	-	8.04	2.37
Aromatics > EC16-EC21		mg/kg	<1000	28600	0	-	-	81.2	6.35
Aromatics > EC21-EC35		mg/kg	<1000	28600	0	-	-	372	54.9
Aromatics > EC35-EC44		mg/kg	<1000	28600	0	-	-	63.6	7.48
Aromatics > EC40-EC44		mg/kg	<1000	-	-	-	-	7.97	4.76
Total Aromatics > EC10-EC44		mg/kg	<1000	-	-	-	-	526	70.9
Total Aromatics & Aromatics <C5-C44		mg/kg	<10000	-	-	-	-	552	146
Polyaromatic Hydrocarbons (PAHs)									
Naphthalene-d0 % recovery**		%	-	-	-	-	-	70.6	71.3
Acenaphthene-d10 % recovery**		%	-	-	-	-	-	72.4	72.6
Phenanthrene-d10 % recovery**		%	-	-	-	-	-	81.1	79.2
Chrysene-d12 % recovery**		%	-	-	-	-	-	83.1	79.2
Benzo[a]pyrene-d12 % recovery**		%	-	-	-	-	-	78.7	72.6
Naphthalene		mg/kg	<9	193	0	0.4	0	0.234	0.127
Acenaphthylene		mg/kg	<12	-	-	-	-	0.699	0.0666
Acenaphthene		mg/kg	<8	-	-	-	-	0.085	0.137
Fluorene		mg/kg	<10	-	-	-	-	1.46	0.155
Phenanthrene		mg/kg	<15	-	-	-	-	7.25	1.21
Anthracene		mg/kg	<16	-	-	-	-	4.24	0.255
Fluoranthene		mg/kg	<17	-	-	-	-	1.7	1.67
Pyrene		mg/kg	<16	-	-	-	-	12.6	1.63
Benzo[a]anthracene		mg/kg	<14	38	0	-	-	12.4	1.38
Chrysene		mg/kg	<10	-	-	-	-	10.5	1.09
Benzo[b]fluoranthene		mg/kg	<15	-	-	-	-	16.1	1.83
Benzo[k]fluoranthene		mg/kg	<14	-	-	-	-	5.12	0.538
Benzo[e]pyrene		mg/kg	<15	-	-	-	-	8.46	0.862
Indeno[1,2,3-cd]pyrene		mg/kg	<18	-	-	-	-	6.48	0.806
Dibenz[a,h]anthracene		mg/kg	<18	-	-	-	-	1.79	0.186
Benzo[g,h,i]perylene		mg/kg	<24	-	-	-	-	5.16	0.77
PAHs Total Detected (GSP Pa 10)		mg/kg	<118	-	-	-	-	109	12.8
Volatile Organic Compounds (VOCs)									
Dichloromethane**		%	-	-	-	-	-	-	-
Toluene-d8**		%	-	-	-	-	-	96.5	97.1
4-Bromofluorobenzene**		%	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether		mg/kg	<10	-	-	-	-	<0.100	<0.100
Benzene		mg/kg	<9	27	0	1	0	<0.050	<0.050
Toluene		mg/kg	<7	56300	0	0.557	0	<0.070	<0.070
Ethylbenzene		mg/kg	<4	5710	0	0.45	0	<0.040	<0.040
p-Xylene		mg/kg	<10	5920	0	0	0	<0.100	<0.100
o-Xylene		mg/kg	<10	5920	0	0	0	<0.100	<0.100
Sum of Detected Xylenes		mg/kg	<10	-	-	1	0	<0.200	<0.200
Sum of BTEX		mg/kg	<40	-	-	-	-	<0.400	<0.400

Appendix F.2

UPPER PLATEAU



[illegible]

Appendix F.3

VALIDATION TRIAL PITS



Total Number of Cases in US	avg	<100	-	-	-	-	100-250	250-500	500-750	750-1,000	1,000-1,250	1,250-1,500	1,500-2,000	2,000-2,500	2,500-3,000	3,000-3,500	3,500-4,000	4,000-4,500	4,500-5,000	5,000-5,500	5,500-6,000	6,000-6,500	6,500-7,000	7,000-7,500	7,500-8,000	8,000-8,500	8,500-9,000	9,000-9,500	9,500-10,000	10,000-10,500	10,500-11,000	11,000-11,500	11,500-12,000	12,000-12,500	12,500-13,000	13,000-13,500	13,500-14,000	14,000-14,500	14,500-15,000	15,000-15,500	15,500-16,000	16,000-16,500	16,500-17,000	17,000-17,500	17,500-18,000	18,000-18,500	18,500-19,000	19,000-19,500	19,500-20,000	20,000-20,500	20,500-21,000	21,000-21,500	21,500-22,000	22,000-22,500	22,500-23,000	23,000-23,500	23,500-24,000	24,000-24,500	24,500-25,000	25,000-25,500	25,500-26,000	26,000-26,500	26,500-27,000	27,000-27,500	27,500-28,000	28,000-28,500	28,500-29,000	29,000-29,500	29,500-30,000	30,000-30,500	30,500-31,000	31,000-31,500	31,500-32,000	32,000-32,500	32,500-33,000	33,000-33,500	33,500-34,000	34,000-34,500	34,500-35,000	35,000-35,500	35,500-36,000	36,000-36,500	36,500-37,000	37,000-37,500	37,500-38,000	38,000-38,500	38,500-39,000	39,000-39,500	39,500-40,000	40,000-40,500	40,500-41,000	41,000-41,500	41,500-42,000	42,000-42,500	42,500-43,000	43,000-43,500	43,500-44,000	44,000-44,500	44,500-45,000	45,000-45,500	45,500-46,000	46,000-46,500	46,500-47,000	47,000-47,500	47,500-48,000	48,000-48,500	48,500-49,000	49,000-49,500	49,500-50,000	50,000-50,500	50,500-51,000	51,000-51,500	51,500-52,000	52,000-52,500	52,500-53,000	53,000-53,500	53,500-54,000	54,000-54,500	54,500-55,000	55,000-55,500	55,500-56,000	56,000-56,500	56,500-57,000	57,000-57,500	57,500-58,000	58,000-58,500	58,500-59,000	59,000-59,500	59,500-60,000	60,000-60,500	60,500-61,000	61,000-61,500	61,500-62,000	62,000-62,500	62,500-63,000	63,000-63,500	63,500-64,000	64,000-64,500	64,500-65,000	65,000-65,500	65,500-66,000	66,000-66,500	66,500-67,000	67,000-67,500	67,500-68,000	68,000-68,500	68,500-69,000	69,000-69,500	69,500-70,000	70,000-70,500	70,500-71,000	71,000-71,500	71,500-72,000	72,000-72,500	72,500-73,000	73,000-73,500	73,500-74,000	74,000-74,500	74,500-75,000	75,000-75,500	75,500-76,000	76,000-76,500	76,500-77,000	77,000-77,500	77,500-78,000	78,000-78,500	78,500-79,000	79,000-79,500	79,500-80,000	80,000-80,500	80,500-81,000	81,000-81,500	81,500-82,000	82,000-82,500	82,500-83,000	83,000-83,500	83,500-84,000	84,000-84,500	84,500-85,000	85,000-85,500	85,500-86,000	86,000-86,500	86,500-87,000	87,000-87,500	87,500-88,000	88,000-88,500	88,500-89,000	89,000-89,500	89,500-90,000	90,000-90,500	90,500-91,000	91,000-91,500	91,500-92,000	92,000-92,500	92,500-93,000	93,000-93,500	93,500-94,000	94,000-94,500	94,500-95,000	95,000-95,500	95,500-96,000	96,000-96,500	96,500-97,000	97,000-97,500	97,500-98,000	98,000-98,500	98,500-99,000	99,000-99,500	99,500-100,000	100,000-100,500	100,500-101,000	101,000-101,500	101,500-102,000	102,000-102,500	102,500-103,000	103,000-103,500	103,500-104,000	104,000-104,500	104,500-105,000	105,000-105,500	105,500-106,000	106,000-106,500	106,500-107,000	107,000-107,500	107,500-108,000	108,000-108,500	108,500-109,000	109,000-109,500	109,500-110,000	110,000-110,500	110,500-111,000	
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Appendix F.4

VALIDATION BOREHOLES - SOILS



Appendix F.5

VALIDATION BOREHOLES - GROUNDWATER



Concentrations exceed Commercial GAC for Groundwater Vapour
Concentrations are below the Laboratory LOD

		Groundwater Vapour - Sandy																	
Test	Units	LOD	Max	Commercial GAC	# Exceedances	BH001	BH002	BH003	BH004	BH005	BH006	BH007	BH008	BH009	BH010	BH011	BH012	BH013	BH014
						100000000	100000000	100000000	100000000	100000000	100000000	100000000	100000000	100000000	100000000	100000000	100000000	100000000	100000000
TPH	ppm	<0.02	50.0	-	-	<10.000	50	40	<10.000	35	<10.000	<10.000	35	<10.000	<10.000	15	<10.000	<10.000	<10.000
Benzene Working Group (BPG CWC)																			
%	ppm	50	-	-	-	51	88	80	83	95	99	<100	87	94	99	111	96	104	107
Sum of Benzene to 100000000	ppm	<0.000	-	-	-	<100.000	1500	46300	<100.000	3100	<100.000	12300	623	1530	3210	331	24600	<100.000	<100.000
Aliphatics <C5-C12	ppm	<110	111	100979	0	<110.000	<110.000	111	<110.000	13	<110.000	<110.000	<110.000	10	11	<110.000	<110.000	<110.000	29
Aliphatics <C5-C12	ppm	<150	340	420770	0	<110.000	37	340	<110.000	57	<110.000	41	44	38	127	<110.000	43	291	<110.000
Aliphatics <C5-C18	ppm	<150	368	12625	0	<110.000	97	368	<110.000	118	<110.000	851	29	267	260	<110.000	<110.000	<110.000	127
Aliphatics <C5-C18	ppm	<150	4660	10067	0	<110.000	493	4660	<110.000	667	<110.000	3240	126	314	869	<110.000	181	6300	<110.000
Aliphatics <C12-C18 (sat)	ppm	<150	170	3791	0	<110.000	55	135	<110.000	28	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000
Aliphatics <C12-C18 (unsat)	ppm	<150	70	-	-	<110.000	26	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000
Aliphatics <C18-C25 (sat)	ppm	<150	49	-	-	<110.000	49	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000
Total Aliphatics <C12-C25 (sat)	ppm	<150	130	-	-	<110.000	134	130	<110.000	26	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000
Aliphatics <C18-C25 (unsat)	ppm	<150	10000	51042177	0	<110.000	200	20000	<110.000	794	<110.000	2500	254	179	123	<110.000	<110.000	4000	<110.000
Aromatics <C6C7-C8	ppm	<150	8800	5266244	0	<110.000	84	9800	<110.000	747	<110.000	89	<110.000	200	400	<110.000	<110.000	11400	<110.000
Aromatics <C6C7-C10	ppm	<150	8800	526624	0	<110.000	237	8800	<110.000	344	<110.000	3620	89	472	805	<110.000	32	7100	<110.000
Aromatics <C10-C12	ppm	<150	3110	1051334	0	<110.000	329	3110	<110.000	445	<110.000	2160	84	309	579	<110.000	108	4160	<110.000
Aromatics <C12-C18 (sat)	ppm	<150	340	26421276	0	<110.000	224	340	<110.000	255	<110.000	117	86	<110.000	106	<110.000	26	439	<110.000
Aromatics <C12-C18 (unsat)	ppm	<150	64	-	-	<110.000	59	64	<110.000	15	<110.000	<110.000	<110.000	43	<110.000	<110.000	306	<110.000	<110.000
Aromatics <C18-C25 (sat)	ppm	<150	115	-	-	<110.000	115	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	79	<110.000	<110.000	<110.000	<110.000	<110.000
Total Aromatics <C12-C25 (sat)	ppm	<150	412	-	-	<110.000	408	412	<110.000	170	<110.000	317	86	<110.000	152	<110.000	34	145	<110.000
Total Aliphatics & Aromatics <C5-C25	ppm	<150	68000	-	-	<110.000	2040	68000	<110.000	3360	<110.000	12400	709	1320	3000	<110.000	407	25400	<110.000
Polycyclic Aromatic Hydrocarbons (PAHs)																			
ppm	<0.01	2200	57000	0	0.0102	200	1000	<0.010	57.0	0.0100	1200	45.9	200	402	<0.010	0.04	2200	<0.010	0.010
Acenaphthene (sat)	ppm	<0.005	30.00	-	-	0.0024	29.7	30.0	<0.005	21.2	<0.005	3.0	4.0	2.3	12.1	<0.005	1.0	40	<0.005
Acenaphthene (unsat)	ppm	<0.005	8.30	-	-	0.0023	0.420	<0.005	<0.005	8.30	<0.005	<0.005	1.41	<0.005	0.264	<0.005	0.0003	0.420	<0.005
Phenanthrene (sat)	ppm	<0.005	1.24	-	-	0.010	0.592	<0.005	0.0025	1.24	0.037	<0.005	0.078	<0.005	0.207	<0.005	0.113	0.592	<0.005
Phenanthrene (unsat)	ppm	<0.005	1.49	-	-	0.011	0.211	<0.005	<0.005	1.49	0.0021	<0.005	0.109	<0.005	0.179	<0.005	0.00407	0.00844	<0.005
Pyrene (sat)	ppm	<0.005	5.11	-	-	0.0081	1.09	1.09	<0.005	5.11	0.0087	0.937	0.747	0.714	0.850	<0.005	0.0062	1.2	<0.005
Pyrene (unsat)	ppm	<0.005	7.62	-	-	0.0333	5.39	2.41	<0.005	7.62	<0.005	0.789	1.2	0.581	2.23	<0.005	0.0079	5.93	<0.005
Chrysene (sat)	ppm	<0.005	0.50	-	-	0.186	0.262	<0.005	<0.005	0.142	0.161	<0.005	0.009	<0.005	0.0377	<0.005	0.0041	0.267	<0.005
Chrysene (unsat)	ppm	<0.005	0.71	-	-	0.256	0.43	<0.005	<0.005	0.731	0.185	<0.005	0.177	<0.005	0.114	0.00833	0.0005	0.351	0.00837
Benzo[a]fluoranthene (sat)	ppm	<0.005	0.50	-	-	0.130	0.2	<0.005	<0.005	0.122	0.131	<0.005	0.0006	<0.005	0.0289	<0.005	0.0349	0.190	<0.005
Benzo[a]fluoranthene (unsat)	ppm	<0.005	0.50	-	-	0.219	0.208	<0.005	<0.005	0.211	0.206	<0.005	0.010	<0.005	0.0209	<0.005	0.0051	0.209	<0.005
Benzo[b]fluoranthene (sat)	ppm	<0.005	0.50	-	-	0.101	0.127	<0.005	<0.005	0.0402	0.108	<0.005	0.00706	<0.005	0.0115	<0.005	0.0022	0.114	<0.005
Benzo[b]fluoranthene (unsat)	ppm	<0.005	0.20	-	-	0.110	0.193	<0.005	<0.005	0.0981	0.113	<0.005	<0.005	<0.005	0.0109	<0.005	0.0114	0.151	<0.005
Indeno[1,2,3-cd]fluoranthene (sat)	ppm	<0.005	0.50	-	-	0.0187	0.0496	<0.005	<0.005	0.00942	0.019	<0.005	<0.005	<0.005	0.0106	<0.005	0.0072	<0.005	<0.005
Indeno[1,2,3-cd]fluoranthene (unsat)	ppm	<0.005	0.50	-	-	0.127	0.174	<0.005	<0.005	0.0407	0.122	<0.005	<0.005	<0.005	0.0099	<0.005	0.01	0.123	<0.005
Other Total Detectable LOPPA 18 (sat)	ppm	<0.005	1	-	-	0.101	0.137	<0.005	<0.005	0.0406	0.091	<0.005	<0.005	<0.005	0.0147	<0.005	0.00441	0.102	<0.005
Other Total Detectable LOPPA 18 (unsat)	ppm	<0.002	1300	-	-	1.9	348	1040	<0.002	102	1.15	1300	94.5	297	498	<0.002	3.30	2330	<0.002
Volatile Organic Compounds (VOCs)																			
%	100	-	-	-	-	69.7	38.9	99.9	99.9	99.9	100	94	99.9	99.9	100	100	100	99.9	100
Methyl tertiary butyl ether (MTBE)	ppm	<1	100	2903803	0	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Trichloroethylene (TCE)	ppm	<1	21000	17504	0	<1.000	260	21000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Trichloroethylene (TCE)	ppm	<1	9000	631031.18	0	<1.000	125	9000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Ethylbenzene	ppm	<1	15170	2903803	0	<1.000	7.87	15170	<1.000	<1.000	<1.000	44.9	29.7	85.4	863	<1.000	<1.000	<1.000	417
Isobutylene	ppm	<1	5000	-	-	<1.000	126	5000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Isobutylene	ppm	<1	1000	-	-	<1.000	19.7	1000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
Sum of detected Volatiles	ppm	<2	60700	2903705	0	<2.000	1.85	60700	<2.000	<2.000	<2.000	39.0	34.6	104.0	85.7	<2.000	<2.000	<2.000	499
Sum of BTEX	ppm	<5	30000	-	-	<5.000	508	30000	<5.000	182	<5.000	495	461	5640	<5.000	7.75	12000	<5.000	884
BTEX Criteria Working Group (BTEX CWC)																			
Aliphatics <C5-C10 (sat)	ppm	<150	66	-	-	<110.000	69	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000	<110.000

Appendix G

PHOTOGRAPHIC RECORD



Appendix G.1

LNAPL REMOVAL



LNAPL REMOVAL - PROGRESS PHOTOGRAPHS

BH104 / BH204A



21st September 2021



23rd September 2021 (BH104)



23rd September 2021 (BH204A)



4th October 2021



6th October 2021 (BH104)



6th October 2021 (BH204A)

TP203A



20th July 2021 (trial dig)



8th September 2021



20th September 2021



1st October 2021 (delineation trench)



6th October 2021 (delineation trench)

BHC5/TPH05



6th September 2021



9th September 2021



23rd September 2021



30th September 2021



4th October 2021



6th October 2021

DERYN BOUNDARY TRENCH



16th September 2021



17th September 2021



6th October 2021

Appendix G.2

DRONE



PORT TALBOT HARBOURSIDE - PROGRESS PHOTOGRAPHS

INITIAL



REMEDIATION & CONSTRUCTION WORKS







COMPLETED



Appendix H

WASTE CONSIGNMENT



Appendix H.1

HYDROCARBON IMPACTED SOILS



	Consignment Note Code	WTN	Vehicle Reg	Weight (Tonne)	Volume (m3)	Source - inc. Grid Ref / Description	Disposal Site	Outcome	
South West Corner / Deryn Eastern Boundary	CAV211 / HAR 97		PY18 ENR	28.00	14.20	Oil pipe cica F8-E11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	South West Corner / Deryn Eastern Boundary
	CAV211 / HAR 96	22322	PX18 JVL	27.78	13.89	Oil pipe cica F8-E11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 86	22003	PX18 JVL	28.46	14.23	Oil pipe cica F8-E11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 84	21217	PY18 ENR	28.40	14.20	Oil pipe cica F8-E11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 82	22002	PX67 JZG	28.52	14.26	Oil pipe cica F8-E11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 83	21216	PX18 JVL	28.02	14.01	Oil pipe cica F8-E11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 81	21215	PY18 ENR	28.30	14.15	Concrete Foundations in H8 - H9 area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 79	21100	CN71 SLU	20.28	10.14	Concrete Foundations in H8 - H9 area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 78	21101	PX18 JVL	28.10	14.05	Concrete Foundations in H8 - H9 area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 77	21099	PX18 JVL	28.24	14.12	Concrete Foundations in H8 - H9 area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 76	21098	CN71 SLU	19.92	9.96	Concrete Foundations in H8 - H9 area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 75	20572	CN71 SLU	20.57	10.29	Concrete Foundations in H8 - H9 area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 74	21213	CN71 SLU	20.10	10.05	Concrete Foundations in H8 - H9 area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 73	21097	PX18 JVL	27.96	13.98	Further contam around Concrete Foundations (to North and below)	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 72	21214	PX18 JVL	27.92	13.96	Further contam around Concrete Foundations (to North and below)	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 71	20744	CN71 SLU	19.58	9.79	Further contam around Concrete Foundations (to North and below)	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 70	21025	CN71 SLU	20.12	10.06	Contamination in/around sheet piles a Grid E9 (nb. Separate sheet piles to Memo 61/62)	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 68	20743	CN71 SLU	20.36	10.18	Contamination in/around sheet piles a Grid E9 (nb. Separate sheet piles to Memo 61/62)	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 67	20573	PY18 ENR	27.88	13.94	Contamination in/around sheet piles a Grid E9 (nb. Separate sheet piles to Memo 61/62)	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
Borehole Delineation	CAV211 / HAR 66	20742	PX67 JZG	29.78	14.89	BH104 / 204A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	Borehole Delineation
	CAV211 / HAR 65 (duplicate No.)	20576	PY18 ENR	27.74	13.87	BH104 / 204A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 65	20575	CN17 OLT	19.92	9.96	BH104 / 204A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 64	20574	PY18 ENR	28.18	14.09	BH104 / 204A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 63	20216	PX67 JZG	29.78	14.89	TP203A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 62	19413	PX18 JVL	28.34	14.17	TP203A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 60	19414	PX18 JVL	28.20	14.10	TP203A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 59	19497	CN71 SLU	20.16	10.08	TP203A delineation, outside perceived tender area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
Miscellaneous, hydrocaborns	CAV211 / HAR 58	19412	PX18 JVL	28.10	14.05	Oil Interceptor, grid S11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	Miscellaneous, hydrocaborns
	CAV211 / HAR 57	19496	CN71 SLU	20.36	10.18	Oil Interceptor, grid S11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 56	19494	CN21 WZZ	19.44	9.72	Oil Interceptor, grid S11	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 55	19495	CN71 SLU	20.42	10.21	Area 1; Hydrocarbon contam at N/P12	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 54	19410	PX18 JVL	27.94	13.97	Area 1; Hydrocarbon contam at N/P12	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 53	19411	PX18 JVL	28.68	14.34	Contaminated soils under stantion at H18, evidence of old pipe	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 52	19493	CN67 XWW	18.72	9.36	Contaminated soils under stantion at H18, evidence of old pipe	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 51	19301	PX18 JVL	28.60	14.30	Naphthalene Exceedances on crushed concrete	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 50	19302	PY18 ENR	28.36	14.18	Naphthalene Exceedances on crushed concrete	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
				911.23	455.82				
ASL Allowances	CAV211 / HAR 46	18089	PY18 ENR	27.96	13.98	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	ASL Allowances
	CAV211 / HAR 45	18090	PY18 ENR	28.90	14.45	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 41	18088	PY18 ENR	28.16	14.08	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 40	18087	PX18 JVL	28.16	14.08	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 34	17846	PX67 JZG	28.38	14.19	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 32	18086	PY18 ENR	28.14	14.07	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 30	17845	PX18 JVL	28.18	14.09	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 28	17958	CN17 OLT	18.12	9.06	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 27	17957	CN20 ZXY	18.54	9.27	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 27 (duplicate No.)	17843	PX67 JZG	28.98	14.49	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 26	17844	PX18 JVL	28.14	14.07	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 25	17842	PX18 JVL	33.38	16.69	ASL Allowance - Hydrocarbon removal in designated areas	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
				325.04	162.52				
JKW Soils	CAV211 / HAR 99	14635	CN17 OLR	17.90	8.95	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	JKW Soils
	CAV211 / HAR 18	14778	CN15 PHV	18.24	9.12	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 15	14777	CN15 PHV	17.60	8.80	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 14	15043	PX18 JVL	27.44	13.72	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 13	14776	PX67 JZG	28.86	14.43	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 12	14763	CN20 ZXY	18.30	9.15	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 10	14629	CN17 OLT	18.34	9.17	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 09	14632	CN65 OVC	18.08	9.04	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 08	14630	CN67 XWW	18.28	9.14	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 06	14634	CN20 ZXY	17.92	8.96	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 05	14633	CN20 ZXX	19.00	9.50	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 04	14627	CN20 ZXX	18.70	9.35	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 03	14628	CN20 ZXY	20.00	10.00	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
	CAV211 / HAR 01	14625	CN17 OLR	17.58	8.79	JKW Soils - Culvert outfall area	FCC ERQ, Rowley Regis, B65 9BT	Soil Treatment	
				276.24	138.12				

Appendix H.2

LNAPL





GD Environmental Services
Nash Road
Newport
NP18 2BS
T| 01633 277755 F| 01633 290888
E| info@gd-environmental.co.uk
www.gd-environmental.co.uk

Duty of Care - Controlled Waste Transfer Note

Waste Carrier Licence: CBDU2618

Waste Management Licence:

EPR/RP3295FS - 11 East Bank Road, Felnex Industrial Estate, Newport, NP194PP

Annual Waste Transfer Note - valid for 12 months from:

Date: 29/09/2021

Waste Producer

GEO POLLUTION TECHNOLOGIES

Boc, Cramic Way, Margam, Port Talbot, SA13 1RU

Job Number: 540800

Grade & EWC

wastes from cooling-water treatment containing oil - 10 02 11*

SIC Code: 20110

Order Details

HAU

PO: 9702

Contact:

Time On Site 07:00 **Time Off Site** 11:00

Load Details:

Driver Notes

EMPTY IBC'S OF WASTE OIL AND
DISPOSE OF AT TRADEBE BRIDGEND.
TRADEBE BOOKING REF: 2911466

Waste Producer Signature

Print Name _____

Signing represents total acceptance of all the Terms and Conditions

I (the customer) do hereby declare that the service contracted for as defined above has been carried out to my complete satisfaction. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011. Signing represents acceptance of the Terms and Conditions.

Waste Carrier

GD ENVIRONMENTAL LTD

Nash Road, Newport, NP18 2BS

Waste Receiver

TRADEBE LIMITED

Factory Lane, Bridgend, CF35 5BQ

Registration Number: CBDU2618

Vehicle Registration: CK63 AOL

Driver Name: Gareth Sweeney

Carrier Signature *Gareth Sweeney*

Registration Number:

Receiver Signature

VAT number: 810 8629 35

Company registration number: 4704681

Weighbridge Details

Our Ref: 540800

PO: 9702

Ticket Ref: 540800

Gross: 12.000 T

Tare: 0.000 T

Gross timestamp: 06/10/2021 09:54:50

Tare timestamp:

Vehicle Registration: CK63 AOL

Grade Weight

wastes from cooling-water treatment containing oil: 12.000 T



GD Environmental Services
Nash Road
Newport
NP18 2BS
T| 01633 277755 F| 01633 290888
E| info@gd-environmental.co.uk
www.gd-environmental.co.uk

Duty of Care - Controlled Waste Transfer Note

Waste Carrier Licence: CBDU2618

Waste Management Licence:

EPR/RP3295FS - 11 East Bank Road, Felnex Industrial Estate, Newport, NP194PP

Annual Waste Transfer Note - valid for 12 months from:

Date: 05/11/2021

Waste Producer

GEO POLLUTION TECHNOLOGIES

Boc, Cramic Way, Margam, Port Talbot, SA13 1RU

SIC Code: 20110

Order Details

HAU 11:00

PO: 9936

Contact:

Time On Site 09:30 **Time Off Site** 13:30

Job Number: 547647

Grade & EWC

Wastes Containing Oil - 16 07 08*

Load Details:

Driver Notes

EMPTY IBC'S OF WASTE OIL AND
WATER FROM MOBILE SEPERATOR
DISPOSE OF AT TRADEBE BRIDGEND.
TRADEBE BOOKING REF:2960050

Waste Producer Signature

Print Name _____

Signing represents total acceptance of all the Terms and Conditions

I (the customer) do hereby declare that the service contracted for as defined above has been carried out to my complete satisfaction. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011. Signing represents acceptance of the Terms and Conditions.

Waste Carrier

GD ENVIRONMENTAL LTD

Nash Road, Newport, NP18 2BS

Waste Receiver

GD ENVIRONMENTAL LTD

18A East Bank Road, Felnex Industrial Estate,
Newport, NP194PP

Registration Number: CBDU2618

Vehicle Registration: CK63 AOL

Driver Name: Gareth Sweeney

Carrier Signature *Gareth Sweeney*

Registration Number:

Receiver Signature

VAT number: 810 8629 35

Company registration number: 4704681

Weighbridge Details

Our Ref: 547647

PO: 9936

Ticket Ref: 547647

Gross: 24.560 T

Tare: 15.400 T

Gross timestamp: 10/11/2021 09:32:17

Tare timestamp: 10/11/2021 09:32:21

Vehicle Registration: CK63 AOL

Grade Weight

Wastes Containing Oil: 9.160 T

Appendix H.3

ASBESTOS



Part A Notification Details

1. Consignment note code: AV21/A0001 Gavin Griffiths DOC Ticket Number:	4. The waste will be taken to (name, address and postcode): Biffa Landfill Trecatti Landfill site, Fochriw Road Nr Merthyr Tydfil, Mid Glamorgan CF48 4AB
2. The waste described below is to be removed from (name, address, postcode, telephone, e-mail, facsimile): Andrew Scott Ltd, Harbourside SES Remediation, Off Oakwood Drive, Port Talbot, SA13 1RU	5. The waste producer was (if different from 2) (name, address, postcode, telephone, e-mail, facsimile): Andrew Scott Ltd, The Grange, Port Talbot SA13 2SP
3. Premises code (where applicable): N/A	Permit number EPR/RP3733PC

Part B Description of the Waste

1. The process giving rise to the waste(s): Filling station tank leak Demolition / Remediation		2. SIC for the process giving rise to the waste: 39.00	
3. Waste Details (where more than one waste type is collected all of the information given below must be completed for each EWC identified)			
Description of Waste:	List of Wastes EWC Code(s) (6 digits):	Quantity (kg):	The chemical / biological components of the waste and their concentrations are:
			Component
			Concentration (mg/kg or %)
BONDED ASBESTOS	170605*	APPROX 3,000	CHRYSTOLE
			Not known
			Solid
			HP5
			16 YD Skip

The information given below is to be completed for each EWC identified

EWC Code	Packing Group(s)	UN Identification Number(s)	Proper Shipping Name(s)	UN Class(es)	Special Handling Requirements
1 7 0 6 0 5	BONDED	UN2590	WHITE ASBESTOS	N/A	PPE

Part C Carrier's Details

(If more than one carrier is used, please attach schedule for subsequent carriers. If a schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A4 & B3 are correct and I have been advised of any specific handling requirements. Where this note comprises part of a multiple collection the round number and collection numbers are:

1. Carrier Name: On behalf of (name, address, postcode, telephone, e-mail, facsimile):

Griffiths Waste Management Ltd, Beechwood House, Bryntwyod, Llangyfelach, Swansea, SA5 7LP

2. Carrier registration no./reason for exemption: **CBDU6001**

3. Vehicle Registration No. (or mode of transport, if not road): **CA680XV**

Signature: 

Date: **14/12/21** Time: **8:20**

Part D Consignor's Details

I certify that the information in A, B and C above is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly, and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the waste (England & Wales) Regulations 2011

Consignor Name: **C. J. LEDDEN**

On behalf of (name, address, postcode, telephone, e-mail, facsimile):
Andrew Scott Ltd, The Grange, Port Talbot. SA13 2SP. 01639 889800

Signature: 

Date: **14.12.21** Time: **12:10**

Part E Consignee's Certificate

Individual EWC code(s) received (kg)	Quantity of each EWC code received (kg)	EWC Code accepted/rejected	Waste management operation (R or D code)
170605	2680	A	DS

I received this waste at the address given in A4 on: (Date): **14.12.2021** (Time): **14:02**

Vehicle Registration No. (or mode of transport if not road): **CA680XV**

Name: **G DAVY**

On behalf of (name, address, postcode, telephone, e-mail, facsimile):
BIFFA WASTE SERVICES
Trecatti Landfill Site
Port-Y-Waun
Merthyr Tydfil
CF48 4AB

Signature: 

Date: **14.12.21**

Where waste is rejected please provide details:

I certify that waste management licence/permit/authorised exemption no(s): **RP3733PC**

I authorise the management of the waste described in B at the address given in A4.



BIFFA WASTE SERVICES LIMITED
CORONATION ROAD, CRESSEX
HIGH WYCOMBE
BUCKS. HP12 3TZ
VAT No. 537 9116 27 Company Reg. No. 946107
Landfill Tax no. XFLF00000100123 (Eng. & N.I.) and Landfill Disposal Tax no. 379001 (Wales)

TELEPHONE: 01494 521221
FACSIMILE: 01494 463368

TE 817 TRECATTI LANDFILL SITE		TICKET No. L657526	DATE 14/12/2021
C. No. RP3733PC CENSING AUTHORITY 80 HOLES - SOUTH EAST		CUSTOMER TRANSFER NOTE No. N/A LOAD REF. B1 SP02455 ORDER REF. BONDED ASB SOURCE 12 NEATH PORT TALBOT	
CENCE HOLDER BIFFA WASTE SERVICES /817			
JSTOMER GRIFFITHS WASTE MANAGEMENT LTD JDE 033272*1*1 JRESS BEECHWOOD HOUSE BRYNTYWOD SWANSEA		WASTE DESCRIPTION (BONDED) Bonded Asb	
JSTCODE SA5 7LP JULIER GAVIN GRIFFITHS RECYCLING LTD JARRIER REG. No. SIC 38.11 JGISTRATION AUTHORITY CBDU13285 JNRW		CODE 170605 DESTINATION DIS DISPOSAL CONTRACT 144547*6/1 EWC CODE 170605 PRE-TREATED CONSIGNMENT CODE CAV211/A0001 LANDFILL TAX EXEMPTION REF. No. Standard rate	
JHICLE CAG680XV MULTI-BUCKET JNTAINER 132 13.8 CU.M ENCLOSED SKIP J.M 13.80		DEPOSIT THIS LOAD AT DIS/DISPOSAL PHASE 08 LIFT 405 CELL K16	

WEIGHT	DATE	TIME	TALLY No.	
LOSS 13380 Kg	14/12/2021	14:02	A078330	
RE 10700 Kg	14/12/2021	14:22	A078337	
T 2680 Kg				
Y. CHARGED *** 2.68 TONNE ***				

THIS IS NOT A VAT INVOICE

NET COST *****

VAT @ *****%

TOTAL COST *****

SIGNING THIS WASTE TRANSFER NOTE THE HOLDER / CUSTOMER IS CONFIRMING THAT THEY HAVE FULFILLED THEIR DUTY TO APPLY THE W.F.D. WASTE HIERARCHY.

BIFFA WASTE SERVICES GERARD DAVEY	DRIVERS SIGNATURE FOR JASON MATTHEWS NAME
--	--

By signing above, I the driver / waste holder confirm that I have fulfilled my duty to apply the WFD Waste Hierarchy

Appendix I

GROUNDWATER GAUGING



BH#	17/12/2021		20/12/2021			06/01/2022			13/01/2022			18/01/2022			28/01/2022			03/02/2022			11/02/2022		
	DTP	DTW	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB
	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl
301		2.45	-	2.19	5.05	-	2.45	5.10	-	2.25	4.92	-	2.30	4.94	-	2.57	4.94	-	2.56	4.94	-	2.51	4.94
302	-	2.53	-	2.58	4.97	-	2.53	4.99	-	2.50	4.94	-	2.54	4.94	-	2.68	4.94	-	2.69	4.94	-	2.63	4.94
303	-	2.19	-	2.23	4.71	-	2.17	4.77	-	2.17	4.74	-	2.23	4.73	-	2.45	4.74	-	2.49	4.74	-	2.43	4.74
304	-	2.15	-	2.19	4.79	-	2.13	4.79	-	2.10	4.79	-	2.16	4.77	-	2.30	4.78	-	2.30	4.78	-	2.22	4.78
305	-	2.24	-	2.27	4.81	-	2.21	4.80	-	2.19	4.83	-	2.24	4.82	-	2.63	4.82	-	2.76	4.82	-	2.69	4.82
306	-	2.07	-	2.32	4.60	-	2.40	4.55	-	2.03	4.52	-	2.09	4.13	-	2.23	4.16	-	2.31	4.16	-	2.23	4.16
307	-	2.56	-	2.04	5.00	-	2.54	4.99	-	2.54	4.98	-	2.61	5.00	-	2.13	5.00	-	2.73	5.00	-	2.67	5.00
308	-	2.44	-	2.47	5.09	-	2.39	5.06	-	2.38	5.10	-	2.39	5.10	-	2.60	5.08	-	2.60	5.08	-	2.54	5.08
309	-	2.32	-	2.36	5.00	-	2.28	4.98	-	2.29	4.99	-	2.24	4.97	-	2.49	4.99	-	2.37	4.99	-	2.42	4.99
310	-	2.53	-	2.58	5.08	-	2.49	5.45	-	2.50	5.05	-	2.51	5.03	-	2.69	5.02	-	2.69	5.02	-	2.64	5.02

	BH's Sampled																					BH's Sampled		
	22/02/2022			25/02/2022			04/03/2022			10/03/2022			15/03/2022			23/03/2022			31/03/2022			05/04/2022		
BH#	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB	DTP	DTW	DTB
	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl	m bcl
301	-	2.75	4.40	-	2.61	4.49	-	2.51	4.57	-	2.64	4.57	-	2.69	4.57	-	2.62	4.57	-	2.60	4.57	-	2.67	4.62
302	-	2.14	4.94	-	2.10	4.95	-	2.59	4.95	-	2.73	4.93	-	2.78	4.93	-	2.75	4.93	-	2.75	4.93	-	2.78	4.91
303	-	2.05	4.74	-	2.32	4.75	-	2.39	4.75	-	2.51	4.90	-	2.68	4.90	-	2.66	4.90	-	2.67	4.90	-	2.51	4.89
304	-	2.18	4.78	-	1.97	4.79	-	2.64	4.79	-	2.30	4.77	-	2.54	4.77	-	2.41	4.77	-	2.40	4.77	-	2.34	4.77
305	-	2.22	4.82	-	2.39	4.80	-	2.19	4.80	-	2.78	4.76	-	2.71	4.76	-	2.71	4.76	-	2.66	4.76	-	2.83	4.76
306	-	2.01	4.16	-	2.24	4.15	-	2.05	4.15	-	2.26	4.08	-	2.51	4.08	-	2.44	4.08	-	2.39	4.08	-	2.36	4.10
307	-	2.14	5.00	-	2.21	4.99	-	2.55	4.99	-	2.72	4.97	-	2.82	4.97	-	2.80	4.97	-	2.80	4.97	-	2.82	4.99
308	-	2.10	5.08	-	2.43	5.08	-	2.45	5.08	-	2.60	5.08	-	2.75	5.08	-	2.73	5.08	-	2.69	5.08	-	2.68	5.09
309	-	2.23	4.99	-	2.34	4.99	-	2.34	4.99	-	2.48	4.99	-	2.55	4.99	-	2.51	4.99	-	2.53	4.99	-	2.56	4.96
310	-	2.09	5.02	-	2.23	5.03	-	2.55	5.03	-	2.71	5.04	-	2.76	5.04	-	2.80	5.04	-	2.77	5.04	-	2.76	4.99

Appendix J

ASBESTOS SUMMARY



Date	Sample Name	Location	Description of Material	Sample by:	Results	Received
12.10.2020	"Pipe Lagging"	Original Afan Main inspection chamber	Black bituminous pipe protective coating	C J Associates	NAD	
23.10.2020	PT1	Afan Main West connection pit	Loose insulation (Rock wool)	C J Associates	NAD	
23.10.2020	PT9	Afan Main East connection pit	Cementitious sheet fragment (single)	C J Associates	NAD	
29.03.2021	CS1	Just S.W of TPC49, bottom of Upper Plateau batter.	Slate' roofing sheet - some visible fibres at edge of broken sheets.	C J Associates	NAD	13.04.2021
29.03.2021	CS2	Just W of BHH03 location, on concrete hard standing.	Cementitious sheet fragments (small,multiple)	C J Associates	Chrysotile	13.04.2021
29.03.2021	CS3	Just North of BHH03 location, cement sheets underneath concrete - dislodged by machine tracking/spragging.	Cementitious sheet fragments (larger,multiple)	C J Associates	Chrysotile	13.04.2021
29.03.2021	CS4	On top of old steps adjacent to North path, North of BH106 location	Cementitious sheet fragments (small,multiple)	C J Associates	Chrysotile	13.04.2021
22.04.2021	CS5	Central to Gas Holder foundation	Large cementitious sheet, bound to underside of concrete slab	N/A - Presumed ACM and dealt with as such.	N/A	N/A
23.04.2021			Fragments of the above sheet			
05.05.2021			More fragments, suspected to be from above sheet			
05.05.2021	CS6	Bottom of Upper Plateau batter, West of BH 103	Cementitious sheet fragments (small,multiple)	N/A - Presumed ACM and dealt with as such.	N/A	N/A
05.05.2021	CS3	As CS3 above	Cementitious sheet fragments (small,multiple)	Assumed to be similar to CS3 above, similar location.	N/A	N/A
03.06.21	PLag1	Exposed buried pipework	3-4" pipe lagging around a 1" pipe; loose insulation	C J Associates	Amosite; 85%	23.06.21
03.06.21	PLag2	Exposed buried pipework; crossing 'old' Afan main	Bitumous, thin pipe lagging with suspect fibres.	C J Associates	NAD	23.06.21
12.07.21	Ins1	At pipe support / Building foudnation area South of Gas Holder	Very friable, Insulation ("Rock Wool") appearance)	C J Associates	NAD	19.07.21
06.08.21	1	Original Afan Main gasket in brickwork chamber	Gasket	Leftfield Environmental	Chrysotile	06.08.21
06.08.21	2	Chamber in centre of Gas Holder slab	Loose insulation around pipework	Leftfield Environmental	NAD	06.08.21
23.08.2021	CS7	Upper Plateau, 0.2m bgl - with brick/rubble backfill	Cementitious sheet fragments (5" square)	C J Associates	Chrysotile; 15%	27.08.21



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