Annual Groundwater Monitoring Interpretative Report

Stolthaven Dagenham Ltd.

Project Number: 60546332

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Quality information

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The opinions expressed in this Report concerning any contamination found and the risks arising there from are based on current good practice simple statistical assessment and comparison with available soil guideline values, AECOM generic assessment criteria and other guidance values.

It should be noted that the effects of ground and water borne contamination on the environment are constantly under review, and authoritative guidance values are potentially subject to change. The conclusions presented herein are based on the guidance values available at the time this Report was prepared, however, no liability by AECOM can be accepted for the retrospective effects of any changes or amendments to these values.

Table of Contents

1. Introduction

1.1. General Introduction

AECOM Infrastructure & Environment UK Ltd (AECOM) is pleased to present this interpretative report detailing the 2019 annual groundwater monitoring round completed at Stolthaven, Dagenham, Hindmans Way, Dagenham, London, RM9 6PU (the Site – **Figure 1**). The December 2019 biannual monitoring round was undertaken between 4th and 10th December 2019 and forms part of a biannual groundwater monitoring programme that was initiated in June 2016.

The Site is an operational ship-fed bulk storage terminal that is divided into two parts by Hindmans Way. It is comprised of six operational areas each of which contains above ground bulk storage tanks. Areas 1 to 5 are located on the main site on the northern side of Thunderer Road and east of Hindmans Way with the terminal offices along the river front. Area 6 is located to the northwest of Areas 1 to 5 on the western side of Hindmans Way. The Site also comprises an undeveloped area called Maskell site north, which is separated by a pipetrack and surface water feature running northwest to southeast from Stolt's main terminal (southeast) under Hindmans Way to Area 6. A plan showing the layout of the different areas is presented in **Figure 2**.

1.2. Objective

The objective of the monitoring works is to build a representative groundwater quality data set that facilitates the assessment of contaminant trends over time in relation to current and historical site operations and to monitor any improvements in groundwater quality resulting from ongoing environmental betterment works.

1.3. Scope of Work

To achieve the objective described above, the following scope of work has been undertaken:

- Site-wide dip round to measure presence and thickness of light non-aqueous phase liquids (LNAPL) and gauge groundwater depths in Made Ground (MG) and River Terrace Gravel (RTG) aquifer monitoring wells on site;
- Recording of field parameters and collection of groundwater samples at a selection of 40 monitoring wells across the whole site;
- Analysis of samples for a predetermined analytical suite in accordance with the main contaminants of concern in the area (including those identified as part of the March 2019 sampling rationale and tank inventory review).
- Completion of a quality assurance and quality control assessment;
- Presentation of the analytical results and production of graphs for the key contaminants showing concentration trends over time (since November 2015);
- Presentation of LNAPL thickness records obtained by Stolthaven site staff since June 2016 from existing recovery wells and trenches;
- Screening of results against Generic Assessment Criteria (GAC) and previously derived Site-Specific Assessment Criteria (SSAC); and
- Completion and submission of this interpretative groundwater monitoring event.

1.4. Background Information

1.4.1. Project Background

The Site was acquired by Stolthaven Dagenham Ltd (the Client) in October 2012 for continued use as a bulk liquid storage terminal. Former site operations had led to releases of petroleum hydrocarbons and chlorinated solvent compounds into the near surface soils and groundwater beneath the site, principally within the shallow MG horizon.

These impacts have been characterised as multiple sources of light non-aqueous phase liquids (LNAPL) and dissolved phase hydrocarbon plumes across the site within the shallow smear zone and a dissolved phase chlorinated solvent plume identified within the northwest corner of Area 3.

In 2012, prior to the client's acquisition of the site, a detailed quantitative risk assessment (DQRA) was undertaken by SLR for Areas 1 to 6. This identified dissolved phase and LNAPL impacts to shallow groundwater but concluded that there was no unacceptable risk to human health or off-site controlled water receptors. Site Specific Assessment Criteria (SSAC) were derived by SLR as part of the DQRA for the protection of the underlying aquifers and the on-site and offsite workers.

In February 2014 URS (now AECOM) completed a DQRA for the Maskell site to assess reported GAC exceedances in the area. SSACs were generated for the protection of the Dagenham Breach (nearest surface water receptor on the basis of the observed groundwater flow direction).

A programme of infrastructure improvements is underway across the site, as follows:

- Areas 1 & 4 - Major phased redevelopment to upgrade existing tanks, pipework, loading gantries and other infrastructure. These were completed in 2016.
- Areas 2, 3 & 6 - Minor upgrade works to existing infrastructure. Areas 3 (western tank farm) and 2 were completed in 2017 and 2018 respectively.
- Maskell South – Construction works in Maskell South for the construction of the new Stolthaven offices

Stolthaven has taken the opportunity to perform environmental betterment work in areas where redevelopment works are occurring. AECOM (formerly as URS) were commissioned by the client in March 2013 to develop and produce a Remediation Strategy for Areas 1, 4 and 5 of the site, ahead of redevelopment works. The Remediation Strategy was subsequently submitted to and agreed by the regulatory authorities as part of a detailed planning application for the site infrastructure upgrades.

During the redevelopment works, excavated MG soils have been quarantined, subjected to laboratory analysis, classified as hazardous or non-hazardous waste as appropriate and disposed off-site under the CLAIRE Code of Practice for the Definition of Waste. Where recoverable quantities of LNAPL were encountered during excavation works, they were separately removed and collected for off-site disposal. In order to monitor and manage potential LNAPL migration, a capture trench was installed in the north of Area 4 in May 2015 (Shown in **Figure 3**).

During redevelopment works, a number of existing monitoring wells were decommissioned (in general accordance with Environment Agency guidance; "Decommissioning Redundant Boreholes and Wells") in areas where construction works were planned. Key monitoring wells have been replaced in order to provide a network of monitoring points across the site in both the MG perched water and the RTG aquifer.

In October 2015, an accidental release of approximately 48.5 m^3 of gas oil occurred within the Area 3 Tank Bund. Site emergency response procedures shut-off the release and resulted in the majority of the release being recovered within 6 hours. Recovery works from drainage sumps within the bund and through the site drainage system were conducted. The release was reported to the Environment Agency (EA) and additional site investigation works were undertaken in November and December 2015 to install additional monitoring wells in the vicinity of, and down-gradient from, the release to assess potential resulting impacts. The investigation works concluded that, although additional petroleum hydrocarbon impacts to shallow made ground soils had been identified, no evidence was reported of significant impacts to groundwater either inside or outside the Area 3 tank farm bund. A groundwater monitoring programme was initiated to both identify any potential wider impacts from the Area 3 release, as well as to monitor the concentrations of previously identified impacts in the MG and RTG aquifers following a programme of voluntary soil and groundwater remediation works undertaken between 2014 and 2016.

An additional product recovery trench (shown in **Figure 3**) was installed downgradient of the north of Areas 1 and 3, adjacent to the northern Site boundary for the identification and recovery (if necessary) of LNAPL. This trench was installed during the upgrade works of the underground fire water main, in 2016.

Upgrade works in the eastern tank farm of Area 3 were carried out in 2017 to build a new concrete floor. For this purpose, approximately the top 500mm of soils were excavated and stockpiled on a new soil storage area in the Maskell North site. These soils were sampled and screened against the on-site reuse criteria. Unsuitable soils were disposed offsite. Once the top layer of the bund floor (500mm) was removed, a Rawmat layer (bentonite layer) was placed with concrete poured on top of it.

More recent upgrade/construction works at the Site included the construction of the new main Site offices in 2019. They are in the south west corner of Maskell Site South, approximately 70m away from the Area 3 chlorinated solvent impact area and hydraulically up gradient of the terminal. Stolthaven indicated the area was investigated (by trial pitting and 3 boreholes), ground gas data was collected, and ground gas protection measures were fitted below the office concrete slab. The data provided by Stolthaven is however partial/not completed and AECOM was therefore unable to review this data and assess the presence and significance of potential vapour migration and intrusion from the Area 3 solvent contaminated area to the new offices.

As part of the interpretative December 2018 report pressure transducers were installed in five RTG wells located in Area 4 and 1 (approximately 120-210 m away from the Thames) to assess the tidal influence at the site. This concluded:

- Groundwater levels within the RTG are influenced by the tide with an approximate 2m oscillation.
- The magnitude of the tidal oscillation in groundwater and the lag relative to surface water levels in the River Thames lag reflect the relatively high hydraulic conductivity of the RTG.
- For the majority of the tidal cycle there is a higher water level in the River Thames, indicating an overall in-land groundwater flow direction in the RTG.

Rationalisation of the sampling programme was completed in March 2019 to reflect the identified general downward trends of contaminants within the MG and considering that the main earthworks/redevelopment works in the terminal had been completed. This review recommended the reduction of the sampling frequency to annual, with one localized / smaller groundwater sampling event every year at the main locations of concern and one site-wide / full groundwater sampling event every 2 years. As part of this sampling rationalisation, a review of the tank inventory was completed to identify potential gaps in the existing analytical suite and suitable groundwater sampling locations where these data gaps could be addressed, downgradient of storing tanks and/or associated loading bays (potential sources). These additional sampling requirements were recommended on a biannual basis, with the smaller groundwater sampling event focusing only on the known groundwater contamination. A list of the proposed sampling locations and suite of analyses is presented in **Appendix A**.

1.4.2. Site Setting

A summary of the environmental setting is provided below.

Table 1 – Summary of environmental settings

Environmental Setting	
Site location	The Site is located in an industrial and commercial area, on the northern bank of the River Thames, approximately 20km to the east of central London, 2km south of Dagenham town centre and identified approximately by national grid reference 548547, 182036. The Site occupies an approximate area of 11.5 hectares (including the Main Terminal, Area 6 and Maskell Site).
Elevation	Ground elevations in the Stolthaven Terminal vary between approximately 3.3m AOD and 5.5m AOD and generally dip to the north. A steel interlocking sheet pile wall extends along the southern site boundary with the River Thames approximately 2m above ground level. The sheet piling is believed to penetrate through the Alluvium and possibly to the top of the RTG, which exists at an elevation of approximately -6mAOD.
Surface Water Features	The River Thames forms the south western boundary of the site. The next nearest surface water feature is Dagenham Breach, located approximately 300m north east of the Maskell site and approximately 550m north east of the Main Stolthaven Terminal. Dagenham Breach is an open water body east of the site that drains surrounding marshland and extends 1,100m north from the Thames before trending east 800m, with an outlet that meanders back south to the Thames.

<table>
<tr><th colspan="2">Environmental Setting</th></tr>
<tr><td>Geology</td><td>Based on a review of the previous reports and the regional geological map (British Geological Survey (BSG) Map 1:50,000 Sheet 257), and the geology encountered during the completed site investigations, the site is underlain by the following strata:
- Made Ground (MG);
- Alluvium;
- River Terrace Gravels (RTG).
The geology encountered across the site during the different phases of intrusive site investigation is summarized below:
<table>
<tr><th>Unit</th><th>Depth Unit Encountered (m bgl)</th><th>Encountered Thickness (m)</th></tr>
<tr><td>Made Ground (typically soft, brown, sandy, gravelly clay with fragments of concrete, brick, metal, plastic, wood, glass and pottery)</td><td>0.0</td><td>0.8 – 6.2</td></tr>
<tr><td>Alluvium (typically soft grey sandy gravelly clay, Peaty clay and fibrous Peat)</td><td>0.8 – 10.0</td><td>5.5 – 12.4</td></tr>
<tr><td>RTG (typically silty sandy gravel / silty gravelly sand)</td><td>10.0 – 13.2</td><td>Unproven</td></tr>
</table></td></tr>
<tr><td>Hydrogeology</td><td>Published geological information suggests that the site is directly underlain by unproductive strata (superficial deposits - Alluvium), followed by the RTG deposits (Secondary A aquifer), Thanet Sands Formation (Secondary A aquifer) and Upper Chalk (Principal aquifer).
BGS logs indicate that the Upper Chalk (a Principal aquifer) is present at a depth of approximately 40m bgl.
The EA defines Source Protection Zones (SPZ) around groundwater abstractions used for public water supply. The site is not located within an EA-designated SPZ.
Groundwater within the MG is considered to be perched on the underlying fine-grained Alluvium. Groundwater in the MG is inferred to flow in a north-easterly direction within the central/main terminal. An easterly direction is observed in Area 6 and the north of the Maskell Site. Groundwater in the MG is inferred to flow towards the Dagenham Breach.
Groundwater within the RTG is tidally influenced. For the majority of the tidal cycle there is a higher water level in the River Thames, indicating an overall in-land groundwater flow direction in the RTG. Deployment of pressure transducers in five RTG wells located in the north of Area 1 and Area 4 over a 2-day period in 2018 indicated south-westerly flow. The RTG overlie the Thanet Formation and then the Lewes Nodular Chalk Formation, Seaford Chalk Formation And Newhaven Chalk Formation which subcrops below the River Thames to the south-west of the site. Groundwater levels within the Chalk in the London Basin are depressed below sea-level as a result of historical over abstraction of groundwater[1]. It is possible that groundwater flow in the RTG has a vertical component of flow through the Thanet Formation and into the underlying Chalk towards the historical groundwater depression to the west.</td></tr>
</table>

1.4.3. Conceptual Site Model

The following Conceptual Site Model (CSM) has been previously developed and is still considered applicable.

The CSM illustrates the potential sources, pathways and receptors for the evaluation of potential risk at the site.

[1] Environment Agency, Management of the London Basin Chalk Aquifer, Status Report 2018.

Table 2 – Conceptual Site Model

Conceptual Site Model		
Source	**Pathway**	**Receptor**
Human Health		
• Potential contaminated soils and shallow groundwater	• Direct soil and dust ingestion (construction/earthworks phase); • Dermal soil and dust contact (construction/earthworks phase); • Inhalation of fugitive dust (construction/earthworks phases); • Ingestion of LNAPL / groundwater (construction/earthworks phase); and • Inhalation of vapours (from soil and groundwater) (construction / earthworks and operational phases).	• On-site operational staff and construction workers
Controlled Waters		
• Potentially contaminated soils and shallow groundwater • Potential contaminated groundwater within the RTG	• Leaching and downward vertical migration from potential contamination within the MG or shallow natural soils; • Vertical migration of perched water to the deeper groundwater aquifer within the RTG; and • Lateral migration of potential contamination in the MG and RTG toward surface water receptors	• Groundwater: the site is underlain by MG and alluvium within which perched water exists*. The alluvium is underlain by the RTG deposits (Secondary A aquifer)** • Dagenham Breach for MG

* MG perched water is not considered a receptor and is only considered a pathway. The River Thames is not considered to be in continuity with the perched MG groundwater due to the existence of the River Thames sheet pile flood defences and the absence of any significant tidal response within groundwater in the MG.

**The underlying RTG deposits have not been previously considered to be a sensitive receptor as no widespread impact has been recorded; they are protected by a 5m covering thickness of alluvial clay and peat aquitard, and are also impacted by saline intrusion, with daily reversals of flow direction due to tidal influences. Dilution of any downward vertical flux from perched groundwater within the underlying RTG is also likely to be significant. The River Thames is in continuity with the underlying RTG aquifer, but the inferred groundwater flow is away from the river. Also, any potential discharge from the RTG into the river (during lower tides) would be subject to significant dilution.

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2. Groundwater Sampling & Analysis

2.1. Introduction and sampling rationale

This report presents the findings of the 2019 biannual groundwater monitoring and provides an assessment on the groundwater impact and trends since the groundwater monitoring programme was initiated in 2015. A review of the tank inventory was completed in March 2019, as a result of which, an expanded suite of laboratory testing has been applied in the 2019 biannual sampling event.

The site monitoring well network is presented in **Figure 3**. Groundwater levels and the presence or absence of LNAPL were recorded at all locations with the exception of the following:

- PZ1 which could not be located under newly surfaced gravel; nearby well BH203MS was sampled in place of PZ1;
- PZ2 which was buried under newly laid concrete for new operational pumps; nearby well BH101 was sampled in place of PZ2. BH231A located nearby was also lost due to new concrete;
- BH203 which was inaccessible due to construction works; and
- WS22 which could not be located.

The monitoring wells selected for sampling are presented in **Appendix A**.

The original suite of analyses implemented since 2015, which included the key contaminants of concern at that time, included Total Petroleum Hydrocarbons (TPHCWG), Polycyclic Aromatic Hydrocarbons (PAH), Volatile Organic Compounds (VOC) and Metals (As, Ba, Be, B, Cd, Cr (trivalent and hexavalent), Cu, Pb, Hg, Ni, Se, V, Zn). Dissolved methane and sulphate were scheduled as supplementary analytes in the Area 3 Trap and Treat remediation zone. Based on the recommendations of the December 2018 report, metals have since been dropped form the suite of analyses as they were not considered a key potential contaminant of concern.

A review of the tank inventory was completed in 2019 to identify new chemicals that are stored on site and therefore represent contaminants of potential concern. These additional analyses have been included in the biannual full sampling round for wells located downgradient of the tanks and associated loading bays. The additional sampling/analyses are included in **Appendix A**.

Wells were first purged before being sampled using a low-flow sampling method, utilising a peristaltic pump incorporating a flow through cell and dedicated tubing. Purged water was disposed through the onsite water treatment plant and/or the onsite drainage system (drainage in bund areas or loading bays).

2.2. Groundwater Level Monitoring

The depth to groundwater was measured in 43 of the monitoring wells on the 4th December 2019 before any of the monitoring wells were purged and sampled. Four of the monitoring wells were unable to be measured; these were locations PZ1, PZ2, BH106 and WS22. BH225 was dipped however no top of pipe elevation data was available to determine the groundwater elevation. The measured depths are presented in **Table 1** in **Appendix B**.

The depth to groundwater in MG monitoring wells ranged between 0.070m below ground level (bgl) at BH305 and 2.150m bgl at BH226, with an average depth of 0.952 bgl. Groundwater elevations ranged from 2.074m above ordnance datum (m AOD) at BH312 and 4.123m AOD at WS15, with an average groundwater elevation of 3.228m AOD. In the RTG wells, groundwater depths ranged between 2.720m bgl at BH106A and 5.700m bgl at PZ5, with an average depth of 4.534m bgl. Groundwater elevations ranged between -0.776m AOD at BH105A and 2.288m AOD at BH106A, with an average groundwater elevation of -0.224m AOD.

Groundwater flow in the MG aquifer is inferred to flow in a north-easterly direction within the central/main terminal, which has been consistent throughout the previous monitoring events. An easterly direction is observed in Area 6 and the north of the Maskell Site. Shallow groundwater shows no continuity with the River Thames and is inferred to be due to existing sheet pile flood defences. Aerial photographs from Google Earth show a channel within the tidal flats of the River Thames, south of Area 2 which may represent a potential drainage feature. Stolthaven indicated there are no outfalls to the river. The channel could be associated with localized leakage in

the sheet pile flood defence. Groundwater contours indicate that any localized leakage does not affect the Site MG groundwater flow and as such is not considered to represent a significant pathway to the river.

Groundwater contour plots have been produced for both the MG aquifer and the deeper RTG aquifer. Contour plots are presented in **Figure 4a** and **4b**, respectively.

Given the tidal range (approximately 2 m) observed in groundwater levels in the RTG during the pressure transducer deployment in 2018 in wells located in Area 4 and 1 (approximately 120-210 m away from the River Thames) it is not possible to assess a groundwater flow direction within the RTG from the non-instantaneous gauging data presented in Figure 4b. It is possible that groundwater flow in the RTG has a vertical component of flow through the underlying Thanet Formation and into the underlying Chalk towards the historical groundwater depression to the west.

2.3. Non-Aqueous Phase Liquids

During the groundwater well dip round conducted by AECOM on the 4th December 2019, LNAPL was detected in two of the MG perched water monitoring wells: WS23 (0.055m) located in Area 6 and in S15 (0.030m) located in Area 3. The laboratory certificates for the MG product samples are presented in **Appendix E.**

The LNAPL at WS23 was described as very viscous with a dark brown colour which is consistent with the previously measured NAPL at this location. The thickness recorded during the December 2019 monitoring round is an increase of 0.010m from the previously recorded thickness in December 2018, but is the same thickness reported in December 2017. Laboratory interpretation indicates the LNAPL identified in December 2019 consist of degraded diesel and cable oil (age was unable to be identified as relevant markers were either not present or above the permitted range). This is consistent with previous laboratory interpretations at this location. Additional chemical testing of the LNAPL has been completed for the December 2019 round including whole oil fingerprint, TPHCWG, alcohols / acetates, PAH and VOC. Only TPH concentrations were reported above the laboratory method detection limit.

LNAPL was encountered for the first time at S15 and was described as very viscous with a black colour. S15 is located at the site boundary, north east and downgradient of Area 3 and behind/downgradient of the remediation/capture trench. A LNAPL sample was collected and scheduled for whole oil fingerprint, TPHCWG, PAH, VOC TIC and SVOC TIC. The laboratory interpreted the LNAPL to be degraded diesel, possible cable oil and possible transformer oil. In addition to TPH (predominantly C12 – C21 fractions), concentrations of individual hydrocarbons (isopropylbenzene, 2-butyl-1,1,3-trimethyl-cyclohexane, neopentylidenecyclohexane and tetradecene) were also reported above the laboratory method detection limit.

Stolthaven SHE&Q Manager indicated demolition works were completed in autumn 2019 in the adjacent United Molasses site, potentially mobilizing some historical LNAPL. AECOM consider it unlikely that the S15 LNAPL comes from the main terminal (and/or the former scrap yard in Maskell site north) and that it is more plausible that the LNAPL comes from the adjacent demolition works due to:

- S15 is the closest well to the adjacent demolished site and no other well in the area reported LNAPL or a relevant increase in dissolved-phase concentrations in groundwater.
- S15 was sampled in previous rounds (i.e December 2018) with concentrations not indicative of LNAPL being reported (or a significant increase in concentration reported).
- The remediation trench installed downgradient of Area 3 and immediately up hydraulic gradient of S15 has only reported traces of LNAPL.

Since June 2016, Stolthaven site staff have carried out periodic LNAPL monitoring in the recovery wells across the site (RW1 to RW5) and recovery trenches (CT1 - CT10 and RT1-RT5) in the northern boundary of the site (to the north of areas 1,3 and 4). From 2019 data from interceptors is also incorporated when product is encountered. Location of these recovery wells, trenches and interceptors are indicated in **Figure 3.** According to information provided by Stolthaven, LNAPL is pumped out every time a significant thickness of LNAPL is measured in the recovery wells, trenches and interceptors; however, the recovery is not documented and therefore it is unknown when exactly and how much LNAPL has been recovered from these activities. The LNAPL thickness recorded by Stolthaven is presented in **Table 3** in **Appendix B**.

Stolthaven monitoring at these locations identified LNAPL in July and October 2019 in remediation well RW1 (0.010m and 0.20m), RW2 (0.010m and 0.025m). These thicknesses are in line with previous monitoring and much lower than the maximum thicknesses measured in 2016 (40 and 240mm respectively). 0.1m of LNAPL was

also measured on the 23th July 2019 in the KI oil/water separator located in Area 3, next to RW1 and RW2. According to information provided by Stolthaven, this product is associated with a spill of UAN in the yard area of Area 3 (located to the north of Area 3 tank farm). Although some UAN may have infiltrated through broken concrete, Stolthaven reported the majority of the product was recovered and as the UAN is an aqueous product, this occurrence is not considered to be associated with the LNAPL measured at S15.

Despite the presence of LNAPL at S15 for the first time during this monitoring round, a significant reduction in measured LNAPL thickness can be observed in comparison to the available data before the remedial works completed as part of the redevelopment/improvement works started. A drawing from the 2012 SLR DQRA report is presented in **Appendix F** presenting the measured LNAPL across the site in 2012. LNAPL was recorded in 11 wells in May 2012, with a maximum thickness of 2.561m. Four different areas of LNAPL greater than 10mm in thickness were inferred in 2012, to the east of Area 6 (location of the current well with LNAPL – WS23), in Area 3 (Area 3 – west and Area 3 – east) and the eastern areas of Area 4 (areas with currently no measured LNAPL).

2.4. Field Monitoring

An electric peristaltic pump (Geotech Geopump) was used to purge and collect groundwater samples from each monitoring well. Each well was purged prior to sampling. The purge volumes are detailed on **Table 2** in **Appendix B.**

Prior to the collection of groundwater samples, field monitoring of several physicochemical parameters was undertaken at each location to assess when the formation water had stabilised and was suitable for collection of a representative sample. A SmarTroll multi-parameter water quality meter was used to measure the following physicochemical parameters within a flow-through cell:

- Temperature (°C);
- Electrical Conductivity (µS/cm);
- Dissolved Oxygen (mg/l);
- pH; and
- Oxidation Reduction Potential (mV).

The field monitoring data and other observations are recorded in **Table 2** in **Appendix B**.

2.5. Laboratory Analysis

All groundwater samples were collected in the field and transported under full chain of custody conditions to Element Materials Technology (Element), a United Kingdom Accreditation Service (UKAS) accredited laboratory in Deeside.

All groundwater samples were scheduled for the following suite of analysis:

- Total Petroleum Hydrocarbons – Criteria Working Group method (TPHCWG);
- Polycyclic Aromatic Hydrocarbons (PAH); and
- Volatile Organic Compounds (VOC).

In addition, selected samples were scheduled for the following supplementary analytes based on the tank inventory review and sampling rational. A complete list of analyses completed for each of the monitoring locations is provided in **Appendix A**.

- Semi Volatile Organic Compounds (SVOC);
- Dissolved methane;
- Sulphate as SO_4;
- Alcohols and acetates;
- SVOC Tentatively Identified Compounds (TICs) ;

- VOC TICs ;
- Chemical Oxygen Demand (COD);
- Volatile Fatty Acids (FVA);
- Ammoniacal nitrogen;
- Total nitrogen; and
- Anionic surfactants.

3. Quality Assurance / Quality Control

3.1. Introduction

Quality Assurance and Quality Control (QA/QC) procedures were implemented at all stages of the work to assess the accuracy of the data set collected and enable provision of data that is considered acceptable for use. Regular internal QA/QC checks were completed by the laboratory and the collection and analysis of QA/QC samples were completed. The following subsections summarise the findings of the QA/QC assessment.

Laboratory analytical results are presented in **Tables 4 and 5** in **Appendix B,** with laboratory certificates being attached in **Appendix E**.

3.2. Holding Times

In order to facilitate samples reaching the laboratory for extraction within the recommended analytical holding times, samples were transported every day from site. Samples that were taken after the samples had been collected were stored in a fridge overnight and sent to the laboratory the next day. There were no holding time exceedances reported and therefore the data is considered valid.

3.3. Duplicate Samples

Three duplicate samples were collected during the annual monitoring event for analysis by Element. The duplicate samples were taken at the same time as the primary samples by directly filling the first containers and then filling the second containers with water to minimise the volatilisation of contaminants of concern whilst sampling. The duplicate samples were scheduled for the full set of analytical suites. The duplicate samples were put through the same extraction and analysis procedure as the primary sample and enabled an assessment of the repeatability of the analysis.

Evaluation of the duplicate analysis is based on the Relative Percentage Difference (RPD), which is defined as:

$$RPD = 200*((|X_1 - X_2|)/(X_1 + X_2))$$

Where X_1 and X_2 are the concentrations reported in the primary sample and its duplicate sample, and $|X_1-X_2|$ is the absolute difference of X_1 and X_2.

An RPD assessment was carried out on analytes reported above the respective Method Detection Limit (MDL) in both the primary and duplicate samples, the results of which are included on the laboratory lab results table presented in **Table 6** in **Appendix B**. The following general assumptions are used to assess the duplicate data:

- if the sample concentration of both samples is less than ten times the MDL, the RPD limit is 100%;
- if the sample concentration is between 10 and 20 times greater than the MDL, the RPD limit is 50%; and
- if the sample concentration is greater than 20 times the MDL, the RPD limit is set to 30%.

The RPD limits represent the maximum variation between the primary sample and its duplicate in order for the data to be considered acceptable for interpretation. Data for which the calculated RPD exceeds the RPD limit however, should be reviewed and used with caution. To be conservative, should the RPD fail; the higher detected concentration will be reported.

RPD limit exceedances were noted for C12-C16 and C16-C21 aliphatic TPH chains which exceeded the RPD by a factor of 1.2 and 1.6 respectively in S4. Concentrations are however well below GACs and therefore these RPD exceedances are not considered of concern. No other exceedances above the acceptable RPD limits were reported and therefore the data set is considered acceptable for interpretation

3.4. Trip Blank

Four trip blank samples were transported to Element Materials Technology and analysed for selected parameters including BTEX compounds and VOCs. The trip blank was prepared in the laboratory and travelled with the bottles/samples in a cool box to assess potential external or cross-contamination during transportation of the

samples from the site to the laboratory. No contaminants of concern were detected in the trip blank sample above the laboratory method detection limit (MDL). It is therefore considered that sampling handling and shipping arrangements were suitable, and that no significant external or cross-contamination of samples occurred.

4. Groundwater Assessment

4.1 Introduction

The laboratory groundwater data has been screened against the following criteria:

- Generated generic assessment criteria (GAC). The GAC have been generated using updated regulatory guidance issued by the Environment Agency and relevant regulatory bodies. The GAC employed for the Made Ground includes Freshwater EQS and DWS (when EQS GAC is not available) and Human Health industrial/commercial GAC. The GAC for the RTG includes DWS.
- SLR 2012 Human Health and Controlled Water SSACs for Areas 1 to 6. These are applicable for Made Ground groundwater data.
- URS 2014 Human Health and Controlled Water SSACs for Maskell Site. These are applicable for Made Ground groundwater data.

Laboratory data from the current monitoring round is presented in **Tables 4, 5** and **6** in **Appendix B.** Laboratory certificates are included in **Appendix F**.

To facilitate the assessment of the contaminant trends over time, graphs for the key contaminants have been generated from the groundwater data collected since November 2015. Graphs are presented in **Appendix C**.

4.2 Selected GAC

4.2.1 Human Heath

For the assessment of potential pollutant linkages (PPLs) associated with potential adverse human health effects, AECOM has adopted GAC from SoBRA Groundwater GAC (2017) (for a commercial/industrial land use using an overlying sandy soil).

The CSM developed for the site and presented in section 1.4.3 is considered to be suitably consistent with the assumptions and parameter values used for calculation of the GAC.

However, it is noted that the criteria are not intended to be protective of construction workers that are likely to be involved in sub-surface excavations during the civil works. Such short-term exposure to soil and groundwater during the civil works must be controlled through construction control measures in accordance with relevant health and safety legislation.

4.2.2 Controlled Waters

For the assessment of linkages associated with potential adverse effects to controlled waters the following GAC have been used:

Made Ground (MG):

- Environmental Quality Standards (EQS) for fresh water – protective of Dagenham Breach located 550m north east. Drinking water standards (DWS) have been used when EQS fresh water values are not available.

River Terrace Gravels (RTG):

- Drinking water standards (DWS) - protective of the underlying secondary A aquifer

For the assessment of the above linkages associated with potential adverse effects to controlled waters, GAC have been selected from the following sources in order of preference:

- DWS:
  - WS Regs 2016 (Eng/Wal);
  - WHO DWG 2017;
  - WHO Petroleum DWG 2008;
  - AECOM DWG (WHO method);
  - USEPA RSL (tapwater) [Nov 2019];
- EQS (freshwater)
  - WFD England/Wales. 2015 - Freshwater Standards;
  - WFD England/Wales. 2015 - AA-EQS Inland;
  - WFD England/Wales. 2015 - MAC-EQS Inland.
  - PNEC (EU REACH) – Freshwater;
  - SEPA WAT-SG-53 Marine EQS - AA – 2015;

4.3 Current SSACs

4.3.1 2012 SLR DQRA – Areas 1 to 6

Site Specific Assessment Criteria (SSAC) were generated by SLR as part of the 2012 DQRA for the terminal area (excluding Maskell Site).

SSAC were generated for the following Potential Pollutant Linkages (PPL) in the 2012 SLR DQRA:

- Human Heath (HH): Inhalation of soil and groundwater derived vapours by site workers in offices in Area 4.
- Controlled Water (CW): Lateral migration of Hydrocarbons/NAPL/MTBE contamination through the perched groundwater and impacting water quality at a compliance point located between 50m and 250m.

Below are presented the results of the 2012 SLR HH (**Table 3**) and CW DQRA (**Table 4**) including the generated SSAC, representative concentrations (RC) considered in the assessment and number of exceedances reported in 2012.

Table 3 - 2012 SLR Human Health Site Specific Assessment Criteria

DQRA Results – PPL1 – Human Health – Inhalation- Site Workers

Contaminants	HH-SSAC	RC	RC type	No. over/under SSAC	Hazard Quotient*	Pass or Fail?
Groundwater						
MTBE	48000	3.74	Max	0	7.9E-5	Pass
Benzene	12	0.002	Max	0	1.7E-4	Pass
Toluene	>590	0.012	Max	0	8.9E-7	Pass
Ethylbenzene	>180	0.013	Max	0	6.8E-6	Pass
m/pXylene	>190	0.019	Max	0	2.8E-5	Pass
Aliphatics >C5-C6	>36	0.035	Max	0	1.5E-4	Pass
Aliphatics >C6-C8	>5.4	0.95	Max	0	3.7E-3	Pass
Aliphatics >C8-C10	>0.43	0.087	Max	0	1.3E-2	Pass
Aliphatics >C10-C12	>0.034	0.005	Max	0	1.2E-3	Pass
Aliphatics >C12-C16	>0.00076	0.2	Max	2	1.3E-1	Pass
Aromatics >EC8-EC10	>65	0.033	Max	0	1.7E-4	Pass
Aromatics >EC10-EC12	>25	0.202	Max	0	3.0E-4	Pass
Aromatics >EC12-EC16	>5.8	0.28	Max	0	7.4E-5	Pass
RBCA Cumulative TPH hazard index*		**Target**	**1.0**		**0.19**	Pass

All concentration in mg/kg for soils and mg/l for groundwater
RC – Representative Concentration
HH SSAC – Human Health Site Specific Assessment Criteria – not including CLEA soil vapour to indoor air dilution factor of 10
>230 – No vapour risk present at soil saturation or water solubility limits
Hazard Quotient* – not including CLEA soil vapour to indoor air dilution factor of 10, HQ is calculated using RBCA model predicted indoor air exposure concentrations.
Pass - Hazard Quotient < 1, Representative Concentrations do not resent a vapour risk

Table 4 – 2012 SLR Controlled Waters Site Specific Assessment Criteria.

DQRA Results – PPL3- Controlled Waters 50m to 250m compliance points

Contaminants	Compliance point distance (m)	CW-SSAC	RC	RC type	No. over	Pass or Fail?
MTBE	250	7.82	3.1	Max	0	Pass
Aliphatics C8-C10	50	0.128	0.087	Max	0	Pass
Aromatics >EC8-EC10	50	2.8	0.027	Max	0	Pass
Aromatics >EC10-EC12	50	0.179	0.20	Max	**1**	**Fail**
Aromatics >EC12-EC16	50	0.11	0.28	Max	**1**	**Fail**
Naphthalene	50	0.043	0.016	Max	0	Pass
Fluoranthene	50	0.00034	0.00016	Max	0	Pass

All concentration in mg/l
RC – Representative Site Concentration
CW-SSAC – Controlled Waters Site Specific Assessment Criteria

4.3.2 URS 2014 DQRA – Maskell Site

A CW DQRA was completed by URS in 2014 for the assessment of the data collected at the Maskell Site.

The following SSAC were generated for the protection of the Dagenham Breach, using a 300m meters compliance point.

Table 5 – URS 2014 Maskell Site Controlled Water (Dagenham Breach) Site Specific Assessment Criteria

Analyte	SSAC (µ/l)
Vinyl Chloride (VC)	758
1,1 Dichloroethane	>Saturation

4.4 2019 Analytical Results and Contaminant Trends

4.4.1 Human Health

A comparison of the 2019 Made Ground Perched Water data to GAC protective of human health is presented in **Table 5** (MG groundwater) in **Appendix B**. A summary of the Human Health GAC groundwater exceedances is presented below.

Table 6 – Human Health groundwater GAC exceedances

Analyte	Number of samples	Human Health GAC	Range in Concentrations	Total Number of Human Health GAC Exceedances	Location with Maximum Concentration
Vinyl Chloride (VC)	24 (MG only)	63 µg/l	<0.1 - 16,518 µg/l	5 in MG	RDC307 - NW Area 3

Vinyl chloride (VC) was reported to exceed the adopted GAC (63µg/l) at five locations within the MG perched groundwater, all located in the north west of Area 3. The maximum concentration was reported in RDC307 (16,518µg/l), which is the first downgradient sampling location of the known chlorinated solvent impacted area. The other four exceedances (MW7_S, RDC304, RDC311 and RDC312) were also located in this area and further downgradient or cross gradient (RDC311). It is noted that VC HH SSAC were not generated as part of the 2012 SLR DQRA on the basis that no receptors (buildings) were present in the area of impact.

Trend analysis of key contaminants of concern:

Made Ground concentration graphs for key compounds are presented in **Appendix C**.

Overall, concentrations remain stable and/or continue to decrease in line with previous trends identified.

VC concentrations in the NW corner of Area 3, shown on graph **C-8**, continue to decrease in MW 7_S (18% reduction since last year), where maximum concentrations were historically reported. A 73% reduction is observed in MW7_S when comparing the latest recorded concentration (December 2019) with the maximum historical concentrations reported in September 2013 (42,280µg/l). Concentrations at the other locations in the chlorinated solvent impacted area remained relatively stable and within previous ranges. The exception is RDC 307 (16,518 µg/l) where maximum concentrations are now reported and where concentrations have increased by 40% when compared with the previous maximum historical concentrations reported in June 2017 (or by 157% when compared with the latest sampling round in December 2018). RDC304 is observed to have increased by 46% from the previous year (7,884µg/l to 11,545µg/l), however concentrations remain below that recorded in June 2017 (13,504µg/l). The increase in VC concentrations at RDC307 could be attributable to reductive dechlorination of cis-1,2-dichloroethene, but concentrations of this chlorinated ethene have increased 180% since December 2018 and hence are not indicative of increased dechlorination.

4.4.2 Controlled Waters

4.4.2.1 Made Ground Perched Water

Groundwater data for the Made Ground Perched Water have been compared against GAC protective of controlled waters (Dagenham Breach) as shown in **Table 5** in **Appendix B**. Analytes at concentrations in Made Ground groundwater above CW GAC are summarised in the table below:

Table 7 – Made Ground groundwater concentrations above CW GAC

Analyte	Number of samples	GAC - CW (EN/WA) EQS (Fresh) (µg/l)	GAC - CW (EN/WA) DWS (µg/l) (If No EQS Available)	Range in Concentrations (µg/l)	Total Number of GAC Exceedances	Location with Maximum Concentration
>EC5-EC7 Aromatics	24	10	-	<10 - 11	1	MW7_S
>EC8-EC10 Aromatics	24	-	300	<10 - 591	1	RDC304
>EC10-EC12 Aromatics	24	-	90	<5 - 137	2	RDC304
>EC12-EC16 Aromatics	24	-	90	<10 – 190	1*	S11
>EC16-EC21 Aromatics	24	-	90	<10 - 130	2	S4
Benzene	24	10	-	<0.5 - 12	1	MW7_S
Ethylbenzene	24	20	-	<1 - 608	3	RDC304
Xylene (Total)	14	30	-	<2 - 55	1	RDC307
Vinyl Chloride	24	77	-	<0.1 - 16,518	5 (4**)	RDC307
1,1-dichloroethane	24	-	2.8	<3 – 2,285	9	MW7_S
Trichloroethene	24	10	-	<3 – 157	1	RDC307
Tetrachloroethene	24	10	-	<3 - 11	1	S16
1,2-Dichloroethene	14	-	50	<6 – 2,340	3	RDC307
Fluoranthene	24	0.0063	-	<0.012 – 0.888	19 (5*)	WS15
Anthracene	24	0.1	-	<0.013 – 0.168	3	PZ16
Benzo(a)pyrene	24	0.00017	-	< 0.016 – 0.261	4	PZ13
Benzo(g,h,i)perylene	24	0.0082	-	<0.011 – 0.096	3	PZ13
Benzo(b)fluoranthene	24	0.017	-	<0.01 – 0.32	5	PZ13
Benzo(k)fluoranthene	24	0.017	-	<0.01 – 0.12	3	PZ13
Sulphate	7	400mg/l	-	154.9– 670.2	6	RDC307
Ammoniacal Nitrogen	4	0.3mg/l	-	31.45 - 356.39	4	S16
PAH (Sum of 4)**	24	-	0.1	<0.01 – 0.669	3	PZ13
PCE + TCE	24	-	10	<0.01 - 157	2	RDC307

***MG exceedances of 2012 SLR CW SSAC. **MG exceedances of 2014 URS CW SSAC. **Includes indeno(1,2,3-c,d)pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene and benzo(k)fluoranthene**

A total of five different aromatic TPH fractions have been reported to exceed their respective CW GAC within the MG perched water at two locations in the north west corner of Area 3 (exceedances on light carbon bands – MW7-S and RDC304), one location on the northern edge of Area 3 (S4, exceedance on mid-range carbon bands) and one location north of Area 1 (S11 exceedances on mid-range carbon bands). Concentrations of TPH fraction aromatic >EC12-EC16 at S11 (190 µg/l) have been reported to exceed the 2012 SLR SSAC (110µg/l).

Three BTEX compounds (benzene, ethylbenzene and xylene) reported exceedances above the CW GAC in the north west corner of Area 3. The benzene (MW7-S) and xylene (RDC304, RDC307 & RDC312) concentrations only slightly exceeded the CW GAC, whereas the highest GAC exceedance is for ethylbenzene, with a concentration of 608µg/l compared to the GW GAC of 20µg/l at RDC304.

A total of 19 CW GAC exceedances for Chlorinated Hydrocarbons (vinyl chloride, 1,1-dichloroethane, 1,2-dichloroethene, trichloroethene, tetrachloroethene) have been reported within nine groundwater monitoring wells across the site. The majority of the exceedances are within one order of magnitude of the adopted GAC, with the exception of the wells located in the north east corner of Area 3. VC exceedances were all within the north east corner of Area 3 and are all between one and three orders of magnitude above the GAC. Concentrations in MW7_S, RDC304, RDC307 and RDC312 are reported above the URS 2014 SSAC (758µg/l) for the adjacent Maskell Site by a factor of 15.1, 15.2, 21.8 and 17, respectively. The proximity of this area to the Maskell Site and lack of SLR SSAC for VC warrants the inclusion of the URS SSAC in this instance. High dissolved methane concentrations have been reported in the chlorinated solvent impact area, with the highest concentrations reported in MW7_S where a greater reduction of VC concentrations is noted. This is in line with previous data and indicates that conditions are highly anaerobic and may be suitable for degradation of VC.

A total of 38 CW GAC exceedances for PAH compounds (fluoranthene, anthracene, benzo(a) pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene and benzo(k)fluoranthene) have been reported within nineteen of the twenty four groundwater monitoring wells across the site, with fluoranthene the most frequently exceeded PAH. Fluoranthene concentrations are all reported to be below the 2012 SLR SSAC (0.34µg/l) with the exception of five wells, with WS15 reporting the greatest exceedance (0.888µg/l). No other compounds have been reported to exceed the 2012 SLR SSAC. The highest concentration recorded in December 2018 was at S11 (1.347µg/l). Fluoranthene concentrations at this location have reduced to the second lowest concentration recorded yet (0.557µg/l) during the most recent monitoring round, however the concentration detected still exceeds the SSAC.

A total of six out of seven groundwater monitoring wells tested for sulphate recorded GAC exceedances. All exceedances were within one order of magnitude of the GAC, with the highest exceedance at RDC307 (670.2mg/l) north west of Area 3.

Trend analyses of main contaminants:

TPH concentrations across the site have generally remained stable/within historical ranges since November 2015 (see graph **C-1 and C-1A**).

As shown on graph **C-3**, concentrations of total PAHs have generally increased in concentration from December 2018 to December 2019, with the average concentration in the wells monitored in December 2019 increasing by 9% when compared to December 2018. Fluoranthene concentrations **(C-4)** have generally increased since December 2015 (but remain at similar levels since 2017), and despite the average concentration decreasing since 2018 there were increases noted in six wells across the site, located south of Area 6 (WS15), north-west of Area 3 (RDC307), north east of Area 3 (S4), north of Area 1 (PZ11), east of Area 4 (PZ17) and south east of Area 5 (BH106).

A significant reduction in MTBE concentrations have been reported since December 2015 across the site (see graph **C-5**). Average concentrations for the twenty-four wells monitored in this latest round have reduced from 755µg/l (December 2015) to 58µg/l (December 2019), with an average concentration reduction of 52% from the previous year (December 2018). Concentrations did not exceed the Freshwater CW GAC. The highest reported concentration in the MG (462.8µg/l at MW7_S) is over an order of magnitude below the SLR SSAC (7,820µg/l).

VC concentrations in the NW corner of Area 3, shown on graph **C-8**, continue to decrease in MW 7_S (18% reduction since last year), where maximum concentrations were historically reported. A 73% reduction is observed in MW7_S when comparing the latest recorded concentration (December 2019) with the maximum historical concentrations reported in September 2013 (42,280µg/l). Concentrations at the other locations in the chlorinated solvent impacted area remained relatively stable and within previous ranges. The exception is RDC 307 (16,518 µg/l) where maximum concentrations are now reported and where concentrations have increased by 40% when compared with the previous maximum historical concentrations reported in June 2017 (or by 157%

when compared with the latest sampling round in December 2018). RDC304 is observed to have increased by 46% from the previous year (7,884µg/l to 11,545µg/l), however does not exceed the highest recording taken in June 2017 (13,504µg/l).

Sulphate concentrations remained stable, with only a reduction in concentration at WS20 noted during the recent sampling round.

No Made Ground samples were tested for metals during this monitoring round.

New compound detections:

The following additional laboratory analysis have been completed on groundwater samples following the tank inventory and in specific locations to identify any significant new chemicals of concern. The following section highlights the compounds detected above the laboratory detection limit:

- Semi Volatile Organic Compounds (SVOC) and TICs – tested in four locations for a potential impact from Fentamine DMA and Emoltene products:
  - Cyclic octaatomic sulfur (3,371µg/l) at PZ14. No GACs available for this compound;
  - 2-nitrophenol (4.5 µg/l) at S11. No GACs available for this compound
- Alcohols and Acetates – tested in six locations for a potential impact from various products stored on site:
  - No detections above laboratory detection limit
- Fuel additives – tested in three locations for a potential impact from DEB 100 product:
  - Tert Butyl Alcohol was detected at all three locations with maximum concentrations at PZ11 (322 µg/l). All concentrations were over an order of magnitude below the EQS freshwater GAC;
  - Ethyl Tert Butyl Ether at PZ11 (28 µg/l). Concentration were over an order of magnitude below the EQS freshwater GAC
- VOC TICs - tested in one location for a potential impact from Cyclopentane
  - No detections
- Chemical Oxygen Demand (COD) – tested in 11 locations for a potential impact from various products stored on site:
  - Concentrations ranging between 26 mg/l (WS20) and 118 mg/l (PZ14). Concentrations are relatively similar across the site (varying by less than a factor of five) and therefore these results do not suggest any localized contamination
- Volatile Fatty Acids (FVA) - tested in three locations for a potential impact from Ethylhexanoic Acid:
  - No detections
- Ammoniacal nitrogen - tested in four locations for a potential impact from Ammonium Sulphate, UAN 32, Chafer (APP) and AdBlue products.
  - Detected in all four locations at concentrations greater than two orders of magnitude above the Freshwater GAC (0.3 mg/l). Maximum concentrations were detected in S16 (356 mg/l), over three orders of magnitude above the Freshwater GAC (0.3 mg/l)
- Total nitrogen – tested in five locations for a potential impact from urea and other nitrogen containing products.
  - Concentrations ranged between 7,700 µg/l (RDC307 and WS20) and 318,200 µg/l (S16). Results in PZ14, S11 and S16 were very similar to the ammoniacal nitrogen results, indicating that almost all of the dissolved nitrogen in groundwater at these three locations was present as ammonium. The lowest results were both detected in the north/north west of Area 3, if all this nitrogen was present as ammonium, the concentrations would exceed GAC by greater than an order of magnitude
- Anionic surfactants – tested in two locations for a potential impact from Hlas product.
  - Detected in both locations with concentrations close (factor of seven or less) to the method detection limit. These are not considered to suggest significant contamination from site operations.

4.4.2.2 RTG Aquifer

Groundwater data for the River Terrace Gravels have been compared against GAC protective of controlled waters as shown in **Table 4** in **Appendix B**.

Analytes at concentrations in River Terrace Gravel groundwater above the DWS GAC are summarised in the table below:

Table 8 – RTG groundwater concentrations above DWS GAC

Analyte	Number of samples	GAC - CW (EN/WA) DWS (µg/l	Range in Concentrations (µg/l)	Total Number of GAC Exceedances	Location with Maximum Concentration
Benzo(a) pyrene	14	0.01	<0.016 – 0.424	2	PZ8
Sulphate	3	250mg/l	376.4mg/l – 682.1mg/l	3	BH203MS
Vinyl Chloride	14	0.5	<0.1 – 1.9	1	BH201A
PAH (sum of 4)*	14	0.1	<0.01 – 1.305	2	PZ8

*Includes indeno(1,2,3-c,d)pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene and benzo(k)fluoranthene

Only PAHs (in 2 out of 14 locations), sulphate (in 3 out of 3 locations) and vinyl chloride (in 1 location out of 14) have been reported to exceed the DWS CW GACs.

Benzo(a) pyrene and "PAH (sum of 4)" concentrations were reported to exceed DWS GACs in two locations, with maximum concentrations reported at PZ8 (exceeding the GAC by approximately 1 order of magnitude), located in the western side of the main terminal and adjacent to the River Thames.

Vinyl chloride was recorded to marginally exceed the DWS GAC at BH201A (1.9 µg/l vs. 0.5 µg/l). BH201A is located up hydraulic gradient, but relatively close to the MG impacted chlorinated solvent area. Vinyl chloride is not detected at BH105A screened in the RTG, below an area where MG is heavily impacted and located downgradient of the MG most impacted chlorinated area indicating that alluvium is effectively sealing the MG contamination and degradation of VC is likely to be occurring in the RTG.

Sulphate concentrations were reported to exceed CW GACs in all three locations tested (Area 3 and Maskell site). The maximum concentrations were reported at BH203MS located in the western part of Maskell site (682.1mg/l). These concentrations exceed DWS and EQS freshwater GACs by a maximum factor of 2.7 and 1.7 respectively.

Trend analyses of main contaminants:

RTG concentration graphs for key compounds are presented in **Appendix D**.

As shown on graph **D-1**, TPH concentrations in the RTG wells has been historically low with concentrations since November 2015 remaining below 60µg/l (with the exception of PZ8 (1,213µg/l)) in June 2016 and PZ4 (819µg/l) in December 2016). During the December 2019 monitoring round PZ3 and PZ6 were recorded as reducing in concentrations below detection limits (<10µg/l) from 52µg/l and 23µg/l respectively in December 2018. On the contrary, PZ8 and BH205 were observed to increase from being below detection limits in December 2018 to 84µg/l and 80µg/l, respectably. All other wells recorded TPH concentrations below detectable limits. No exceedances to DWS GACs for TPH and BTEX compounds were reported in any of the RTG monitoring wells.

As shown on graph **(D-2)**, Total PAH concentrations above the method detection limit have been reported in five RTG groundwater monitoring wells since November 2015 (PZ2, PZ3, PZ6, PZ8 and BH205). The December 2019 monitoring round is the first time total PAH has exceeded the detection limit at BH205 (0.542µg/l). Other increases were observed in PZ6 and PZ8, with PZ8 increasing for a second year in a row, having greatly increased from 0.896µg/l in December 2018 to 5.359µg/l in December 2019. PZ3 was recorded to decrease in concentration to 0.235µg/l, having peaked at 2.464µg/l in June 2018. The increase in PAH concentration at PZ8 was largely due to the fluoranthene concentration, which was observed to increase in concentration from December of 2018 to 2019 (see graph **D-3**), and benzo(g,h,i)perylene, which has increased from below the detection limit in 2018 to 0.225µg/l in 2019 (see graph **D-4**).

The highest MTBE concentrations were recorded in May 2016, since then concentrations have reduced (see graph **D-5**). This monitoring round reported further concentration decreases at all monitoring wells with the

exception of BH101, BH106A and BH205 where minor increases were observed and interpreted as small fluctuations near the method detection limit that have occurred since 2015. Concentrations of MTBE in PZ4 and PZ6 were recorded at 3,840µg/l and 1,622µg/l in May 2016 respectively, with concentrations in December 2019 being recorded at 14.3µg/l and 115.4µg/l, respectively.

As shown in graph **D-6,** the highest VC concentrations were reported in PZ3 in May 2016 at 103.8µg/l, after which concentrations dropped below 1µg/l before increasing slightly in December 2018 to 8.8µg/l. VC concentrations at BH201A (location with second highest historical concentrations) have oscillated between 3.8µg/l (December 2018) and 9.4µg/l (June 2018) since 2016, with a reduction to 1.9µg/l observed in December 2019, the highest recorded during the current monitoring round.

No River Terrace Gravel groundwater samples were tested for metals during this monitoring round.

4.5 Summary of Results and Risk Evaluation

4.5.1 Human Health

The presence of VC concentrations at five locations (all located north west of area 3) in MG perched groundwater that exceed the human health GAC is considered unlikely to pose a significant risk to human health as the primary risk driving pathway for exposure to VC is through vapour inhalation and the current open nature of the site in this area and the presence of a sealed concrete slab at the site surface will help mitigate this potential pathway. As such, no significant risk is considered to exist to site operatives engaged in routine activities.

Similarly, the measured LNAPL in Area 6 and Area 3 is not considered to pose a risk to site users due to the open nature of the site. The LNAPL measured at S15 may have an origin from the adjacent United Molasses site (see section 2.3). Whilst the LNAPL at S15 could pose a risk to offsite receptors if mobile and if buildings are present downgradient, the limited thickness detected, and the high viscosity noted indicate that the risk of migration is low.

Where construction or maintenance works are being undertaken in areas where exceedances were reported, the potential for an exposure pathway may be present and, as such, precautions as described in Section 4.2.1 should be implemented as necessary.

The new Site offices were recently constructed in the south west corner of Maskell Site South, approximately 70m away from the Area 3 chlorinated solvent impacted area and up hydraulic gradient of the terminal. Stolthaven indicated the area was investigated (by trial pitting and 3 boreholes), ground gas data was collected, and ground gas protection measures were fitted bellow the office concrete slab. The data provided by Stolthaven is however partial/not completed and AECOM was therefore unable to review this data and assess the presence and significance of potential vapour migration and intrusion from the Area 3 solvent contaminated area to the new offices

4.5.2 Controlled Waters

4.5.2.1 Made Ground Perched Water

The exceedances observed in the perched water are considered to be representative of the long site history of fuel and oil storage at the site. A general downward trend of contaminant concentrations within the MG perched water is observed since the start of the groundwater monitoring programme (Nov 2015) and therefore the risk to the identified CW receptors is considered to be reducing.

Concentrations of TPH (in RDC304, S11 and S4) and fluoranthene (in PZ13, PZ17, RDC312, S11 and WS15) have been reported to exceed the SLR 2012 CW SSACs by a maximum factor of 2.6 (fluoranthene in WS15). Fluoranthene concentrations at S11 (located directly downgradient of the SE tank farm of Area 3 where the gas oil accidental release occurred in 2015) increased from June 2017 to December 2018, which may have been indicative of a potential dissolved-phase plume migration. Since December 2018 however, the concentration has fallen to almost the same level as June 2017. It is noted that other boreholes that could be considered downgradient of Area 3 (S14 - S16) did not register an increase in concentration. The localised increase in concentration at S11 from June 2017 to December 2018 may have been due to a remobilization of contaminants as a result of the 2017 upgrade works in the eastern tank farm of Area 3 (excavation and removal of impacted gravel base and installation of a concrete floor).

VC concentrations in MW7_S, RDC304, RDC307 and RDC312 have been reported to exceed the URS 2014 SSAC by a maximum factor of 21.8 during the December 2019 monitoring round. An 18% reduction in VC concentrations in the previously most impacted well (MW7_S) is observed over the past year (from 14,055µg/l to 11,455µg/l), a 73% reduction is observed in MW7_S when compared with the maximum historical concentrations reported in September 2013 (42,280 µg/l). Currently, the most impacted well is RDC307 (16,518µg/l) where concentrations in 2019 have increased 40% since 2018. Exceedances were not detected in downgradient wells (WS20, S4 and BH312) which may indicate that degradation rates are faster than initially modelled in the DQRA. Risk to the Dagenham Breach is considered unlikely.

From the additional testing carried out as a result of the tank inventory review, ammoniacal nitrogen has been detected in all four sampled locations at concentrations greater than two orders of magnitude above the Freshwater GAC (0.3 mg/l). The higher concentrations were reported downgradient of Area 3 and could be associated with the UAN spill reported by Stolthaven that occurred mid 2019 in the yard area of Area 3. Although Stolthaven reported that most of the product was recovered, a small portion of it may have infiltrated through broken concrete.

No other compounds have been reported to exceed the available SLR 2012 SSAC or URS 2014 SSACs.

A significant reduction in measurable LNAPL extent and thickness is observed when compared to the measured LNAPL across the site in 2012. It is however noted 30mm of LNAPL have been measured in S15 for the first time and could potentially pose a risk to the CW receptors if mobile. However, based on the limited thickness detected and the high viscosity noted the risk of migration is low. This LNAPL may have originated from the adjacent United Molasses site which has recently undergone demolition works.

Overall, it is believed that the removal of historically impacted soil and associated LNAPL completed as part of the redevelopment works is having a positive impact within the shallow MG unit.

4.5.2.2 RTG Aquifer

Only PAHs (in 2 out of 14 locations), sulphate (in 3 out of 3 locations) and vinyl chloride (in 1 location out of 14) have been reported to exceed the DWS CW GACs. With the exception of PZ8, where concentrations exceeded by approximately one order of magnitude, exceedances are considered minor.

A clear overall reduction of the contaminants of concern has been observed since November 2015. The exception is the well PZ8 (located south of Area 2, and likely up gradient of the terminal), where concentrations (predominantly PAHs) appear to have increased since June 2017.

No SSAC are available for the RTG deposits.

Overall, exceedances reported in the RTG are considered minor and unlikely to pose a risk to the identified controlled water receptor (RTG aquifer) as no groundwater abstractions are present in the area and the aquifer is impacted by intrusion of brackish water from the River Thames. The RTG aquifer is considered to be well protected by the approximately 5m covering thickness of alluvial clay and peat aquitard.

5. Conclusion

The annual groundwater monitoring round was undertaken between 4th and 10th December 2019. A total of 40 monitoring wells were gauged for LNAPL and groundwater depth and groundwater sampling was subsequently undertaken at 24 MG wells and 14 RTG wells were submitted to Element Materials Technology and scheduled for a broad suite of analysis based on known historical contaminants of concern and potential new contaminants of concern based on a review of the site tank inventory.

LNAPL was encountered in two MG monitoring wells (WS23 and S15). The maximum LNAPL thickness was 0.055m (WS23). LNAPL at WS23 was described as very viscous with a dark brown colour which is consistent with the previously measured NAPL at this location. It has been characterized as biodegraded diesel and cable oil. The LNAPL at S15 (0.030m) was described as very viscous with a black colour, and it is the first time it has been detected in this location. It has been characterized as degraded diesel, possible cable oil and possible transformer oil, and is considered likely to have an origin from the adjacent United Molasses site which has undergone demolition works in autumn 2019. A significant reduction in LNAPL extent and thickness is observed when comparing with the measured LNAPL detected across the site in 2012, when the SLR DQRA was conducted.

Groundwater flow in the MG aquifer is inferred to flow in a north-easterly direction within the central/main terminal and Maskell Site, which has been consistent throughout the previous monitoring events. An easterly direction is observed in Area 6 and the north of the Maskell Site.

Given the tidal range (approximately 2 m) observed in groundwater levels in the RTG during the pressure transducer deployment in 2018 in wells located in Area 4 and 1 (approximately 120-210 m away from the River Thames) it is not possible to assess a groundwater flow direction within the RTG from the non-instantaneous gauging data collected during the current round. From the site hydrogeological setting, it is possible that groundwater flow in the RTG has a vertical component of flow through the underlying Thanet Formation and into the underlying Chalk towards the historical groundwater depression in the Chalk to the west.

Contaminants of concern were reported in MG groundwater samples collected across the site at concentrations consistent with known historical impacts on site. A general downward trend of contaminants concentrations within the MG perched water is observed since November 2015 and therefore the risk to the identified CW and Human health receptors is considered to be generally reducing. The LNAPL removal and excavation of impacted soils completed as part of the redevelopment works carried out since 2014 are likely to have resulted in an improvement in groundwater quality. The following however should be noted:

- LNAPL has been recorded for the first time in S15, located on the Site boundary with the United Molasses site.
- The presence of VC concentrations in MG perched groundwater in the north-west corner of Area 3 that exceed the human health GAC based on a vapour intrusion pathway. The closest building to the chlorinated solvent impacted area is the new main Site office, located approximately 70m south west and hydraulically up gradient. Stolthaven indicated the area occupied by the Office was investigated, ground gas data was collected, and ground gas protection measures were fitted bellow the office concrete slab. The data provided by Stolthaven is however partial/not completed and AECOM has been therefore unable to review this data and assess the presence and significance of potential vapour migration and intrusion.
- VC concentrations in perched groundwater within the MG at four locations in the north-west corner of Area 3 exceeded the 2014 CW URS SSAC by a maximum factor of 21.8. Exceedances were however not detected in downgradient wells (WS20, S4 and BH312) which may indicate that degradation rates are faster than initially modelled on the DQRA. Risk to the Dagenham Breach is considered unlikely.
- Concentrations of fluoranthene in PZ13, PZ17, RDC312, S11 and WS15 have been reported to exceed the SLR 2012 CW SSACs by a maximum factor of 2.6 (fluoranthene in WS15). The previously identified steady increase in fluoranthene concentrations in S11, where maximum concentrations were previously recorded, have reverted during the December 2019 sampling round. It is considered the increase in S11 was due to a remobilization of contaminants as a result of the 2017 upgrade works in the eastern tank farm of Area 3.
- From the additional tested carried out as a result of the tank inventory review, ammoniacal nitrogen has been detected in all four sampled locations at concentrations greater than two orders of magnitude above the Freshwater GAC (0.3 mg/l). The higher concentrations were reported downgradient of Area 3 and could be associated with the UAN spill reported by Stolthaven that occurred mid 2019 in the yard area of Area 3.

Although Stolthaven reported that most of the product was recovered, a small portion of it may have infiltrated through broken concrete

Within the underlying RTG aquifer, only PAHs (in 2 out of 14 locations), sulphate (in 3 out of 3 locations) and vinyl chloride (in 1 location out of 14) have been reported to exceed the DWS CW GACs. Concentrations were generally not recorded more than one order of magnitude above the DWS GAC (exception is PZ8 were PHA concentrations exceeded by 1.5 orders of magnitude) and a clear overall reduction of the contaminants of concern has been observed since November 2015 (with the exception of PZ8 were PAH concentrations appear to have increased since 2017). Overall, exceedances reported in the RTG are considered minor and unlikely to pose a risk to the identified controlled water receptor (RTG aquifer) as no groundwater abstractions are present in the area and the aquifer is impacted by intrusion of brackish water from the River Thames. The RTG aquifer is considered to be well protected by the approximately 5m covering thickness of alluvial clay and peat aquitard.

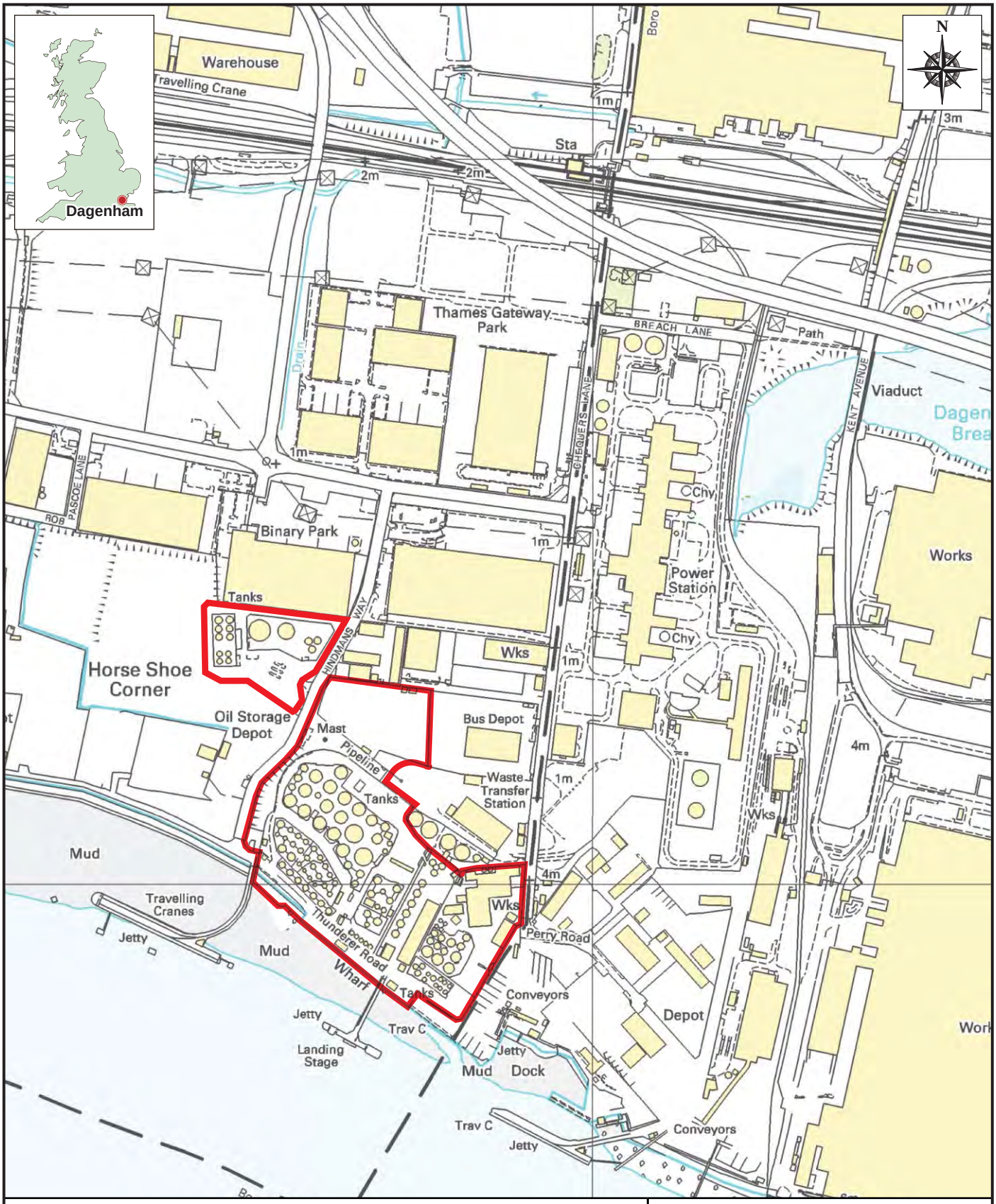
No SSAC for the RTG deposits are currently available.

6. Recommendations

The following sets of recommendations are made:

- Continue with the annual monitoring, with one localised / smaller groundwater sampling event every year at the main locations of concern and one site-wide / full groundwater sampling event every 2 years. It is recommended that ammoniacal nitrogen is added into the annual sampling round in and around Area 3 to further investigate and monitor the potential impact caused by UAN spill and to understand background concentrations. It is also considered that the frequency of monitoring for compounds not detected during this sampling round (alcohols, acetates, VOC TICs and Volatile Fatty Acids) can be extended to potentially a five year frequency, dependent on the site permitting requirements.
- Deployment of pressure transducers within all RTG wells and off the jetty for a 24-hour period to provide instantaneous water level information across the tidal system to inform the assessment of groundwater flow direction within the RTG.
- A review/update of the current DQRA is recommended to update the current Conceptual Site Model, assumptions, site layout and to generate SSACs for the RTG deposits and any missing SSACs for the Made Ground (e.g. ammoniacal nitrogen).
- Periodic purging/LNAPL recovery in WS23 and S15 by site personnel. Alternatively, passive bailers could be installed down these wells to capture the LNAPL if site personnel are not able to carry out the periodic purging.
- It is understood Enzigo Geoenvironmental Ltd carried out the ground investigation and ground gas/vapour risk assessment for the new main site offices. It is recommended the associated report/assessment is shared with AECOM so the information can be reviewed and incorporated into the review/update of the current DQRA and Conceptual Site Model detailed above.
- Carry out well repair works in the following wells:
  - BH205 and BH307 in MS: Needs protecting as last time found buried under gravel;
  - PZ17 in area 5: Well cover damaged;
  - PZ8 in Area 2: Well cover found full of hard sludge;
  - RDC312 in Area 3: under mud;
  - RDC307 in Area 3: missing well cover and exposed to traffic.

Figures



CLIENT

STOLTHAVEN DAGENHAM LTD

PROJECT

STOLTHAVEN TERMINAL, DAGENHAM, UK

DRAWING TITLE

FIGURE 1 _ SITE LOCATION PLAN

0 300m

APPROXIMATE SCALE

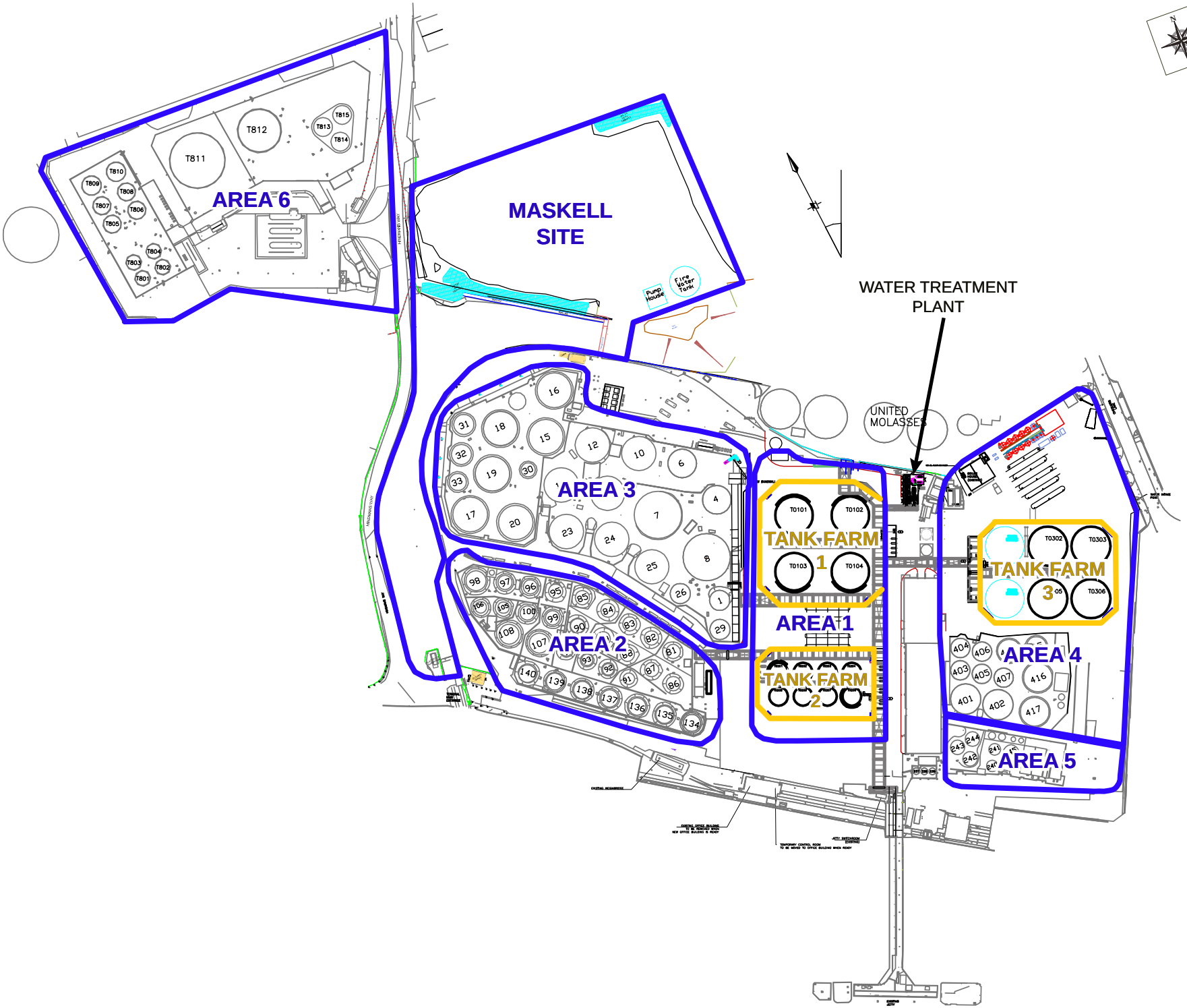
STOLTHAVEN DAGENHAM TERMINAL

AECOM

www.aecom.com

DRAWN	TRACED	CHECKED	APPROVED	DATE
SML		GBA	GBA	25/07/17

SCALE	Job No.	REV
N.T.S	60546332	0



NOTES

0 20 40 60 80 100m

APPROXIMATE SCALE

AECOM

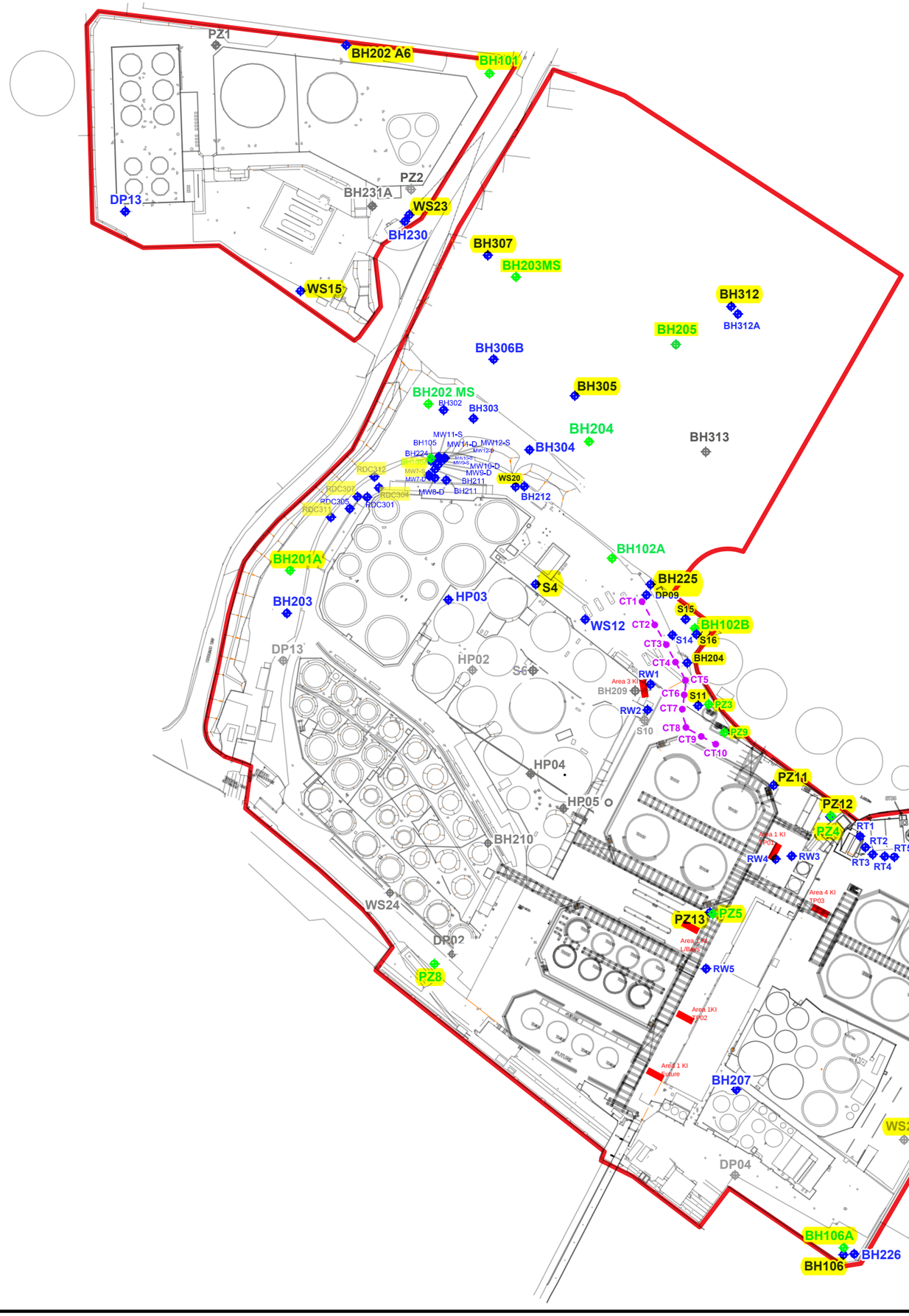
AECOM Infrastructure & Environment UK LTD
St George's House, 3rd Floor
5 St George's Road, Wimbledon, London SW19 4DR
Tel :020 7963 9800 Fax: 020 7963 9801

CLIENT
STOLTHAVEN DAGENHAM LTD

PROJECT
STOLTHAVEN TERMINAL,
DAGENHAM, UK

DRAWING TITLE
Figure 2 – Site Layout

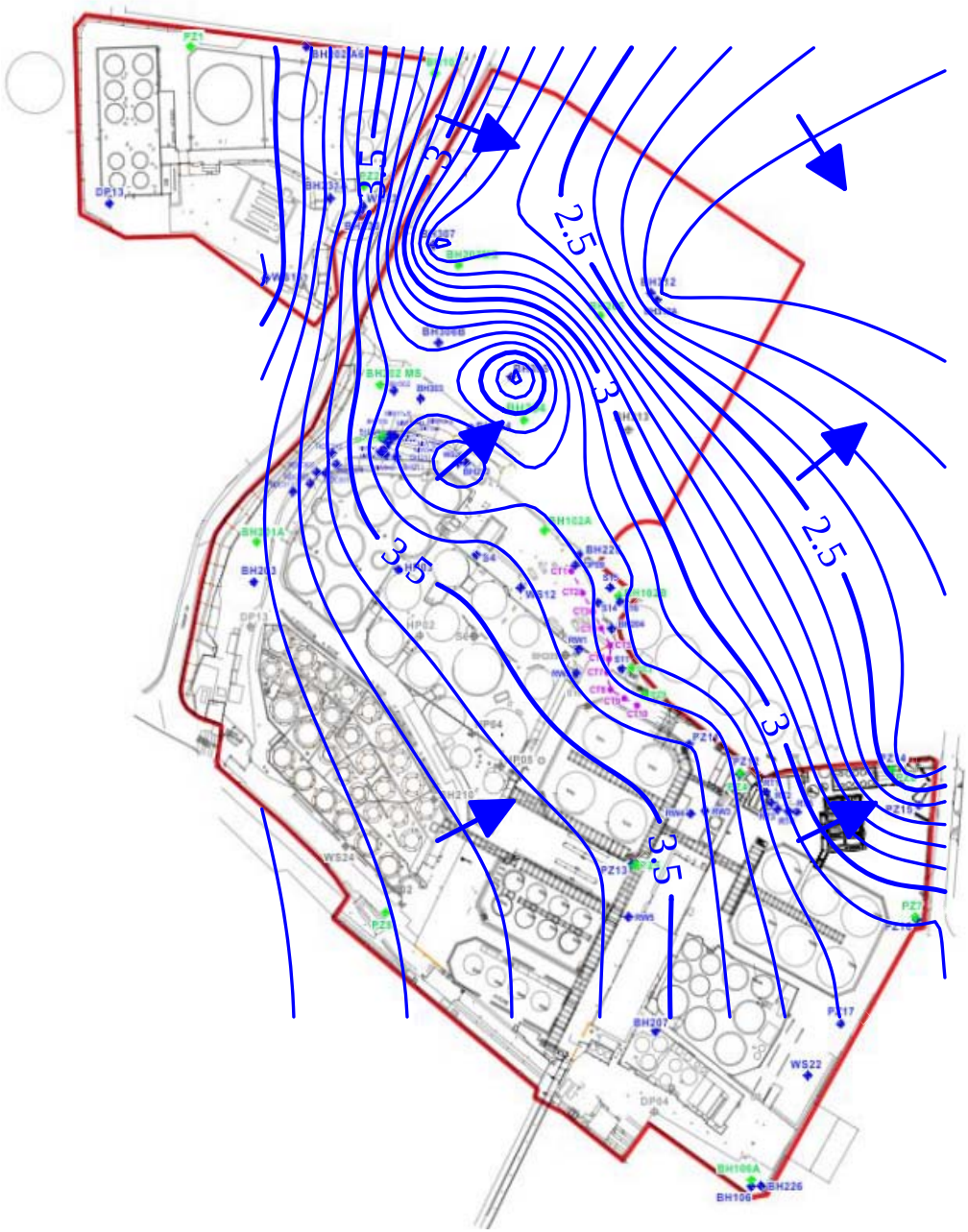
DRAWN		CHECKED	APPROVED	DATE
SML		GBA	GBA	JULY 2017
SCALE		DRG No.		REV.
N.T.S.		60546332		



Title	LOCATION OF GROUNDWATER MONITORING WELLS & RECOVERY WELLS - Highlighted wells for full biannual round
Location	STOLTHAVEN TERMINAL, DAGENHAM, UK
Client	STOLTHAVEN DAGENHAM LTD

AECOM

App'd:	Drawn:	Date:
GRA	RH/SML	February 2020
FINAL		Ref: GBA/WIMB
Scale: N.T.S.		Job No: 60546332
Drg. Size: A4		**FIGURE 1**



N

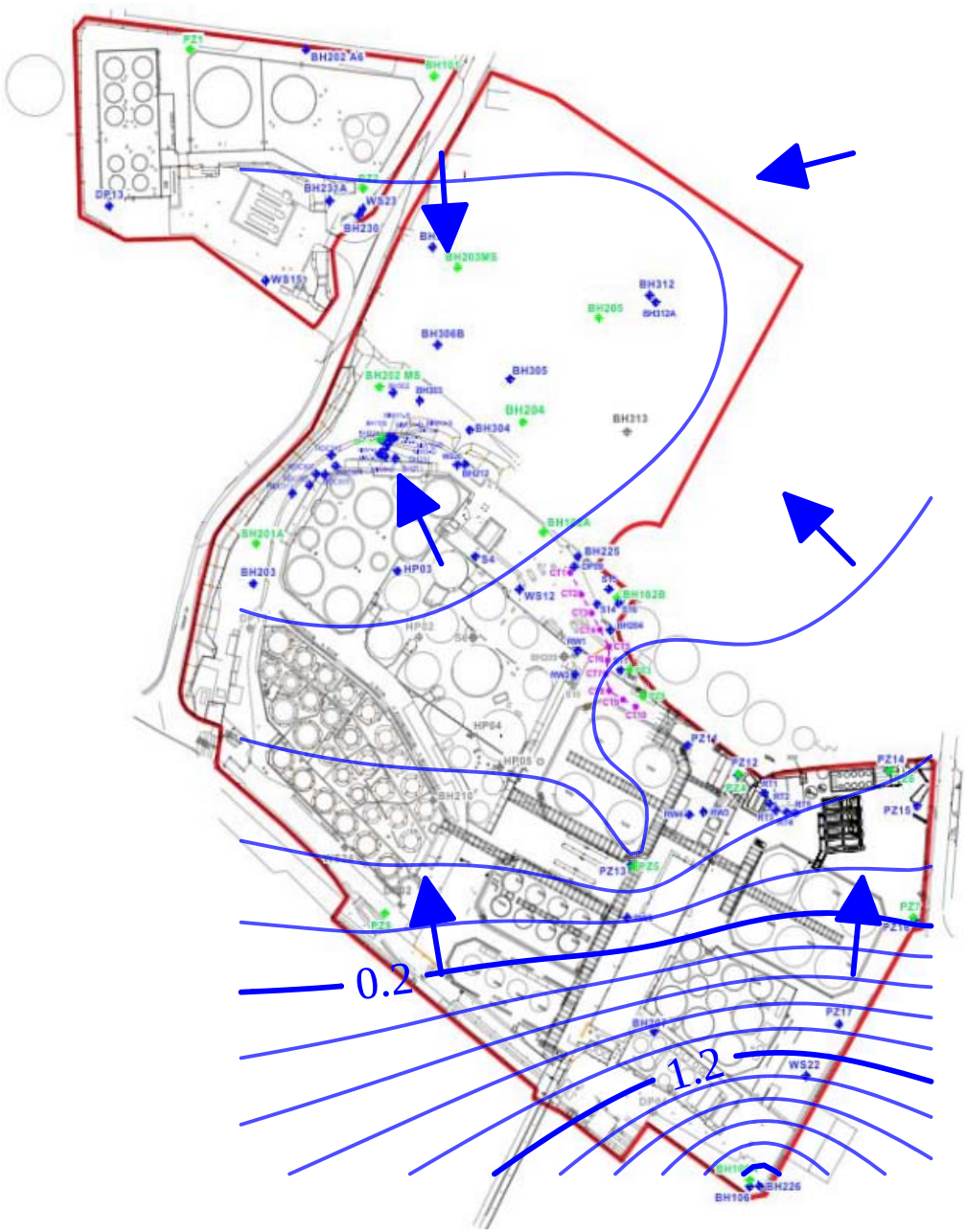
Key

- SITE BOUNDARY
- GROUNDWATER CONTOUR (mAOD)
- DECOMMISSIONED / LOST
- RECOVERY WELL
- REMEDIATION TRENCH
- MG MONITORING WELLS
- RTG MONITORING WELLS
- TRENCH
- TRENCH SAMPLES

Title	Inferred MG Groundwater Contours December 2019
Location	Stolthaven Terminal, Dagenham, RM9 6PU
Client	Stolthaven Dagenham Ltd

AECOM

App'd:	Drawn:	Date:
DG	GBA	Feb 2020
DRAFT		Version: 1
Scale: -		Project No: 60546332
Drg. Size: A4		FIGURE 4a



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Key

- SITE BOUNDARY
- GROUNDWATER CONTOUR (mAOD)
- DECOMMISSIONED / LOST
- RECOVERY WELL
- REMEDIATION TRENCH
- MG MONITORING WELLS
- RTG MONITORING WELLS
- TRENCH
- TRENCH SAMPLES

Title	Inferred MG Groundwater Contours December 2019
Location	Stolthaven Terminal, Dagenham, RM9 6PU
Client	Stolthaven Dagenham Ltd

AECOM

App'd: DG	Drawn: GBA	Date: Feb 2020
DRAFT		Version: 1
Scale: -		Project No: 60546332
Drg. Size: A4		FIGURE 4b

Appendix A - Nominated Monitoring Wells

Appendix A - Proposed Monitoring Wells for Sampling

Name	Easting	Northing	Top Of Pipe/Cover	Screened Horizon	Area	Included in Targeted Monitoring Round	Included in biannual Monitoring Round	Biannual additional analyses above basic suite (CWG TPH, PAH and VOC)
PZ11	548780.676	182032.726	4.415	MG	1	X	X	COD, alcohols and fuel additives
PZ13	548751.401	181974.245	5.491	MG	1		X	
PZ3	548750.9	182069.975	4.362	RTG	1	X	X	
PZ5	548752.748	181973.567	5.333	RTG	1		X	
PZ9	548757.942	182057.106	4.356	RTG	1		X	
PZ8	548624.616	181950.574	4.98	RTG	2		X	
BH204	548661.999	182266.375	3.828	MG	3	X	X	VFA and anionic surfactants
BH225	548723.861	182125.282	3.674	MG	3	X	X	VFA and anionic surfactants
MW7_S	548621.990	182175.330	4.460	MG	3	X	X	Disolved Methane + Sulphate
RDC304	548599.102	182169.503	4.595	MG	3	X	X	Disolved Methane + Sulphate
RDC307	548589.213	182165.36	4.698	MG	3		X	COD, total N and SVOCs TIC + Disolved Methane + Sulphate
RDC311	548575.735	182154.340	4.796	MG	3	X	X	Disolved Methane + Sulphate
RDC312	548597.004	182174.598	4.622	MG	3		X	COD + Disolved Methane + Sulphate
S11	548745.947	182069.332	3.946	MG	3	X	X	COD, Ammoniacal N, total N, SVOC TICs, VOC TICs and alcohols,
S15	548740.214	182109.067	3.769	MG	3		X	COD, Ammoniacal N, total N, SVOC TIC and fuel additives
S16	548744.926	182102.703	3.747	MG	3	X	X	Ammoniacal N and sulphate
S4	548671.224	182125.167	3.859	MG	3		X	COD
WS20	548661.9	182170.299	3.966	MG	3	X	X	COD, total N, SVOCs TIC and fuel additives + Disolved Methane + Sulphate
BH102B	548744.423	182103.552	3.645	RTG	3	X	X	
BH105A	548622.541	182183.172	4.434	RTG	3	X	X	Disolved Methane + Sulphate
PZ12	548806.79	182018.21	4.039	MG	4	X	X	COD
PZ14	548884.245	182020.474	3.511	MG	4	X	X	COD, ammoniacal N, total N, alcohols and SVOC TICs
PZ15	548899.176	182002.899	3.552	MG	4		X	
PZ16	548898.282	181947.145	4.707	MG	4		X	Alcohols
PZ4	548807.198	182018.515	4.017	RTG	4		X	
PZ6	548884.943	182020.365	3.514	RTG	4	X	X	
PZ7	548897.306	181948.518	4.551	RTG	4		X	
BH106	548812.843	181816.771	5.064	MG	5		X	
BH106A	548813.018	181819.971	5.092	RTG	5		X	
PZ17	548859.067	181896.152	4.681	MG	5		X	COD and VFA
~~WS22~~				~~MG~~	~~5~~		~~X~~	COD and VFA
BH202	548583.828	182372.591	4.557	MG	6		X	Alcohols
WS15	548563.017	182260.074	4.693	MG	6		X	
WS23	548612.595	182294.582	4.328	MG	6	X	X	COD and alcohols
~~PZ1~~	~~548524.09~~	~~182373.032~~	~~4.645~~	~~RTG~~	~~6~~		~~X~~	
~~PZ2~~	~~548613.366~~	~~182305.027~~	~~4.354~~	~~RTG~~	~~6~~		~~X~~	
BH101				RTG	6		X	
BH203MS	548661.999	182266.375	3.828	RTG	MS	X	X	Upgradient well: COD, ammoniacal N, total N, alcohols, fuel additives, anionic surfactants VFA, SVOC TICs + Disolved Methane + Sulphate
BH305	548689.356	182211.688	3.833	MG	MS	X	X	
BH307	548649.538	182276.339	4.107	MG	MS	X	X	COD and alcohols
BH312	548762.799	182252.172	3.674	MG	MS	X	X	
BH201A	548558.141	182131.682	4.790	RTG	MS	X	X	Disolved Methane + Sulphate
BH205	548735.132	182241.844	3.610	RTG	MS	X	X	
						Count = 22	Count = 40	

Appendix B - Tables

TABLE 1
GROUNDWATER ELEVATIONS

Site	Stolthaven
Sample Round	Annual 2019 (December)

Borehole	Area	Elevation of top of pipe (m AOD)	Monitoring strata	Dip date	Depth to LNAPL (m bTOC)	Depth to water (m bTOC)	Depth to base (m bTOC)	LNAPL Thickness (m)	Groundwater elevation (m AOD), 2018	Groundwater elevation (m AOD) 2019	Difference Groundwater elevation (m AOD)	Comments
BH101	6	4.525	RTG	04/12/2019	-	4.980	-	-	-0.0252	-0.455	0.430	
BH102B	3	3.645	RTG	04/12/2019	-	4.135	14.400	-	0.3254	-0.490	0.815	
BH105A	3	4.434	RTG	04/12/2019	-	5.210	14.180	-	0.324	-0.776	1.100	
BH106	5	4.987	AL	04/12/2019		2.720	8.180	-	2.8195	2.267	0.553	New surface in area
BH106A	5	5.008	RTG	04/12/2019	-	2.720	10.620	-	1.5425	2.288	-0.745	New surface in area
BH201A	MS	4.790	RTG	04/12/2019	-	5.480	14.830	-	0.5602	-0.690	1.250	
BH202A6	6	4.557	MG	04/12/2019	-	0.620	3.750	-	3.9919	3.937	0.055	
BH203MS	MS	3.828	RTG	04/12/2019	-	4.530	15.160	-	0.4278	-0.702	1.130	
BH204	3	3.669	MG	04/12/2019	-	0.450	2.770	-	-	3.219	-	
BH205	MS	3.610	RTG	04/12/2019	-	4.300	15.700	-	-0.5603	-0.690	0.130	Under 30 cm of gravel.
BH225	0.5	3.674	MG	04/12/2019	-	0.500	2.520	-	-	3.174	-	
BH226	5	5.104	MG	04/12/2019	-	2.150	5.060	-	-	2.954	-	New surface in area
BH305	MS	3.833	MG	04/12/2019	-	0.070	2.450	-	3.7727	3.763	0.010	
BH307	MS	4.107	MG	04/12/2019	-	1.540	2.000	-	2.8221	2.567	0.255	Under gravel
BH312	MS	3.674	MG	04/12/2019	-	1.600	2.960	-	2.2189	2.074	0.145	
MW7_S	3	4.504	MG	04/12/2019	-	1.170	4.330	-	3.7243	3.334	0.390	
PZ11	1	4.382	MG	04/12/2019	-	1.000	4.600	-	3.4915	3.382	0.110	
PZ12	4	3.919	MG	04/12/2019	-	0.720	3.800	-	3.359	3.199	0.160	No LNAPL this time and 0ppm (PID)
PZ13	1	5.393	MG	04/12/2019	-	1.840	5.060	-	3.653	3.553	0.100	
PZ14	4	3.386	MG	04/12/2019	-	1.080	4.060	-	2.2205	2.306	-0.085	
PZ15	4	3.491	MG	04/12/2019	-	0.900	4.700	-	2.3311	2.591	-0.260	
PZ16	4	4.661	MG	04/12/2019	-	1.565	5.990	-	2.6907	3.096	-0.405	
PZ17	5	4.476	MG	04/12/2019	-	1.320	4.900	-	2.9212	3.156	-0.235	Cover slightly damaged. New surface in area
PZ3	1	4.281	RTG	04/12/2019	-	4.655	15.040	-	-0.0842	-0.374	0.290	
PZ4	4	3.889	RTG	04/12/2019	-	4.220	14.420	-	0.559	-0.331	0.890	
PZ5	1	5.296	RTG	04/12/2019	-	5.700	-	-	0.274	-0.404	0.678	
PZ6	4	3.438	RTG	04/12/2019	-	3.650	14.550	-	0.2183	-0.212	0.430	
PZ7	4	4.357	RTG	04/12/2019	-	4.250	12.200	-	0.2272	0.107	0.120	
PZ8	2	4.947	RTG	04/12/2019	-	5.040	12.470	-	0.3467	-0.093	0.440	Cover full of hard sludge
PZ9	1	4.283	RTG	04/12/2019	-	4.600	14.520	-	0.348	-0.317	0.665	
RDC304	3	4.595	MG	04/12/2019	-	1.020	4.740	-	3.9004	3.575	0.325	
RDC 307	3	4.698	MG	04/12/2019	-	1.050	4.660	-	3.9779	3.648	0.330	No well cover and exposed to traffic.
RDC311	3	4.796	MG	04/12/2019	-	1.110	4.800	-	-	3.686	-	
RDC312	3	4.537	MG	04/12/2019	-	1.010	4.570	-	-	3.527	-	Under mud
S11	3	3.871	MG	04/12/2019	-	0.660	3.740	-	3.4006	3.211	0.190	
S15	3	3.595	MG	04/12/2019	0.33	0.360	2.460	0.030	3.385	3.235	0.150	
S16	4	3.713	MG	04/12/2019	-	0.540	2.650	-	3.3579	3.173	0.185	Casing full of mud
S4	3	3.796	MG	04/12/2019	-	0.360	4.640	-	3.6464	3.436	0.210	Well cover full of gravel
WS15	6	4.693	MG	04/12/2019	-	0.570	1.460	-	4.3078	4.123	0.185	
WS20	3	3.860	MG	04/12/2019	-	0.770	2.060	-	3.5453	3.090	0.455	
WS23	6	4.328	MG	04/12/2019	0.720	0.775	-	0.055	3.651	3.553	0.097	

Legend

m bgl - metres below ground level
m AOD - metres Above Ordnance Datum
mb TOC - metres below top of casing
MS - Maskell Site
MG - Made Ground
AL - Alluvium
RTG - River Terrace Gravels
RT - Remediation Trench Well
RW - LNAPL Recovery Well
NM - Not measured

Boreholes were levelled to Ordnance Datum on 26th October 2016.

TABLE 2
GROUNDWATER FIELD PARAMETERS

Site	Stolthaven
Sample	Annual 2019 (December)

Weather conditions: Cloudy - heavy rain

Borehole	Area	Monitoring strata	Sample Date	Sample Method	Sample Technique	Purge Volume (L)	pH	Temperature (°C)	Conductivity (µS/cm^{C})	ORP (mV)	ORP (mV) Corrected	Dissolved Oxygen (mg/L)	Comments
PZ13	1	MG	06/12/2019	Low flow purging	Peristaltic pump	21	7.44	14.74	2,204	-276	-64	0.01	Good recovery. Orange colour. Turbid
PZ11	1	MG	09/12/2019			25	7.25	13.65	1,862	-187	25	0.03	Orange colour. Slightly turbid. Good recovery
WS20	3	MG	09/12/2019			8	7.56	12.22	2,680	-167	45	0.01	Clear. Good recovery
S15	3	MG	09/12/2019			NAPL							Very viscous. Black NAPL
S4	3	MG	05/12/2019			30	7.48	14.47	2,585	-344	-132	0.02	Orange and grey colour. Strong HCO. Good recovery
S11	3	MG	09/12/2019			25	7.30	13.88	2,977	-255	-43	0.00	Orange colour. Slightly turbid. Good recovery. NVO
RDC311	3	MG	05/12/2019			25	6.95	12.32	2,415	-239	-27	0.03	Orange colour. Slightly turbid. Good recovery. NVO
RDC312	3	MG	05/12/2019			23	7.10	13.15	3,022	-278	-66	0.02	Orange and grey colour. Turbid. Good recovery
RDC307	3	MG	05/12/2019			25	6.91	13.88	3,179	-260	-49	0.01	Orange and brown colour. Turbid. Good recovery
RDC304	3	MG	05/12/2019			25	6.94	13.76	3,020	-275	-63	0.02	Brown orange colour. Turbid. Good recovery. Odour
MW7_S	3	MG	10/12/2019			11	7.50	14.92	3,298	-172	40	0.04	Orange colour. Turbid. Sheen. Slightly turbid
BH204	3	MG	09/12/2019			30	7.71	12.45	3,470	-248	-36	0.00	Sheen (black colour). Clear water. Good recovery. HCO
S16	4	MG	12/12/2019			20	7.55	11.91	3,867	-195	16	0.04	Clear. Good recovery
PZ12	4	MG	06/12/2019			22	7.36	14.56	2,519	-286	-74	0.00	Clear. Sheen. Good recovery
PZ14	4	MG	06/12/2019			20	7.46	13.29	2,548	-375	-163	0.02	Orange and black colour. Good recovery. HCO
PZ15	4	MG	06/12/2019			30	7.83	15.42	981	-362	-150	0.01	Orange and gry colour. Slightly turbid. Odor (little sulphate). Good recovery
PZ16	4	MG	06/12/2019			22	8.07	8.02	816	-234	-22	9.75	Clear. Good recovery
PZ17	5	MG	06/12/2019			16	7.02	20.28	1,964	-140	71	0.03	Clear. Fast recovery
WS15	6	MG	10/12/2019			5	7.35	10.36	1,631	-173	39	0.23	Slow recovery. Sheen. Orange and grey colour
BH202A6	6	MG	10/12/2019			20	7.35	12.91	1,612	-183	29	0.08	Orange black (coffee colour). Slightly turbid. Sheen. Good recovery
WS23	6	MG	10/12/2019			NAPL							Dark brown colour. Sample collected. NAPL. Very viscous
BH305	MS	MG	05/12/2019			19	7.62	8.00	1,150	-171	41	0.01	Clear. Good recovery
BH307	MS	MG	05/12/2019			15	7.30	12.10	2,505	-252	-40	0.03	Grey Good recovery. Slightly turbid. HCO. Sheen
BH312	MS	MG	05/12/2019			6	6.99	12.42	4,369	-207	5	0.30	Poor recovery. Orange colour. Slightly turbid.
BH106	5	AL	06/12/2019			12	6.89	13.80	2,201	-225	-13	0.05	Orange colour. Slight turbid. Poor recovery. Odour
PZ5	1	RTG	06/12/2019			45	7.14	14.20	12,703	-266	-54	0.03	Clear. Good recovery. NVO
PZ9	1	RTG	09/12/2019			45	6.80	14.05	13,869	-160	52	0.02	Clear. Good recovery
PZ3	1	RTG	09/12/2019			45	7.02	13.97	15,914	-163	49	0.01	Orange. Slightly turbid. Good recovery
PZ8	2	RTG	10/12/2019			45	6.91	14.02	10,041	-117	95	0.03	Orange colour. Turbid. Good recovery. Organic odour
BH102B	3	RTG	06/12/2019			45	7.01	14.02	14,571	-206	6	0.01	Clear. Good recovery. NVO
BH105A	3	RTG	09/12/2019			50	6.87	11.03	13,001	-211	1	0.01	
PZ7	4	RTG	06/12/2019			50	7.31	14.29	6,726	-281	-69	0.02	Orange colour. Slightly turbid. Good recovery
PZ6	4	RTG	06/12/2019			45	7.21	13.79	11,791	-357	-145	0.02	Strong odour. Grey colour. Slightly turbid. Good recovery
PZ4	4	RTG	06/12/2019			45	6.97	14.20	15,683	-256	-44	0.01	Orange colour. Turbid. NVO. Good recovery
BH106A	5	RTG	06/12/2019			12	6.95	14.11	1,536	-89	122	0.10	Orange colour. Slightly turbid. Poor recovery
BH101	6	RTG	06/12/2019			45	7.00	13.49	15,920	-262	-51	0.02	Clear. Sheen. Good recovery
BH201A	MS	RTG	06/12/2019			45	6.61	13.56	11,219	-233	-21	0.04	Clear. Good recovery. NVO
BH225	MS	RTG	09/12/2019			15	7.80	11.96	2,599	-244	-33	0.01	Clear. Good recovery
BH203MS	MS	RTG	05/12/2019			45	6.82	13.21	15,866	-250	-39	6.82	Green and orange colour. Turbid. Odour
BH205	MS	RTG	05/12/2019			50	6.81	13.33	13,280	-179	33	0.03	Orange colour. Good recovery

Legend

°C - degrees celsius
L - Litres
NVO - no visible or olfactory evidence of impact
pH - potential of Hydrogen (dimensionless)
mg/L - milligrams per litre
µS - micro siemens
mV - milli volts
ORP - Oxidation Reduction Potential

Notes

ORP is corrected against temperature of groundwater.
Equation: Eh = Em + Eref
Where: Eh = Corrected ORP value
EM = ORP measured by probe
Eref = Correction factor = [(temperature2) x -0.0013)-(temperature x 0.6656)+222.02] (for a 3.5mol KCl probe)

Temperature	Approximate specific correction factor
10°C	215.2
15°C	211.7
20°C	208.2

Table 3 - LNAPL Monitoring Data

LNAPL thickness (mm)

Date/ Monitoring well ID	Area 3													Area 1							Area 4						
	Recovery wells		Intercep	Collection trench (all wells connected)										Interceptor				Recovery wells			Interceptor		Remediation trench (wells connected)				
	RW1	RW2	KI	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	CT9	CT10	KI TP01	KI TP02	KI Future	KI L/Bays	RW3	RW4	RW5	KI TP03	KI Outfall	RT1	RT2	RT3	RT4	RT5
16/06/2016	20	80								Nil								Nil	Nil	Nil						Trace	
27/06/2016	10	70								Nil								Nil	Trace	Nil						Trace	30
05/07/2016	20	70								Nil		Nil						Trace	Trace	Trace							25
08/07/2016	18	50																									20
15/07/2016	20	60																Nil	Nil	Nil						Trace	25
28/07/2016	10	90																Nil	Nil	Nil							20
04/08/2016	40	110																Nil	Nil	Nil							30
11/08/2016	20	70																Nil	Nil	Nil							40
18/08/2016	20	50																Nil	Nil	Nil							30
07/09/2016	40	130																Nil	Nil	Nil							25
29/09/2016	20	230																Nil	Nil	Nil							20
12/10/2016	20	240																Nil	Nil	Nil							20
26/10/2016	10	170																Nil	Nil	Nil							20
16/11/2016	10	80					Nil	5	Trace	10	Trace	Nil	Nil					Nil	Nil	Nil			10	10	30	35	30
08/12/2016	10	50																Nil	Nil	Nil							50
04/01/2017	Nil	25																Nil	Nil	Nil							20
19/01/2017	Nil	10																									40
01/03/2017	10	20																Nil	Nil	Nil							10
29/03/2017	5	10																									20
02/05/2017																											
11/05/2017	20	40																					Nil	Nil	Nil	Nil	Nil
18/05/2017																											
12/06/2017	20	20				Trace				Trace								Nil	Nil	Nil							20
04/12/2018	Trace	Nil				Trace		Nil		Nil		Nil						Nil	Nil	Nil							
23/07/2019	10	10	100															Nil	Nil	Nil		Trace					Nil
14/10/2019	20	25	Trace															Nil	Nil	Nil		Trace					Trace
13/01/2020				Nil	Nil	Trace	Nil	Nil	Nil	Nil	Nil	Nil	Nil														

Table 4 - RTG analytical results

					Location_Code	BH101	BH102B	BH105A	BH106A	BH201A	BH203MS	BH205	PZ3	PZ4	PZ5	PZ6	PZ7	PZ8	PZ9
					Monitoring_Unit	RTG	RTG	RTG	RTG	RTG	RTG	RTG	RTG	RTG	RTG	RTG	RTG	RTG	RTG
					Sampled_Date_Time	10/12/2019	09/12/2019	09/12/2019	06/12/2019	05/12/2019	05/12/2019	05/12/2019	09/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	10/12/2019	09/12/2019
					Lab_Report_Number	19-19999-4-171219	19-19999-3-181219	19-19999-3-181219	19-19999-2-131219	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-3-181219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-4-171219	19-19999-3-181219
					Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
				GAC_WTV_EN/WA_DWS															
Method_Type	ChemName	output	EQL																
TPH CWG by GC-FID	>C5-C35 Aliphatics	µg/L	10		<10	<10	<10	<10	<10	<10	84	<10	<10	<10	<10	<10	<10	<10	
	>EC5-EC35 Aromatics	µg/L	10		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	80	<10	
	>C5-C35 Aliphatics & Aromatics	µg/L	10		<10	<10	<10	<10	<10	<10	84	<10	<10	<10	<10	<10	80	<10	
EPH by GC-FID	>C10-C12 Aliphatics	µg/L	5	300[#3]	<5	<5	<5	<5	<5	<5	54	<5	<5	<5	<5	<5	<5	<5	
	>C12-C16 Aliphatics	µg/L	10	300[#3]	<10	<10	<10	<10	<10	<10	30	<10	<10	<10	<10	<10	<10	<10	
	>C16-C21 Aliphatics	µg/L	10	300[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
	>C21-C35 Aliphatics	µg/L	10	300[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
	>EC10-EC12 Aromatics	µg/L	5	90[#3]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
	>EC12-EC16 Aromatics	µg/L	10	90[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
	>EC16-EC21 Aromatics	µg/L	10	90[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	80	<10	
	>EC21-EC35 Aromatics	µg/L	10	90[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
PAH by GC-MS	Naphthalene	µg/L	0.1	6[#12]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Acenaphthylene	µg/L	0.013	18[#12]	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.052	<0.013	
	Acenaphthene	µg/L	0.013	18[#12]	<0.013	<0.013	<0.013	<0.013	<0.013	0.042	<0.013	0.094	<0.013	<0.013	<0.013	0.124	<0.013	0.052	<0.013
	Fluorene	µg/L	0.014	12[#12]	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.051	<0.014
	Phenanthrene	µg/L	0.011	4[#12]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.028	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.411	<0.011
	Anthracene	µg/L	0.013	90[#12]	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.055	<0.013	<0.013	<0.013	<0.013	0.023	<0.013	0.13	<0.013
	Fluoranthene	µg/L	0.012	4[#8]	<0.012	<0.012	<0.012	<0.012	0.014	0.022	0.076	0.109	<0.012	<0.012	<0.012	0.033	<0.012	1.132	<0.012
	Pyrene	µg/L	0.013	9[#12]	0.032	0.037	<0.013	<0.013	0.023	0.026	0.078	0.088	0.03	<0.013	<0.013	0.055	0.026	0.954	0.016
	Benz(a)anthracene	µg/L	0.015	3.5[#12]	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.038	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.412	<0.015
	Chrysene	µg/L	0.011	7[#12]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.045	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.388	<0.011
	Benzo(a) pyrene	µg/L	0.016	0.01[#6]	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.051	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.424	<0.016
	Indeno(1,2,3-c,d)pyrene	µg/L	0.011	Use PAHs (sum of 4)[#6]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.04	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.29	<0.011
	Dibenz(a,h)anthracene	µg/L	0.01	0.07[#12]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01
	Benzo(g,h,i)perylene	µg/L	0.011	Use PAHs (sum of 4)[#6]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.033	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.225	<0.011
	Benzo(b)fluoranthene	µg/L	0.01	Use PAHs (sum of 4)[#6]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.57	<0.01
	Benzo(k)fluoranthene	µg/L	0.01	Use PAHs (sum of 4)[#6]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.22	<0.01
	Benzo(b)&(k)fluoranthene	µg/L	0.018		<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	0.098	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	0.798	<0.018
	PAH 16 Total	µg/L	0.195		<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	0.542	0.291	<0.195	<0.195	<0.195	0.235	<0.195	5.359	<0.195
VOC - Target by GC-	Naphthalene	µg/L	2	6[#12]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Dichlorodifluoromethane	µg/L	2	200[#1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	MTBE	µg/L	0.1	1,800[#12]	2.2	34.3	24.9	0.2	15.5	6	2.7	44.3	14.3	0.3	115.4	7.6	0.3	96.3	
	Chloromethane	µg/L	3	190[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Vinyl chloride	µg/L	0.1	0.5[#6]	<0.1	<0.1	0.1	<0.1	1.9	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Bromomethane	µg/L	1	7.5[#1]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroethane	µg/L	3	21,000[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Trichlorofluoromethane	µg/L	3	5,200[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,1-dichloroethene	µg/L	3	140[#8]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Dichloromethane	µg/L	5	20[#8]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	trans-1,2-dichloroethene	µg/L	3	2 dichloroethene' cri	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,1-dichloroethane	µg/L	3	2.8[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	cis-1,2-dichloroethene	µg/L	3	2 dichloroethene' cri	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	2,2-dichloropropane	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromochloromethane	µg/L	2	83[#1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Chloroform	µg/L	2	Use trihalomethanes[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,1,1-trichloroethane	µg/L	2	2,000[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,1-dichloropropene	µg/L	3		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Carbon tetrachloride	µg/L	2	3[#6]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2-dichloroethane	µg/L	2	3[#6]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Benzene	µg/L	0.5	1[#8]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Trichloroethene	µg/L	3	Use PCE + TCE[#6]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2-dichloropropane	µg/L	2	40[#6]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Dibromomethane	µg/L	3	8.3[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Bromodichloromethane	µg/L	2	Use trihalomethanes[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	cis-1,3-dichloropropene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Toluene	µg/L	5	700[#8]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	trans-1,3-dichloropropene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,1,2-trichloroethane	µg/L	2	0.28[#1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Tetrachloroethene	µg/L	3	Use PCE + TCE[#6]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,3-dichloropropane	µg/L	2	370[#1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Chlorodibromomethane	µg/L	2	Use trihalomethanes[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2-dibromoethane	µg/L	2	0.4[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Chlorobenzene	µg/L	2	300[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,1,1,2-tetrachloroethane	µg/L	2	0.57[#1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	1	300[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	1	190[#1]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Styrene	µg/L	2	20[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Bromoform	µg/L	2	Use trihalomethanes[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Isopropylbenzene	µg/L	3	450[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,1,2,2-tetrachloroethane	µg/L	4	0.076[#1]	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Bromobenzene	µg/L	2	62[#1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2,3-trichloropropane	µg/L	3	0.00075[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	n-propylbenzene	µg/L	3	660[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	2-chlorotoluene	µg/L	3	240[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,3,5-trimethylbenzene	µg/L	3	60[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	4-chlorotoluene	µg/L	3	250[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	tert-butylbenzene	µg/L	3	690[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2,4-trimethylbenzene	µg/L	3	56[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	sec-butylbenzene	µg/L	3	2,000[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	p-isopropyltoluene	µg/L	3		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,3-dichlorobenzene	µg/L	3		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,4-dichlorobenzene	µg/L	3	300[#8]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	n-butylbenzene	µg/L	3	1,000[#1]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2-dichlorobenzene	µg/L	3	1,000[#8]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2-dibromo-3-chloropropane	µg/L	2	1[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2,4-trichlorobenzene	µg/L	3	0.1[#5]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Hexachlorobutadiene	µg/L	3	0.1[#5]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2,3-trichlorobenzene	µg/L	3	0.1[#5]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
SVOC - Target by GC-	SVOC TICs	µg/L			-	-	-	-	-	1[#5]	-	-	-	-	-	-	-	-	-	
	1,3-dichlorobenzene	µg/L	1		-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	
	1,4-dichlorobenzene	µg/L	1	300[#5]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	

	1,2-dichlorobenzene	µg/L	1	1000[#5]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	1,2,4-trichlorobenzene	µg/L	1	0.1[#4]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Hexachlorobutadiene	µg/L	1	0.1[#4]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	2-chlorophenol	µg/L	1	91[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	2-methylphenol	µg/L	0.5	930[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	2-nitrophenol	µg/L	0.5		-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	2,4-dichlorophenol	µg/L	0.5	46[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	2,4-dimethylphenol	µg/L	1	360[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	2,4,5-trichlorophenol	µg/L	0.5	1200[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	2,4,6-trichlorophenol	µg/L	1	200[#5]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	µg/L	0.5	1400[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	4-methylphenol	µg/L	1	1900[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	4-nitrophenol	µg/L	10		-	-	-	-	-	<10	-	-	-	-	-	-	-	-
	Pentachlorophenol	µg/L	1	9[#5]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Phenol	µg/L	1	5800[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	2-chloronaphthalene	µg/L	1	750[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	2-methylnaphthalene	µg/L	1	36[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Bis(2-ethylhexyl) phthalate	µg/L	5	8[#5]	-	-	-	-	-	<5	-	-	-	-	-	-	-	-
	Butyl benzyl phthalate	µg/L	1	16[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Di-n-butyl phthalate	µg/L	1.5	900[#1]	-	-	-	-	-	<1.5	-	-	-	-	-	-	-	-
	Di-n-octyl phthalate	µg/L	1	200[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Diethylphthalate	µg/L	1	15000[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Dimethyl phthalate	µg/L	1		-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	2-nitroaniline	µg/L	1	190[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	2,4-Dinitrotoluene	µg/L	0.5	0.24[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	2,6-dinitrotoluene	µg/L	1	0.049[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	3-nitroaniline	µg/L	1		-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	4-bromophenyl phenyl ether	µg/L	1		-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	4-chloroaniline	µg/L	1	0.37[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	4-chlorophenyl phenyl ether	µg/L	1		-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	4-nitroaniline	µg/L	0.5	3.8[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Azobenzene	µg/L	0.5	0.12[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Bis(2-chloroethoxy) methane	µg/L	0.5	59[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Bis(2-chloroethyl)ether	µg/L	1	0.014[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Carbazole	µg/L	0.5		-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Dibenzofuran	µg/L	0.5	7.9[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Hexachlorobenzene	µg/L	1	0.1[#4]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Hexachlorocyclopentadiene	µg/L	1	0.41[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Hexachloroethane	µg/L	1	0.33[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Isophorone	µg/L	0.5	78[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	N-nitrosodi-n-propylamine	µg/L	0.5	0.011[#1]	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Nitrobenzene	µg/L	1	9990000000000.082[#5]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
Alcohols and Acetates	Methanol	µg/L	500	20000[#1]	-	-	-	-	-	<500	-	-	-	-	-	-	-	-
	Ethanol	µg/L	100	1100000[#2]	-	-	-	-	-	<100	-	-	-	-	-	-	-	-
	2-Propanol	µg/L	100	410[#1]	-	-	-	-	-	<100	-	-	-	-	-	-	-	-
	1-Propanol	mg/L	0.1		-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	1-Butanol	µg/L	100	2000[#1]	-	-	-	-	-	<100	-	-	-	-	-	-	-	-
	Methyl acetate	µg/L	100	20000[#1]	-	-	-	-	-	<100	-	-	-	-	-	-	-	-
	Ethyl acetate	µg/L	100	140[#1]	-	-	-	-	-	<100	-	-	-	-	-	-	-	-
	1,2-butylacetate	µg/L	100		-	-	-	-	-	<100	-	-	-	-	-	-	-	-
	Ethyl Tert Butyl Ether	µg/L	1		-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Diisopropyl ether	µg/L	1	1500[#1]	-	-	-	-	-	<1	-	-	-	-	-	-	-	-
	Tert Butyl Alcohol	µg/L	100		-	-	-	-	-	<100	-	-	-	-	-	-	-	-
	Tert Amyl Methyl Ether	µg/L	1		-	-	-	-	-	<1	-	-	-	-	-	-	-	-
Anionic Surfactants by	Anionic surfactants	mg/L	0.2		-	-	-	-	-	0.8	-	-	-	-	-	-	-	-
COD by Colorimetric	COD	mg/L	7		-	-	-	-	-	118	-	-	-	-	-	-	-	-
Dissolved Methane,	Methane (Filtered)	µg/L	1		-	-	2955[#4]	-	745[#4]	50	-	-	-	-	-	-	-	-
GRO by Headspace GC	>C5-C6 Aliphatics	µg/L	10	15000[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C6-C8 Aliphatics	µg/L	10	15000[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C8-C10 Aliphatics	µg/L	10	300[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC5-EC7 Aromatics	µg/L	10	1[#4]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC7-EC8 Aromatics	µg/L	10	700[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC8-EC10 Aromatics	µg/L	10	300[#3]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
SO4, Cl, NO3, NO2,	Sulphate	mg/L	0.5	250[#4]	-	-	376.4	-	516	682.1	-	-	-	-	-	-	-	-
	Ammoniacal Nitrogen as N	mg/L	0.03		-	-	-	-	-	4.32	-	-	-	-	-	-	-	-
Total Nitogen/Organic	Nitrogen (Total)	µg/L	500		-	-	-	-	-	6100	-	-	-	-	-	-	-	-
Volatile Fatty Acids by	Acetic Acid	µg/L	10000		-	-	-	-	-	<10,000	-	-	-	-	-	-	-	-
	Propanoic Acid	µg/L	1000		-	-	-	-	-	<1000	-	-	-	-	-	-	-	-
	2-methyl propanoic acid	µg/L	1000		-	-	-	-	-	<1000	-	-	-	-	-	-	-	-
	3-methyl butanoic acid	µg/L	500		-	-	-	-	-	<500	-	-	-	-	-	-	-	-
	Valeric Acid	µg/L	500		-	-	-	-	-	<500	-	-	-	-	-	-	-	-
	4-methyl pentanoic acid	µg/L	500		-	-	-	-	-	<500	-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L	0.5		-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Heptanoic acid	µg/L	500		-	-	-	-	-	<500	-	-	-	-	-	-	-	-
ESDAT Combined	>C16-C35 Aliphatics	µg/L			0[#5]	0[#5]	0[#5]	<20[#6]	0[#5]	0[#5]	0[#5]	0[#5]	<20[#6]	<20[#6]	<20[#6]	<20[#6]	0[#5]	0[#5]
	PAHs (sum of 4)	µg/L		0.1[#4]	0[#5]	0[#5]	0[#5]	<0.042[#6]	0[#5]	0[#5]	0.173[#5]	0[#5]	<0.042[#6]	<0.042[#6]	<0.042[#6]	<0.042[#6]	1.305[#5]	0[#5]
	benzo(g,h,i)perylene + indeno(1,2,3-cd	µg/L			0[#5]	0[#5]	0[#5]	<0.022[#6]	0[#5]	0[#5]	0.073[#5]	0[#5]	<0.022[#6]	<0.022[#6]	<0.022[#6]	<0.022[#6]	0.515[#5]	0[#5]
	Benzo(a)pyrene (surrogate marker for	µg/L			0[#5]	0[#5]	0[#5]	<0.016[#6]	0[#5]	0[#5]	0.051[#5]	0[#5]	<0.016[#6]	<0.016[#6]	<0.016[#6]	<0.016[#6]	0.424[#5]	0[#5]
	Sum of PCE and TCE	µg/L		10[#4]	0[#5]	0[#5]	0[#5]	<6[#6]	0[#5]	0[#5]	0[#5]	0[#5]	<6[#6]	<6[#6]	<6[#6]	<6[#6]	0[#5]	0[#5]
	TCE+DCE+VC	µg/L			0[#5]	0[#5]	0.1[#5]	<12.1[#6]	1.9[#5]	0.1[#5]	0[#5]	0[#5]	<12.1[#6]	<12.1[#6]	<12.1[#6]	<12.1[#6]	0[#5]	0[#5]
	PCE+TCE+DCE+VC	µg/L			0[#5]	0[#5]	0.1[#5]	<15.1[#6]	1.9[#5]	0.1[#5]	0[#5]	0[#5]	<15.1[#6]	<15.1[#6]	<15.1[#6]	<15.1[#6]	0[#5]	0[#5]
	Xylene Total	µg/L		500[#5]	0[#1]	0[#1]	0[#1]	<3[#2]	0[#1]	0[#1]	0[#1]	0[#1]	<3[#2]	<3[#2]	<3[#2]	<3[#2]	0[#1]	0[#1]
	Total BTEX	µg/L			0[#1]	0[#1]	0[#1]	<9.5[#2]	0[#1]	0[#1]	0[#1]	0[#1]	<9.5[#2]	<9.5[#2]	<9.5[#2]	<9.5[#2]	0[#1]	0[#1]
	1,2-Dichloroethene	µg/L		50[#5]	0[#5]	0[#5]	0[#5]	<6[#6]	0[#5]	0[#5]	0[#5]	0[#5]	<6[#6]	<6[#6]	<6[#6]	<6[#6]	0[#5]	0[#5]
	Trihalomethanes	µg/L		100[#4]	0[#5]	0[#5]	0[#5]	<8[#6]	0[#5]	0[#5]	0[#5]	0[#5]	<8[#6]	<8[#6]	<8[#6]	<8[#6]	0[#5]	0[#5]
	Trichlorobenzene (total)	µg/L		0.1[#4]	0[#3]	0[#3]	0[#3]	<6[#4]	0[#3]	0[#1]	0[#3]	0[#3]	<6[#4]	<6[#4]	<6[#4]	<6[#4]	0[#3]	0[#3]

Env Stds Comments
#1:USEPA RSL (tapwater) [May 2020]
#2:California Draft health protective concentration
#3:WHO Petroleum DWG 2008
#4:WS Regs 2016 (Eng/Wal)
#5:WHO DWG 2017
#6:AECOM DWG (WHO method)

GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key

XXX Exceedance of CW/WE Water. DWS - England/Wales

Table 5 - Made Ground Groundwater Analytical Results

						Location_Code	BH106	BH202A6	BH204	BH225	BH305	BH307	BH312	MW7_S	PZ11	PZ12	PZ13	PZ14	PZ15	PZ16	PZ17	RDC304	RDC307	RDC311	RDC312	S11	S16	S4	WS15	WS20
						Monitoring_Unit	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
						Sampled_Date_Time	06/12/2019	10/12/2019	09/12/2019	09/12/2019	05/12/2019	05/12/2019	05/12/2019	10/12/2019	09/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	09/12/2019	09/12/2019	05/12/2019	10/12/2019	09/12/2019
						Lab_Report_Number	19-19999-2-140120	19-19999-4-171219	19-19999-3-181219	19-19999-3-181219	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-4-171219	19-19999-3-181219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-3-181219	19-19999-3-181219	19-19999-1-130220	19-19999-4-171219	19-19999-3-181219
						Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Method_Ty	ChemName	output	EQL	GAC_HH_COM/IND_SAND	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh																								
TPH CWG by GC-FID	>C5-C35 Aliphatics	µg/L	10				<10	<10	67	<10	<10	<10	<10	713	<10	66	<10	<10	<10	<10	<10	816	862	81	233	509	<10	130	<10	<10
	>EC5-EC35 Aromatics	µg/L	10				<10	<10	<10	<10	<10	<10	<10	40	<10	<10	<10	<10	<10	<10	<10	728	205	<10	134	421	<10	170	<10	<10
	>C5-C35 Aliphatics & Aromatics	µg/L	10				<10	<10	67	<10	<10	<10	<10	753	<10	66	<10	<10	<10	<10	<10	1544	1067	81	367	930	<10	300	<10	<10
GRO by Headspace GC-FID	>C5-C6 Aliphatics	µg/L	10	Insufficiently volatile[#4]	15,000[#5]		<10	<10	<10	<10	<10	<10	<10	<10	<10	31	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C6-C8 Aliphatics	µg/L	10	Insufficiently volatile[#4]	15,000[#5]		<10	<10	22	<10	<10	<10	<10	713	<10	35	<10	<10	<10	<10	<10	695	825	81	209	20	<10	<10	<10	<10
	>C8-C10 Aliphatics	µg/L	10	Insufficiently volatile[#4]	300[#5]		<10	<10	45	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	121	37	<10	24	65	<10	<10	<10	<10
	>EC5-EC7 Aromatics	µg/L	10	Insufficiently volatile[#4]	1[#6]	10[#10]	<10	<10	<10	<10	<10	<10	<10	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC7-EC8 Aromatics	µg/L	10	Insufficiently volatile[#4]	700[#5]	74[#11]	<10	<10	<10	<10	<10	<10	<10	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC8-EC10 Aromatics	µg/L	10	Insufficiently volatile[#4]	300[#5]		<10	<10	<10	<10	<10	<10	<10	18	<10	<10	<10	<10	<10	<10	<10	591	195	<10	126	<10	<10	<10	<10	<10
EPH by GC-FID	>C10-C12 Aliphatics	µg/L	5	Insufficiently volatile[#4]	300[#5]		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	174	<5	<5	<5	<5
	>C12-C16 Aliphatics	µg/L	10	Insufficiently volatile[#4]	300[#5]		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	170	<10	40	<10	<10
	>C16-C21 Aliphatics	µg/L	10		300[#5]		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	80	<10	90	<10	<10
	>C21-C35 Aliphatics	µg/L	10		300[#5]		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC10-EC12 Aromatics	µg/L	5	Insufficiently volatile[#4]	90[#5]		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5[#7]	<5	<5	<5	137	10	<5	8	111	<5	<5	<5	<5
	>EC12-EC16 Aromatics	µg/L	10	Insufficiently volatile[#4]	90[#5]		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10[#7]	<10	<10	<10	<10	<10	<10	<10	190	<10	40	<10	<10
	>EC16-EC21 Aromatics	µg/L	10	Insufficiently volatile[#4]	90[#5]		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10[#7]	<10	<10	<10	<10	<10	<10	<10	120	<10	130	<10	<10
	>EC21-EC35 Aromatics	µg/L	10	Insufficiently volatile[#4]	90[#5]		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10[#7]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
PAH by GC-MS	Naphthalene	µg/L	0.1	Insufficiently volatile[#4]	6[#12]	2[#10]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
	Acenaphthylene	µg/L	0.013	Insufficiently volatile[#4]	18[#12]		<0.013	<0.013	0.024	<0.013	<0.013	<0.013	<0.013	0.216	<0.013	<0.013	0.027	<0.013	<0.013	<0.013	0.037	0.019	0.069	0.013	0.046	0.073	<0.013	0.019	0.1	<0.013
	Acenaphthene	µg/L	0.013	Insufficiently volatile[#4]	18[#12]		0.016	0.015	0.074	<0.013	<0.013	<0.013	0.021	<0.013	<0.013	0.019	0.044	0.02	0.241	<0.013	2.19	0.342	0.117	<0.013	1.356	0.914	<0.013	5.242	1.656	<0.013
	Fluorene	µg/L	0.014	Insufficiently volatile[#4]	12[#12]		<0.014	<0.014	0.055	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.019	0.02	<0.014	<0.014	<0.014	0.022	0.164	0.027	0.025	0.035	0.072	<0.014	0.034	0.153	<0.014
	Phenanthrene	µg/L	0.011	Insufficiently volatile[#4]	4[#12]		0.015	<0.011	0.026	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.224	0.013	<0.011	<0.011	0.016	0.109	0.027	0.034	0.031	0.026	<0.011	0.022	<0.011	<0.011
	Anthracene	µg/L	0.013	Insufficiently volatile[#4]	90[#12]	0.1[#10]	<0.013	<0.013	0.035	<0.013	<0.013	<0.013	<0.013	0.024	0.013	<0.013	0.069	<0.013	0.03	<0.013	0.168	0.044	0.014	0.016	0.15	0.167	<0.013	0.038	0.085	<0.013
	Fluoranthene	µg/L	0.012	Insufficiently volatile[#4]	4[#8]	0.0063[#10]	0.037	<0.012	0.252	0.032	<0.012	0.018	0.028	0.124	0.02	0.044	0.396	<0.012	0.187	<0.012	0.385	0.108	0.035	0.074	0.53	0.557	0.03	0.183	0.888	<0.012
	Pyrene	µg/L	0.013	Insufficiently volatile[#4]	9[#12]		0.038	<0.013	0.266	0.031	<0.013	0.019	0.024	0.153	0.097	0.089	0.383	<0.013	0.123	<0.013	0.374	0.08	0.036	0.065	0.478	0.464	0.028	0.254	0.657	<0.013
	Benz(a)anthracene	µg/L	0.015	Insufficiently volatile[#4]	3.5[#12]		<0.015	<0.015	0.037	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.281	<0.015	<0.015	<0.015	0.022	<0.015	<0.015	<0.015	0.029	0.093	<0.015	0.03	0.182	<0.015
	Chrysene	µg/L	0.011	Insufficiently volatile[#4]	7[#12]		<0.011	<0.011	0.039	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.226	<0.011	<0.011	<0.011	0.014	<0.011	<0.011	<0.011	0.029	0.079	<0.011	0.026	0.154	<0.011
	Benzo(a) pyrene	µg/L	0.016	Insufficiently volatile[#4]	0.01[#6]	0.00017[#10]	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.261	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.057	<0.016	0.016	0.181	<0.016
	Indeno(1,2,3-c,d)pyrene	µg/L	0.011	Insufficiently volatile[#4]	Use PAHs (sum of 4)[#6]	see BaP and notes[#13]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.133	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.026	<0.011	<0.011	0.109	<0.011
	Dibenz(a,h)anthracene	µg/L	0.01	Insufficiently volatile[#4]	0.07[#12]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Benzo(g,h,i)perylene	µg/L	0.011	Insufficiently volatile[#4]	Use PAHs (sum of 4)[#6]	0.0082[#14]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.096	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.022	<0.011	<0.011	0.078	<0.011
	Benzo(b)fluoranthene	µg/L	0.01	Insufficiently volatile[#4]	Use PAHs (sum of 4)[#6]	0.017[#14]	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.32	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.07	<0.01	0.02	0.21	<0.01
	Benzo(k)fluoranthene	µg/L	0.01	Insufficiently volatile[#4]	Use PAHs (sum of 4)[#6]	0.017[#14]	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.08	<0.01
	Benzo(b)&(k)fluoranthene	µg/L	0.018	Use individual PAHs[#4]			<0.018	<0.018	0.051	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	0.444	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	0.02	0.092	<0.018	0.033	0.287	<0.018
	PAH 16 Total	µg/L	0.195				<0.195	<0.195	0.859	<0.195	<0.195	<0.195	<0.195	0.517	<0.195	<0.195	2.634	<0.195	0.581	<0.195	3.228	0.866	0.425	0.227	2.704	2.642	<0.195	6.097	4.53	<0.195
VOC - Target by GC-MS	Naphthalene	µg/L	2	Insufficiently volatile[#4]	6[#12]	2[#10]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Dichlorodifluoromethane	µg/L	2		200[#1]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	MTBE	µg/L	0.1	7,800,000[#4]	1,800[#12]	5,100[#3]	0.1	<0.1	114.4	56.2	<0.1	3.1	0.2	462.8	197.3	60.4	3.6	148.8	15.7	<0.1	12.1	2.8	13.5	2.3	4.5	121.3	179.7	15.9	<0.1	31.9
	Chloromethane	µg/L	3	1,400[#4]	190[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Vinyl chloride	µg/L	0.1	63[#4]	0.5[#6]	77[#3]	<0.1	<0.1	8.2	0.7	0.1	0.1	<0.1	11,455	0.4	0.1	0.9	0.2	1	<0.1	0.4	11,545	16,518	747.6	12,908	3.5	4.4	1.2	<0.1	0.9
	Bromomethane	µg/L	1		7.5[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroethane	µg/L	3	1,000,000[#4]	21,000[#1]		<3	<3	8	6	<3	<3	<3	21	<3	<3	<3	<3	<3	<3	<3	16	26	18	16	<3	<3	<3	<3	<3
	Trichlorofluoromethane	µg/L	3		5,200[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,1-dichloroethene	µg/L	3	16,000[#4]	140[#8]	9[#3]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	3	4	<3	<3	<3	<3	<3	<3	<3
	Dichloromethane	µg/L	5	370,000[#4]	20[#8]	20[#10]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	trans-1,2-dichloroethene	µg/L	3	16,000[#4]	,2 dichloroethene' criteria[#8]		<3	<3	<3	<3	<3	<3	<3	21	<3	<3	<3	<3	<3	<3	<3	15	13	<3	13	<3	<3	<3	<3	<3
	1,1-dichloroethane	µg/L	3	260,000[#4]	2.8[#1]		<3	<3	25	4	<3	<3	<3	2285	<3	<3	<3	<3	<3	<3	<3	625	617	207	569	<3	17	<3	<3	3
	cis-1,2-dichloroethene	µg/L	3	13,000[#4]	.,2 dichloroethene' criteria[#8]		<3	<3	10	<3	<3	<3	<3	24	<3	<3	<3	<3	<3	<3	<3	1640	2327	36	121	<3	12	<3	<3	<3
	2,2-dichloropropane	µg/L	1				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromochloromethane	µg/L	2		83[#1]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Chloroform	µg/L	2	85,000[#4]	Use trihalomethanes[#6]	2.5[#10]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,1,1-trichloroethane	µg/L	2	290,000[#4]	2,000[#8]	100[#9]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	37	78	13	11	<2	<2	<2	<2	<2
	1,1-dichloropropene	µg/L	3				<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Carbon tetrachloride	µg/L	2	770[#4]	3[#6]	12[#10]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2-dichloroethane	µg/L	2	850[#4]	3[#6]	10[#10]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Benzene	µg/L	0.5	20,000[#4]	1[#6]	10[#10]	<0.5	<0.5	2.4	0.9	<0.5	<0.5	<0.5	12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.1	3.5	0.9	3.3	3	<0.5	0.6 - 0.7	<0.5	<0.5
	Trichloroethene	µg/L	3	530[#4]	Use PCE + TCE[#6]	10[#10]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	4	157	<3	<3	<3	5	<3	<3	<3
	1,2-dichloropropane	µg/L	2	2,600[#4]	40[#8]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Dibromomethane	µg/L	3		8.3[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Bromodichloromethane	µg/L	2	1,600[#4]	Use trihalomethanes[#6]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	cis-1,3-dichloropropene	µg/L	2				<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Toluene	µg/L	5	Insufficiently volatile[#4]	700[#8]	74[#11]	<5	<5	<5	<5	<5	<5	<5	12	<5	<5	<5	<5	<5	<5	<5	6	<5	<5	<5	<5	<5	<5	<5	<5
	trans-1,3-dichloropropene	µg/L	2				<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,1,2-trichloroethane	µg/L	2	49,000[#4]	0.28[#1]	400[#9]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Tetrachloroethene	µg/L	3	4,600[#4]	Use PCE + TCE[#6]	10[#10]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	11	<3	<3	<3
	1,3-dichloropropane	µg/L	2		370[#1]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Chlorodibromomethane	µg/L	2	Use trihalomethanes[#6]	Use trihalomethanes[#6]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2-dibromoethane	µg/L	2		0.4[#8]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Chlorobenzene	µg/L	2	15,000[#4]	300[#8]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,1,1,2-tetrachloroethane	µg/L	2	22,000[#4]	0.57[#1]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	1	Insufficiently volatile[#4]	300[#8]	20[#9]	<1	<1	1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	608	155	<1	112	<1	<1	<1	<1	<1
	Xylene (m & p)	µg/L	2				<2	<2	<2	<2	<2	<2	<2	6	<2	<2	<2	<2	<2	<2	<2	14	40	<2	11	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	1	Insufficiently volatile[#4]	190[#1]		<1	<1	<1	<1	<1	<1	<1	7	<1	<1	<1	<1	<1	<1	<1	12	15	<1	11	<1	<1	<1	<1	<1
	Styrene	µg/L	2	Insufficiently volatile[#4]	20[#8]	50[#9]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Bromoform	µg/L	2	400,000[#4]	Use trihalomethanes[#6]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Isopropylbenzene	µg/L	3	Insufficiently volatile[#4]	450[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,1,2,2-tetrachloroethane	µg/L	4	150,000[#4]	0.076[#1]	140[#11]	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Bromobenzene	µg/L	2	20,000[#4]	62[#1]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2,3-trichloropropane	µg/L	3		0.00075[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	n-propylbenzene	µg/L	3	Insufficiently volatile[#4]	660[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	2-chlorotoluene	µg/L	3		240[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,3,5-trimethylbenzene	µg/L	3		60[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	4-chlorotoluene	µg/L	3		250[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	tert-butylbenzene	µg/L	3		690[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2,4-trimethylbenzene	µg/L	3	2,200[#4]	56[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	10	<3	<3	<3	<3	<3	<3	<3	<3
	sec-butylbenzene	µg/L	3		2,000[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	p-isopropyltoluene	µg/L	3				<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,3-dichlorobenzene	µg/L	3	2,800[#4]			<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,4-dichlorobenzene	µg/L	3	Insufficiently volatile[#4]	300[#8]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	n-butylbenzene	µg/L	3		1,000[#1]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2-dichlorobenzene	µg/L	3	Insufficiently volatile[#4]	1,000[#8]		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2-dibromo-3-chloropropane	µg/L	2		1[#8]		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	1,2,4-trichlorobenzene	µg/L	3	7,200[#4]	0.1[#6]	o 'Trichlorobenzene (to	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Hexachlorobutadiene	µg/L	3	230[#4]	0.1[#6]	0.6[#14]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	1,2,3-trichlorobenzene	µg/L	3	3,100[#4]	0.1[#6]	o 'Trichlorobenzene (to	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	VOC TICs	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[#6]	-	-	-	-
SVOC - Target by GC-MS	SVOC TICs	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[#6]	-	-	1[#6]	-	-	-	1[#6]
	1,3-dichlorobenzene	µg/L	1	2,800[#4]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	1,4-dichlorobenzene	µg/L	1	Insufficiently volatile[#4]	300[#8]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	1,2-dichlorobenzene	µg/L	1	Insufficiently volatile[#4]	1,000[#8]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	1,2,4-trichlorobenzene	µg/L	1	7,200[#4]	0.1[#6]	o 'Trichlorobenzene (to	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Hexachlorobutadiene	µg/L	1	230[#4]	0.1[#6]	0.6[#14]	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Cyclic octaatomic sulfur	µg/L	100				-	-	-	-	-	-	-	-	-	-	-	3371[#5]	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorophenol	µg/L	1	Insufficiently volatile[#4]	91[#1]	50[#9]	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	2-methylphenol	µg/L	0.5	Insufficiently volatile[#4]	930[#1]		-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	2-nitrophenol	µg/L	0.5				-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	4.5	-	-	-	<0.5
	2,4-dichlorophenol	µg/L	0.5	Insufficiently volatile[#4]	46[#1]	4.2[#11]	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	2,4-dimethylphenol	µg/L	1	Insufficiently volatile[#4]	360[#1]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	2,4,5-trichlorophenol	µg/L	0.5		1,200[#1]		-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	2,4,6-trichlorophenol	µg/L	1	Insufficiently volatile[#4]	200[#8]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	4-chloro-3-methylphenol	µg/L	0.5		1,400[#1]	40[#9]	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	4-methylphenol	µg/L	1	Insufficiently volatile[#4]	1,900[#1]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	4-nitrophenol	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-	<10	-	-	<10	-	-	-	<10
	Pentachlorophenol	µg/L	1	Insufficiently volatile[#4]	9[#8]	0.4[#10]	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Phenol	µg/L	1	Insufficiently volatile[#4]	5,800[#1]	7.7[#11]	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	2-chloronaphthalene	µg/L	1	Insufficiently volatile[#4]	750[#1]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	2-methylnaphthalene	µg/L	1		36[#1]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Bis(2-ethylhexyl) phthalate	µg/L	5	Insufficiently volatile[#4]	8[#8]	1.3[#10]	-	-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-	<5	-	-	<5	-	-	-	<5
	Butyl benzyl phthalate	µg/L	1	Insufficiently volatile[#4]	16[#1]	7.5[#11]	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Di-n-butyl phthalate	µg/L	1.5	Insufficiently volatile[#4]	900[#1]	8[#9]	-	-	-	-	-	-	-	-	-	-	-	<1.5	-	-	-	-	<1.5	-	-	<1.5	-	-	-	<1.5
	Di-n-octyl phthalate	µg/L	1	Insufficiently volatile[#4]	200[#1]	20[#9]	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Diethylphthalate	µg/L	1	Insufficiently volatile[#4]	15,000[#1]	200[#9]	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1

Table 5 - Made Ground Groundwater Analytical Results

							Location_Code	BH106	BH202A6	BH204	BH225	BH305	BH307	BH312	MW7_S	PZ11	PZ12	PZ13	PZ14	PZ15	PZ16	PZ17	RDC304	RDC307	RDC311	RDC312	S11	S16	S4	WS15	WS20
							Monitoring_Unit	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
							Sampled_Date_Time	06/12/2019	10/12/2019	09/12/2019	09/12/2019	05/12/2019	05/12/2019	05/12/2019	10/12/2019	09/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	09/12/2019	09/12/2019	05/12/2019	10/12/2019	09/12/2019
							Lab_Report_Number	19-19999-2-140120	19-19999-4-171219	19-19999-3-181219	19-19999-3-181219	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-4-171219	19-19999-3-181219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-2-131219	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-1-130220	19-19999-3-181219	19-19999-3-181219	19-19999-1-130220	19-19999-4-171219	19-19999-3-181219
							Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
							Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
				GAC_HH_COM/IND_SAND	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh																											
Method_Ty	ChemName	output	EQL																												
	Dimethyl phthalate	µg/L	1			800[#9]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	2-nitroaniline	µg/L	1		190[#1]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	2,4-Dinitrotoluene	µg/L	0.5	Insufficiently volatile[#4]	0.24[#1]			-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5[#9]	-	-	-	<0.5[#9]
	2,6-dinitrotoluene	µg/L	1	Insufficiently volatile[#4]	0.049[#1]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	3-nitroaniline	µg/L	1					-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	4-bromophenyl phenyl ether	µg/L	1					-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	4-chloroaniline	µg/L	1		0.37[#1]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	4-chlorophenyl phenyl ether	µg/L	1					-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	4-nitroaniline	µg/L	0.5		3.8[#1]			-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	Azobenzene	µg/L	0.5		0.12[#1]			-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	Bis(2-chloroethoxy) methane	µg/L	0.5		59[#1]			-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	Bis(2-chloroethyl)ether	µg/L	1		0.014[#1]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Carbazole	µg/L	0.5					-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	Dibenzofuran	µg/L	0.5		7.9[#1]			-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	Hexachlorobenzene	µg/L	1	Insufficiently volatile[#4]	0.1[#6]	0.05[#14]		-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Hexachlorocyclopentadiene	µg/L	1		0.41[#1]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Hexachloroethane	µg/L	1	740[#4]	0.33[#1]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
	Isophorone	µg/L	0.5		78[#1]			-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	4.3	-	-	-	<0.5
	N-nitrosodi-n-propylamine	µg/L	0.5		0.011[#1]			-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	<0.5	-	-	<0.5	-	-	-	<0.5
	Nitrobenzene	µg/L	1		8 to 63[#8]			-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	<1
Alcohols	Methanol	µg/L	500		20,000[#1]			-	<500	-	-	-	<500	-	-	<500	-	-	<500	-	<500	-	-	-	-	-	<500	-	-	-	-
and	Ethanol	µg/L	100		1,100,000[#12]			-	<500	-	-	-	<500	-	-	<100	-	-	<500	-	<500	-	-	-	-	-	<500	<100	-	-	<100
Acetates	2-Propanol	µg/L	100		410[#1]			-	<100	-	-	-	<100	-	-	<100	-	-	<100	-	<100	-	-	-	-	-	<100	-	-	-	-
plus	1-Propanol	mg/L	0.1					-	<0.1	-	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-
Acetone,	1-Butanol	µg/L	100		2,000[#1]			-	<100	-	-	-	<100	-	-	<100	-	-	<100	-	<100	-	-	-	-	-	<100	-	-	-	-
Fuel	Methyl acetate	µg/L	100		20,000[#1]			-	<100	-	-	-	<100	-	-	<100	-	-	<100	-	<100	-	-	-	-	-	<100	-	-	-	-
Oxygen...	Ethyl acetate	µg/L	100		140[#1]			-	<100	-	-	-	<100	-	-	<100	-	-	<100	-	<100	-	-	-	-	-	<100	-	-	-	-
	1,2-butylacetate	µg/L	100					-	<100	-	-	-	<100	-	-	<100	-	-	<100	-	<100	-	-	-	-	-	<100	-	-	-	-
	Ethyl Tert Butyl Ether	µg/L	1			510[#3]		-	-	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	<1
	Diisopropyl ether	µg/L	1		1,500[#1]	190[#3]		-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	<1
	Tert Butyl Alcohol	µg/L	100			6,640[#3]		-	-	-	-	-	-	-	-	322	-	-	-	-	-	-	-	-	-	-	-	188	-	-	273
	Tert Amyl Methyl Ether	µg/L	1			510[#3]		-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	<1
Anionic	Anionic surfactants	mg/L	0.2					-	-	0.7	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COD by	COD	mg/L	7					-	-	-	-	-	52	-	-	46	61	-	118	-	-	69	-	56	-	49	95	68	77	-	26
Dissolved	Methane (Filtered)	µg/L	1					-	-	-	-	-	-	-	10,289[#8]	-	-	-	-	-	-	-	4402[#8]	5975[#8]	4126[#8]	5628[#8]	-	-	-	-	2409[#8]
SO4, Cl,	Sulphate	mg/L	0.5		250[#6]	400[#9]		-	-	-	-	-	-	-	618.3	-	-	-	-	-	-	-	616.8	670.2	490.8	636.6	-	-	583.4	-	154.9
NO3, NO2,	Ammoniacal Nitrogen as N	mg/L	0.03			0.3[#11]		-	-	-	194.45	-	-	-	-	-	-	-	31.45	-	-	-	-	-	-	-	62.07	356.39	-	-	-
Total	Nitrogen (Total)	µg/L	500					-	-	-	-	-	-	-	-	-	-	-	33,200	-	-	-	-	7700	-	-	63,600	318,200	-	-	7700
Volatile	Acetic Acid	µg/L	10000					-	-	<10,000	<10,000	-	-	-	-	-	-	-	-	-	-	<10,000	-	-	-	-	-	-	-	-	-
Fatty Acids	Propanoic Acid	µg/L	1000					-	-	<1000	<1000	-	-	-	-	-	-	-	-	-	-	<1000	-	-	-	-	-	-	-	-	-
by LCMS	2-methyl propanoic acid	µg/L	1000					-	-	<1000	<1000	-	-	-	-	-	-	-	-	-	-	<1000	-	-	-	-	-	-	-	-	-
	3-methyl butanoic acid	µg/L	500					-	-	<500	<500	-	-	-	-	-	-	-	-	-	-	<500	-	-	-	-	-	-	-	-	-
	Valeric Acid	µg/L	500					-	-	<500	<500	-	-	-	-	-	-	-	-	-	-	<500	-	-	-	-	-	-	-	-	-
	4-methyl pentanoic acid	µg/L	500					-	-	<500	<500	-	-	-	-	-	-	-	-	-	-	<500	-	-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L	0.5					-	-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-
	Heptanoic acid	µg/L	500					-	-	<500	<500	-	-	-	-	-	-	-	-	-	-	<500	-	-	-	-	-	-	-	-	-
ESDAT	>C16-C35 Aliphatics	µg/L		Insufficiently volatile[#4]				0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	<20[#7]	<20[#7]	<20[#7]	<20[#7]	<20[#7]	<20[#7]	0[#6]	0[#6]	0[#6]	0[#6]	80[#6]	0[#6]	90[#6]	0[#6]	0[#6]
Combined	PAHs (sum of 4)	µg/L		Use individual PAHs[#4]	0.1[#6]			0[#6]	0[#6]	0.05[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	<0.042[#7]	0.669[#6]	<0.042[#7]	<0.042[#7]	<0.042[#7]	<0.042[#7]	0[#6]	0[#6]	0[#6]	0.01[#6]	0.148[#6]	0[#6]	0.02[#6]	0.477[#6]	0[#6]
Compounds	benzo(g,h,i)perylene + indeno(1,2,3-c	µg/L		Use individual PAHs[#4]				0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	<0.022[#7]	0.229[#6]	<0.022[#7]	<0.022[#7]	<0.022[#7]	<0.022[#7]	0[#6]	0[#6]	0[#6]	0[#6]	0.048[#6]	0[#6]	0[#6]	0.187[#6]	0[#6]
	Benzo(a)pyrene (surrogate marker fo	µg/L		Sat[#7]				0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	<0.016[#7]	0.261[#6]	<0.016[#7]	<0.016[#7]	<0.016[#7]	<0.016[#7]	0[#6]	0[#6]	0[#6]	0[#6]	0.057[#6]	0[#6]	0.016[#6]	0.181[#6]	0[#6]
	Sum of PCE and TCE	µg/L		Use individual GAC[#4]	10[#6]			0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	<6[#7]	<6[#7]	<6[#7]	<6[#7]	<6[#7]	<6[#7]	4[#6]	157[#6]	0[#6]	0[#6]	16[#6]	0[#6]	0[#6]	0[#6]	0[#6]
	TCE+DCE+VC	µg/L						0[#6]	0[#6]	18.2[#6]	0.7[#6]	0.1[#6]	0.1[#6]	0[#6]	11,500[#6]	0.4[#6]	12.1[#5]	12.9[#5]	13[#5]	12.2[#5]	13[#5]	<12.1[#7]	12.4[#5]	13,207[#6]	19,019[#6]	783.6[#6]	13,042[#6]	3.5[#6]	12.4[#6]	1.2[#6]	0[#6]	0.9[#6]
	PCE+TCE+DCE+VC	µg/L						0[#6]	0[#6]	18.2[#6]	0.7[#6]	0.1[#6]	0.1[#6]	0[#6]	11,500[#6]	0.4[#6]	15.1[#5]	15.9[#5]	15.2[#5]	16[#5]	<15.1[#7]	15.4[#5]	13,207[#6]	19,019[#6]	783.6[#6]	13,042[#6]	3.5[#6]	32.4[#6]	1.2[#6]	0[#6]	0.9[#6]
	Xylene Total	µg/L		Insufficiently volatile[#4]	500[#8]	30[#9]		0[#1]	0[#1]	0[#1]	0[#1]	0[#1]	0[#1]	0[#1]	13[#1]	0[#1]	<3[#2]	<3[#2]	<3[#2]	<3[#2]	<3[#2]	<3[#2]	<3[#2]	26[#1]	55[#1]	0[#1]	22[#1]	0[#1]	0[#1]	0[#1]	0[#1]	0[#1]
	Total BTEX	µg/L						0[#1]	0[#1]	3.4[#1]	0.9[#1]	0[#1]	0[#1]	0[#1]	38[#1]	0[#1]	<9.5[#2]	<9.5[#2]	<9.5[#2]	<9.5[#2]	<9.5[#2]	<9.5[#2]	<9.5[#2]	643.1[#1]	213.5[#1]	0.9[#1]	137.9[#1]	3[#1]	0[#1]	0.7[#1]	0[#1]	0[#1]
	1,2-Dichloroethene	µg/L			50[#8]			0[#6]	0[#6]	10[#6]	0[#6]	0[#6]	0[#6]	0[#6]	45[#6]	0[#6]	<6[#7]	<6[#7]	<6[#7]	<6[#7]	<6[#7]	<6[#7]	<6[#7]	1,655[#6]	2,340[#6]	36[#6]	134[#6]	0[#6]	12[#6]	0[#6]	0[#6]	0[#6]
	Trihalomethanes	µg/L			100[#6]			0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	<8[#7]	<8[#7]	<8[#7]	<8[#7]	8[#6]	<8[#7]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]	0[#6]
	Trichlorobenzene (total)	µg/L			0.1[#6]	0.4[#10]		0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	<6[#4]	<6[#4]	<6[#4]	<4[#4]	<6[#4]	<6[#4]	<6[#4]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]	0[#3]

Env Stds
#1:USEPA RSL (tapwater) [Nov 2019]
#2:California Draft health protective concentration
#3:PNEC (EU REACH) - Freshwater
#4:SoBRA GW GAC 2017 (Comm.)
#5:WHO Petroleum DWG 2008
#6:WS Regs 2016 (Eng/Wal)
#7:AECOM (modified LQM/CIEH S4ULs)
#8:WHO DWG 2017
#9:SEPA WAT-SG-53 Fresh EQS - AA - 2015
#10:WFD England/Wales. 2015 - AA-EQS Inland
#11:WFD England/Wales. 2015 - Freshwater Standards
#12:AECOM DWG (WHO method)
#13:Water Env't Regs (Scotland) 2015. AA-EQS Inland
#14:WFD England/Wales. 2015 - MAC-EQS Inland
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
DWS: Drinking Water Standard
EQS: Environmental Quality Standard

Key

XXX	Exceedance of HH GW. Commercial/Industrial. Sand
XXX	Exceedance of 20,000#1
XXX	Exceedance of CW/WE Water. Aquatic Toxicity - England/Wales - Freshwater

Table 6
Primary and duplicate samples results

Field Duplicates (WATER) Filter: [Sampled_Date	**SDG**	EMT-19-19999-1	EMT-19-19999-1		EMT-19-19999-2	EMT-19-19999-2		EMT-19-19999-4	EMT-19-19999-4	
	Field_ID	S4	DUP1	**RPD**	PZ6	DUP2	**RPD**	BH202A6	DUP3	**RPD**
	Sampled_Date-Time	05/12/2019	05/12/2019		06/12/2019	06/12/2019		10/12/2019	10/12/2019	

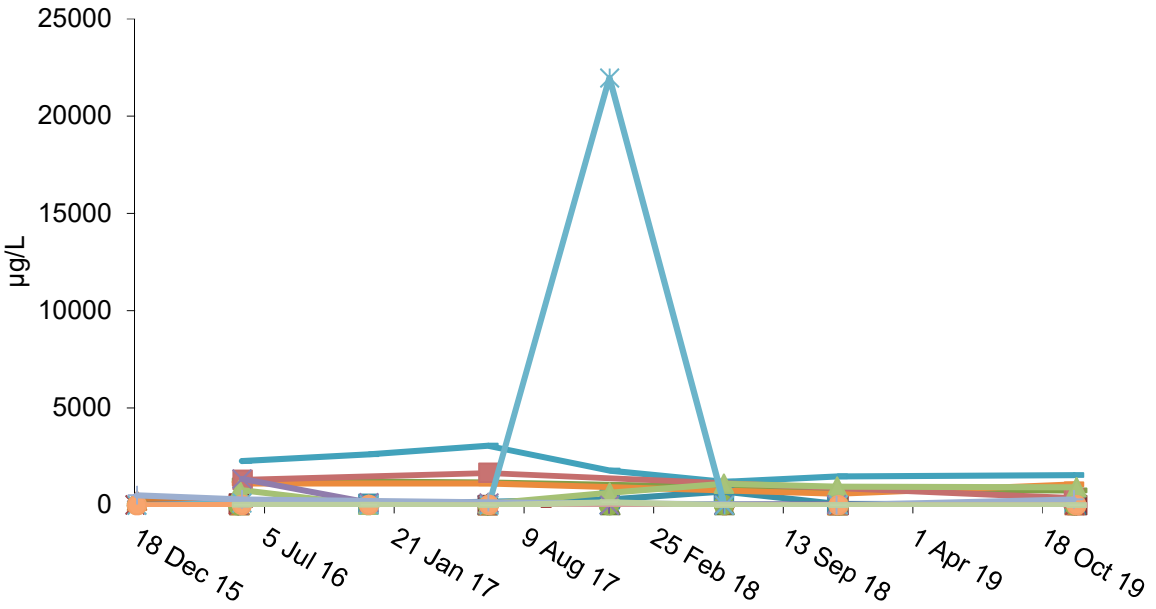
Method_T	**ChemNam**	**Units**	**EQL**									
Alcohols a	Methanol	µg/l	500							<500	<500	0
	Ethanol	µg/l	500							<500	<500	0
	2-Propano	µg/l	100							<100	<100	0
	1-Propano	mg/l	0.1							<0.1	<0.1	0
	1-Butanol	µg/l	100							<100	<100	0
	Methyl ace	µg/l	100							<100	<100	0
	Ethyl aceta	µg/l	100							<100	<100	0
	1,2-butylac	µg/l	100							<100	<100	0
nd Acetates plus Acetone, Fuel Oxygen...												
COD by C	COD	mg/l	7	77	72	7						
olorimetric measurement.												
EPH by G	>C10-C12	µg/l	5	<5	<5	0	<5	<5	0	<5	<5	0
	>C12-C16	µg/l	10	**40**	**<10**	**120**	<10	<10	0	<10	<10	0
	>C16-C21	µg/l	10	**90**	**<10**	**160**	<10	<10	0	<10	<10	0
	>C21-C35	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
	>EC10-EC	µg/l	5	<5	<5	0	<5	<5	0	<5	<5	0
	>EC12-EC	µg/l	10	40	40	0	<10	<10	0	<10	<10	0
	>EC16-EC	µg/l	10	130	120	8	<10	<10	0	<10	<10	0
	>EC21-EC	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
C-FID												
GRO by H	>C5-C6 Al	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
	>C6-C8 Al	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
	>C8-C10 A	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
	>EC5-EC7	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
	>EC7-EC8	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
	>EC8-EC1	µg/l	10	<10	<10	0	<10	<10	0	<10	<10	0
eadspace GC-FID												
PAH by G	Naphthale	µg/l	0.1	0.2	0.2	0	<0.1	<0.1	0	<0.1	<0.1	0
	Acenaphth	µg/l	0.013	0.019	0.018	5	<0.013	<0.013	0	<0.013	<0.013	0
	Acenaphth	µg/l	0.013	5.242	5.061	4	0.124	0.121	2	0.015	0.015	0
	Fluorene	µg/l	0.014	0.034	0.03	13	<0.014	<0.014	0	<0.014	<0.014	0
	Phenanthr	µg/l	0.011	0.022	0.017	26	<0.011	<0.011	0	<0.011	<0.011	0
	Anthracen	µg/l	0.013	0.038	0.037	3	0.023	0.02	14	<0.013	<0.013	0
	Fluoranthe	µg/l	0.012	0.183	0.156	16	0.033	0.033	0	<0.012	0.015	22
	Pyrene	µg/l	0.013	0.254	0.22	14	0.055	0.054	2	<0.013	0.023	56
	Benz(a)an	µg/l	0.015	0.03	0.023	26	<0.015	<0.015	0	<0.015	<0.015	0
	Chrysene	µg/l	0.011	0.026	0.02	26	<0.011	<0.011	0	<0.011	0.012	9
	Benzo(a) p	µg/l	0.016	0.016	<0.016	0	<0.016	<0.016	0	<0.016	<0.016	0
	Indeno(1,2	µg/l	0.011	<0.011	<0.011	0	<0.011	<0.011	0	<0.011	<0.011	0
	Dibenz(a,h	µg/l	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
	Benzo(g,h	µg/l	0.011	<0.011	<0.011	0	<0.011	<0.011	0	<0.011	<0.011	0
	Benzo(b)fl	µg/l	0.01	0.02	0.02	0	<0.01	<0.01	0	<0.01	<0.01	0
	Benzo(k)fl	µg/l	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
	Benzo(b)&	µg/l	0.018	0.033	0.022	40	<0.018	<0.018	0	<0.018	<0.018	0
	PAH 16 To	µg/l	0.195	6.097	5.804	5	0.235	0.228	3	<0.195	<0.195	0
C-MS												
TPH CWG	>C5-C35 A	µg/l	10	**130**	**<10**	**171**	<10	<10	0	<10	<10	0
	>EC5-EC3	µg/l	10	170	160	6	<10	<10	0	<10	<10	0
	>C5-C35 A	µg/l	10	**300**	**160**	**61**	<10	<10	0	<10	<10	0
by GC-FID												
VOC - Tar	Naphthale	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Dichlorodif	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	MTBE	µg/l	0.1	15.9	15.7	1	115.4	114.8	1	<0.1	<0.1	0
	MTBE	µg/l	0.1	15.9	15.7	1	115.4	114.8	1	<0.1	<0.1	0
	Chlorometh	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	Vinyl chlor	µg/l	0.1	1.2	1.4	15	<0.1	<0.1	0	<0.1	<0.1	0
	Bromometh	µg/l	1	<1	<1	0	<1	<1	0	<1	<1	0
	Chloroetha	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	Trichlorofl	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,1-dichlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	Dichlorome	µg/l	5	<5	<5	0	<5	<5	0	<5	<5	0
	trans-1,2-d	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,1-dichlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	cis-1,2-dic	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	2,2-dichlor	µg/l	1	<1	<1	0	<1	<1	0	<1	<1	0
	Bromochlo	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Chloroform	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,1,1-trichl	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,1-dichlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	Carbon tet	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,2-dichlor	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Benzene	µg/l	0.5	0.6	<0.5	18	<0.5	<0.5	0	<0.5	<0.5	0
	Benzene	µg/l	0.5	0.7	<0.5	33	<0.5	<0.5	0	<0.5	<0.5	0
	Trichloroet	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,2-dichlor	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Dibromom	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	Bromodich	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	cis-1,3-dic	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Toluene	µg/l	5	<5	<5	0	<5	<5	0	<5	<5	0
	Toluene	µg/l	5	<5	<5	0	<5	<5	0	<5	<5	0
	trans-1,3-d	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,1,2-trichl	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Tetrachlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,3-dichlor	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Chlorodibr	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,2-dibrom	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Chloroben	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,1,1,2-tet	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Ethylbenze	µg/l	1	<1	<1	0	<1	<1	0	<1	<1	0
	Ethylbenze	µg/l	1	<1	<1	0	<1	<1	0	<1	<1	0
	Xylene (m	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Xylene (m	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Xylene (o)	µg/l	1	<1	<1	0	<1	<1	0	<1	<1	0
	Xylene (o)	µg/l	1	<1	<1	0	<1	<1	0	<1	<1	0
	Styrene	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Bromoform	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	Isopropylb	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,1,2,2-tet	µg/l	4	<4	<4	0	<4	<4	0	<4	<4	0
	Bromoben	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,2,3-trichl	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	n-propylbe	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	2-chlorotol	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,3,5-trime	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	4-chlorotol	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	tert-butylb	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,2,4-trime	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	sec-butylb	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	p-isopropy	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,3-dichlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,4-dichlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	n-butylben	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,2-dichlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,2-dibrom	µg/l	2	<2	<2	0	<2	<2	0	<2	<2	0
	1,2,4-trichl	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	Hexachlor	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0
	1,2,3-trichl	µg/l	3	<3	<3	0	<3	<3	0	<3	<3	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Appendix C – Made Ground concentration graphs

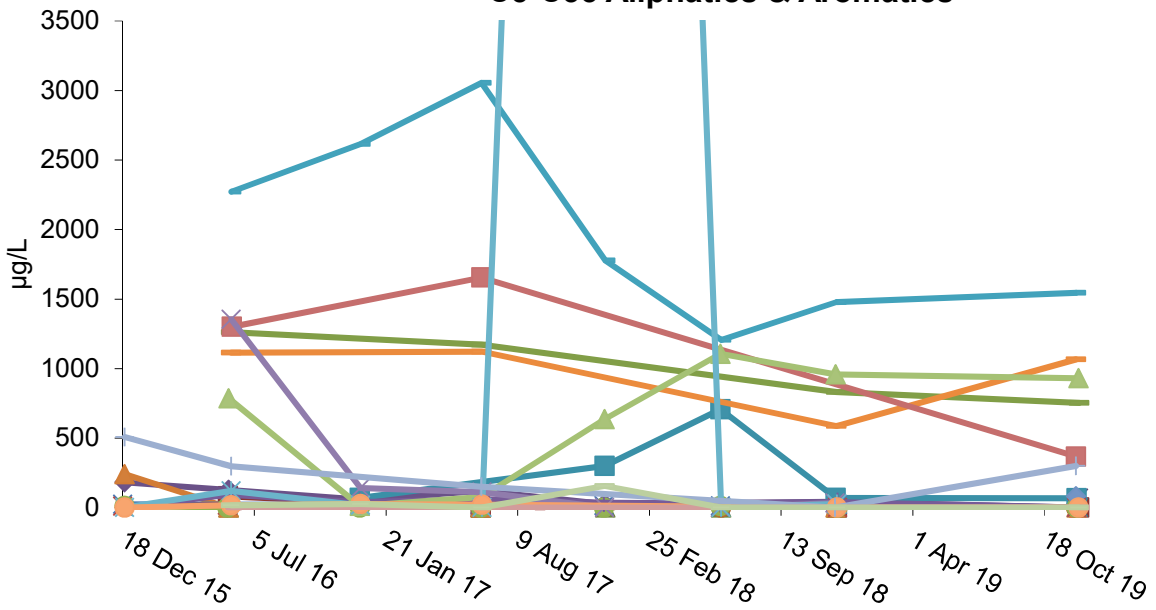
C-1

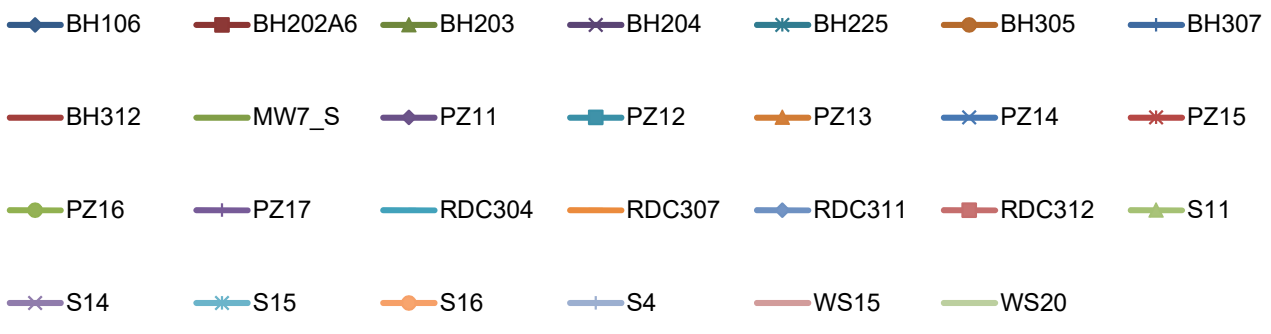
>C5-C35 Aliphatics & Aromatics



C-1A

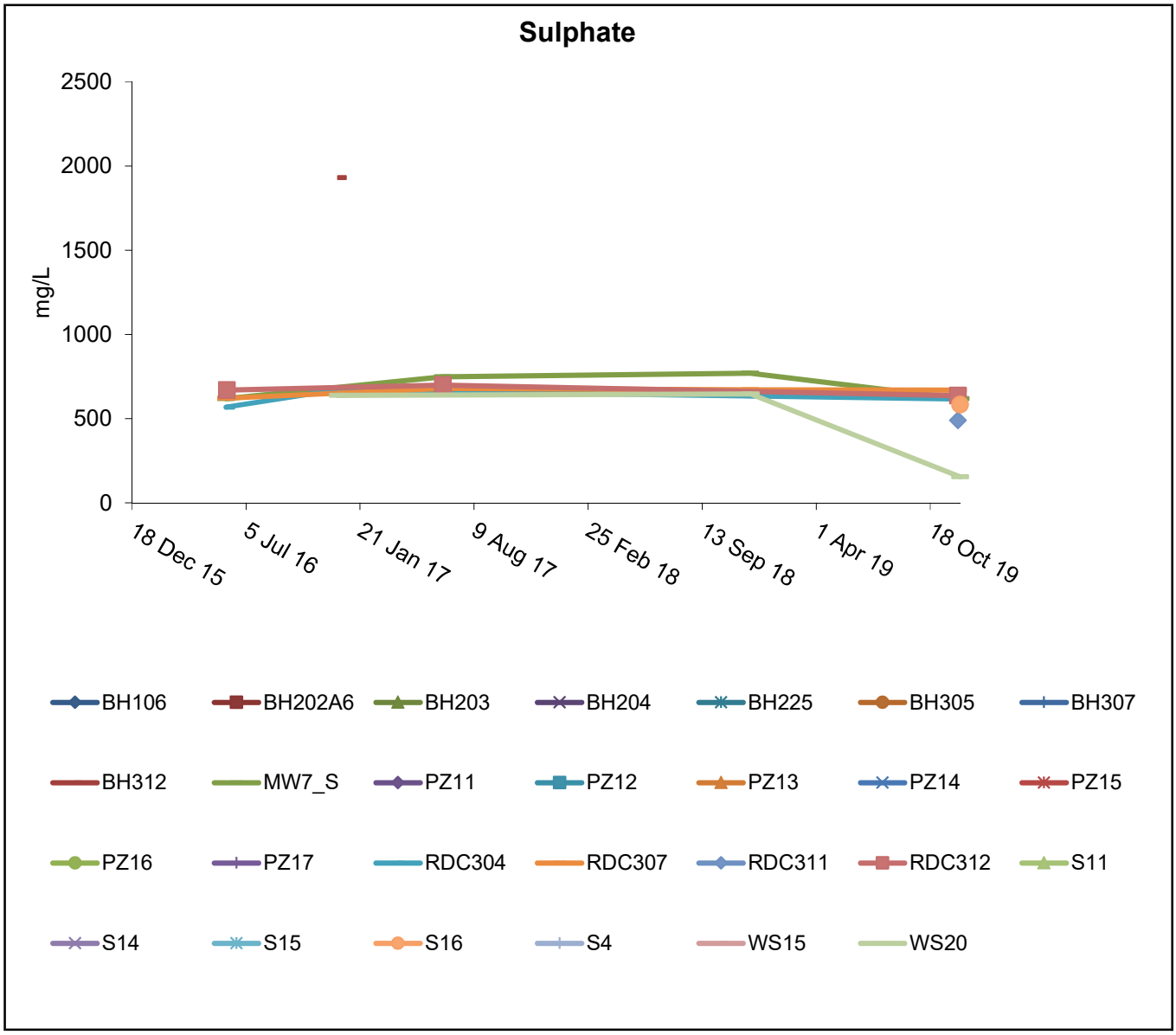
>C5-C35 Aliphatics & Aromatics





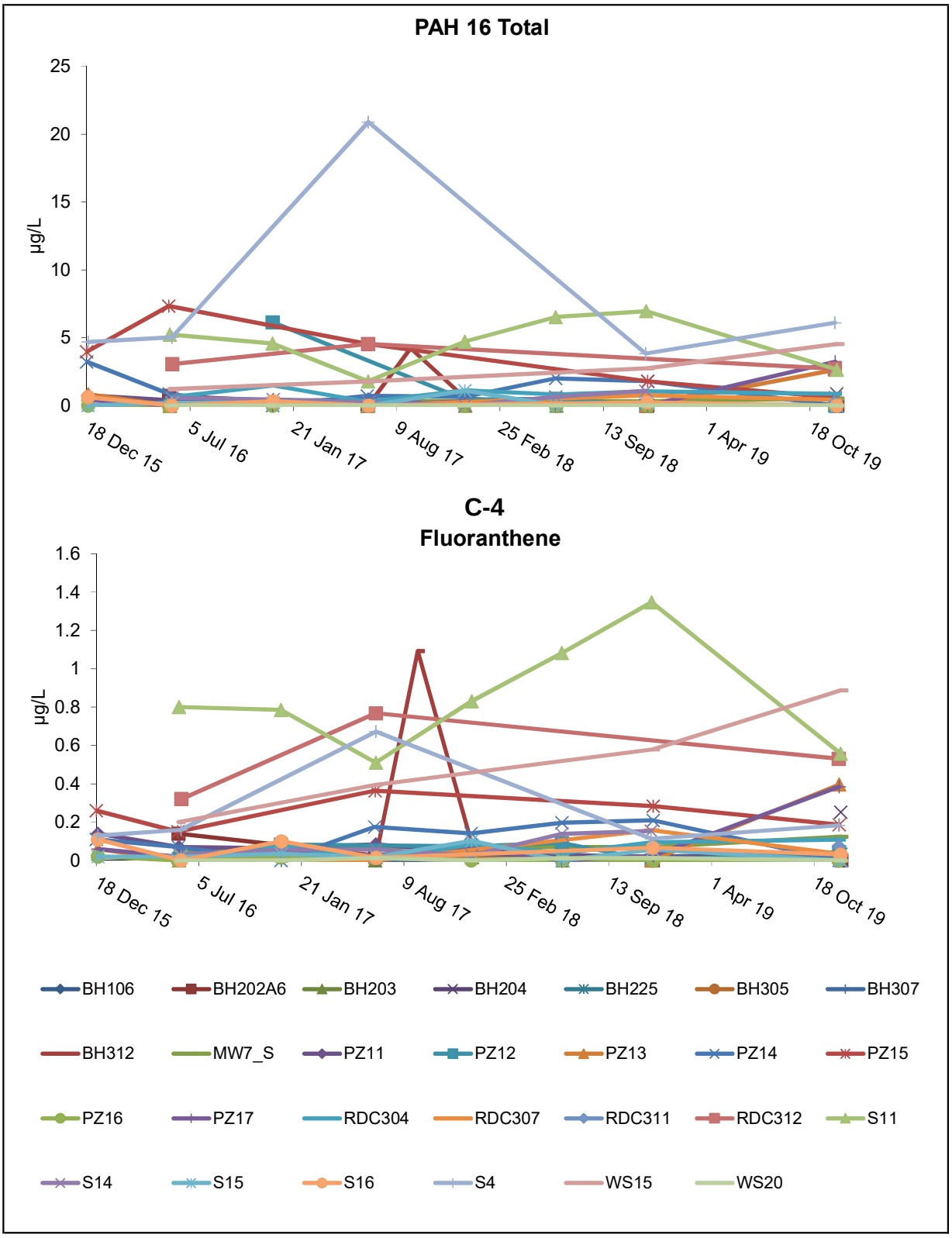
Total TPH concentration in Made Ground

C-2



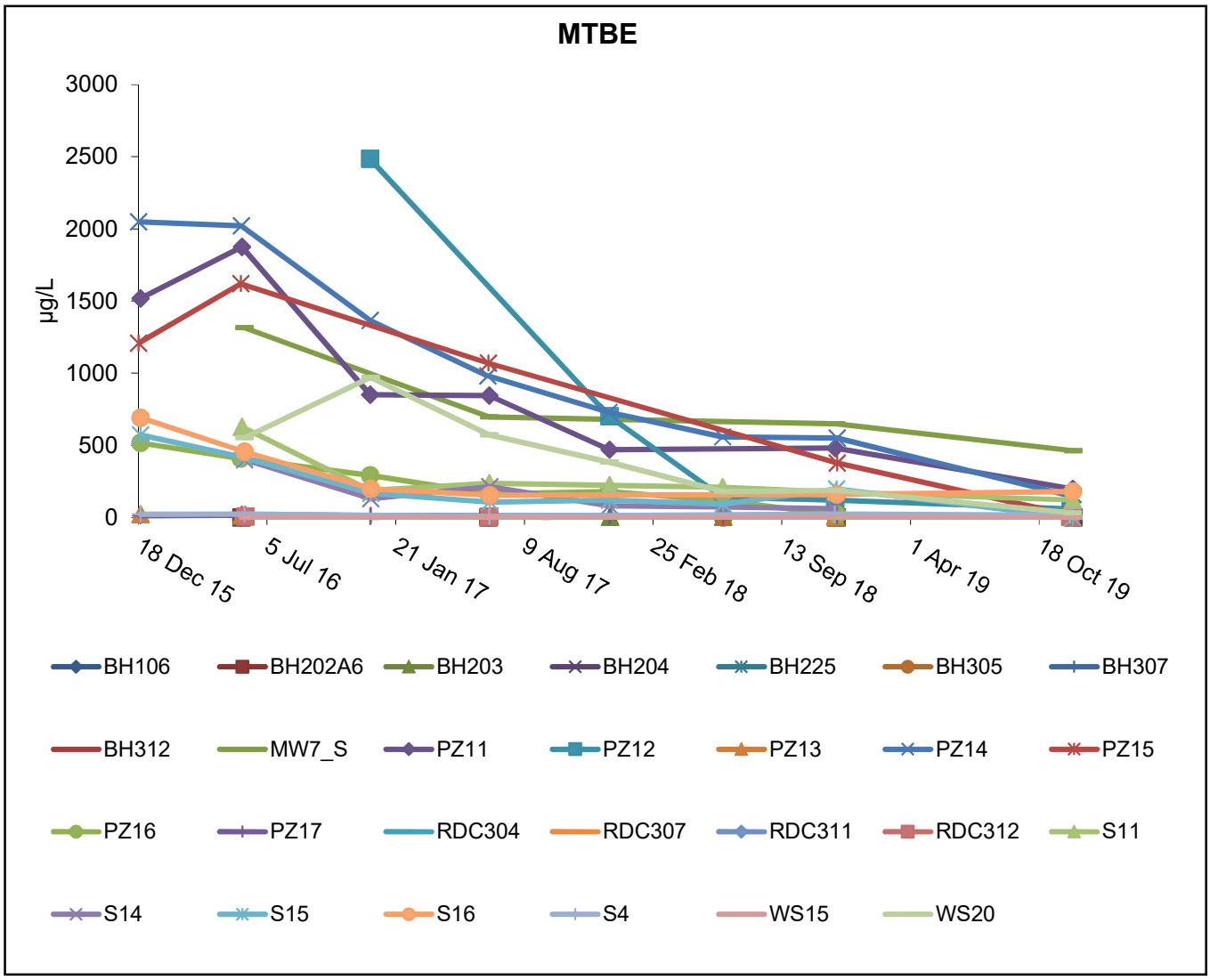
Sulphate concentrations in Made Ground

C-3



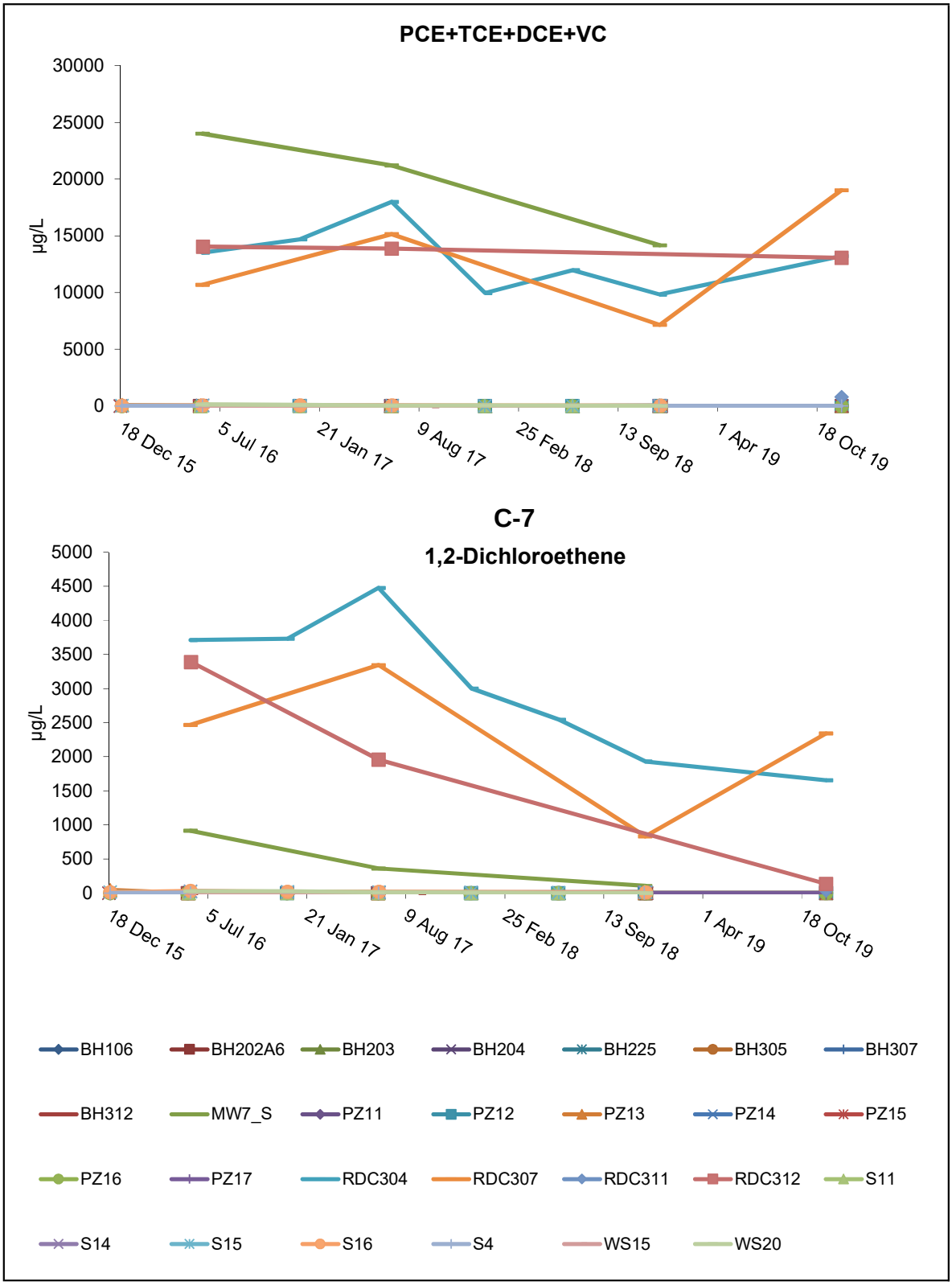
PAH 16 and fluoranthene concentrations in Made Ground

C-5



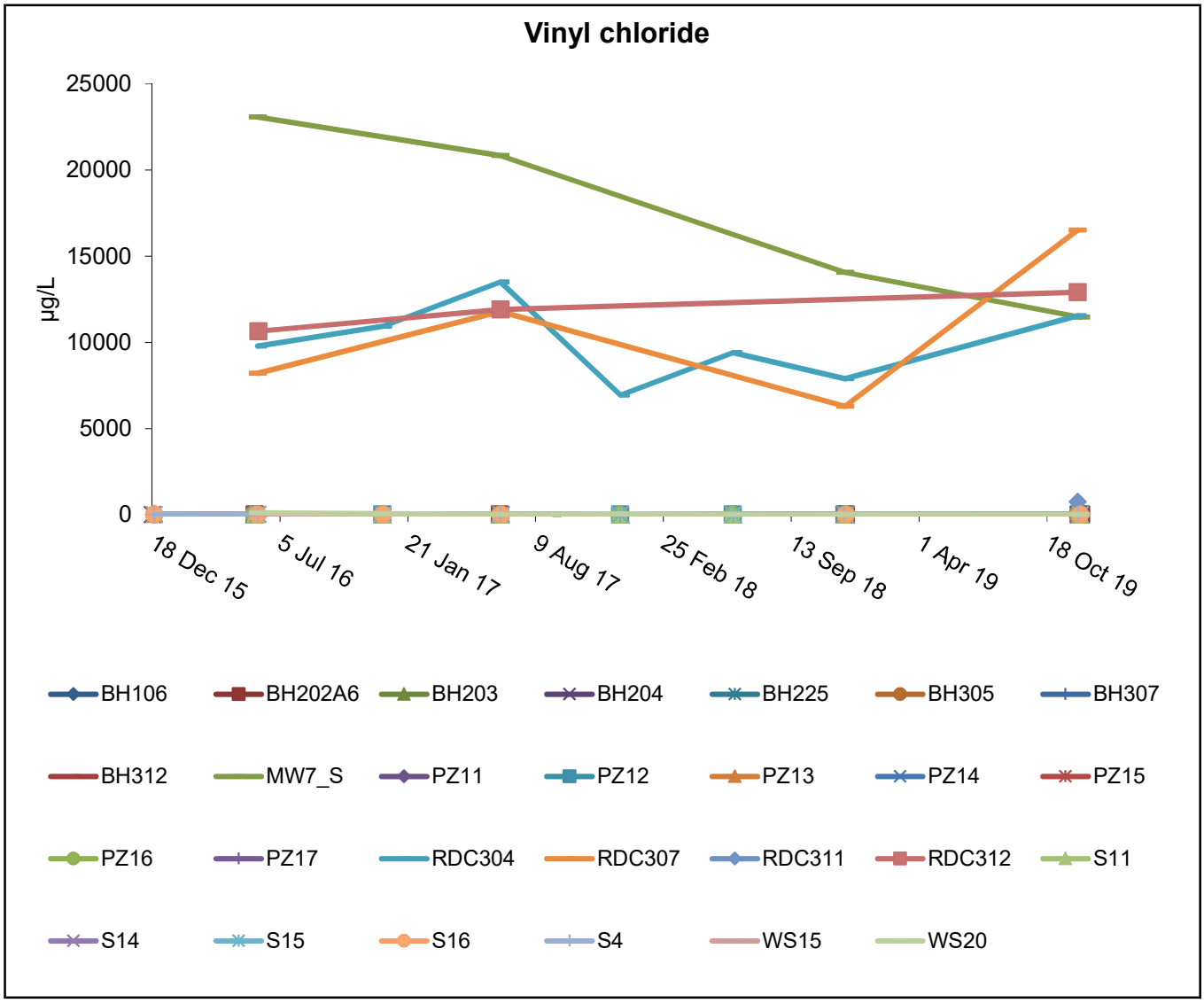
MTBE concentrations in Made Ground

C-6



PCE+TCE+DCE+VC and 1,2-Dichloroethene concentrations in Made Ground

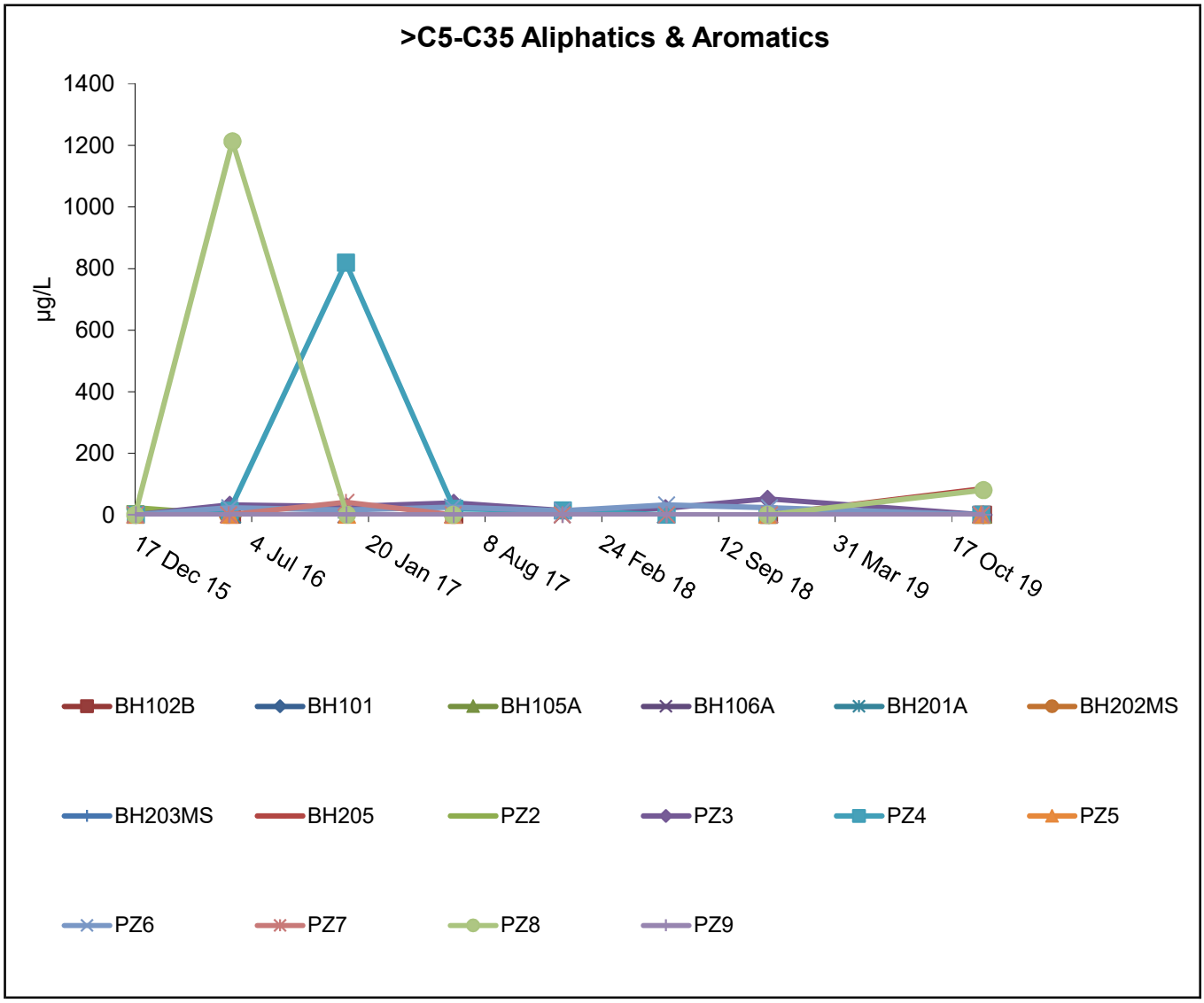
C-8



Vinyl Chloride concentrations in Made Ground

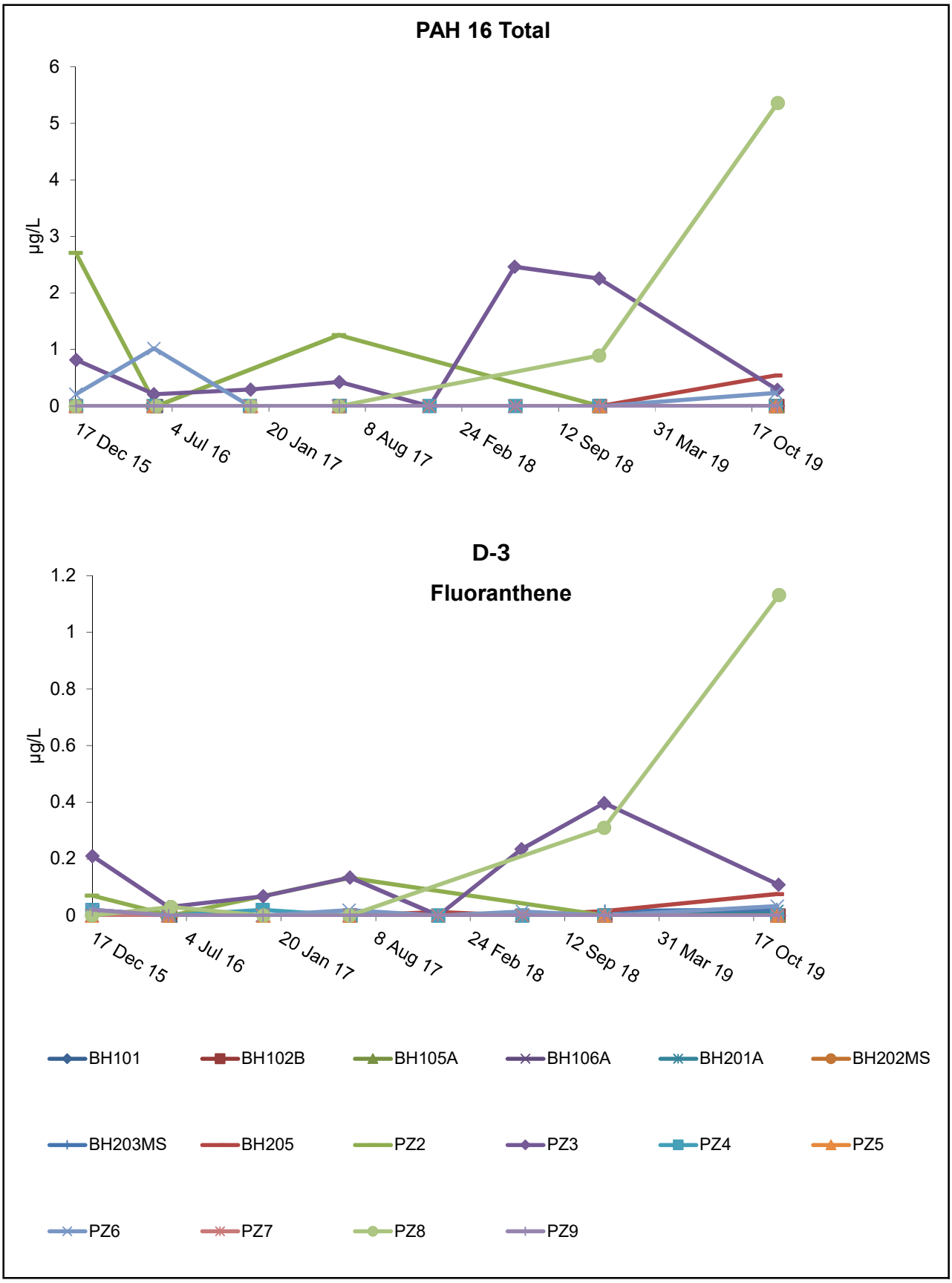
Appendix D – River Terrace Deposits concentration graphs

D-1



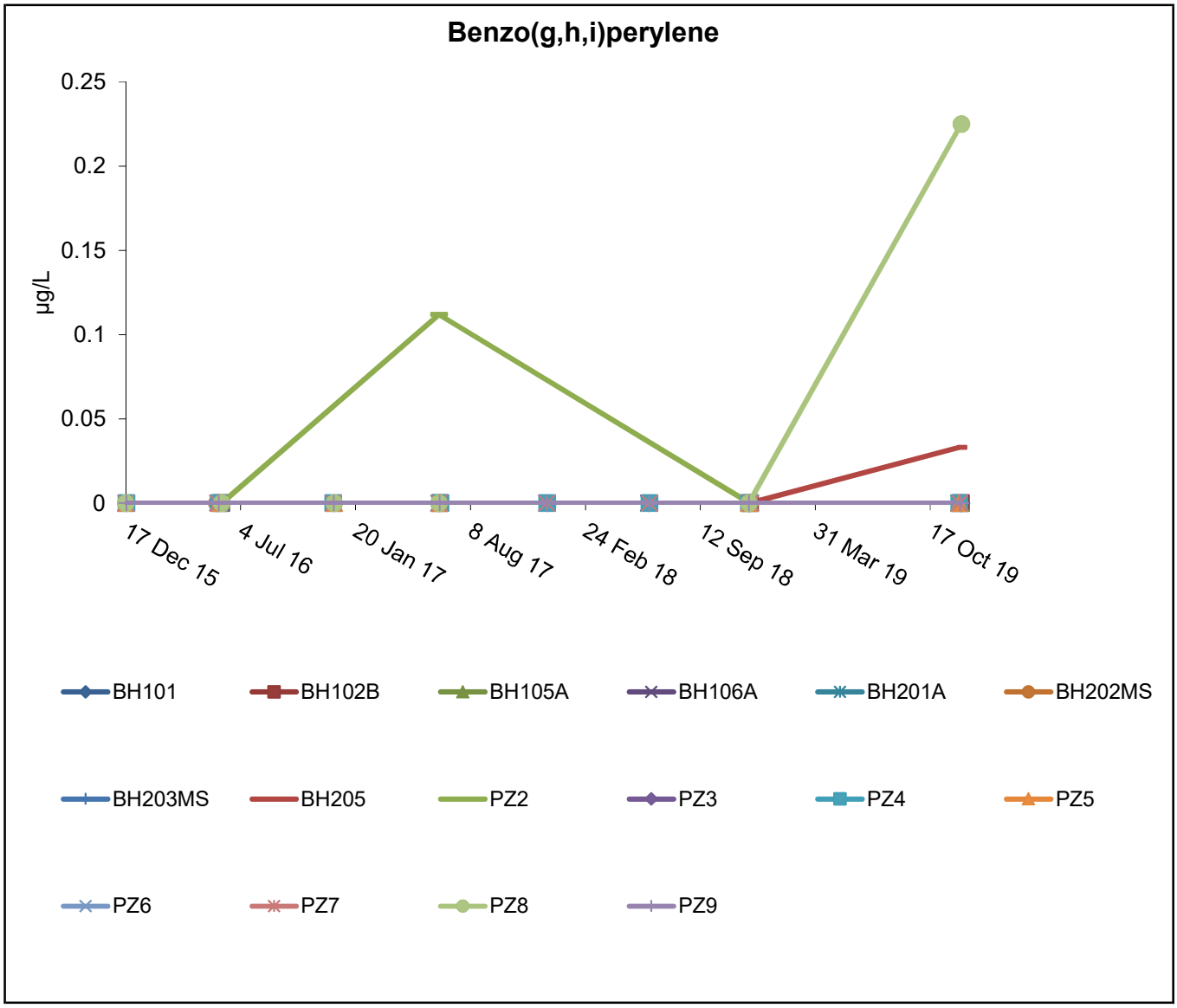
Total TPH concentrations in RTG aquifer

D-2



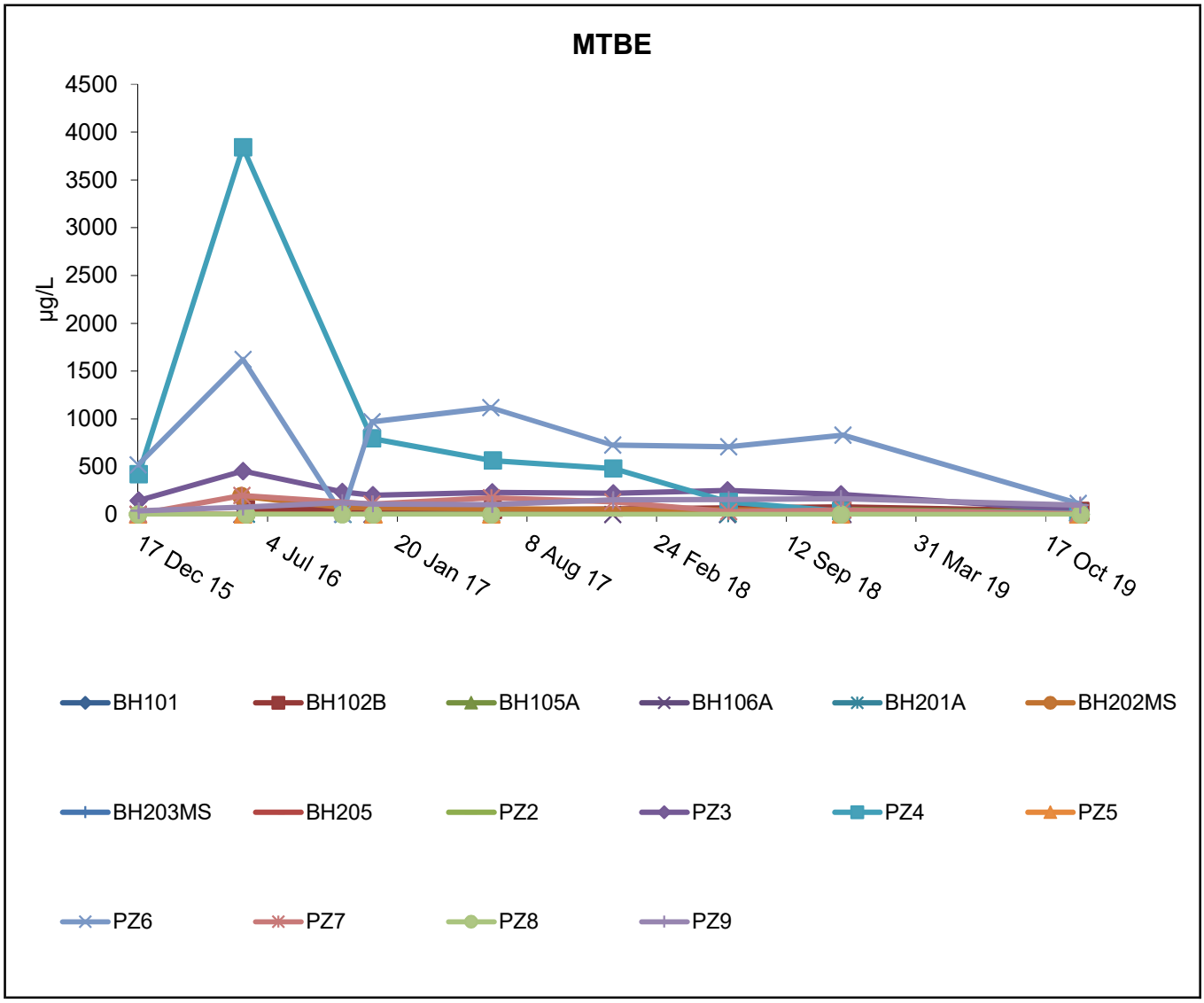
PAH 16 Total and fluoranthene concentrations in RTG aquifer

D-4



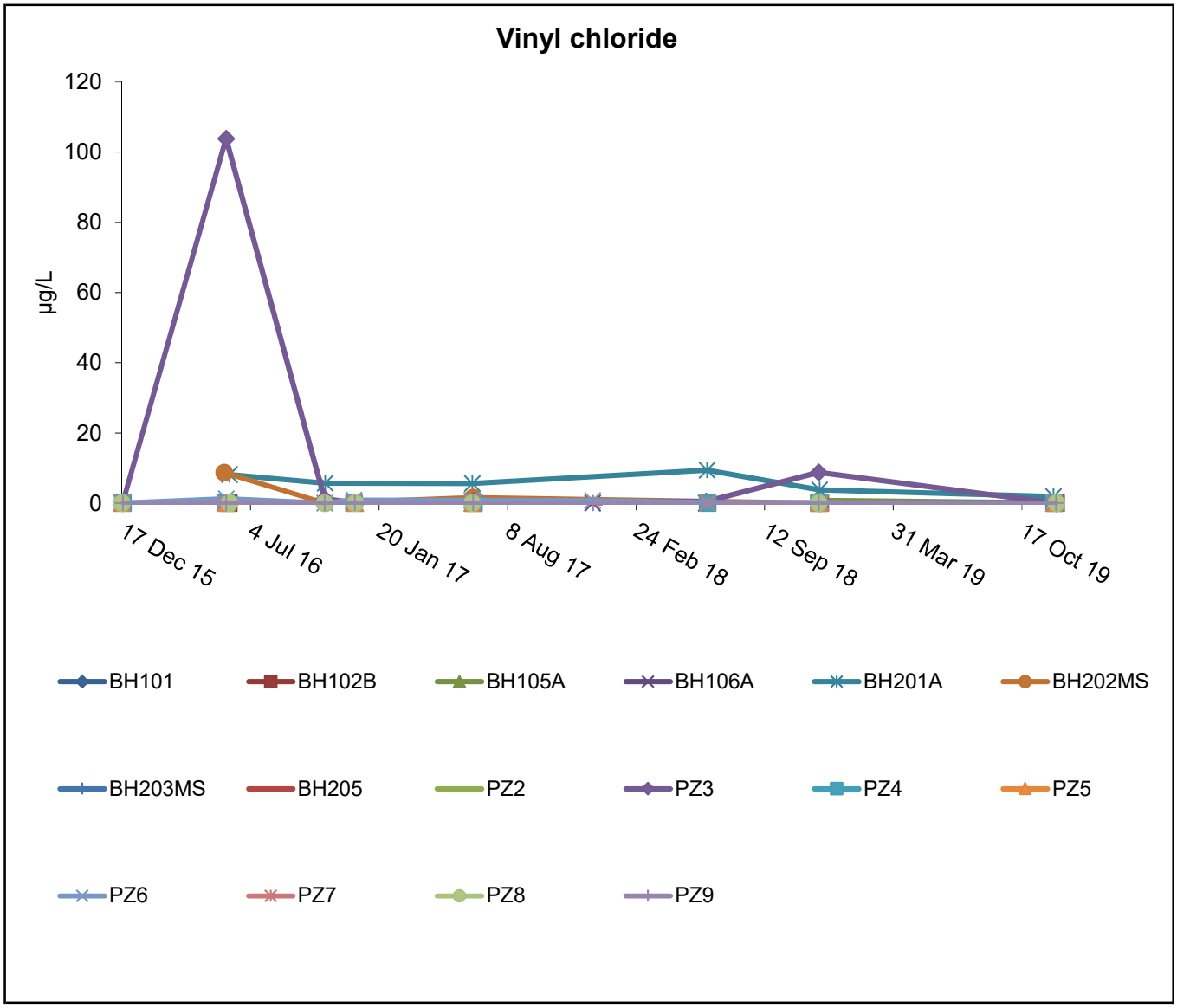
Benzo(g,h,i)perylene concentrations in RTG aquifer

D-5



MTBE concentrations in RTG aquifer

D-6



Vinyl Chloride concentrations in RTG aquifer

Appendix E – Laboratory Certificates

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	Guillem Badiella Anglada
Date :	13th February, 2020
Your reference :	
Our reference :	Test Report 19/19999 Batch 1
Location :	Stolthaven
Date samples received :	6th December, 2019
Status :	Final report
Issue :	2

Thirteen samples were received for analysis on 6th December, 2019 of which thirteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Simon Gomery BSc
Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-5	6-11	12-17	18-23	24-29	30-35	36-40	41-47	48-52	53-57	LOD/LOR	Units	Method No.
Sample ID	S4	BH201A	RDC304	RDC307	RDC311	RDC312	BH305	BH203MS	BH307	BH205			
Depth													
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G			
Sample Date	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019			
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
PAH MS													
Naphthalene	0.2	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM4/PM30
Acenaphthylene	0.019	<0.013	0.019	0.069	0.013	0.046	<0.013	<0.013	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Acenaphthene	5.242	<0.013	0.342	0.117	<0.013	1.356	<0.013	0.042	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Fluorene	0.034	<0.014	0.164	0.027	0.025	0.035	<0.014	<0.014	<0.014	<0.014	<0.014	ug/l	TM4/PM30
Phenanthrene	0.022	<0.011	0.109	0.027	0.034	0.031	<0.011	<0.011	<0.011	0.028	<0.011	ug/l	TM4/PM30
Anthracene	0.038	<0.013	0.044	0.014	0.016	0.150	<0.013	<0.013	<0.013	0.055	<0.013	ug/l	TM4/PM30
Fluoranthene	0.183	0.014	0.108	0.035	0.074	0.530	<0.012	0.022	0.018	0.076	<0.012	ug/l	TM4/PM30
Pyrene	0.254	0.023	0.080	0.036	0.065	0.478	<0.013	0.026	0.019	0.078	<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	0.030	<0.015	<0.015	<0.015	<0.015	0.029	<0.015	<0.015	<0.015	0.038	<0.015	ug/l	TM4/PM30
Chrysene	0.026	<0.011	<0.011	<0.011	<0.011	0.029	<0.011	<0.011	<0.011	0.045	<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	0.033	<0.018	<0.018	<0.018	<0.018	0.020	<0.018	<0.018	<0.018	0.098	<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.051	<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.040	<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.033	<0.011	ug/l	TM4/PM30
PAH 16 Total	6.097	<0.195	0.866	0.425	0.227	2.704	<0.195	<0.195	<0.195	0.542	<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.02	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.07	<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	85	76	82	81	90	81	79	82	82	79	<0	%	TM4/PM30
Methyl Tertiary Butyl Ether	15.9	15.5	2.8	13.5	2.3	4.5	<0.1	6.0	3.1	2.7	<0.1	ug/l	TM15/PM10
Benzene	0.7	<0.5	3.1	3.5	0.9	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Toluene	<5	<5	6	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
Ethylbenzene	<1	<1	608	155	<1	112	<1	<1	<1	<1	<1	ug/l	TM15/PM10
m/p-Xylene	<2	<2	14	40	<2	11	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene	<1	<1	12	15	<1	11	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	88	93	94	93	92	95	94	94	83	96	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	130	117	114	107	104	109	106	101	95	108	<0	%	TM15/PM10
SVOC TICs	-	-	-	ND	-	-	-	ND	-	-		None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C6-C8	<10	<10	695	825	81	209	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C8-C10	<10	<10	121	37	<10	24	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C10-C12	<5	<5	<5	<5	<5	<5	<5	<5	<5	54	<5	ug/l	TM5/PM16/PM30
>C12-C16	40	<10	<10	<10	<10	<10	<10	<10	<10	30	<10	ug/l	TM5/PM16/PM30
>C16-C21	90	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	130	<10	816	862	81	233	<10	<10	<10	84	<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-5	6-11	12-17	18-23	24-29	30-35	36-40	41-47	48-52	53-57	LOD/LOR	Units	Method No.
Sample ID	S4	BH201A	RDC304	RDC307	RDC311	RDC312	BH305	BH203MS	BH307	BH205			
Depth													
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G			
Sample Date	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019			
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
TPH CWG													
Aromatics													
>C5-EC7	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC7-EC8	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC8-EC10	<10	<10	591	195	<10	126	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC10-EC12	<5	<5	137	10	<5	8	<5	<5	<5	<5	<5	ug/l	TM5/PM16/PM30
>EC12-EC16	40	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC16-EC21	130	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	170	<10	728	205	<10	134	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35)	300	<10	1544	1067	81	367	<10	<10	<10	84	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Alcohols/Acetates													
Methyl Alcohol (Methanol)	-	-	-	-	-	-	-	<500	<500	-	<500	ug/l	TM83/PM10
Ethyl Alcohol (Ethanol)	-	-	-	-	-	-	-	<500	<500	-	<500	ug/l	TM83/PM10
i-Propyl Alcohol (Isopropanol)	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
n-Propyl Alcohol	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
n-Butyl Alcohol	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
n-Pentyl Alcohol	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
n-Hexyl Alcohol	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
n-Heptyl Alcohol	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
Methyl Acetate	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
Ethyl Acetate	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
i-Propyl Acetate	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
n-Propyl Acetate	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
n-Butyl Acetate	-	-	-	-	-	-	-	<100	<100	-	<100	ug/l	TM83/PM10
Sulphate as SO4	-	516.0	616.8	670.2	490.8	636.6	-	682.1	-	-	<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N	-	-	-	-	-	-	-	4.32	-	-	<0.03	mg/l	TM38/PM0
Dissolved Methane	-	>>745	>>4402	>>5975	>>4126	>>5628	-	50	-	-	<1	ug/l	TM25/PM0
Acetic Acid	-	-	-	-	-	-	-	<10	-	-	<10	mg/l	TM127/PM0
Propanoic Acid	-	-	-	-	-	-	-	<1	-	-	<1	mg/l	TM127/PM0
2-methyl propanoic acid / Butanoic acid	-	-	-	-	-	-	-	<1	-	-	<1	mg/l	TM127/PM0
3-methyl butanoic acid	-	-	-	-	-	-	-	<0.5	-	-	<0.5	mg/l	TM127/PM0
Pentanoic acid	-	-	-	-	-	-	-	<0.5	-	-	<0.5	mg/l	TM127/PM0
4-methyl pentanoic acid	-	-	-	-	-	-	-	<0.5	-	-	<0.5	mg/l	TM127/PM0
Hexanoic acid	-	-	-	-	-	-	-	<0.5	-	-	<0.5	mg/l	TM127/PM0
Heptanoic acid	-	-	-	-	-	-	-	<0.5	-	-	<0.5	mg/l	TM127/PM0
Ethyl Tert Butyl Ether (ETBE)	-	-	-	-	-	-	-	<1	-	-	<1	ug/l	TM83/PM10
Di isopropyl Ether (DIPE)	-	-	-	-	-	-	-	<1	-	-	<1	ug/l	TM83/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-5	6-11	12-17	18-23	24-29	30-35	36-40	41-47	48-52	53-57	LOD/LOR	Units	Method No.
Sample ID	S4	BH201A	RDC304	RDC307	RDC311	RDC312	BH305	BH203MS	BH307	BH205			
Depth													
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G			
Sample Date	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019			
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
Tert Butyl Alcohol (TBA)	-	-	-	-	-	-	-	<100	-	-	<100	ug/l	TM83/PM10
Tert Amyl Methyl Ether (TAME)	-	-	-	-	-	-	-	<1	-	-	<1	ug/l	TM83/PM10
Ethanol	-	-	-	-	-	-	-	<100	-	-	<100	ug/l	TM83/PM10
Anionic Surfactants	-	-	-	-	-	-	-	0.8	-	-	<0.2	mg/l	TM33/PM0
COD (Settled)	77	-	-	56	-	49	-	118	52	-	<7	mg/l	TM57/PM0
Total Nitrogen	-	-	-	7.7	-	-	-	6.1	-	-	<0.5	mg/l	TM38/TM125/PM0

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Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	58-62	63-67									LOD/LOR	Units	Method No.
Sample ID	BH312	DUP1											
Depth													
COC No / misc													
Containers	V P G	V P G											
Sample Date	05/12/2019	05/12/2019											
Sample Type	Liquid	Liquid											
Batch Number	1	1											
Date of Receipt	06/12/2019	06/12/2019											
PAH MS													
Naphthalene	<0.1	0.2									<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.013	0.018									<0.013	ug/l	TM4/PM30
Acenaphthene	0.021	5.061									<0.013	ug/l	TM4/PM30
Fluorene	<0.014	0.030									<0.014	ug/l	TM4/PM30
Phenanthrene	<0.011	0.017									<0.011	ug/l	TM4/PM30
Anthracene	<0.013	0.037									<0.013	ug/l	TM4/PM30
Fluoranthene	0.028	0.156									<0.012	ug/l	TM4/PM30
Pyrene	0.024	0.220									<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	<0.015	0.023									<0.015	ug/l	TM4/PM30
Chrysene	<0.011	0.020									<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.018	0.022									<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	<0.016	<0.016									<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	<0.011									<0.011	ug/l	TM4/PM30
PAH 16 Total	<0.195	5.804									<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	0.02									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	81	79									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether	0.2	15.7									<0.1	ug/l	TM15/PM10
Benzene	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene	<2	<2									<2	ug/l	TM15/PM10
o-Xylene	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	97	93									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	110	105									<0	%	TM15/PM10
SVOC TICs	-	-										None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6	<10	<10									<10	ug/l	TM36/PM12
>C6-C8	<10	<10									<10	ug/l	TM36/PM12
>C8-C10	<10	<10									<10	ug/l	TM36/PM12
>C10-C12	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30

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Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	58-62	63-67									LOD/LOR	Units	Method No.
Sample ID	BH312	DUP1											
Depth													
COC No / misc													
Containers	V P G	V P G											
Sample Date	05/12/2019	05/12/2019											
Sample Type	Liquid	Liquid											
Batch Number	1	1											
Date of Receipt	06/12/2019	06/12/2019											
TPH CWG													
Aromatics													
>C5-EC7	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	40									<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	120									<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	<10	160									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35)	<10	160									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Alcohols/Acetates													
Methyl Alcohol (Methanol)	-	-									<500	ug/l	TM83/PM10
Ethyl Alcohol (Ethanol)	-	-									<500	ug/l	TM83/PM10
i-Propyl Alcohol (Isopropanol)	-	-									<100	ug/l	TM83/PM10
n-Propyl Alcohol	-	-									<100	ug/l	TM83/PM10
n-Butyl Alcohol	-	-									<100	ug/l	TM83/PM10
n-Pentyl Alcohol	-	-									<100	ug/l	TM83/PM10
n-Hexyl Alcohol	-	-									<100	ug/l	TM83/PM10
n-Heptyl Alcohol	-	-									<100	ug/l	TM83/PM10
Methyl Acetate	-	-									<100	ug/l	TM83/PM10
Ethyl Acetate	-	-									<100	ug/l	TM83/PM10
i-Propyl Acetate	-	-									<100	ug/l	TM83/PM10
n-Propyl Acetate	-	-									<100	ug/l	TM83/PM10
n-Butyl Acetate	-	-									<100	ug/l	TM83/PM10
Sulphate as SO4	-	-									<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N	-	-									<0.03	mg/l	TM38/PM0
Dissolved Methane	-	-									<1	ug/l	TM25/PM0
Acetic Acid	-	-									<10	mg/l	TM127/PM0
Propanoic Acid	-	-									<1	mg/l	TM127/PM0
2-methyl propanoic acid / Butanoic acid	-	-									<1	mg/l	TM127/PM0
3-methyl butanoic acid	-	-									<0.5	mg/l	TM127/PM0
Pentanoic acid	-	-									<0.5	mg/l	TM127/PM0
4-methyl pentanoic acid	-	-									<0.5	mg/l	TM127/PM0
Hexanoic acid	-	-									<0.5	mg/l	TM127/PM0
Heptanoic acid	-	-									<0.5	mg/l	TM127/PM0
Ethyl Tert Butyl Ether (ETBE)	-	-									<1	ug/l	TM83/PM10
Di isopropyl Ether (DIPE)	-	-									<1	ug/l	TM83/PM10

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	58-62	63-67											
Sample ID	BH312	DUP1											
Depth													
COC No / misc													
Containers	V P G	V P G											
Sample Date	05/12/2019	05/12/2019											
Sample Type	Liquid	Liquid											
Batch Number	1	1											
Date of Receipt	06/12/2019	06/12/2019											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Tert Butyl Alcohol (TBA)	-	-									<100	ug/l	TM83/PM10
Tert Amyl Methyl Ether (TAME)	-	-									<1	ug/l	TM83/PM10
Ethanol	-	-									<100	ug/l	TM83/PM10
Anionic Surfactants	-	-									<0.2	mg/l	TM33/PM0
COD (Settled)	-	72									<7	mg/l	TM57/PM0
Total Nitrogen	-	-									<0.5	mg/l	TM38/TM125/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

SVOC Report : **Liquid**

EMT Sample No.	18-23	41-47											
Sample ID	RDC307	BH203MS											
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V P G	V H P G											
Sample Date	05/12/2019	05/12/2019											
Sample Type	Liquid	Liquid											
Batch Number	1	1											
Date of Receipt	06/12/2019	06/12/2019											
SVOC MS											LOD/LOR	Units	Method No.
Phenols													
2-Chlorophenol	<1	<1									<1	ug/l	TM16/PM30
2-Methylphenol	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1									<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1									<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol	<0.5	<0.5									<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1									<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10									<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1									<1	ug/l	TM16/PM30
Phenol	<1	<1									<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene	<1	<1									<1	ug/l	TM16/PM30
2-Methylnaphthalene	<1	<1									<1	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5									<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Di-n-butyl phthalate	<1.5	<1.5									<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Diethyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Other SVOCs													
1,2-Dichlorobenzene	<1	<1									<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene	<1	<1									<1	ug/l	TM16/PM30
1,3-Dichlorobenzene	<1	<1									<1	ug/l	TM16/PM30
1,4-Dichlorobenzene	<1	<1									<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1									<1	ug/l	TM16/PM30
2,4-Dinitrotoluene	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1									<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1									<1	ug/l	TM16/PM30
4-Bromophenylphenylether	<1	<1									<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1									<1	ug/l	TM16/PM30
4-Chlorophenylphenylether	<1	<1									<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Azobenzene	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether	<1	<1									<1	ug/l	TM16/PM30
Carbazole	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Dibenzofuran	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Hexachlorobenzene	<1	<1									<1	ug/l	TM16/PM30
Hexachlorobutadiene	<1	<1									<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1									<1	ug/l	TM16/PM30
Hexachloroethane	<1	<1									<1	ug/l	TM16/PM30
Isophorone	<0.5	<0.5									<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Nitrobenzene	<1	<1									<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	112	118									<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	106	112									<0	%	TM16/PM30

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	1-5	6-11	12-17	18-23	24-29	30-35	36-40	41-47	48-52	53-57	LOD/LOR	Units	Method No.
Sample ID	S4	BH201A	RDC304	RDC307	RDC311	RDC312	BH305	BH203MS	BH307	BH205			
Depth													
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G			
Sample Date	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019			
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether	15.9	15.5	2.8	13.5	2.3	4.5	<0.1	6.0	3.1	2.7	<0.1	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	-	-	-	-	-	-	-	-	-	-	<0.1	ug/l	TM15/PM10
Chloromethane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Chloromethane #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Vinyl Chloride	1.2	1.9	11545.3$_{AA}$	16518.1$_{AA}$	747.6	12907.8$_{AA}$	0.1	0.1	0.1	<0.1	<0.1	ug/l	TM15/PM10
Vinyl Chloride #	-	-	-	-	-	-	-	-	-	-	<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Chloroethane	<3	<3	16	26	18	16	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Chloroethane #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Trichlorofluoromethane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Trichlorofluoromethane #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)	<3	<3	3	4	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Dichloromethane (DCM)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
Dichloromethane (DCM) #	-	-	-	-	-	-	-	-	-	-	<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene	<3	<3	15	13	<3	13	<3	<3	<3	<3	<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloroethane	<3	<3	625	617	207	569	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethane #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene	<3	<3	1640$_{AA}$	2327$_{AA}$	36	121	<3	<3	<3	<3	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Bromochloromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromochloromethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Chloroform	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chloroform #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane	<2	<2	37	78	13	11	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,1-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloropropene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Carbon tetrachloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Carbon tetrachloride #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dichloroethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloroethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Benzene	0.6	<0.5	3.1	3.5	0.9	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Benzene #	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM15/PM10
Trichloroethene (TCE)	<3	<3	4	157	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Trichloroethene (TCE) #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2-Dichloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloropropane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Dibromomethane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Dibromomethane #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Bromodichloromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromodichloromethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Toluene	<5	<5	6	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
Toluene #	-	-	-	-	-	-	-	-	-	-	<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Tetrachloroethene (PCE)	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,3-Dichloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,3-Dichloropropane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromochloromethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dibromoethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dibromoethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Chlorobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chlorobenzene #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	1-5	6-11	12-17	18-23	24-29	30-35	36-40	41-47	48-52	53-57	LOD/LOR	Units	Method No.
Sample ID	S4	BH201A	RDC304	RDC307	RDC311	RDC312	BH305	BH203MS	BH307	BH205			
Depth													
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G			
Sample Date	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019	05/12/2019			
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
VOC MS Continued													
1,1,1,2-Tetrachloroethane #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Ethylbenzene	<1	<1	608	155	<1	112	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Ethylbenzene #	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM15/PM10
m/p-Xylene	<2	<2	14	40	<2	11	<2	<2	<2	<2	<2	ug/l	TM15/PM10
m/p-Xylene #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
o-Xylene	<1	<1	12	15	<1	11	<1	<1	<1	<1	<1	ug/l	TM15/PM10
o-Xylene #	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Isopropylbenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Isopropylbenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromobenzene #	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2,3-Trichloropropane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,3-Trichloropropane #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Propylbenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Propylbenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2-Chlorotoluene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Chlorotoluene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
tert-Butylbenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
tert-Butylbenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene	<3	<3	10	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
sec-Butylbenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
sec-Butylbenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
4-Isopropyltoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Isopropyltoluene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
n-Butylbenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
n-Butylbenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	88	93	94	93	92	95	94	94	83	96	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	130	117	114	107	104	109	106	101	95	108	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	58-62	63-67	68-69									
Sample ID	BH312	DUP1	TRIP BLANK									
Depth										Please see attached notes for all abbreviations and acronyms		
COC No / misc												
Containers	V P G	V P G	V									
Sample Date	05/12/2019	05/12/2019	<>									
Sample Type	Liquid	Liquid	Trip Blank (water)									
Batch Number	1	1	1									
Date of Receipt	06/12/2019	06/12/2019	06/12/2019									
VOC MS										LOD/LOR	Units	Method No.
Dichlorodifluoromethane	<2	<2	<2							<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether	0.2	15.7	-							<0.1	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	-	-	<0.1							<0.1	ug/l	TM15/PM10
Chloromethane	<3	<3	-							<3	ug/l	TM15/PM10
Chloromethane #	-	-	<3							<3	ug/l	TM15/PM10
Vinyl Chloride	<0.1	1.4	-							<0.1	ug/l	TM15/PM10
Vinyl Chloride #	-	-	<0.1							<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1							<1	ug/l	TM15/PM10
Chloroethane	<3	<3	-							<3	ug/l	TM15/PM10
Chloroethane #	-	-	<3							<3	ug/l	TM15/PM10
Trichlorofluoromethane	<3	<3	-							<3	ug/l	TM15/PM10
Trichlorofluoromethane #	-	-	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)	<3	<3	-							<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	-	-	<3							<3	ug/l	TM15/PM10
Dichloromethane (DCM)	<5	<5	-							<5	ug/l	TM15/PM10
Dichloromethane (DCM) #	-	-	<5							<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene	<3	<3	-							<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	-	-	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethane	<3	<3	-							<3	ug/l	TM15/PM10
1,1-Dichloroethane #	-	-	<3							<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene	<3	<3	-							<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	-	-	<3							<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1							<1	ug/l	TM15/PM10
Bromochloromethane	<2	<2	-							<2	ug/l	TM15/PM10
Bromochloromethane #	-	-	<2							<2	ug/l	TM15/PM10
Chloroform	<2	<2	-							<2	ug/l	TM15/PM10
Chloroform #	-	-	<2							<2	ug/l	TM15/PM10
1,1,1-Trichloroethane	<2	<2	-							<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	-	-	<2							<2	ug/l	TM15/PM10
1,1-Dichloropropene	<3	<3	-							<3	ug/l	TM15/PM10
1,1-Dichloropropene #	-	-	<3							<3	ug/l	TM15/PM10
Carbon tetrachloride	<2	<2	-							<2	ug/l	TM15/PM10
Carbon tetrachloride #	-	-	<2							<2	ug/l	TM15/PM10
1,2-Dichloroethane	<2	<2	-							<2	ug/l	TM15/PM10
1,2-Dichloroethane #	-	-	<2							<2	ug/l	TM15/PM10
Benzene	<0.5	<0.5	-							<0.5	ug/l	TM15/PM10
Benzene #	-	-	<0.5							<0.5	ug/l	TM15/PM10
Trichloroethene (TCE)	<3	<3	-							<3	ug/l	TM15/PM10
Trichloroethene (TCE) #	-	-	<3							<3	ug/l	TM15/PM10
1,2-Dichloropropane	<2	<2	-							<2	ug/l	TM15/PM10
1,2-Dichloropropane #	-	-	<2							<2	ug/l	TM15/PM10
Dibromomethane	<3	<3	-							<3	ug/l	TM15/PM10
Dibromomethane #	-	-	<3							<3	ug/l	TM15/PM10
Bromodichloromethane	<2	<2	-							<2	ug/l	TM15/PM10
Bromodichloromethane #	-	-	<2							<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM10
Toluene	<5	<5	-							<5	ug/l	TM15/PM10
Toluene #	-	-	<5							<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,2-Trichloroethane	<2	<2	-							<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	-	-	<2							<2	ug/l	TM15/PM10
Tetrachloroethene (PCE)	<3	<3	-							<3	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	-	-	<3							<3	ug/l	TM15/PM10
1,3-Dichloropropane	<2	<2	-							<2	ug/l	TM15/PM10
1,3-Dichloropropane #	-	-	<2							<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2	-							<2	ug/l	TM15/PM10
Dibromochloromethane #	-	-	<2							<2	ug/l	TM15/PM10
1,2-Dibromoethane	<2	<2	-							<2	ug/l	TM15/PM10
1,2-Dibromoethane #	-	-	<2							<2	ug/l	TM15/PM10
Chlorobenzene	<2	<2	-							<2	ug/l	TM15/PM10
Chlorobenzene #	-	-	<2							<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane	<2	<2	-							<2	ug/l	TM15/PM10

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	58-62	63-67	68-69									
Sample ID	BH312	DUP1	TRIP BLANK									
Depth										Please see attached notes for all abbreviations and acronyms		
COC No / misc												
Containers	V P G	V P G	V									
Sample Date	05/12/2019	05/12/2019	<>									
Sample Type	Liquid	Liquid	Trip Blank (water)									
Batch Number	1	1	1									
Date of Receipt	06/12/2019	06/12/2019	06/12/2019									
VOC MS Continued										LOD/LOR	Units	Method No.
1,1,1,2-Tetrachloroethane #	-	-	<2							<2	ug/l	TM15/PM10
Ethylbenzene	<1	<1	-							<1	ug/l	TM15/PM10
Ethylbenzene #	-	-	<1							<1	ug/l	TM15/PM10
m/p-Xylene	<2	<2	-							<2	ug/l	TM15/PM10
m/p-Xylene #	-	-	<2							<2	ug/l	TM15/PM10
o-Xylene	<1	<1	-							<1	ug/l	TM15/PM10
o-Xylene #	-	-	<1							<1	ug/l	TM15/PM10
Styrene	<2	<2	<2							<2	ug/l	TM15/PM10
Bromoform	<2	<2	-							<2	ug/l	TM15/PM10
Bromoform #	-	-	<2							<2	ug/l	TM15/PM10
Isopropylbenzene	<3	<3	-							<3	ug/l	TM15/PM10
Isopropylbenzene #	-	-	<3							<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4							<4	ug/l	TM15/PM10
Bromobenzene	<2	<2	-							<2	ug/l	TM15/PM10
Bromobenzene #	-	-	<2							<2	ug/l	TM15/PM10
1,2,3-Trichloropropane	<3	<3	-							<3	ug/l	TM15/PM10
1,2,3-Trichloropropane #	-	-	<3							<3	ug/l	TM15/PM10
Propylbenzene	<3	<3	-							<3	ug/l	TM15/PM10
Propylbenzene #	-	-	<3							<3	ug/l	TM15/PM10
2-Chlorotoluene	<3	<3	-							<3	ug/l	TM15/PM10
2-Chlorotoluene #	-	-	<3							<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene	<3	<3	-							<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	-	-	<3							<3	ug/l	TM15/PM10
4-Chlorotoluene	<3	<3	-							<3	ug/l	TM15/PM10
4-Chlorotoluene #	-	-	<3							<3	ug/l	TM15/PM10
tert-Butylbenzene	<3	<3	-							<3	ug/l	TM15/PM10
tert-Butylbenzene #	-	-	<3							<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene	<3	<3	-							<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	-	-	<3							<3	ug/l	TM15/PM10
sec-Butylbenzene	<3	<3	-							<3	ug/l	TM15/PM10
sec-Butylbenzene #	-	-	<3							<3	ug/l	TM15/PM10
4-Isopropyltoluene	<3	<3	-							<3	ug/l	TM15/PM10
4-Isopropyltoluene #	-	-	<3							<3	ug/l	TM15/PM10
1,3-Dichlorobenzene	<3	<3	-							<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	-	-	<3							<3	ug/l	TM15/PM10
1,4-Dichlorobenzene	<3	<3	-							<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	-	-	<3							<3	ug/l	TM15/PM10
n-Butylbenzene	<3	<3	-							<3	ug/l	TM15/PM10
n-Butylbenzene #	-	-	<3							<3	ug/l	TM15/PM10
1,2-Dichlorobenzene	<3	<3	-							<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	-	-	<3							<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3							<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	97	93	95							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	110	105	107							<0	%	TM15/PM10

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM

Matrix : Liquid

Reference:

Location: Stolthaven

Contact: Guillem Badiella Anglada

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
19/19999	1	TRIP BLANK		68-69	All analyses	No sampling date given

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/19999

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x20 Dilution

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM33	Determination of Anionic surfactants by reaction with Methylene Blue to form complexes which are analysed spectrophotometrically. (MBAS)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.				

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.				
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM127	Determination of specific Volatile Fatty Acids with Liquid Chromatography and Mass Spectroscopy detection.	PM0	No preparation is required.				

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AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	Guillem Badiella Anglada
Date :	14th January, 2020
Your reference :	
Our reference :	Test Report 19/19999 Batch 2
Location :	Stolthaven
Date samples received :	7th December, 2019
Status :	Final report
Issue :	2

Fourteen samples were received for analysis on 7th December, 2019 of which fourteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	70-74	75-79	80-84	85-89	90-94	95-99	100-105	106-110	111-115	116-120	LOD/LOR	Units	Method No.
Sample ID	PZ16	PZ7	PZ13	PZ5	BH106A	BH106	PZ14	PZ4	PZ12	PZ15			
Depth	1.56-4.95	4.33-12.2	1.83-5.06	5.77	2.700-10.620	2.17-8.18	1.06-4.06	4.13-44.42	0.9-4.780	3.33-14.55			
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G	V P G			
Sample Date	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019			
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013	0.027	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	<0.013	0.044	<0.013	<0.013	0.016	0.020	<0.013	0.019	0.241	<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	<0.014	0.020	<0.014	<0.014	<0.014	<0.014	<0.014	0.019	<0.014	<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	<0.011	0.224	<0.011	<0.011	0.015	0.013	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	<0.013	0.069	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.030	<0.013	ug/l	TM4/PM30
Fluoranthene #	<0.012	<0.012	0.396	<0.012	<0.012	0.037	<0.012	<0.012	0.044	0.187	<0.012	ug/l	TM4/PM30
Pyrene #	<0.013	0.026	0.383	<0.013	<0.013	0.038	<0.013	0.030	0.089	0.123	<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	<0.015	0.281	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	<0.011	0.226	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.018	<0.018	0.444	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016	0.261	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011	0.133	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011	0.096	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	<0.195	2.634	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	0.581	<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	0.32	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	74	75	80	74	76	79	77	75	77	76	<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	7.6	3.6	0.3	0.2	0.1	148.8	14.3	60.4	15.7	<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	100	99	98	100	99	102	99	100	92	90	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	111	110	110	112	110	112	112	112	120	101	<0	%	TM15/PM10
SVOC TICs	-	-	-	-	-	-	See Attached	-	-	-		None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10	<10	<10	31	<10	<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	<10	<10	<10	35	<10	<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10	66	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	70-74	75-79	80-84	85-89	90-94	95-99	100-105	106-110	111-115	116-120	LOD/LOR	Units	Method No.
Sample ID	PZ16	PZ7	PZ13	PZ5	BH106A	BH106	PZ14	PZ4	PZ12	PZ15			
Depth	1.56-4.95	4.33-12.2	1.83-5.06	5.77	2.700-10.620	2.17-8.18	1.06-4.06	4.13-44.42	0.9-4.780	3.33-14.55			
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G	V P G			
Sample Date	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	<5	<5 SV	<5	<5	<5	<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	<10	<10 SV	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10	<10 SV	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	<10	<10 SV	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10	<10	<10	<10	66	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Alcohols/Acetates													
Methyl Alcohol (Methanol)	<500	-	-	-	-	-	<500	-	-	-	<500	ug/l	TM83/PM10
Ethyl Alcohol (Ethanol)	<500	-	-	-	-	-	<500	-	-	-	<500	ug/l	TM83/PM10
i-Propyl Alcohol (Isopropanol)	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Propyl Alcohol	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Butyl Alcohol	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Pentyl Alcohol	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Hexyl Alcohol	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Heptyl Alcohol	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
Methyl Acetate	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
Ethyl Acetate	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
i-Propyl Acetate	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Propyl Acetate	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Butyl Acetate	<100	-	-	-	-	-	<100	-	-	-	<100	ug/l	TM83/PM10
Ammoniacal Nitrogen as N #	-	-	-	-	-	-	31.45	-	-	-	<0.03	mg/l	TM38/PM0
Acetic Acid	-	-	-	-	-	-	-	-	-	-	<10	mg/l	TM127/PM0
Propanoic Acid	-	-	-	-	-	-	-	-	-	-	<1	mg/l	TM127/PM0
2-methyl propanoic acid / Butanoic acid	-	-	-	-	-	-	-	-	-	-	<1	mg/l	TM127/PM0
3-methyl butanoic acid	-	-	-	-	-	-	-	-	-	-	<0.5	mg/l	TM127/PM0
Pentanoic acid	-	-	-	-	-	-	-	-	-	-	<0.5	mg/l	TM127/PM0
4-methyl pentanoic acid	-	-	-	-	-	-	-	-	-	-	<0.5	mg/l	TM127/PM0
Hexanoic acid	-	-	-	-	-	-	-	-	-	-	<0.5	mg/l	TM127/PM0
Heptanoic acid	-	-	-	-	-	-	-	-	-	-	<0.5	mg/l	TM127/PM0
COD (Settled) #	-	-	-	-	-	-	118	-	61	-	<7	mg/l	TM57/PM0
Total Nitrogen	-	-	-	-	-	-	33.2	-	-	-	<0.5	mg/l	TM38/TM125/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	121-125	126-130	131-135								LOD/LOR	Units	Method No.
Sample ID	PZ6	PZ17	DUP2										
Depth	1.31-4.9	3.33-14.55											
COC No / misc													
Containers	V P G	V P G	V P G										
Sample Date	06/12/2019	06/12/2019	06/12/2019										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	2	2	2										
Date of Receipt	07/12/2019	07/12/2019	07/12/2019										
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1								<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	0.037	<0.013								<0.013	ug/l	TM4/PM30
Acenaphthene #	0.124	2.190	0.121								<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	0.022	<0.014								<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	0.016	<0.011								<0.011	ug/l	TM4/PM30
Anthracene #	0.023	0.168	0.020								<0.013	ug/l	TM4/PM30
Fluoranthene #	0.033	0.385	0.033								<0.012	ug/l	TM4/PM30
Pyrene #	0.055	0.374	0.054								<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	0.022	<0.015								<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	0.014	<0.011								<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.018	<0.018	<0.018								<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016	<0.016								<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011	<0.011								<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01	<0.01								<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011	<0.011								<0.011	ug/l	TM4/PM30
PAH 16 Total #	0.235	3.228	0.228								<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	<0.01								<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	<0.01								<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	74	84	68 SV								<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	115.4	12.1	114.8								<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1								<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	91	90	90								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	101	101								<0	%	TM15/PM10
SVOC TICs	-	-	-									None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	121-125	126-130	131-135									
Sample ID	PZ6	PZ17	DUP2									
Depth	1.31-4.9	3.33-14.55										
COC No / misc												
Containers	V P G	V P G	V P G									
Sample Date	06/12/2019	06/12/2019	06/12/2019									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	2	2	2									
Date of Receipt	07/12/2019	07/12/2019	07/12/2019									

Please see attached notes for all abbreviations and acronyms

				LOD/LOR	Units	Method No.
TPH CWG						
Aromatics						
>C5-EC7 #	<10	<10	<10	<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Alcohols/Acetates						
Methyl Alcohol (Methanol)	-	-	-	<500	ug/l	TM83/PM10
Ethyl Alcohol (Ethanol)	-	-	-	<500	ug/l	TM83/PM10
i-Propyl Alcohol (Isopropanol)	-	-	-	<100	ug/l	TM83/PM10
n-Propyl Alcohol	-	-	-	<100	ug/l	TM83/PM10
n-Butyl Alcohol	-	-	-	<100	ug/l	TM83/PM10
n-Pentyl Alcohol	-	-	-	<100	ug/l	TM83/PM10
n-Hexyl Alcohol	-	-	-	<100	ug/l	TM83/PM10
n-Heptyl Alcohol	-	-	-	<100	ug/l	TM83/PM10
Methyl Acetate	-	-	-	<100	ug/l	TM83/PM10
Ethyl Acetate	-	-	-	<100	ug/l	TM83/PM10
i-Propyl Acetate	-	-	-	<100	ug/l	TM83/PM10
n-Propyl Acetate	-	-	-	<100	ug/l	TM83/PM10
n-Butyl Acetate	-	-	-	<100	ug/l	TM83/PM10
Ammoniacal Nitrogen as N #	-	-	-	<0.03	mg/l	TM38/PM0
Acetic Acid	-	<10	-	<10	mg/l	TM127/PM0
Propanoic Acid	-	<1	-	<1	mg/l	TM127/PM0
2-methyl propanoic acid / Butanoic acid	-	<1	-	<1	mg/l	TM127/PM0
3-methyl butanoic acid	-	<0.5	-	<0.5	mg/l	TM127/PM0
Pentanoic acid	-	<0.5	-	<0.5	mg/l	TM127/PM0
4-methyl pentanoic acid	-	<0.5	-	<0.5	mg/l	TM127/PM0
Hexanoic acid	-	<0.5	-	<0.5	mg/l	TM127/PM0
Heptanoic acid	-	<0.5	-	<0.5	mg/l	TM127/PM0
COD (Settled) #	-	69	-	<7	mg/l	TM57/PM0
Total Nitrogen	-	-	-	<0.5	mg/l	TM38/TM125/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM **SVOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	100-105												
Sample ID	PZ14												
Depth	1.06-4.06										Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V H P G												
Sample Date	06/12/2019												
Sample Type	Ground Water												
Batch Number	2												
Date of Receipt	07/12/2019										LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<1										<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5										<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5										<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5										<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1										<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5										<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1										<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5										<0.5	ug/l	TM16/PM30
4-Methylphenol	<1										<1	ug/l	TM16/PM30
4-Nitrophenol	<10										<10	ug/l	TM16/PM30
Pentachlorophenol	<1										<1	ug/l	TM16/PM30
Phenol	<1										<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene #	<1										<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1										<1	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5										<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1										<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5										<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1										<1	ug/l	TM16/PM30
Diethyl phthalate #	<1										<1	ug/l	TM16/PM30
Dimethyl phthalate	<1										<1	ug/l	TM16/PM30
Other SVOCs													
1,2-Dichlorobenzene #	<1										<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1										<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<1										<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1										<1	ug/l	TM16/PM30
2-Nitroaniline	<1										<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5										<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1										<1	ug/l	TM16/PM30
3-Nitroaniline	<1										<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1										<1	ug/l	TM16/PM30
4-Chloroaniline	<1										<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1										<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5										<0.5	ug/l	TM16/PM30
Azobenzene #	<0.5										<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5										<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<1										<1	ug/l	TM16/PM30
Carbazole #	<0.5										<0.5	ug/l	TM16/PM30
Dibenzofuran #	<0.5										<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<1										<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1										<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1										<1	ug/l	TM16/PM30
Hexachloroethane #	<1										<1	ug/l	TM16/PM30
Isophorone #	<0.5										<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5										<0.5	ug/l	TM16/PM30
Nitrobenzene #	<1										<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	123										<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	115										<0	%	TM16/PM30

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	70-74	75-79	80-84	85-89	90-94	95-99	100-105	106-110	111-115	116-120	LOD/LOR	Units	Method No.
Sample ID	PZ16	PZ7	PZ13	PZ5	BH106A	BH106	PZ14	PZ4	PZ12	PZ15			
Depth	1.56-4.95	4.33-12.2	1.83-5.06	5.77	2.700-10.620	2.17-8.18	1.06-4.06	4.13-44.42	0.9-4.780	3.33-14.55			
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V H P G	V P G	V P G	V P G			
Sample Date	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019	06/12/2019			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019	07/12/2019			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	7.6	3.6	0.3	0.2	0.1	148.8	14.3	60.4	15.7	<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	0.9	<0.1	<0.1	<0.1	0.2	<0.1	0.1	1.0	<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chloroform #	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	100	99	98	100	99	102	99	100	92	90	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	111	110	110	112	110	112	112	112	120	101	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	121-125	126-130	131-135	136									
Sample ID	PZ6	PZ17	DUP2	TRIP BLANK									
Depth	1.31-4.9	3.33-14.55									Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V P G	V P G	V P G	V									
Sample Date	06/12/2019	06/12/2019	06/12/2019	06/12/2019									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	2	2	2	2									
Date of Receipt	07/12/2019	07/12/2019	07/12/2019	07/12/2019									
VOC MS											LOD/LOR	Units	Method No.
Dichlorodifluoromethane	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	115.4	12.1	114.8	<0.1							<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	0.4	<0.1	<0.1							<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1							<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5							<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1							<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5							<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1							<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1							<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4							<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	91	90	90	90							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	101	101	101							<0	%	TM15/PM10

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/19999
Sample number: 105
Sample identity: PZ14
Sample depth: 1.06-4.06
Sample Type: Ground Water
Units: ug/l

Method: SVOC
Matrix: Liquid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
10544-50-0	Cyclic octaatomic sulfur	11.361	94	3371

Client Name: AECOM

Matrix : Liquid

Reference:

Location: Stolthaven

Contact: Guillem Badiella Anglada

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/19999

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM127	Determination of specific Volatile Fatty Acids with Liquid Chromatography and Mass Spectroscopy detection.	PM0	No preparation is required.				

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AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	Guillem Badiella Anglada
Date :	17th December, 2019
Your reference :	
Our reference :	Test Report 19/19999 Batch 3 Schedule A
Location :	Stolthaven
Date samples received :	10th December, 2019
Status :	Final report
Issue :	1

Twelve samples were received for analysis on 10th December, 2019 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	137-141	142-147	150-155	156-160	161-165	166-170	171-176	177-181	182-186	187-191	LOD/LOR	Units	Method No.
Sample ID	WS20	BH105A	S16	PZ3	PZ11	PZ9	S11	BH204	BH102B	BH225			
Depth	0.82-2.86	4.13-14.18	0.58-2.65	4.29-15.04	1.14-4.60	4.34-14.52	0.70-3.74	0.50-2.77	3.34-14.4	0.63-2.52			
COC No / misc													
Containers	V P G	V P G	V H P G	V P G	V P G	V P G	V H P G	V P G	V P G	V P G			
Sample Date	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	3	3	3	3	3	3	3	3	3	3			
Date of Receipt	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019			
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.073	0.024	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	<0.013	<0.013	0.094	<0.013	<0.013	0.914	0.074	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.072	0.055	<0.014	<0.014	<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.026	0.026	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	<0.013	<0.013	<0.013	0.013	<0.013	0.167	0.035	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Fluoranthene #	<0.012	<0.012	0.030	0.109	0.020	<0.012	0.557	0.252	<0.012	0.032	<0.012	ug/l	TM4/PM30
Pyrene #	<0.013	<0.013	0.028	0.088	0.097	0.016	0.464	0.266	0.037	0.031	<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.093	0.037	<0.015	<0.015	<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.079	0.039	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	0.092	0.051	<0.018	<0.018	<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.057	<0.016	<0.016	<0.016	<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.026	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.022	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	<0.195	<0.195	0.291	<0.195	<0.195	2.642	0.859	<0.195	<0.195	<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	0.04	<0.01	<0.01	<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	81	76	79	77	82	74	78	74	81	78	<0	%	TM4/PM30
VOC TICs	-	-	-	-	-	-	ND	-	-	-		None	TM15/PM10
Methyl Tertiary Butyl Ether #	31.9	24.9	179.7	44.3	197.3	96.3	121.3	114.4	34.3	56.2	<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.0	2.4	<0.5	0.9	<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	88	94	87	91	88	92	90	94	91	91	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	103	101	103	103	103	104	109	100	105	<0	%	TM15/PM10
SVOC TICs	ND	-	-	-	-	-	ND	-	-	-		None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	<10	20	22	<10	<10	<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10	65	45	<10	<10	<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	<5	174	<5	<5	<5	<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10	<10	170	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10	80	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10	<10	509	67	<10	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	137-141	142-147	150-155	156-160	161-165	166-170	171-176	177-181	182-186	187-191	LOD/LOR	Units	Method No.
Sample ID	WS20	BH105A	S16	PZ3	PZ11	PZ9	S11	BH204	BH102B	BH225			
Depth	0.82-2.86	4.13-14.18	0.58-2.65	4.29-15.04	1.14-4.60	4.34-14.52	0.70-3.74	0.50-2.77	3.34-14.4	0.63-2.52			
COC No / misc													
Containers	V P G	V P G	V H P G	V P G	V P G	V P G	V H P G	V P G	V P G	V P G			
Sample Date	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	3	3	3	3	3	3	3	3	3	3			
Date of Receipt	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	<5	111	<5	<5	<5	<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	<10	190	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10	120	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10	<10	421	<10	<10	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10	<10	930	67	<10	<10	<10	ug/l	TM5/TM36/PM12/PM16/PM30
Alcohols/Acetates													
Methyl Alcohol (Methanol)	-	-	-	-	<500	-	<500	-	-	-	<500	ug/l	TM83/PM10
Ethyl Alcohol (Ethanol)	-	-	-	-	<500	-	<500	-	-	-	<500	ug/l	TM83/PM10
i-Propyl Alcohol (Isopropanol)	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Propyl Alcohol	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Butyl Alcohol	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Pentyl Alcohol	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Hexyl Alcohol	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Heptyl Alcohol	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
Methyl Acetate	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
Ethyl Acetate	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
i-Propyl Acetate	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Propyl Acetate	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
n-Butyl Acetate	-	-	-	-	<100	-	<100	-	-	-	<100	ug/l	TM83/PM10
Sulphate as SO4 #	154.9	376.4	583.4	-	-	-	-	-	-	-	<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	-	-	356.39	-	-	-	62.07	-	-	-	<0.03	mg/l	TM38/PM0
Dissolved Methane #	>>2409	>>2955	-	-	-	-	-	-	-	-	<1	ug/l	TM25/PM0
Acetic Acid	-	-	-	-	-	-	-	<10	-	<10	<10	mg/l	TM127/PM0
Propanoic Acid	-	-	-	-	-	-	-	<1	-	<1	<1	mg/l	TM127/PM0
2-methyl propanoic acid / Butanoic acid	-	-	-	-	-	-	-	<1	-	<1	<1	mg/l	TM127/PM0
3-methyl butanoic acid	-	-	-	-	-	-	-	<0.5	-	<0.5	<0.5	mg/l	TM127/PM0
Pentanoic acid	-	-	-	-	-	-	-	<0.5	-	<0.5	<0.5	mg/l	TM127/PM0
4-methyl pentanoic acid	-	-	-	-	-	-	-	<0.5	-	<0.5	<0.5	mg/l	TM127/PM0
Hexanoic acid	-	-	-	-	-	-	-	<0.5	-	<0.5	<0.5	mg/l	TM127/PM0
Heptanoic acid	-	-	-	-	-	-	-	<0.5	-	<0.5	<0.5	mg/l	TM127/PM0
Ethyl Tert Butyl Ether (ETBE) #	<1	-	-	-	28	-	-	-	-	-	<1	ug/l	TM83/PM10
Di isopropyl Ether (DIPE) #	<1	-	-	-	<1	-	-	-	-	-	<1	ug/l	TM83/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	137-141	142-147	150-155	156-160	161-165	166-170	171-176	177-181	182-186	187-191	LOD/LOR	Units	Method No.
Sample ID	WS20	BH105A	S16	PZ3	PZ11	PZ9	S11	BH204	BH102B	BH225			
Depth	0.82-2.86	4.13-14.18	0.58-2.65	4.29-15.04	1.14-4.60	4.34-14.52	0.70-3.74	0.50-2.77	3.34-14.4	0.63-2.52			
COC No / misc													
Containers	V P G	V P G	V H P G	V P G	V P G	V P G	V H P G	V P G	V P G	V P G			
Sample Date	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	3	3	3	3	3	3	3	3	3	3			
Date of Receipt	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019			
Tert Butyl Alcohol (TBA)	273	-	-	-	322	-	-	-	-	-	<100	ug/l	TM83/PM10
Tert Amyl Methyl Ether (TAME) #	<1	-	-	-	<1	-	-	-	-	-	<1	ug/l	TM83/PM10
Ethanol	<100	-	-	-	<100	-	-	-	-	-	<100	ug/l	TM83/PM10
Anionic Surfactants	-	-	-	-	-	-	-	0.7	-	1.4	<0.2	mg/l	TM33/PM0
COD (Settled) #	26	-	-	-	46	-	95	-	-	-	<7	mg/l	TM57/PM0
Total Nitrogen	7.7	-	318.2	-	-	-	63.6	-	-	-	<0.5	mg/l	TM38/TM125/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM **SVOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	137-141	171-176									LOD/LOR	Units	Method No.
Sample ID	WS20	S11											
Depth	0.82-2.86	0.70-3.74											
COC No / misc													
Containers	V P G	V H P G											
Sample Date	09/12/2019	09/12/2019											
Sample Type	Ground Water	Ground Water											
Batch Number	3	3											
Date of Receipt	10/12/2019	10/12/2019											
SVOC MS													
Phenols													
2-Chlorophenol #	<1	<1									<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	4.5									<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1									<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1									<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1									<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10									<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1									<1	ug/l	TM16/PM30
Phenol	<1	<1									<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene #	<1	<1									<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1									<1	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5									<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5									<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1									<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Other SVOCs													
1,2-Dichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1									<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5+	<0.5+									<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1									<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1									<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1									<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1									<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1	<1									<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Azobenzene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<1	<1									<1	ug/l	TM16/PM30
Carbazole #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Dibenzofuran #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<1	<1									<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1	<1									<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1									<1	ug/l	TM16/PM30
Hexachloroethane #	<1	<1									<1	ug/l	TM16/PM30
Isophorone #	<0.5	4.3									<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Nitrobenzene #	<1	<1									<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	123	119									<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	108	127									<0	%	TM16/PM30

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	137-141	142-147	150-155	156-160	161-165	166-170	171-176	177-181	182-186	187-191	LOD/LOR	Units	Method No.
Sample ID	WS20	BH105A	S16	PZ3	PZ11	PZ9	S11	BH204	BH102B	BH225			
Depth	0.82-2.86	4.13-14.18	0.58-2.65	4.29-15.04	1.14-4.60	4.34-14.52	0.70-3.74	0.50-2.77	3.34-14.4	0.63-2.52			
COC No / misc													
Containers	V P G	V P G	V H P G	V P G	V P G	V P G	V H P G	V P G	V P G	V P G			
Sample Date	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	3	3	3	3	3	3	3	3	3	3			
Date of Receipt	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	31.9	24.9	179.7	44.3	197.3	96.3	121.3	114.4	34.3	56.2	<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Vinyl Chloride #	0.9	0.1	4.4	<0.1	0.4	<0.1	3.5	8.2	<0.1	0.7	<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3	<3	8	<3	6	<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethane #	3	<3	17	<3	<3	<3	<3	25	<3	4	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	12	<3	<3	<3	<3	10	<3	<3	<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.0	2.4	<0.5	0.9	<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	5	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	11	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	88	94	87	91	88	92	90	94	91	91	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	103	101	103	103	103	104	109	100	105	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	192												
Sample ID	TRIP BLANK												
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V												
Sample Date	09/12/2019												
Sample Type	Trip Blank (water)												
Batch Number	3												
Date of Receipt	10/12/2019										LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1										<0.1	ug/l	TM15/PM10
Chloromethane #	<3										<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1										<0.1	ug/l	TM15/PM10
Bromomethane	<1										<1	ug/l	TM15/PM10
Chloroethane #	<3										<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3										<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3										<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5										<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1										<1	ug/l	TM15/PM10
Bromochloromethane #	<2										<2	ug/l	TM15/PM10
Chloroform #	<2										<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2										<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2										<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2										<2	ug/l	TM15/PM10
Benzene #	<0.5										<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2										<2	ug/l	TM15/PM10
Dibromomethane #	<3										<3	ug/l	TM15/PM10
Bromodichloromethane #	<2										<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2										<2	ug/l	TM15/PM10
Toluene #	<5										<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2										<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2										<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2										<2	ug/l	TM15/PM10
Dibromochloromethane #	<2										<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2										<2	ug/l	TM15/PM10
Chlorobenzene #	<2										<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2										<2	ug/l	TM15/PM10
Ethylbenzene #	<1										<1	ug/l	TM15/PM10
m/p-Xylene #	<2										<2	ug/l	TM15/PM10
o-Xylene #	<1										<1	ug/l	TM15/PM10
Styrene	<2										<2	ug/l	TM15/PM10
Bromoform #	<2										<2	ug/l	TM15/PM10
Isopropylbenzene #	<3										<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4										<4	ug/l	TM15/PM10
Bromobenzene #	<2										<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3										<3	ug/l	TM15/PM10
Propylbenzene #	<3										<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3										<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3										<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3										<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3										<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3										<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3										<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3										<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3										<3	ug/l	TM15/PM10
n-Butylbenzene #	<3										<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3										<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2										<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3										<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3										<3	ug/l	TM15/PM10
Naphthalene	<2										<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3										<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	92										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	105										<0	%	TM15/PM10

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/19999						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/19999

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			
TM33	Determination of Anionic surfactants by reaction with Methylene Blue to form complexes which are analysed spectrophotometrically. (MBAS)	PM0	No preparation is required.				

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM38/TM125	Total Nitogen/Organic Nitrogen by calculation	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM127	Determination of specific Volatile Fatty Acids with Liquid Chromatography and Mass Spectroscopy detection.	PM0	No preparation is required.				

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AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	Guillem Badiella Anglada
Date :	18th December, 2019
Your reference :	
Our reference :	Test Report 19/19999 Batch 3 Schedule B
Location :	Stolthaven
Date samples received :	10th December, 2019
Status :	Final report
Issue :	1

Twelve samples were received for analysis on 10th December, 2019 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	150-155	187-191									LOD/LOR	Units	Method No.
Sample ID	S16	BH225											
Depth	0.58-2.65	0.63-2.52											
COC No / misc													
Containers	V H P G	V P G											
Sample Date	09/12/2019	09/12/2019											
Sample Type	Ground Water	Ground Water											
Batch Number	3	3											
Date of Receipt	10/12/2019	10/12/2019											
Ammoniacal Nitrogen as N #	-	194.45									<0.03	mg/l	TM38/PM0
Ethyl Tert Butyl Ether (ETBE) #	<1	-									<1	ug/l	TM83/PM10
Di isopropyl Ether (DIPE) #	<1	-									<1	ug/l	TM83/PM10
Tert Butyl Alcohol (TBA)	188	-									<100	ug/l	TM83/PM10
Tert Amyl Methyl Ether (TAME) #	<1	-									<1	ug/l	TM83/PM10
Ethanol	<100	-									<100	ug/l	TM83/PM10
COD (Settled) #	68	-									<7	mg/l	TM57/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Product

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	148-149										Please see attached notes for all abbreviations and acronyms		
Sample ID	S15-NAPL												
Depth													
COC No / misc													
Containers	V												
Sample Date	09/12/2019												
Sample Type	Product												
Batch Number	3												
Date of Receipt	10/12/2019											LOD/LOR	Units	Method No.
Whole Oil Trace #	See Attached												None	TM1/PM0
TPH CWG														
Aliphatics														
>C5-C6 #	<0.01											<0.01	%	TM1/PM0
>C6-C8 #	<0.01											<0.01	%	TM1/PM0
>C8-C10 #	0.85											<0.01	%	TM1/PM0
>C10-C12 #	7.96											<0.01	%	TM1/PM0
>C12-C16 #	32.28											<0.01	%	TM1/PM0
>C16-C21 #	31.80											<0.01	%	TM1/PM0
>C21-C35 #	6.61											<0.01	%	TM1/PM0
Aromatics														
>EC6-EC8 #	<0.01											<0.01	%	TM1/PM0
>EC8-EC10 #	0.01											<0.01	%	TM1/PM0
>EC10-EC12 #	0.06											<0.01	%	TM1/PM0
>EC12-EC16 #	4.11											<0.01	%	TM1/PM0
>EC16-EC21 #	11.89											<0.01	%	TM1/PM0
>EC21-EC35 #	4.41											<0.01	%	TM1/PM0
SVOC TICs	See Attached												None	TM16/PM0
VOC TICs	See Attached												None	TM124/PM0
PAH MS														
Naphthalene	<0.01											<0.01	%	TM16/PM0
Acenaphthylene	<0.01											<0.01	%	TM16/PM0
Acenaphthene	<0.01											<0.01	%	TM16/PM0
Fluorene	<0.01											<0.01	%	TM16/PM0
Phenanthrene	<0.01											<0.01	%	TM16/PM0
Anthracene	<0.01											<0.01	%	TM16/PM0
Fluoranthene	<0.01											<0.01	%	TM16/PM0
Pyrene	<0.01											<0.01	%	TM16/PM0
Benzo(a)anthracene	<0.01											<0.01	%	TM16/PM0
Chrysene	<0.01											<0.01	%	TM16/PM0
Benzo(bk)fluoranthene	<0.01											<0.01	%	TM16/PM0
Benzo(a)pyrene	<0.01											<0.01	%	TM16/PM0
Indeno(123cd)pyrene	<0.01											<0.01	%	TM16/PM0
Dibenzo(ah)anthracene	<0.01											<0.01	%	TM16/PM0
Benzo(ghi)perylene	<0.01											<0.01	%	TM16/PM0
PAH 16 Total	<0.01											<0.01	%	TM16/PM0

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

SVOC Report : **Product**

EMT Sample No.	148-149												
Sample ID	S15-NAPL												
Depth													
COC No / misc													
Containers	V												
Sample Date	09/12/2019												
Sample Type	Product												
Batch Number	3												
Date of Receipt	10/12/2019												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol	<0.01										<0.01	%	TM16/PM0
2-Methylphenol	<0.01										<0.01	%	TM16/PM0
2-Nitrophenol	<0.01										<0.01	%	TM16/PM0
2,4-Dichlorophenol	<0.01										<0.01	%	TM16/PM0
2,4-Dimethylphenol	<0.01										<0.01	%	TM16/PM0
2,4,5-Trichlorophenol	<0.01										<0.01	%	TM16/PM0
2,4,6-Trichlorophenol	<0.01										<0.01	%	TM16/PM0
4-Chloro-3-methylphenol	<0.01										<0.01	%	TM16/PM0
4-Methylphenol	<0.01										<0.01	%	TM16/PM0
4-Nitrophenol	<0.01										<0.01	%	TM16/PM0
Pentachlorophenol	<0.01										<0.01	%	TM16/PM0
Phenol	<0.01										<0.01	%	TM16/PM0
PAHs													
2-Chloronaphthalene	<0.01										<0.01	%	TM16/PM0
2-Methylnaphthalene	<0.01										<0.01	%	TM16/PM0
Naphthalene	<0.01										<0.01	%	TM16/PM0
Acenaphthylene	<0.01										<0.01	%	TM16/PM0
Acenaphthene	<0.01										<0.01	%	TM16/PM0
Fluorene	<0.01										<0.01	%	TM16/PM0
Phenanthrene	<0.01										<0.01	%	TM16/PM0
Anthracene	<0.01										<0.01	%	TM16/PM0
Fluoranthene	<0.01										<0.01	%	TM16/PM0
Pyrene	<0.01										<0.01	%	TM16/PM0
Benzo(a)anthracene	<0.01										<0.01	%	TM16/PM0
Chrysene	<0.01										<0.01	%	TM16/PM0
Benzo(bk)fluoranthene	<0.01										<0.01	%	TM16/PM0
Benzo(a)pyrene	<0.01										<0.01	%	TM16/PM0
Indeno(123cd)pyrene	<0.01										<0.01	%	TM16/PM0
Dibenzo(ah)anthracene	<0.01										<0.01	%	TM16/PM0
Benzo(ghi)perylene	<0.01										<0.01	%	TM16/PM0
Phthalates													
Bis(2-ethylhexyl) phthalate	<0.01										<0.01	%	TM16/PM0
Butylbenzyl phthalate	<0.01										<0.01	%	TM16/PM0
Di-n-butyl phthalate	<0.01										<0.01	%	TM16/PM0
Di-n-Octyl phthalate	<0.01										<0.01	%	TM16/PM0
Diethyl phthalate	<0.01										<0.01	%	TM16/PM0
Dimethyl phthalate	<0.01										<0.01	%	TM16/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

SVOC Report : **Product**

EMT Sample No.	148-149												
Sample ID	S15-NAPL												
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V												
Sample Date	09/12/2019												
Sample Type	Product												
Batch Number	3												
Date of Receipt	10/12/2019										LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<0.01										<0.01	%	TM16/PM0
1,2,4-Trichlorobenzene	<0.01										<0.01	%	TM16/PM0
1,3-Dichlorobenzene	<0.01										<0.01	%	TM16/PM0
1,4-Dichlorobenzene	<0.01										<0.01	%	TM16/PM0
2-Nitroaniline	<0.01										<0.01	%	TM16/PM0
2,4-Dinitrotoluene	<0.01										<0.01	%	TM16/PM0
2,6-Dinitrotoluene	<0.01										<0.01	%	TM16/PM0
3-Nitroaniline	<0.01										<0.01	%	TM16/PM0
4-Bromophenylphenylether	<0.01										<0.01	%	TM16/PM0
4-Chloroaniline	<0.01										<0.01	%	TM16/PM0
4-Chlorophenylphenylether	<0.01										<0.01	%	TM16/PM0
4-Nitroaniline	<0.01										<0.01	%	TM16/PM0
Azobenzene	<0.01										<0.01	%	TM16/PM0
Bis(2-chloroethoxy)methane	<0.01										<0.01	%	TM16/PM0
Bis(2-chloroethyl)ether	<0.01										<0.01	%	TM16/PM0
Carbazole	<0.01										<0.01	%	TM16/PM0
Dibenzofuran	<0.01										<0.01	%	TM16/PM0
Hexachlorobenzene	<0.01										<0.01	%	TM16/PM0
Hexachlorobutadiene	<0.01										<0.01	%	TM16/PM0
Hexachlorocyclopentadiene	<0.01										<0.01	%	TM16/PM0
Hexachloroethane	<0.01										<0.01	%	TM16/PM0
Isophorone	<0.01										<0.01	%	TM16/PM0
N-nitrosodi-n-propylamine	<0.01										<0.01	%	TM16/PM0
Nitrobenzene	<0.01										<0.01	%	TM16/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

VOC Report : **Product**

EMT Sample No.	148-149												
Sample ID	S15-NAPL												
Depth													
COC No / misc													
Containers	V												
Sample Date	09/12/2019												
Sample Type	Product												
Batch Number	3												
Date of Receipt	10/12/2019												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<0.01										<0.01	%	TM124/PM0
Methyl Tertiary Butyl Ether	<0.05										<0.05	%	TM124/PM0
Chloromethane	<0.01										<0.01	%	TM124/PM0
Vinyl Chloride	<0.01										<0.01	%	TM124/PM0
Bromomethane	<0.01										<0.01	%	TM124/PM0
Chloroethane	<0.01										<0.01	%	TM124/PM0
Trichlorofluoromethane	<0.01										<0.01	%	TM124/PM0
1,1-Dichloroethene (1,1 DCE)	<0.01										<0.01	%	TM124/PM0
Dichloromethane (DCM)	<0.01										<0.01	%	TM124/PM0
trans-1-2-Dichloroethene	<0.01										<0.01	%	TM124/PM0
1,1-Dichloroethane	<0.01										<0.01	%	TM124/PM0
cis-1-2-Dichloroethene	<0.01										<0.01	%	TM124/PM0
2,2-Dichloropropane	<0.01										<0.01	%	TM124/PM0
Bromochloromethane	<0.01										<0.01	%	TM124/PM0
Chloroform	<0.01										<0.01	%	TM124/PM0
1,1,1-Trichloroethane	<0.01										<0.01	%	TM124/PM0
1,1-Dichloropropene	<0.01										<0.01	%	TM124/PM0
Carbon tetrachloride	<0.01										<0.01	%	TM124/PM0
1,2-Dichloroethane	<0.01										<0.01	%	TM124/PM0
Benzene	<0.01										<0.01	%	TM124/PM0
Trichloroethene (TCE)	<0.01										<0.01	%	TM124/PM0
1,2-Dichloropropane	<0.01										<0.01	%	TM124/PM0
Dibromomethane	<0.01										<0.01	%	TM124/PM0
Bromodichloromethane	<0.01										<0.01	%	TM124/PM0
cis-1-3-Dichloropropene	<0.01										<0.01	%	TM124/PM0
Toluene	<0.01										<0.01	%	TM124/PM0
trans-1-3-Dichloropropene	<0.01										<0.01	%	TM124/PM0
1,1,2-Trichloroethane	<0.01										<0.01	%	TM124/PM0
Tetrachloroethene (PCE)	<0.01										<0.01	%	TM124/PM0
1,3-Dichloropropane	<0.01										<0.01	%	TM124/PM0
Dibromochloromethane	<0.01										<0.01	%	TM124/PM0
1,2-Dibromoethane	<0.01										<0.01	%	TM124/PM0
Chlorobenzene	<0.01										<0.01	%	TM124/PM0
1,1,1,2-Tetrachloroethane	<0.01										<0.01	%	TM124/PM0
Ethylbenzene	<0.01										<0.01	%	TM124/PM0
m/p-Xylene	0.01										<0.01	%	TM124/PM0
o-Xylene	<0.01										<0.01	%	TM124/PM0
Styrene	<0.01										<0.01	%	TM124/PM0
Bromoform	<0.01										<0.01	%	TM124/PM0
Isopropylbenzene	0.02										<0.01	%	TM124/PM0
1,1,2,2-Tetrachloroethane	<0.01										<0.01	%	TM124/PM0
Bromobenzene	<0.01										<0.01	%	TM124/PM0
1,2,3-Trichloropropane	<0.01										<0.01	%	TM124/PM0
Propylbenzene	<0.01										<0.01	%	TM124/PM0
2-Chlorotoluene	<0.01										<0.01	%	TM124/PM0
1,3,5-Trimethylbenzene	<0.01										<0.01	%	TM124/PM0
4-Chlorotoluene	<0.01										<0.01	%	TM124/PM0
tert-Butylbenzene	<0.01										<0.01	%	TM124/PM0
1,2,4-Trimethylbenzene	<0.01										<0.01	%	TM124/PM0
sec-Butylbenzene	<0.01										<0.01	%	TM124/PM0
4-Isopropyltoluene	<0.01										<0.01	%	TM124/PM0
1,3-Dichlorobenzene	<0.01										<0.01	%	TM124/PM0
1,4-Dichlorobenzene	<0.01										<0.01	%	TM124/PM0
n-Butylbenzene	<0.01										<0.01	%	TM124/PM0
1,2-Dichlorobenzene	<0.01										<0.01	%	TM124/PM0
1,2-Dibromo-3-chloropropane	<0.01										<0.01	%	TM124/PM0
1,2,4-Trichlorobenzene	<0.01										<0.01	%	TM124/PM0
Hexachlorobutadiene	<0.01										<0.01	%	TM124/PM0
Naphthalene	<0.01										<0.01	%	TM124/PM0
1,2,3-Trichlorobenzene	<0.01										<0.01	%	TM124/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/19999
Sample number: 148
Sample identity: S15-NAPL
Sample depth:
Sample Type: Product
Units: %

Method: VOC
Matrix: Product

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
UI_PEAK_GRP	Unidentified Group of Compounds (Poor Quality Match)	7.726 - 17.908	80,80,80,80,80,80	0.61
20536-40-7	Bicyclo[2.2.1]heptane, 2,2,3-trimethyl-, endo-	11.432	87	0.04
66633-38-3	Cyclodecene, 1-methyl-	13.812	96	<0.01
54676-39-0	Cyclohexane, 2-butyl-1,1,3-trimethyl-	15.524	83	<0.01

Job number: 19/19999
Sample number: 148
Sample identity: S15-NAPL
Sample depth:
Sample Type: Product
Units: %

Method: SVOC
Matrix: Product

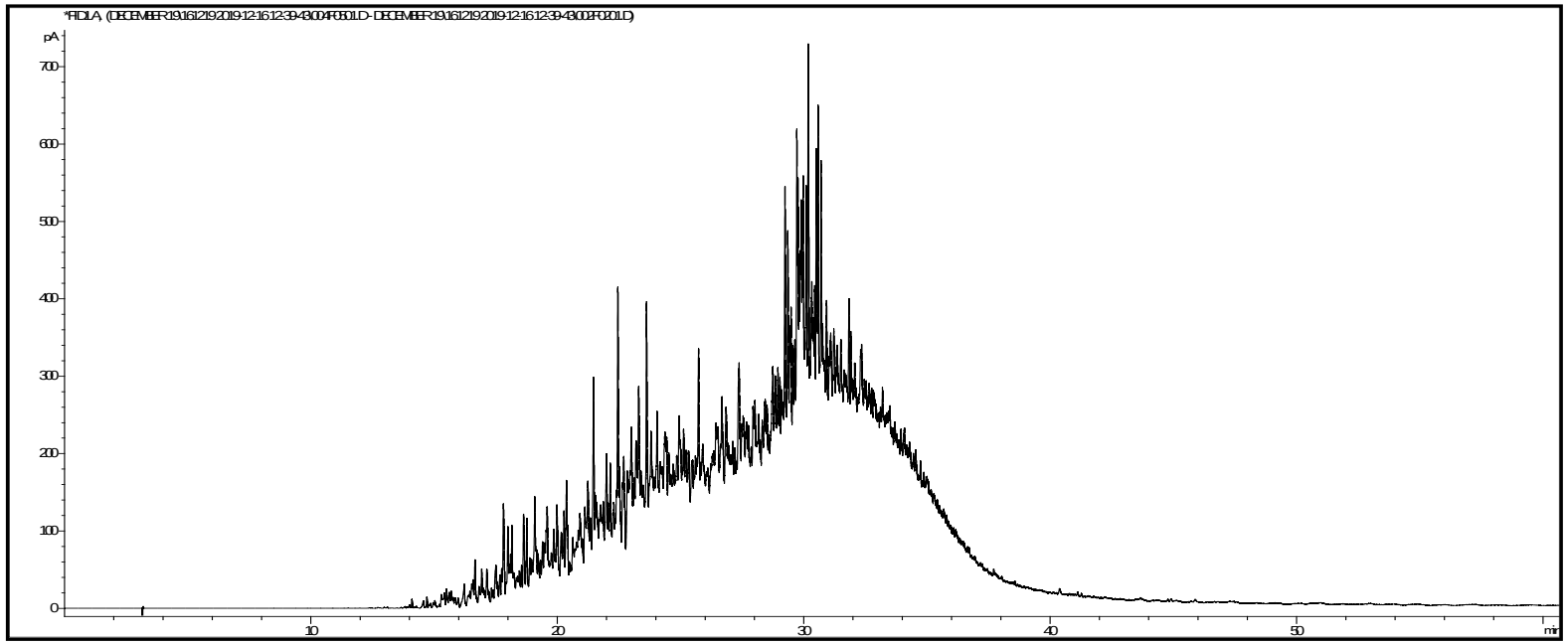
Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
54676-39-0	Cyclohexane, 2-butyl-1,1,3-trimethyl-	7.105	94	0.08
41446-64-4	6-Tetradecene, (E)-	7.512	89	0.09
39546-80-0	Neopentylidenecyclohexane	8.471	84	0.15

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name:	AECOM	**EMT Job No.:**	19/19999
Reference:		**EMT Sample No.:**	148
Location:	Stolthaven	**Sample Identity:**	S15-NAPL
Contact:	Guillem Badiella Anglada	**Depth:**	
Description:	Dark Brown Oil on Water	**% Diesel:**	-
Carbon Range:	9-30	**% Petrol:**	-
Boiling Point Range (°C):	151-450	**Estimated % Weathering of Petrol:**	-
Pristane/Phytane Ratio:	N/A	**Toluene/nC_8 ratio of Petrol:**	-
nC_{17}/Pristane Ratio:	N/A	**Age of Petrol (years) (schmidt et al 2002):**	-
Age of Diesel (+/- 2 years)*:	Not possible as relevant markers are either not present or values are above the permitted range		
Interpretation:	Degraded Diesel, Possible Cable Oil and Possible Transformer Oil		

Chromatogram:



*The age of release estimated in this report is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996). Age estimation should be treated with caution as it can be influenced by site specific factors that the laboratory are not aware of.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/19999						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/19999

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM1	Modified USEPA 8015B method for the determination of carbon banding in oil and product samples by GC-FID.	PM0	No preparation is required.			AR	
TM1	Modified USEPA 8015B method for the determination of carbon banding in oil and product samples by GC-FID.	PM0	No preparation is required.	Yes		AR	
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM0	No preparation is required.			AR	
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM124	Modified USEPA 8260. Semi- Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM0	No preparation is required.			AR	

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AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	Guillem Badiella Anglada
Date :	17th December, 2019
Your reference :	
Our reference :	Test Report 19/19999 Batch 4 Schedule A 19/19999 Batch 4 Schedule B
Location :	Stolthaven
Date samples received :	11th December, 2019
Status :	Final report
Issue :	1

Eight samples were received for analysis on 11th December, 2019 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	193-198	199-203	204-208	209-213	214-218	221-225					LOD/LOR	Units	Method No.
Sample ID	MW7-S	PZ8	WS15	BH202-A6	BH101	DUP3							
Depth	1.23-4.33	4.76-12.45	0.75-1.46	0.63-3.75	4.75-14.90	0.63-3.75							
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G							
Sample Date	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019							
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid							
Batch Number	4	4	4	4	4	4							
Date of Receipt	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019							
PAH MS													
Naphthalene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM4/PM30
Acenaphthylene	0.216	0.052	0.100	<0.013	<0.013	<0.013					<0.013	ug/l	TM4/PM30
Acenaphthene	<0.013	0.052	1.656	0.015	<0.013	0.015					<0.013	ug/l	TM4/PM30
Fluorene	<0.014	0.051	0.153	<0.014	<0.014	<0.014					<0.014	ug/l	TM4/PM30
Phenanthrene	<0.011	0.411	<0.011	<0.011	<0.011	<0.011					<0.011	ug/l	TM4/PM30
Anthracene	0.024	0.130	0.085	<0.013	<0.013	<0.013					<0.013	ug/l	TM4/PM30
Fluoranthene	0.124	1.132	0.888	<0.012	<0.012	0.015					<0.012	ug/l	TM4/PM30
Pyrene	0.153	0.954	0.657	<0.013	0.032	0.023					<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	<0.015	0.412	0.182	<0.015	<0.015	<0.015					<0.015	ug/l	TM4/PM30
Chrysene	<0.011	0.388	0.154	<0.011	<0.011	0.012					<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.018	0.798	0.287	<0.018	<0.018	<0.018					<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	<0.016	0.424	0.181	<0.016	<0.016	<0.016					<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	0.290	0.109	<0.011	<0.011	<0.011					<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	0.04	<0.01	<0.01	<0.01	<0.01					<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	0.225	0.078	<0.011	<0.011	<0.011					<0.011	ug/l	TM4/PM30
PAH 16 Total	0.517	5.359	4.530	<0.195	<0.195	<0.195					<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	0.57	0.21	<0.01	<0.01	<0.01					<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	0.22	0.08	<0.01	<0.01	<0.01					<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	80	76	75	75	76	79					<0	%	TM4/PM30
Methyl Tertiary Butyl Ether	462.8	0.3	<0.1	<0.1	2.2	<0.1					<0.1	ug/l	TM15/PM10
Benzene	12.0	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM15/PM10
Toluene	12	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM10
Ethylbenzene	1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
m/p-Xylene	6	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
o-Xylene	7	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	105	114	115	112	115	113					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	106	108	107	106	109	107					<0	%	TM15/PM10
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C6-C8	713	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C8-C10	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C10-C12	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	713	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	193-198	199-203	204-208	209-213	214-218	221-225					LOD/LOR	Units	Method No.
Sample ID	MW7-S	PZ8	WS15	BH202-A6	BH101	DUP3							
Depth	1.23-4.33	4.76-12.45	0.75-1.46	0.63-3.75	4.75-14.90	0.63-3.75							
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G							
Sample Date	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019							
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid							
Batch Number	4	4	4	4	4	4							
Date of Receipt	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019							
TPH CWG													
Aromatics													
>C5-EC7	11	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC7-EC8	11	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC8-EC10	18	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC10-EC12	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	80	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	40	80	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35)	753	80	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30
Alcohols/Acetates													
Methyl Alcohol (Methanol)	-	-	-	<500	-	<500					<500	ug/l	TM83/PM10
Ethyl Alcohol (Ethanol)	-	-	-	<500	-	<500					<500	ug/l	TM83/PM10
i-Propyl Alcohol (Isopropanol)	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
n-Propyl Alcohol	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
n-Butyl Alcohol	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
n-Pentyl Alcohol	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
n-Hexyl Alcohol	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
n-Heptyl Alcohol	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
Methyl Acetate	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
Ethyl Acetate	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
i-Propyl Acetate	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
n-Propyl Acetate	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
n-Butyl Acetate	-	-	-	<100	-	<100					<100	ug/l	TM83/PM10
Sulphate as SO4	618.3	-	-	-	-	-					<0.5	mg/l	TM38/PM0
Dissolved Methane	>>10289	-	-	-	-	-					<1	ug/l	TM25/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM **VOC Report :** **Liquid**
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

EMT Sample No.	193-198	199-203	204-208	209-213	214-218	221-225	226						
Sample ID	MW7-S	PZ8	WS15	BH202-A6	BH101	DUP3	TRIP BLANK						
Depth	1.23-4.33	4.76-12.45	0.75-1.46	0.63-3.75	4.75-14.90	0.63-3.75							
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V						
Sample Date	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	<>						
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid						
Batch Number	4	4	4	4	4	4	4						
Date of Receipt	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019						
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether	462.8	0.3	<0.1	<0.1	2.2	<0.1	<0.1				<0.1	ug/l	TM15/PM10
Chloromethane	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Vinyl Chloride	11455.2 AA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1				<1	ug/l	TM15/PM10
Chloroethane	21	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Trichlorofluoromethane	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Dichloromethane (DCM)	<5	<5	<5	<5	<5	<5	<5				<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene	21	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,1-Dichloroethane	2285 AA	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene	24	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1				<1	ug/l	TM15/PM10
Bromochloromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Chloroform	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,1,1-Trichloroethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,1-Dichloropropene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Carbon tetrachloride	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,2-Dichloroethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Benzene	12.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5				<0.5	ug/l	TM15/PM10
Trichloroethene (TCE)	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,2-Dichloropropane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Dibromomethane	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Bromodichloromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Toluene	12	<5	<5	<5	<5	<5	<5				<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,1,2-Trichloroethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Tetrachloroethene (PCE)	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,3-Dichloropropane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,2-Dibromoethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Chlorobenzene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Ethylbenzene	1	<1	<1	<1	<1	<1	<1				<1	ug/l	TM15/PM10
m/p-Xylene	6	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
o-Xylene	7	<1	<1	<1	<1	<1	<1				<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Bromoform	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
Isopropylbenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4				<4	ug/l	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,2,3-Trichloropropane	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Propylbenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
tert-Butylbenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
sec-Butylbenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
4-Isopropyltoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,3-Dichlorobenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,4-Dichlorobenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
n-Butylbenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,2-Dichlorobenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2				<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3				<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	105	114	115	112	115	113	113				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	106	108	107	106	109	107	108				<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/19999						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/19999

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x100 Dilution

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.				
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				

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AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	Guillem Badiella Anglada
Date :	18th December, 2019
Your reference :	
Our reference :	Test Report 19/19999 Batch 4 Schedule C
Location :	Stolthaven
Date samples received :	11th December, 2019
Status :	Final report
Issue :	1

Eight samples were received for analysis on 11th December, 2019 of which one were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Simon Gomery BSc
Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

Report : Product

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	219-220												
Sample ID	WS23-NAPL												
Depth													
COC No / misc													
Containers	V												
Sample Date	<>												
Sample Type	Product												
Batch Number	4												
Date of Receipt	11/12/2019												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Whole Oil Trace #	See Attached											None	TM1/PM0
TPH CWG													
Aliphatics													
>C5-C6 #	<0.01										<0.01	%	TM1/PM0
>C6-C8 #	0.07										<0.01	%	TM1/PM0
>C8-C10 #	1.66										<0.01	%	TM1/PM0
>C10-C12 #	6.28										<0.01	%	TM1/PM0
>C12-C16 #	23.15										<0.01	%	TM1/PM0
>C16-C21 #	30.39										<0.01	%	TM1/PM0
>C21-C35 #	12.76										<0.01	%	TM1/PM0
Aromatics													
>EC6-EC8 #	<0.01										<0.01	%	TM1/PM0
>EC8-EC10 #	0.04										<0.01	%	TM1/PM0
>EC10-EC12 #	0.95										<0.01	%	TM1/PM0
>EC12-EC16 #	8.73										<0.01	%	TM1/PM0
>EC16-EC21 #	11.83										<0.01	%	TM1/PM0
>EC21-EC35 #	4.14										<0.01	%	TM1/PM0
Alcohols/Acetates													
Methyl Alcohol	<0.01										<0.01	%	TM124/PM0
Ethyl Alcohol	<0.01										<0.01	%	TM124/PM0
i-Propyl Alcohol	<0.01										<0.01	%	TM124/PM0
n-Propyl Alcohol	<0.01										<0.01	%	TM124/PM0
n-Butyl Alcohol	<0.01										<0.01	%	TM124/PM0
n-Pentyl Alcohol	<0.01										<0.01	%	TM124/PM0
n-Hexyl Alcohol	<0.01										<0.01	%	TM124/PM0
n-Heptyl Alcohol	<0.01										<0.01	%	TM124/PM0
Methyl Acetate	<0.01										<0.01	%	TM124/PM0
Ethyl Acetate	<0.01										<0.01	%	TM124/PM0
i-Propyl Acetate	<0.01										<0.01	%	TM124/PM0
n-Propyl Acetate	<0.01										<0.01	%	TM124/PM0
n-Butyl Acetate	<0.01										<0.01	%	TM124/PM0

Element Materials Technology

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Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
PAH MS													
Naphthalene	<0.01										<0.01	%	TM16/PM0
Acenaphthylene	<0.01										<0.01	%	TM16/PM0
Acenaphthene	<0.01										<0.01	%	TM16/PM0
Fluorene	<0.01										<0.01	%	TM16/PM0
Phenanthrene	<0.01										<0.01	%	TM16/PM0
Anthracene	<0.01										<0.01	%	TM16/PM0
Fluoranthene	<0.01										<0.01	%	TM16/PM0
Pyrene	<0.01										<0.01	%	TM16/PM0
Benzo(a)anthracene	<0.01										<0.01	%	TM16/PM0
Chrysene	<0.01										<0.01	%	TM16/PM0
Benzo(bk)fluoranthene	<0.01										<0.01	%	TM16/PM0
Benzo(a)pyrene	<0.01										<0.01	%	TM16/PM0
Indeno(123cd)pyrene	<0.01										<0.01	%	TM16/PM0
Dibenzo(ah)anthracene	<0.01										<0.01	%	TM16/PM0
Benzo(ghi)perylene	<0.01										<0.01	%	TM16/PM0
PAH 16 Total	<0.01										<0.01	%	TM16/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference:
Location: Stolthaven
Contact: Guillem Badiella Anglada
EMT Job No: 19/19999

VOC Report : **Product**

EMT Sample No.	219-220												
Sample ID	WS23-NAPL												
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V												
Sample Date	<>												
Sample Type	Product												
Batch Number	4												
Date of Receipt	11/12/2019										LOD/LOR	Units	Method No.
VOC MS													
Methyl Tertiary Butyl Ether	<0.05										<0.05	%	TM124/PM0
Benzene	<0.01										<0.01	%	TM124/PM0
Toluene	<0.01										<0.01	%	TM124/PM0
Ethylbenzene	<0.01										<0.01	%	TM124/PM0
m/p-Xylene	<0.01										<0.01	%	TM124/PM0
o-Xylene	<0.01										<0.01	%	TM124/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

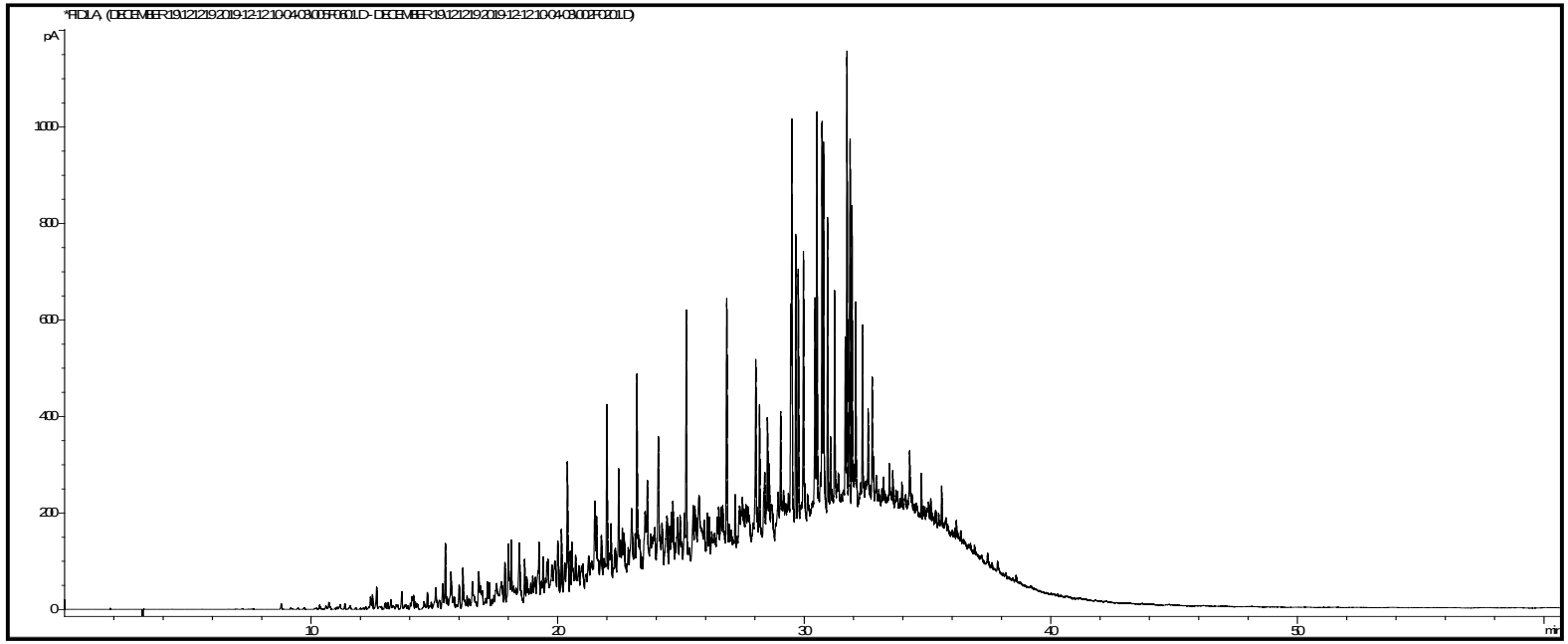
Client Name:	AECOM	**EMT Job No.:**	19/19999
Reference:		**EMT Sample No.:**	219
Location:	Stolthaven	**Sample Identity:**	WS23-NAPL
Contact:	Guillem Badiella Anglada	**Depth:**	

Description:	Brown Oil on Water	**% Diesel:**	-
Carbon Range:	7-30	**% Petrol:**	-
Boiling Point Range (°C):	98-450	**Estimated % Weathering of Petrol:**	-
Pristane/Phytane Ratio:	N/A	**Toluene/nC_8 ratio of Petrol:**	-
nC_{17}/Pristane Ratio:	N/A	**Age of Petrol (years) (schmidt et al 2002):**	-

Age of Diesel (+/- 2 years)*: Not possible as relevant markers are either not present or values are above the permitted range

Interpretation: Degraded Diesel and Cable Oil

Chromatogram:



*The age of release estimated in this report is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996). Age estimation should be treated with caution as it can be influenced by site specific factors that the laboratory are not aware of.

Client Name: AECOM

Matrix : Product

Reference:

Location: Stolthaven

Contact: Guillem Badiella Anglada

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
19/19999	4	WS23-NAPL		219-220	All analyses	No sampling date given

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/19999

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

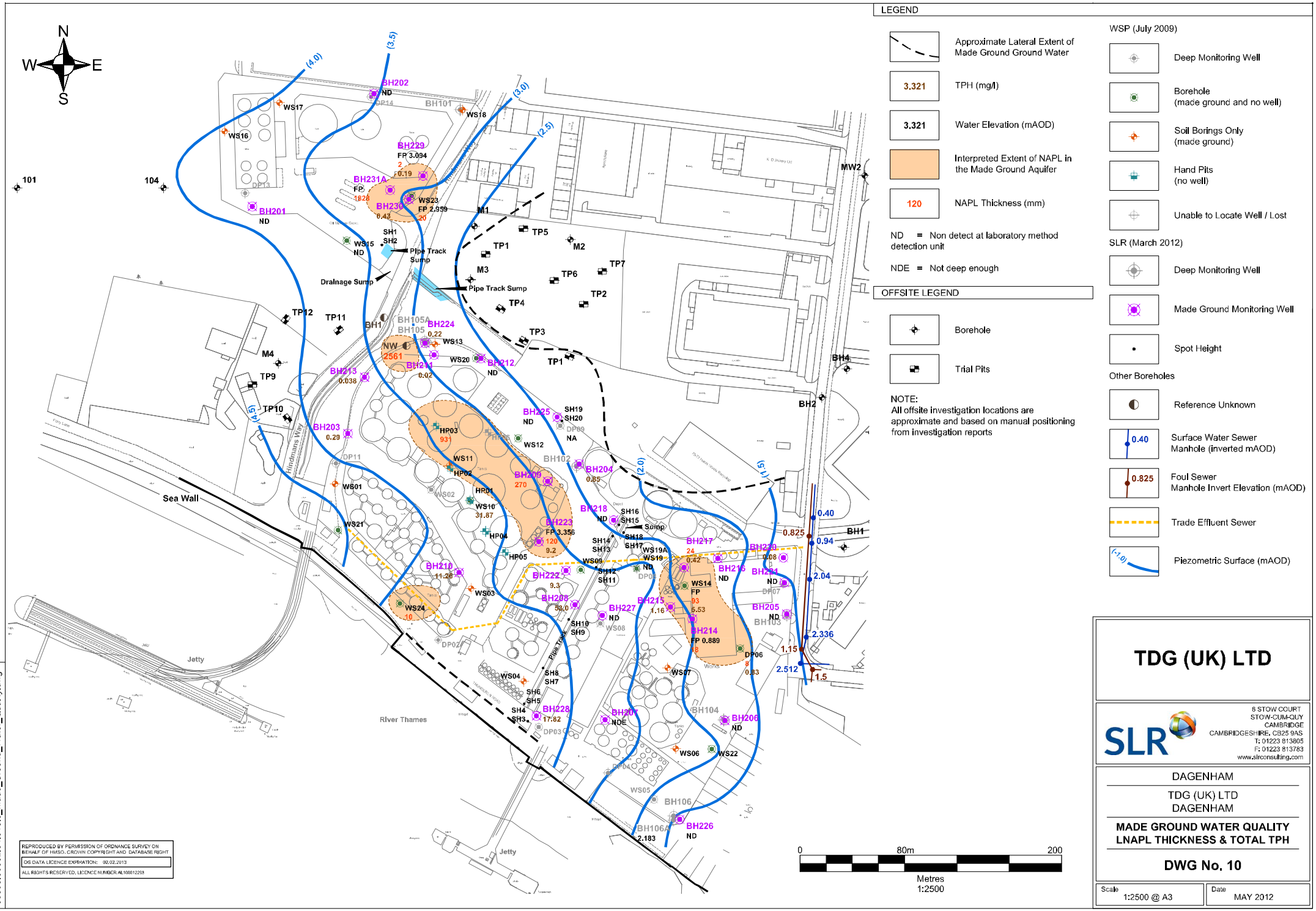
ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/19999

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM1	Modified USEPA 8015B method for the determination of carbon banding in oil and product samples by GC-FID.	PM0	No preparation is required.			AR	
TM1	Modified USEPA 8015B method for the determination of carbon banding in oil and product samples by GC-FID.	PM0	No preparation is required.	Yes		AR	
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM0	No preparation is required.			AR	
TM124	Modified USEPA 8260. Semi- Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM0	No preparation is required.			AR	

Appendix F – 2012 SLR LNAPL Thickness and Total TPH Concentrations


N
W
E
S
LEGEND
Approximate Lateral Extent of Made Ground Ground Water
3.321
TPH (mg/l)
3,321
Water Elevation (mAOD)
Interpreted Extent of NAPL in the Made Ground Aquifer
120
NAPL Thickness (mm)
ND = Non detect at laboratory method detection unit
NDE = Not deep enough
OFFSITE LEGEND
Borehole
Trial Pits
NOTE:
All offsite investigation locations are approximate and based on manual positioning from investigation reports
WSP (July 2009)
Deep Monitoring Well
Borehole (made ground and no well)
Soil Borings Only (made ground)
Hand Pits (no well)
Unable to Locate Well / Lost
SLR (March 2012)
Deep Monitoring Well
Made Ground Monitoring Well
Spot Height
Other Boreholes
Reference Unknown
0.40
Surface Water Sewer Manhole (inverted mAOD)
0.825
Foul Sewer Manhole Invert Elevation (mAOD)
Trade Effluent Sewer
(-1.0)
Piezometric Surface (mAOD)
Sea Wall
Jetty
River Thames
Hindmans Way
Pipe Track Sump
Drainage Sump
0
80m
200
Metres
1:2500
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LNAPL THICKNESS & TOTAL TPH
DWG No. 10
Scale
1:2500 @ A3
Date
MAY 2012