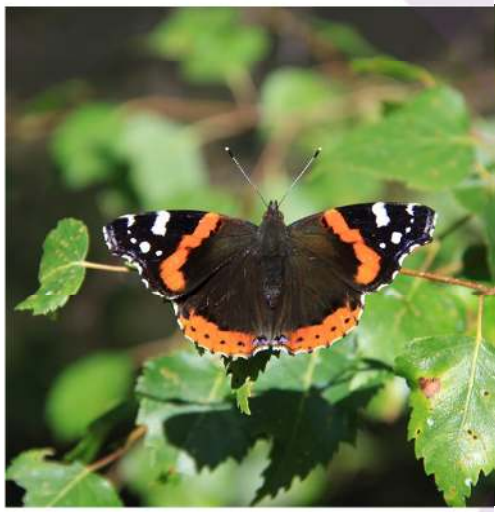
Wessex Water Services Ltd

Avonmouth Food Waste Treatment Plant (AFWTP) Combined Heat and Power (CH&P) Biomethane Upgrade Plant (BUP)

Annual Groundwater Monitoring (Environmental Permit PP3734LK) January 2020



Wood Environment & Infrastructure Solutions UK Limited – March 2020

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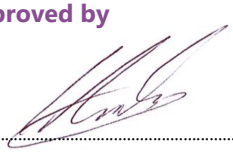

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Executive summary

Purpose of this report

This report presents the findings of groundwater monitoring carried out at the Avonmouth Food Waste Treatment Plant (AFWTP), Combined Heat and Power (CHP) Plant and Biomethane Upgrade Plant (BUP) located at Kingsweston Lane, Avonmouth ("the installation"). The installation is operated by Wessex Water Services Limited (WWSL) and is regulated under the Environmental Permitting (England and Wales) Regulations 2016, as amended, under permit reference PP3734LK.

The permit requires WWSL to carry out regular groundwater monitoring, and in accordance with the Site Protection and Monitoring Programme (SPMP)[1] monitoring takes place on an annual basis and the results are reported to the Environment Agency. This annual report is representative of the 12-month period up to the annual groundwater sampling round completed in January 2020. Chemical analysis results for groundwater have been compared against trigger values (Control Levels and Compliance Levels) agreed with the Environment Agency in 2016.

Findings and Recommendations

The annual groundwater monitoring round for 2020 has found all targeted organic Potentially Polluting Substances (PPS) at concentrations below the trigger values, and inorganic PPS generally below the trigger values, with a few minor exceptions at two monitoring wells (WS001 and WS003). Inorganic PPS above the trigger values comprised chloride, nitrate and sodium. For chloride in WS003 the concentrations recorded were lower than in the previous monitoring round, and the sodium concentration in WS003 is comparable the previous maximum (1 mg/l higher). The nitrate trigger value exceedance in the sample from WS001 was not replicated in its duplicate sample which had a lower concentration; however, this monitoring round is the first one where nitrate has been found above the limit of detection in WS001.

The data generally indicates that concentrations of PPS in groundwater have not increased due to site activities. WWSL have confirmed that they are not aware of any incidents that may have impacted ground or groundwater within the last 12 months. However, due to the appearance of nitrate above laboratory detection limits in WS001 it is recommended that WWSL continues to review this location to check if any spills or leaks occur, and the same recommendation is made for WS003 on a precautionary basis.

For all locations it is recommended that WWSL continues the annual monitoring programme, with the monitoring suite continuing to include the following analytes:

- Inorganics: pH, EC, nitrite (as NO_2), nitrate (as NO_3), sulphate, sulphite, chloride, chemical oxygen demand (COD), ammoniacal nitrogen (as NH_4), phosphate (as PO_4), hardness (alkalinity as $CaCO_3$).
- Metals and metalloids: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Potassium (K), Selenium (Se), Sodium (Na) and Zinc (Zn).
- Organics: TPH (CWG speciated with aliphatic/aromatic split), MTBE and BTEX.

[1] Design of a Site Protection and Monitoring Programme for the Collection of Reference Data (Amec Foster Wheeler ref. 20172/C00/RR001i2) (Amec Foster Wheeler, 2007).

The recommended analytical suite (above) should be amended and agreed between WWSL and the Environment Agency if new processes or operations on site have the potential to release different contaminants [PPS] to the ground or groundwater.

Contents

1. Introduction

This report presents the findings of groundwater monitoring carried out at the Avonmouth Food Waste Treatment Plant (AFWTP), Combined Heat and Power (CHP) Plant and Biomethane Upgrade Plant (BUP) located at Kingsweston Lane, Avonmouth ("the installation"). The installation is operated by Wessex Water Services Limited (WWSL) and is regulated under the Environmental Permitting (England and Wales) Regulations 2016, as amended, under permit reference PP3734LK. The permit requires WWSL to carry out regular groundwater monitoring, and in accordance with the Site Protection and Monitoring Programme (SPMP)[2] monitoring takes place on an annual basis and the results are reported to the Environment Agency. This annual report is representative of the 12-month period up to the annual groundwater sampling round completed in January 2020.

Chemical analysis results have been compared against trigger values (Control Levels and Compliance Levels) agreed with the Environment Agency in 2016[3]. This report is supported by, and should be read in conjunction with, previous environmental monitoring reports, as follows:

- Design of a Site Protection and Monitoring Programme for the Collection of Reference Data (Amec Foster Wheeler ref. 20172/C00/RR001i2) (Amec Foster Wheeler, 2007)[2].
- Wessex Water Services Ltd, Avonmouth Food Waste Treatment Plant (AFWTP)/ Combined Heat and Power (CHP) Plant/ Biomethane Upgrade Plant (BUP), Site Condition Report – Operational (Amec Foster Wheeler Report ref. 32546RR016i3), September 2017, Amec Foster Wheeler.
- Wessex Water Services Ltd, Avonmouth Food Waste Treatment Plant (AFWTP) Combined Heat and Power (CH&P) Biomethane Upgrade Plant (BUP), Annual Groundwater Monitoring (Environmental Permit PP3734LK):
  - January 2018 Annual Groundwater Monitoring Report, Wood Report Ref. 40478RR009i3, dated 27 June 2018.
  - March 2019 Annual Groundwater Monitoring Report, Wood Report Ref. 40478RR012i1, dated 02 May 2019.

The annual groundwater monitoring results are to be provided to the Environment Agency by WWSL to demonstrate that the site soil and groundwater is being protected and that the site is being maintained in a 'satisfactory state' throughout the permitted operations. Regular monitoring also provides WWSL with a record of the site condition throughout the lifespan of the Environmental Permit. The results of monitoring should be maintained by WWSL as they can support an application to vary or surrender the Environmental Permit.

Legislative Context

The Industrial Emissions Directive (IED) is enacted in England by the Environmental Permitting (England and Wales) Regulations 2016 (EPR). Regular groundwater monitoring (minimum frequency of every 5 years) is a requirement for all Part A installations where there is a possibility of historical or future land or groundwater contamination. The IED also states that periodic soil monitoring is required at a minimum frequency of every 10 years. These requirements are set out in the Environment Agency's H5 Site Condition Report – template and guidance (Environment Agency, ref. LIT 8001 Version 3.0 April 2013). WWSL is carrying out annual groundwater monitoring in accordance with the Environmental Permit for the installation and therefore,

[2] Amec Foster Wheeler (2007). Design of a Site Protection and Monitoring Programme for the Collection of Reference Data, Report Ref. 20172/C00/RR001i2.
[3] Amec Foster Wheeler (July 2016). Revised Proposed Control Levels / Compliance Levels and Proposed Environmental Monitoring programme, Ref. 32546P201i1). Accepted by the Environment Agency on 4 August 2016 (Amec Foster Wheeler ref. 32546P202).

complies with the groundwater monitoring requirements of the IED. WWSL has agreed with the Environment Agency that following the reporting of the baseline soil condition in the Site Condition Report (SCR)[4], regular soil monitoring is not required.

In the context of Site Condition Reports, pollutants are interpreted to refer to only the substances handled at the installation under an Environmental Permit, meeting the definition of 'substance' or 'hazardous substance', as given in paragraph 4 of Schedule 22 of EPR 2016. In this report the term potentially polluting substances (PPS) is used to refer to both hazardous substances and other substances with potential to cause pollution.

Use of Trigger Values for Groundwater Assessment

Trigger values (Control and Compliance Limits) have been developed for groundwater at each of the monitoring wells at the site. These are used for comparison with monitoring results to provide a means of assessing whether deterioration in groundwater quality has occurred in the vicinity of each well. In addition, use of trigger values is designed to alert WWSL if further investigation is needed to determine whether releases of PPS are occurring to the land from the installation.

The analytical suite for the groundwater monitoring has been agreed between WWSL and the Environment Agency but may be subject to amendment by agreement with the Environment Agency. The suite of analysis used in this monitoring round is detailed in Section 2.3.

[4] Amec Foster Wheeler (September 2017). Wessex Water Services Ltd, Avonmouth Food Waste Treatment Plant (AFWTP)/ Combined Heat and Power (CHP) Plant/ Biomethane Upgrade Plant (BUP), Site Condition Report – Operational, Report Ref. 32546RR016i3.

2. Methodology

2.1 Setting Control Levels and Compliance Levels

The methodology used for setting the Control Levels and Compliance Levels was set out in correspondence to the Environment Agency in 2016[3].

A Control Level (Trigger 1) and a Compliance Level (Trigger 2) were set for each potentially polluting substance (PPS) at each monitoring well.

Where minimum reporting values (MRVs) are available they have been used as both the Control Level and the Compliance Level. Where applicable (WS006 and WS007), the laboratory chemical test method limit of detection (LOD) has been used for hydrocarbons. Where baseline data indicates an exceedance of the respective MRV (or LOD for hydrocarbons) in background groundwater from historical contamination, the Control Level and the Compliance Level have been set at the maximum baseline value and it has been assumed that groundwater conditions will improve.

Where MRVs are not available, Compliance Levels have been set with respect to Water Quality Targets.

Calculation of Control Levels (Trigger 1) and Compliance Levels (Trigger 2)

Control Level (Trigger 1) = Mean result + (1.2 x Variance) where Variance is the maximum value minus the mean.

N.B. where the baseline data is less than the laboratory detection limit, Trigger 1 has been set as double the detection limit. In any cases where the value exceeds the Compliance Level, the Control Level has been set as the same as the Compliance Level.

Compliance Level (Trigger 2) = MRV, or WQT where MRVs are not available and the LOD for hydrocarbons (where applicable).

In any other cases, Trigger 2 has been set at ten times the detection limit where the baseline data is less than the LOD, or double the maximum 'baseline' result.

Trigger values are used as follows:

- If annual monitoring data indicates that Trigger 1 has been exceeded, it will be established by WWSL / Wessex Water whether the exceedance is due to an on-site activity (spills, leakages etc). If the exceedance is confirmed or suspected as being due to an on-site activity a repeat sample will be taken immediately, and if this is still above Trigger 1, additional quarterly monitoring will be conducted.
- If annual monitoring data indicates that Trigger 2 has been exceeded, similar measures as those for Trigger 1 will initially be taken by WWSL / Wessex Water to establish whether the exceedance is due to an on-site activity and if the exceedance is confirmed or suspected as being due to an on-site activity a repeat sample will be taken immediately. If this is still above Trigger 2, it is proposed that monthly monitoring will be conducted, and further action taken to identify and address the source of the pollution.

If there is an exceedance of trigger value(s), WWSL / Wessex Water will communicate this to the Environment Agency as soon as is reasonably possible, particularly if:

- The exceedance of trigger values may be, or is confirmed to be, due to an on-site activity and a release of PPS is ongoing (established by monthly / quarterly monitoring); or
- It poses an immediate risk to the environment or other receptors.

If this is the case, then the source of the pollution will be identified, and measures taken to prevent further release. The environmental impact of any pollution caused by the permitted process will be investigated and assessed and, depending on the impact, remediation and mitigation measures may be implemented in consultation with, and the agreement of, the Environment Agency.

2.2 Environmental Monitoring of Groundwater

Six groundwater monitoring wells (WS001 to WS003 and WS005 to WS007), were used for the collection of groundwater samples and were designed to target the areas of the site outlined in Table 2.1. The site location is shown on Figure 1 and the locations of the wells are shown on Figure 2 in Appendix A. Groundwater sample collection took place on the 13 January 2020.

Table 2.1 Monitoring Well Locations

Location ID	Position/ Target
WS001	Biomethane Upgrade Plant (General) and Chemical Storage
WS002	Former Condensate Soakaway and Anaerobic Digester Tanks
WS003	Former Condensate Soakaway and Anaerobic Digester Tanks
WS005	Anaerobic Digester Tanks, Sludge Drying and Proposed Pumping Station
WS006	Former Condensate Soakaway and Standby Boiler
WS007	Fuel Storage, Workshop and Engines

Environmental Monitoring Infrastructure

The condition of the well installations was inspected, and all targeted wells were found to be in good condition.

Sampling Techniques and Protocols

Groundwater sampling was carried out by a Wood consultant. Sampling was undertaken in accordance with an agreed protocol, which comprised:

- Initial groundwater measurement (depth to water, depth to installation base) using an oil/water interface meter or clean dip meter. The interface meter was used to detect the presence/absence and thickness (if present) of light non-aqueous phase liquid (LNAPL) within the monitoring well.
- A peristaltic pump was used to carry out low flow groundwater sampling, following purging of standing water in each well sufficient to ensure the sample was representative of groundwater in the surrounding area. A sample was collected following stabilisation of field monitoring

parameters including pH, electrical conductivity, dissolved oxygen and temperature (Note: the dissolved oxygen probe failed to calibrate during the work).

- Samples were collected into laboratory-provided, chilled containers. Samples were then submitted by courier to ALS Life Sciences Ltd (ALS) for analysis.
- Filtration and preservation of water samples for metals analysis was undertaken onsite. This is in accordance with best practice guidance as specified in ISO5667-3:2012 Water Quality – Sampling – Part 3: Preservation and handling of Water.

All measurements and observations were recorded on Groundwater Monitoring Record Sheets, which are summarised in Appendix B.

Purge water from the monitoring wells was released to the site effluent drains flowing to the head of the sewage treatment works by prior agreement with WWSL.

2.3 Field Observations of Groundwater Quality

Visual and olfactory observations of groundwater quality during purging and sampling of the monitoring installations found that:

- No free hydrocarbon product was detected by the oil water interface probe.
- Water in all wells was brown (WS006 was brownish orange) and slightly turbid.
- Slight sulphurous odours were noted at WS001, WS005, WS006 and WS007.

Chemical Analysis

Analytical Suite

The analytical suite used for the annual site wide monitoring event is presented in Table 2.2.

Table 2.2 Suite of Laboratory Analysis (Annual Monitoring, January 2020)

Sample type	Determinands
Groundwater	pH, EC, nitrite (as NO_2), nitrate (as NO_3), sulphate, sulphite, chloride, chemical oxygen demand (COD), ammoniacal nitrogen (as NH_4), phosphate (as PO_4), hardness (alkalinity as $CaCO_3$). Metals and metalloids: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Potassium (K), Selenium (Se), Sodium (Na) and Zinc (Zn) TPHCWG (speciated with aliphatic/aromatic split), MTBE and BTEX

EC – electrical conductivity
BTEX – benzene, toluene, ethylbenzene and xylenes
MTBE – methyl tertiary butyl ether
TPH – total petroleum hydrocarbons
TPH CWG (TPH Criteria Working Group)

Analytical Techniques and Detection Limits

Analytical techniques were selected to target specific PPS and on the basis of the analysis techniques having low limits of detection (LOD) and ISO 17025 accreditation, where possible. All LODs were below the trigger values.

Total Petroleum Hydrocarbons (TPH)

All samples were subject to TPH analysis using the TPHCWG approach, which divides the petroleum mixtures into fractions using the Equivalent Carbon (EC) number convention. EC numbers are used to normalise petroleum constituents by reference to their boiling point and the boiling point of equivalent n-alkanes where the number of carbon atoms is known. This allows EC numbers to be determined for constituents where only the boiling point is known. This convention is described fully in TPHCWG *(1997*).

In addition to dividing the petroleum mixtures by EC number, the TPHCWG method also considers aliphatic and aromatic hydrocarbon fractions separately due to their differing behaviour in the environment and variation in toxicity. Thus, for the purposes of laboratory analysis (and risk assessment), the TPHCWG recommend that petroleum mixtures are considered in fractions which includes aliphatic and aromatic compounds with equivalent carbon numbers of up to 35.

Analytical Quality Assurance and Quality Control (QA/QC)

The selected laboratory, ALS (Hawarden), has UKAS (ISO 17025) accreditation for metals, other inorganics (not including nitrate) and gasoline range organics (GRO). The laboratory accreditation for each analysis technique is detailed on the certificates presented in Appendix C.

ALS has a number of quality control systems in place including:

- Use of Analytical Quality Control Samples (AQC): These can be a Certified Reference Material (CRM), Internal Reference Material (IRM) or Matrix spiked material. These are matrix matched to and within the calibration range of the relevant test method. An AQC sample is prepared and analysed within each batch of samples. Results are charted and assessed statistically monthly to ensure continued method performance. Rules are set to indicate whether an analytical method is out of control and relevant action is taken and recorded when any one of the control rules is breached e.g. a) When any single result exceeds an action limit i.e. ± 3SD, b) When two or more consecutive results fall outside the warning limits (± 2SD) and c) Cases of significant bias (9 successive QC results on the same side of the mean);
- Use of process blanks with each batch of samples and use of instrument blanks to check for contamination within the instrument; and
- Ongoing competence of analysts is monitored using proficiency testing (PT) samples and comparing Analysts' results to those expected by the PT provider. Proficiency testing is undertaken where available for every accredited component. All PT scheme results are audited, and investigations and root cause analysis is carried out and recorded where unsatisfactory z scores are reported.

Project Quality Assurance

During this monitoring round the following sampling process was used to provide additional quality assurance of the sampling and analysis:

- One duplicate groundwater sample was collected from WS001 and submitted for an identical suite of analysis. The duplicate sample was obtained by taking two discrete water samples at this location.

The use of duplicate samples is designed to check that the sampling and analytical procedures provide consistent results and, therefore, provides an indication that the analysis for the remaining monitoring wells is reliable.

A comparison of the duplicate sample results (referenced as WS001 and DUP1) indicates good correlation between the samples, with results consistently below LOD for organics and relative percentage differences (RPD) typically below 20% for inorganics, exceptions were chloride (46 %), nitrate (72 %) and phosphate (50 %). The laboratory does not currently hold ISO 17025 accreditation for the nitrate test where the highest variation was recorded. Laboratory certificates are presented in Appendix C.

3. Groundwater Monitoring Results

Six water samples were obtained from groundwater monitoring wells WS001, WS002, WS003, WS005, WS006 and WS007. The laboratory certificates are presented in Appendix C.

3.1 Summary of Chemical Analysis Results (January 2020)

Inorganics

All samples were tested for a range of water quality parameters and inorganics. The results are presented in Table 3.1.

Table 3.1 Summary of Laboratory Inorganic Chemical Analysis Results

Inorganic	Locations where Substance Recorded above the LOD	Unit	LOD	Minimum	Maximum
pH	N/A	N/A	N/A	7.25	7.89
Electrical conductivity	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS001)	mS/cm	<0.005	0.599	1.45
Hardness (as CaCO3)	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS001)	mg/l	<0.35	300	625
Ammoniacal nitrogen	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS001)	mg/l	<0.3	1.28	3.47
Nitrate	WS001 (and its duplicate), WS002, WS006, WS007	mg/l	<0.3	<0.3	27.3
Nitrite	WS006	mg/l	<0.05	<0.05	0.149
Sulphate	WS001, WS002, WS003, WS007 and duplicate of WS001	mg/l	<2	<2	174
Phosphate	WS001, WS002, WS003, WS007 and duplicate of WS001	mg/l	<0.05	<0.05	3.61

Metals

A range of metals and metalloids were analysed in the annual groundwater monitoring round. The sample locations with concentrations above the LOD are identified in Table 3.2.

Table 3.2 Summary of Metals Analysis Results

Inorganic	Locations where Substance Recorded above the LOD	Unit	LOD	Minimum	Maximum
Arsenic (diss.filt)	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS001)	mg/l	<0.0005	0.000973	0.0609
Cadmium (diss.filt)	WS006	mg/l	<0.00008	<0.00008	0.000093
Chromium (diss.filt)	None	mg/l	<0.001	<0.001	<0.001

Inorganic	Locations where Substance Recorded above the LOD	Unit	LOD	Minimum	Maximum
Copper (diss.filt)	WS002 and WS006	mg/l	<0.0003	<0.0003	0.00727
Lead (diss.filt)	WS002, WS003, WS006 and WS007	mg/l	<0.0002	<0.0002	0.000554
Mercury (diss.filt)	None	mg/l	<0.00001	<0.00001	<0.00001
Nickel (diss.filt)	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS012)	mg/l	<0.0004	0.00196	0.00814
Potassium (Dis.Filt)	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS001)	mg/l	<0.2	4.22	29.4
Selenium (diss.filt)	WS002 and WS006	mg/l	<0.001	<0.001	0.00154
Sodium (Dis.Filt)	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS001)	mg/l	<0.076	28.8	258
Zinc (diss.filt)	All locations (WS001 to WS003, WS005 to WS007 and duplicate of WS001)	mg/l	<0.001	0.00145	0.022

Organics

Total Petroleum Hydrocarbons (TPH)

Aliphatic TPH concentrations in the C5 to C16 carbon range, and aromatic TPH in the EC5 to EC35 range were below the LOD (<0.01mg/l) in all samples. Total aliphatic and aromatic >C5 to C35 TPH concentrations at WS001 (duplicate sample), WS002 and WS003 were recorded at the LOD, with no individual aliphatic or aromatic carbon band above the LOD. The sample locations with concentrations above the LOD are presented in Table 3.3.

Table 3.3 Summary of TPH Analysis Results

Inorganic / Metal Element	Locations where Substance was Recorded Above LOD	Minimum (mg/l)	Maximum (mg/l)
Aliphatics >C16-C21 (aq)	WS006	<0.01	0.026
Aliphatics >C21-C35 (aq)	WS006	<0.01	0.014
Total Aliphatics & Aromatics >C5-35 (aq)	WS001 (duplicate sample)*, WS002, WS003* and WS006	<0.01	0.042

The laboratory TPH analysis did not detect BTEX compounds or MTBE above the relevant LODs (<0.001mg/l to <0.008mg/l) in any samples.

4. Annual Site Monitoring Results Compared with Trigger Values

Section 2.1 of this report sets out the way trigger values are to be used to provide a comparison with the results obtained from the groundwater monitoring rounds.

The Environment Agency should be informed in the event of an exceedance of a trigger value. If the reason for the exceedance of trigger value is due to an on-site activity and the source is ongoing (established by monthly / quarterly monitoring) or critical, remediation may be necessary by agreement with the Environment Agency.

4.1 Comparison of Trigger Values with Chemical Analysis Results

Concentrations of PPS in comparison to trigger values are tabulated in Appendix D, the results for the previous annual monitoring round in 2019 are also presented for comparison. Values in excess of Trigger 1 are highlighted in yellow and values in excess of Trigger 2 are highlighted in orange.

All organic PPS were at concentrations below the trigger values and the majority of analytes were at concentrations below the laboratory LOD.

The majority of inorganic PPS including metals and metalloids, were at concentrations below Trigger 1 and 2, with the exceptions of nitrate in WS001 (not its duplicate), and chloride, sodium and potassium in WS003 (as observed in the 2019 monitoring).

Inorganics

In WS001 the nitrate concentration was 1.04 mg/l which exceeds the Trigger 1 value of 0.6 mg/l. WS001's duplicate had a concentration of 0.49 mg/l. Nitrate was not recorded in WS001 above the detection limit of <0.3 mg/l in the previous monitoring in 2018 or 2019.

In WS003 the chloride concentration of 105 mg/l slightly exceeded the Trigger 1 value of 103.23mg/l, however the result was lower than in the two previous annual monitoring rounds. The results for other non-metallic inorganic substances were below the trigger limits in all wells.

A summary of the inorganic results that exceed trigger values is presented in Table 4.1.

Table 4.1 Summary of Trigger Value Comparison for Inorganics (January 2020)

Substance	Locations where Substance was Above Trigger 1 only	Locations where Substance was Recorded Above Trigger 1 and Trigger 2	Comment
Chloride	WS003	None	The concentration slightly exceeds Trigger 1 but is below the WQT and below the last two monitoring results. The result may be within the range of natural variation in the aquifer.
Nitrate	WS001	None	The concentration slightly exceeds Trigger 1 but is below the WQT. The duplicate sample result is below the Trigger 1 value. Nitrate has not been recorded above detection limit in this well in previous monitoring. The result may be within the range of natural variation in the aquifer.

Metals and Metalloids

Chromium and mercury were below their LODs (<0.001 mg/l and <0.00001 mg/l, respectively) in all samples.

Arsenic, cadmium, copper, lead, nickel and zinc were present at concentrations above their respective LODs in some or all of the samples, however, all concentrations were below their respective trigger values.

There was a trigger value exceedances at one location, WS003, for sodium:

- The sodium concentration was 258 mg/l and exceeded the Trigger 1 control level and the Trigger 2 compliance level of 232 mg/l (the same value for both triggers, based on a maximum concentration detected during baseline sampling). Previously the maximum concentration previously recorded in this well was 257 mg/l in 2018.

A summary of the metal and metalloid results that exceed trigger values is presented in Table 4.2.

Table 4.2 Summary of Trigger Value Comparison for Metals and Metalloids (January 2020)

Substance	Locations where Substance was Above Trigger 1 only	Locations where Substance was Recorded Above Trigger 1 and Trigger 2	Comment
Sodium	WS003	WS003	Sodium is non-hazardous. The result is similar to the maximum concentration recorded in 2018 however so far there is no sustained upwards trend. The results may be indicative of natural variation in the aquifer.

Total Petroleum Hydrocarbons

Concentrations of TPH were generally below LODs. Samples from WS001, WS002 and WS003 contained hydrocarbons at the LOD and WS006 slightly above the LOD (see Table 3.3 in the previous section). All results were below the trigger values for all aliphatic/ aromatic hydrocarbon fractions.

At each of the monitored wells concentrations of BTEX and MTBE, measured as part of the TPHCWG suite, were below the trigger value and below the LOD.

4.2 Conclusions

The inorganic PPS are generally below both control and compliance trigger values. The only exceedances are limited to WS001 and WS003 and are relatively marginal when compared to the trigger values and to UK Drinking Water Standard (where available). Based on the monitoring rounds to date so far there are no sustained increasing trends in concentrations of inorganic PPS. All of the trigger value exceedances for inorganic compounds are for non-hazardous PPS and are below the concentrations detected in the previous round of annual sampling in 2018.

Organic PPS were all below trigger values in this round.

5. Conclusions and Recommendations

The annual groundwater monitoring round for 2020 has found all targeted organic PPS at concentrations below the trigger values, and inorganic PPS generally below the trigger values, with a few minor exceptions at two monitoring wells (WS001 and WS003). Inorganic PPS above the trigger values comprised chloride, nitrate and sodium. For chloride in WS003, the concentrations recorded were lower than in the previous monitoring round, and the sodium concentration in WS003 is close to the previous maximum (only 1 mg/l higher). The nitrate trigger value exceedance in the sample from WS001 was not replicated in its duplicate sample which had a concentration that was lower than the Trigger 1 value; however, this monitoring round is the first one where nitrate has been found above the limit of detection in WS001. The data generally indicates that concentrations of PPS in groundwater have not increased due to site activities.

Correspondence from WWSL states that they are not aware of any incidents that may have impacted ground or groundwater in the last 12 months.

Table 5.1 presents a summary of the comments on the data as compared against the trigger values and provides recommendations.

Table 5.1 Summary of PPS Concentrations against Trigger Values and Trends

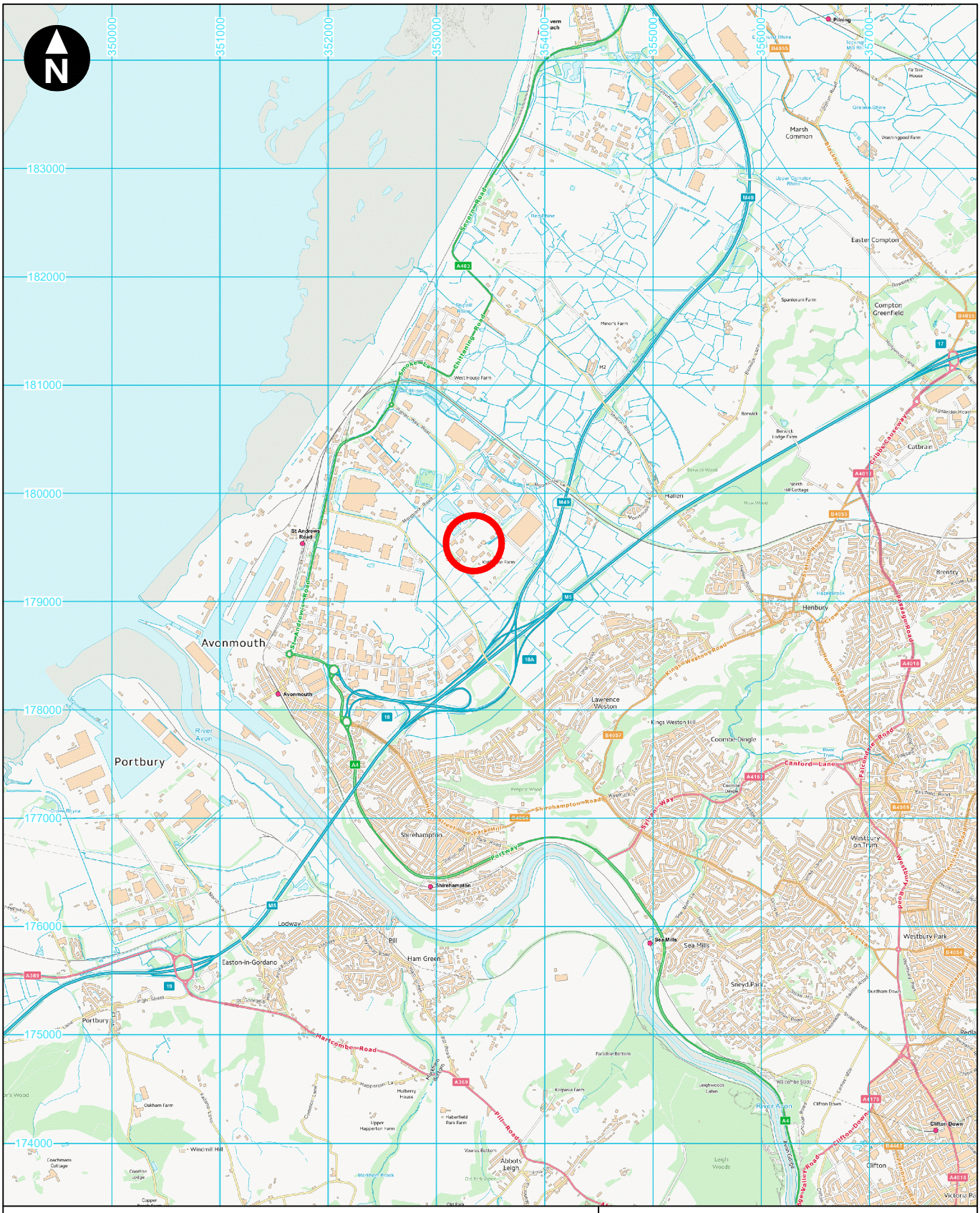
PPS	Relevant Wells	Comment	Recommendations
Chloride	WS003	The chloride concentration in WS003 is slightly above Trigger 1 but is lower than the previous two annual monitoring round results. The result is well below the UK Drinking Water Standard of 250mg/l. There is the potential for the concentration to reflect natural variation.	Continued annual monitoring and check for increasing trend. As a precautionary measure, WWSL should continue to review this location to check if any spills or leaks occur.
Nitrate	WS001	The nitrate concentration slightly exceeds Trigger 1 in the sample from WS001 but is below the WQT. The duplicate sample result is below the Trigger 1 value. Nitrate has not been recorded above detection limit in this well in previous monitoring. There is the potential for the concentration to reflect natural variation however WWSL should review potential sources and pathways to groundwater in the vicinity of WS001.	Continued annual monitoring and check for increasing trend. WWSL should continue to review this location to check if any spills or leaks occur.
Sodium	WS003	The sodium concentration slightly exceeds the Trigger 1 & 2 value (same for both), and slightly exceeds the UK Drinking Water Standard of 200mg/l. The result is very slightly higher than the maximum concentration recorded in 2018 however so far there is no sustained upwards trend. There is the potential for the increased concentration to reflect natural variation	Continued annual monitoring and check for increasing trend. As a precautionary measure, WWSL should continue to review this location to check if any spills or leaks occur.

For all locations it is recommended that WWSL continues the annual monitoring programme, with the monitoring suite continuing to include the following analytes:

- Inorganics: pH, EC, nitrite (as NO_2), nitrate (as NO_3), sulphate, sulphite, chloride, chemical oxygen demand (COD), ammoniacal nitrogen (as NH_4), phosphate (as PO_4), hardness (alkalinity as $CaCO_3$).
- Metals and metalloids: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Potassium (K), Selenium (Se), Sodium (Na) and Zinc (Zn).
- Organics: TPH (CWG speciated with aliphatic/aromatic split), MTBE and BTEX.

The recommended analytical suite (above) should be amended and agreed between WWSL and the Environment Agency if new processes or operations on site have the potential to release different contaminants [PPS] to the ground or groundwater.

Appendix A
Figures



Key

Site location

0 km 3 km

Scale 1:50,000 @ A4

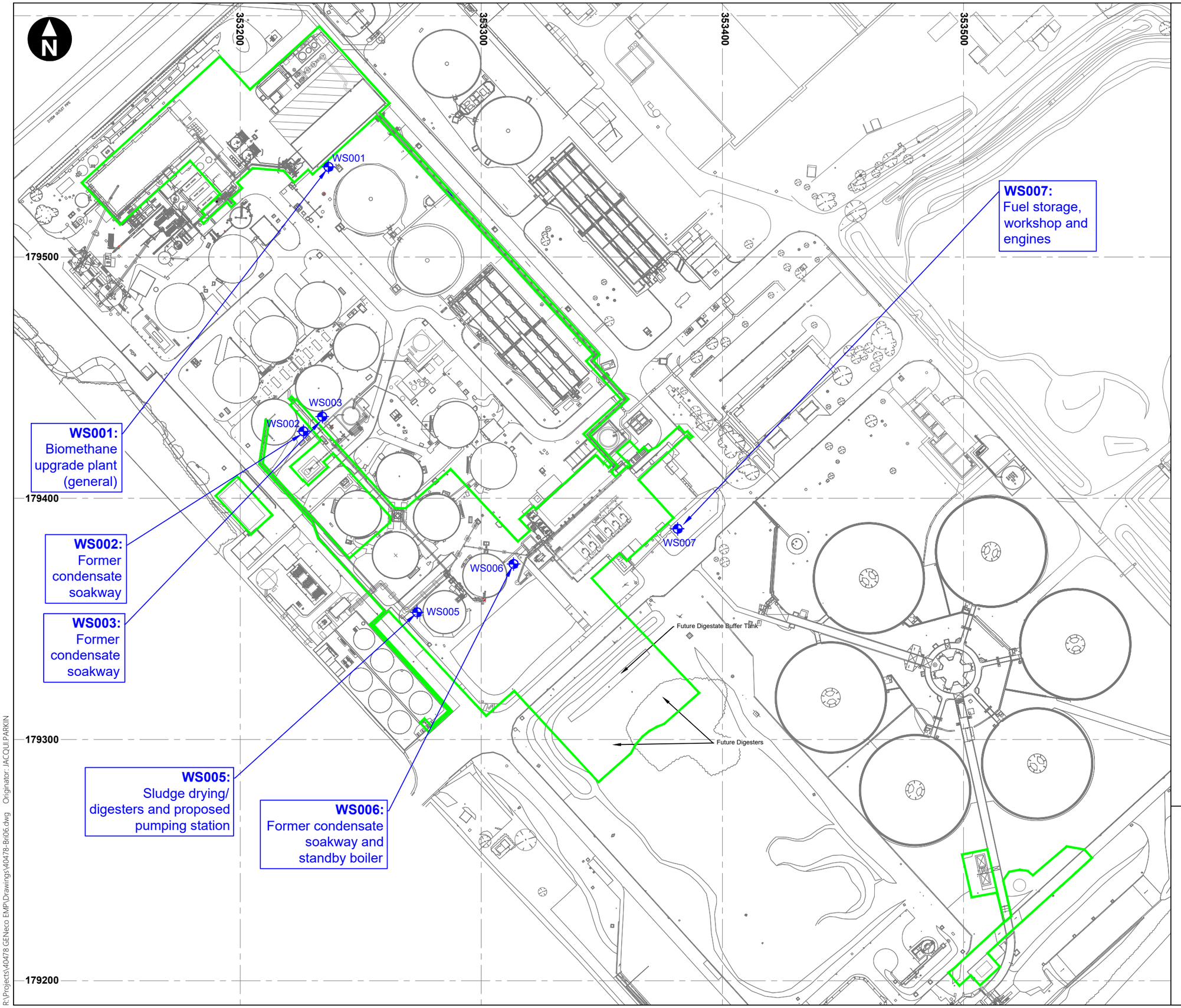
Wessex Water Services Limited - Avonmouth Food Waste Treatment Plant (AFWTP), Combined Heat and Power (CHP) Plant and Biomethane Upgrade Plant (BUP)

Figure 1
Site location map

February 2020

wood.

R:\Projects\40478 GENeco EMP\Drawings\40478-Bri05.dwg Originator: JACQUI.PARKIN



Key

- Revised installation boundary (AFWTP)
- Monitoring well

0 m — 75 m

Scale 1:1500 @ A3

Based upon Drawings "E7492/001" "Rev B" Dated "13/05/10" and "D1457/9014" "Rev E" Dated "04/02/2010" Drawn by "Wessex Engineering & Construction Services" supplied by "Geneco Sustainable Solutions"

Wessex Water Services Limited - Avonmouth Food Waste Treatment Plant (AFWTP), Combined Heat and Power (CHP) Plant and Biomethane Upgrade Plant (BUP)

Figure 2
Layout showing groundwater monitoring locations

February 2020

wood.

R:\Projects\40478 GENeco EMP\Drawings\40478-Bri06.dwg Originator: JACQUI PARKIN

Appendix B
Field Monitoring Results

Borehole Monitoring Records

Site:	Avonmouth WWTW
Data Description:	Monitoring Well Records
Date:	13/01/2020
Weather	Overcast AM, Light rain PM.
Monitoring values	pH, EC, DO stabilised values
Completed By:	Reece Temple
Checked By:	Laurence Munden

Key

m AOD	Metres Above Ordnance Datum
m bcl	Metres below cover level
DO	Dissolved Oxygen
EC	Electrical Conductivity
µS/cm	Micro Siemens per Centimetre

Round 3

		Groundwater Monitoring										
Exploratory Hole	**Date**	Ground Level	Depth to Water	Water Level	Well Depth	Water Column	Purge Volume	Stablised conditions after purging				Comments
								pH	EC	Temp	DO	
	Sampled	m AOD	mbcl	m AOD	mbgl	m	Litres		µS/cm	ºC	%	
WS001	13/01/2020	7.31	1.30	6.01	5.16	3.86	13.5	7.15	940	11.26	28.5	Slight brownish tint, slightly turbid. Slight sulphurous odour, no sheen. DUP1
WS002	13/01/2020	7.59	1.66	5.93	4.98	3.32	11.6	7.72	766	12.30	19.6	Brown tint, slightly turbid. No obvious odour or sheen.
WS003	13/01/2020	7.70	1.91	5.79	4.89	2.98	10.4	7.42	1301	15.64	20.6	Brown tint, slightly turbid. No obvious odour or sheen.
WS005	13/01/2020	7.78	1.78	6.00	3.97	2.19	7.7	7.13	1085	11.27	29.3	Brown tint, slightly turbid. Slight sulphurous odour, no sheen.
WS006	13/01/2020	7.89	1.89	6.00	3.67	1.78	6.2	6.95	832	10.87	20.1	Brownish-orange tint, high turbidity. Slight sulphurous odour, no sheen.
WS007	13/01/2020	7.86	2.16	5.70	4.74	2.58	9.0	7.14	1105	11.05	18.3	Brown tint, slightly turbid. Slight sulphurous odour, no sheen.

Appendix C
Certificates of Laboratory Analysis

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

Wood Environment & Infrastructure Solutions UK Limited
Ground Floor
Redcliff Quay
120 Redcliff Street
Almondsbury
Bristol
Avon
BS1 6HU

Attention: Laurence Munden

CERTIFICATE OF ANALYSIS

Date of report Generation:	04 February 2020
Customer:	Wood Environment & Infrastructure Solutions UK Limited
Sample Delivery Group (SDG):	200114-40
Your Reference:	40478
Location:	Avonmouth
Report No:	539623

This report has been revised and directly supersedes 539339 in its entirety.

We received 7 samples on Tuesday January 14, 2020 and 7 of these samples were scheduled for analysis which was completed on Tuesday February 04, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.

Approved By:

Sonia McWhan
Operations Manager

Validated

CERTIFICATE OF ANALYSIS

SDG:	200114-40	**Client Reference:**	40478	**Report Number:**	539623
Location:	Avonmouth	**Order Number:**	323655	**Superseded Report:**	539339

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21482892	DUP1	EWJan 2020	0.00 - 0.00	13/01/2020
21482816	WS001	EWJan 2020	0.00 - 3.50	13/01/2020
21482826	WS002	EWJan 2020	0.00 - 4.00	13/01/2020
21482841	WS003	EWJan 2020	0.00 - 3.90	13/01/2020
21482853	WS005	EWJan 2020	0.00 - 3.00	13/01/2020
21482867	WS006	EWJan 2020	0.00 - 2.70	13/01/2020
21482880	WS007	EWJan 2020	0.00 - 3.50	13/01/2020

Maximum Sample/Coolbox Temperature (°C) : **7.6**

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	200114-40	**Client Reference:**	40478	**Report Number:**	539623
Location:	Avonmouth	**Order Number:**	323655	**Superseded Report:**	539339

Results Legend

- X — Test
- N — No Determination Possible

Sample Types -

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

Col.			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Lab Sample No(s)			21482892								21482816								21482826		
Customer Sample Reference			DUP1								WS001								WS002		
AGS Reference			EWJan 2020								EWJan 2020								EWJan 2020		
Depth (m)			0.00 - 0.00								0.00 - 3.50								0.00 - 4.00		
Container			250ml Amber Gl. PTFE/PE (ALE219)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)	250ml Amber Gl. PTFE/PE (ALE219)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)	250ml Amber Gl. PTFE/PE (ALE219)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 7			X								X								X
Anions by Kone (w)	All	NDPs: 0 Tests: 7		X								X								X	
COD Unfiltered	All	NDPs: 0 Tests: 7		X								X								X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 7		X								X								X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7				X								X							
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7	X								X								X		
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7	X								X								X		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 7							X								X				
Mercury Dissolved	All	NDPs: 0 Tests: 7				X								X							
Nitrite by Kone (w)	All	NDPs: 0 Tests: 7						X								X					
pH Value	All	NDPs: 0 Tests: 7		X								X								X	
Phosphate by Kone (w)	All	NDPs: 0 Tests: 7		X								X								X	
Sulphide	All	NDPs: 0 Tests: 7								X								X			
Total Metals by ICP-MS	All	NDPs: 0 Tests: 7					X								X						
TPH CWG (W)	All	NDPs: 0 Tests: 7	X								X								X		

21482853	WS005	EWJan 2020	0.00 - 3.00	ZnAc (ALE246)	GW														X			
				Vial (ALE297)	GW								X									
				NaOH (ALE245)	GW										X							
				HNO3 Unfiltered (ALE204)	GW															X		
				HNO3 Filtered (ALE204)	GW					X				X								
				H2SO4 (ALE244)	GW	X																
				500ml Plastic (ALE208)	GW		X	X	X								X	X				
				250ml Amber Gl. PTFE/PE (ALE219)	GW						X	X										X
21482841	WS003	EWJan 2020	0.00 - 3.90	ZnAc (ALE246)	GW														X			
				Vial (ALE297)	GW								X									
				NaOH (ALE245)	GW										X							
				HNO3 Unfiltered (ALE204)	GW															X		
				HNO3 Filtered (ALE204)	GW					X				X								
				H2SO4 (ALE244)	GW	X																
				500ml Plastic (ALE208)	GW		X	X	X								X	X				
				250ml Amber Gl. PTFE/PE (ALE219)	GW						X	X										X
21482826	WS002	EWJan 2020	0.00 - 4.00	ZnAc (ALE246)	GW														X			
				Vial (ALE297)	GW								X									
				NaOH (ALE245)	GW										X							
				HNO3 Unfiltered (ALE204)	GW															X		
				HNO3 Filtered (ALE204)	GW					X				X								

Validated

CERTIFICATE OF ANALYSIS

SDG:	200114-40	**Client Reference:**	40478	**Report Number:**	539623
Location:	Avonmouth	**Order Number:**	323655	**Superseded Report:**	539339

Results Legend

X Test

N No Determination Possible

Sample Types -

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

Lab Sample No(s)										21482867								21482880	
Customer Sample Reference										WS006								WS007	
AGS Reference										EWJan 2020								EWJan 2020	
Depth (m)										0.00 - 2.70								0.00 - 3.50	
Container										250ml Amber Gl. PTFE/PE (ALE219)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)	250ml Amber Gl. PTFE/PE (ALE219)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)
Sample Type										GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 7										X								X					
Anions by Kone (w)	All	NDPs: 0 Tests: 7									X								X						
COD Unfiltered	All	NDPs: 0 Tests: 7									X								X						
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 7									X								X						
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7											X								X				
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7	X								X														
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7	X								X														
GRO by GC-FID (W)	All	NDPs: 0 Tests: 7							X															X	
Mercury Dissolved	All	NDPs: 0 Tests: 7											X								X				
Nitrite by Kone (w)	All	NDPs: 0 Tests: 7						X															X		
pH Value	All	NDPs: 0 Tests: 7									X								X						
Phosphate by Kone (w)	All	NDPs: 0 Tests: 7									X								X						
Sulphide	All	NDPs: 0 Tests: 7								X															X
Total Metals by ICP-MS	All	NDPs: 0 Tests: 7					X															X			
TPH CWG (W)	All	NDPs: 0 Tests: 7	X								X														

Validated

CERTIFICATE OF ANALYSIS

SDG:	200114-40	**Client Reference:**	40478	**Report Number:**	539623
Location:	Avonmouth	**Order Number:**	323655	**Superseded Report:**	539339

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	DUP1	WS001	WS002	WS003	WS005	WS006
			Depth (m)	0.00 - 0.00	0.00 - 3.50	0.00 - 4.00	0.00 - 3.90	0.00 - 3.00	0.00 - 2.70
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	13/01/2020	13/01/2020	13/01/2020	13/01/2020	13/01/2020	13/01/2020
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/01/2020	14/01/2020	14/01/2020	14/01/2020	14/01/2020	14/01/2020
			SDG Ref	200114-40	200114-40	200114-40	200114-40	200114-40	200114-40
			Lab Sample No.(s)	21482892	21482816	21482826	21482841	21482853	21482867
			AGS Reference	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099		2.64 #	3 #	3.47 #	2.42 #	1.28 #	<0.3 #
Sulphide	<0.01 mg/l	TM101		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
COD, unfiltered	<7 mg/l	TM107		27.9 #	25.7 #	15.7 #	30.2 #	45.2 #	18 #
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		1.34 #	1.08 #	0.599 #	1.45 #	1.4 #	0.606 #
Arsenic (diss.filt)	<0.0005 mg/l	TM152		0.00209 #	0.00205 #	0.00566 #	0.0609 #	0.00794 #	0.000973 #
Cadmium (diss.filt)	<0.00008 mg/l	TM152		<0.00008 #	<0.00008 #	<0.00008 #	<0.00008 #	<0.00008 #	0.000093 #
Chromium (diss.filt)	<0.001 mg/l	TM152		<0.001 #	<0.001 #	<0.001 #	<0.001 #	<0.001 #	<0.001 #
Copper (diss.filt)	<0.0003 mg/l	TM152		<0.0003 #	<0.0003 #	0.00511 #	<0.0003 #	<0.0003 #	0.00727 #
Lead (diss.filt)	<0.0002 mg/l	TM152		<0.0002 #	<0.0002 #	0.000554 #	0.000239 #	<0.0002 #	0.00029 #
Nickel (diss.filt)	<0.0004 mg/l	TM152		0.0026 #	0.00241 #	0.00196 #	0.00764 #	0.00814 #	0.00422 #
Selenium (diss.filt)	<0.001 mg/l	TM152		<0.001 #	<0.001 #	0.00116 #	<0.001 #	<0.001 #	0.00154 #
Zinc (diss.filt)	<0.001 mg/l	TM152		0.0196 #	0.022 #	0.0204 #	0.00145 #	0.00735 #	0.0084 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		105 #	101 #	28.8 #	258 #	132 #	49.3 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		24.3 #	23.2 #	13.5 #	29.4 #	5.89 #	4.22 #
Hardness, Total as CaCO3 unfiltered	<0.35 mg/l	TM152		518	512	337	326	625	300
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #
Nitrite as NO2	<0.05 mg/l	TM184		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	0.149 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		0.212 #	0.127 #	0.578 #	3.61 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184		174 #	137 #	53.8 #	<2 #	35.1 #	38.9 #
Chloride	<2 mg/l	TM184		66.9 #	41.7 #	14.4 #	105 #	189 #	18 #
Nitrate as NO3	<0.3 mg/l	TM184		0.492	1.04	0.846	<0.3	<0.3	27.3
pH	<1 pH Units	TM256		7.29 #	7.57 #	7.89 #	7.59 #	7.35 #	7.25 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	200114-40	**Client Reference:**	40478	**Report Number:**	539623
Location:	Avonmouth	**Order Number:**	323655	**Superseded Report:**	539339

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.	WS007
Depth (m)	0.00 - 3.50
Sample Type	Ground Water (GW)
Date Sampled	13/01/2020
Sample Time	00:00
Date Received	14/01/2020
SDG Ref	200114-40
Lab Sample No.(s)	21482880
AGS Reference	EWJan 2020

Component	LOD/Units	Method	
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.5 #
Sulphide	<0.01 mg/l	TM101	<0.01 #
COD, unfiltered	<7 mg/l	TM107	24.9 #
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	1.24 #
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.00399 #
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008 #
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001 #
Copper (diss.filt)	<0.0003 mg/l	TM152	<0.0003 #
Lead (diss.filt)	<0.0002 mg/l	TM152	0.000264 #
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.00227 #
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.001 #
Zinc (diss.filt)	<0.001 mg/l	TM152	0.00963 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152	81.4 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152	23.4 #
Hardness, Total as CaCO3 unfiltered	<0.35 mg/l	TM152	577
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001 #
Nitrite as NO2	<0.05 mg/l	TM184	<0.05 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	0.352 #
Sulphate	<2 mg/l	TM184	166 #
Chloride	<2 mg/l	TM184	112 #
Nitrate as NO3	<0.3 mg/l	TM184	1.13
pH	<1 pH Units	TM256	7.42 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	200114-40	**Client Reference:**	40478	**Report Number:**	539623
Location:	Avonmouth	**Order Number:**	323655	**Superseded Report:**	539339

TPH CWG (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	DUP1	WS001	WS002	WS003	WS005	WS006
			Depth (m)	0.00 - 0.00	0.00 - 3.50	0.00 - 4.00	0.00 - 3.90	0.00 - 3.00	0.00 - 2.70
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	13/01/2020	13/01/2020	13/01/2020	13/01/2020	13/01/2020	13/01/2020
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/01/2020	14/01/2020	14/01/2020	14/01/2020	14/01/2020	14/01/2020
			SDG Ref	200114-40	200114-40	200114-40	200114-40	200114-40	200114-40
			Lab Sample No.(s)	21482892	21482816	21482826	21482841	21482853	21482867
			AGS Reference	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020
GRO Surrogate % recovery**	%	TM245		96	96	92	96	98	93
GRO >C5-C12	<0.05 mg/l	TM245		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Methyl tertiary butyl ether (MTBE)	<0.003 mg/l	TM245		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Benzene	<0.007 mg/l	TM245		<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
Toluene	<0.004 mg/l	TM245		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Ethylbenzene	<0.005 mg/l	TM245		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
m,p-Xylene	<0.008 mg/l	TM245		<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
o-Xylene	<0.003 mg/l	TM245		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Sum of detected Xylenes	<0.011 mg/l	TM245		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Sum of detected BTEX	<0.028 mg/l	TM245		<0.028	<0.028	<0.028	<0.028	<0.028	<0.028
Aliphatics >C5-C6	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C12-C16 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C16-C21 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	0.026
Aliphatics >C21-C35 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	0.014
Total Aliphatics >C12-C35 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	0.04
Aromatics >EC5-EC7	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	<0.01 mg/l	TM245		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC12-EC16 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC16-EC21 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC21-EC35 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aromatics >EC12-EC35 (aq)	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	<0.01 mg/l	TM174		0.01	<0.01	0.012	0.01	<0.01	0.042
Aliphatics >C16-C35 Aqueous	<0.01 mg/l	TM174		<0.01	<0.01	<0.01	<0.01	<0.01	0.04

Validated

CERTIFICATE OF ANALYSIS

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TPH CWG (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.	WS007
Depth (m)	0.00 - 3.50
Sample Type	Ground Water (GW)
Date Sampled	13/01/2020
Sample Time	00:00
Date Received	14/01/2020
SDG Ref	200114-40
Lab Sample No.(s)	21482880
AGS Reference	EWJan 2020

Component	LOD/Units	Method	
GRO Surrogate % recovery**	%	TM245	92
GRO >C5-C12	<0.05 mg/l	TM245	<0.05 #
Methyl tertiary butyl ether (MTBE)	<0.003 mg/l	TM245	<0.003
Benzene	<0.007 mg/l	TM245	<0.007
Toluene	<0.004 mg/l	TM245	<0.004
Ethylbenzene	<0.005 mg/l	TM245	<0.005
m,p-Xylene	<0.008 mg/l	TM245	<0.008
o-Xylene	<0.003 mg/l	TM245	<0.003
Sum of detected Xylenes	<0.011 mg/l	TM245	<0.011
Sum of detected BTEX	<0.028 mg/l	TM245	<0.028
Aliphatics >C5-C6	<0.01 mg/l	TM245	<0.01
Aliphatics >C6-C8	<0.01 mg/l	TM245	<0.01
Aliphatics >C8-C10	<0.01 mg/l	TM245	<0.01
Aliphatics >C10-C12	<0.01 mg/l	TM245	<0.01
Aliphatics >C12-C16 (aq)	<0.01 mg/l	TM174	<0.01
Aliphatics >C16-C21 (aq)	<0.01 mg/l	TM174	<0.01
Aliphatics >C21-C35 (aq)	<0.01 mg/l	TM174	<0.01
Total Aliphatics >C12-C35 (aq)	<0.01 mg/l	TM174	<0.01
Aromatics >EC5-EC7	<0.01 mg/l	TM245	<0.01
Aromatics >EC7-EC8	<0.01 mg/l	TM245	<0.01
Aromatics >EC8-EC10	<0.01 mg/l	TM245	<0.01
Aromatics >EC10-EC12	<0.01 mg/l	TM245	<0.01
Aromatics >EC12-EC16 (aq)	<0.01 mg/l	TM174	<0.01
Aromatics >EC16-EC21 (aq)	<0.01 mg/l	TM174	<0.01
Aromatics >EC21-EC35 (aq)	<0.01 mg/l	TM174	<0.01
Total Aromatics >EC12-EC35 (aq)	<0.01 mg/l	TM174	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	<0.01 mg/l	TM174	<0.01
Aliphatics >C16-C35 Aqueous	<0.01 mg/l	TM174	<0.01

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Table of Results - Appendix

Method No	Reference	Description
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter

NA = not applicable.

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

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Test Completion Dates

Lab Sample No(s)	21482892	21482816	21482826	21482841	21482853	21482867	21482880
Customer Sample Ref.	DUP1	WS001	WS002	WS003	WS005	WS006	WS007
AGS Ref.	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020	EWJan 2020
Depth	0.00 - 0.00	0.00 - 3.50	0.00 - 4.00	0.00 - 3.90	0.00 - 3.00	0.00 - 2.70	0.00 - 3.50
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Ammoniacal Nitrogen	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020
Anions by Kone (w)	16-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	16-Jan-2020	16-Jan-2020	16-Jan-2020
COD Unfiltered	23-Jan-2020	23-Jan-2020	23-Jan-2020	23-Jan-2020	23-Jan-2020	23-Jan-2020	23-Jan-2020
Conductivity (at 20 deg.C)	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020
Dissolved Metals by ICP-MS	28-Jan-2020	28-Jan-2020	27-Jan-2020	27-Jan-2020	28-Jan-2020	28-Jan-2020	27-Jan-2020
EPH CWG (Aliphatic) Aqueous GC (W)	18-Jan-2020	28-Jan-2020	28-Jan-2020	28-Jan-2020	18-Jan-2020	18-Jan-2020	28-Jan-2020
EPH CWG (Aromatic) Aqueous GC (W)	18-Jan-2020	28-Jan-2020	28-Jan-2020	28-Jan-2020	18-Jan-2020	18-Jan-2020	28-Jan-2020
GRO by GC-FID (W)	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020
Mercury Dissolved	30-Jan-2020	30-Jan-2020	04-Feb-2020	30-Jan-2020	30-Jan-2020	30-Jan-2020	30-Jan-2020
Nitrite by Kone (w)	16-Jan-2020	14-Jan-2020	14-Jan-2020	14-Jan-2020	16-Jan-2020	16-Jan-2020	16-Jan-2020
pH Value	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020
Phosphate by Kone (w)	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020	15-Jan-2020
Sulphide	28-Jan-2020	28-Jan-2020	28-Jan-2020	28-Jan-2020	28-Jan-2020	28-Jan-2020	28-Jan-2020
Total Metals by ICP-MS	22-Jan-2020	22-Jan-2020	22-Jan-2020	22-Jan-2020	22-Jan-2020	22-Jan-2020	22-Jan-2020
TPH CWG (W)	18-Jan-2020	28-Jan-2020	28-Jan-2020	28-Jan-2020	18-Jan-2020	18-Jan-2020	28-Jan-2020

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2161
Ammoniacal Nitrogen as N	TM099	**101.2** 93.14 : 108.60

Anions by Kone (w)

Component	Method Code	QC 2142
Chloride	TM184	**108.0** 92.93 : 115.43
Sulphate (soluble)	TM184	**103.2** 90.53 : 113.03
TON as NO3	TM184	**106.0** 94.00 : 111.10

COD Unfiltered

Component	Method Code	QC 2152	QC 2136
COD	TM107	**99.62** 97.45 : 103.77	**99.24** 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 2195	QC 2166
Conductivity (at 20 deg.C)	TM120	**102.26** 100.75 : 105.26	**102.26** 100.75 : 105.26

Dissolved Metals by ICP-MS

Component	Method Code	QC 2178	QC 2112	QC 2134
Aluminium	TM152	**107.0** 95.37 : 118.13	**102.0** 94.12 : 114.23	**102.33** 94.12 : 114.23
Antimony	TM152	**102.5** 88.37 : 130.57	**104.5** 90.44 : 113.04	**98.67** 90.44 : 113.04
Arsenic	TM152	**100.83** 92.62 : 113.52	**99.33** 88.00 : 112.00	**98.83** 88.00 : 112.00
Barium	TM152	**100.5** 93.15 : 115.52	**102.5** 88.00 : 112.00	**100.5** 88.00 : 112.00
Beryllium	TM152	**105.0** 89.98 : 116.88	**96.67** 94.92 : 115.52	**100.67** 94.92 : 115.52
Bismuth	TM152	**98.0** 92.62 : 115.02	**102.67** 91.90 : 112.20	**99.17** 91.90 : 112.20
Borate	TM152		**98.15** 88.00 : 112.00	**103.09** 88.00 : 112.00

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Dissolved Metals by ICP-MS

		QC 2178	QC 2112	QC 2134
Boron	TM152	**104.67** 86.31 : 120.88	**98.33** 96.48 : 114.93	**103.33** 96.48 : 114.93
Cadmium	TM152	**100.83** 93.85 : 111.65	**101.17** 96.43 : 110.53	**101.0** 96.43 : 110.53
Calcium	TM152	**104.67** 89.20 : 126.91	**103.33** 81.38 : 119.09	**102.67** 81.38 : 119.09
Chromium	TM152	**99.5** 92.22 : 109.85	**97.0** 91.84 : 108.67	**97.83** 91.84 : 108.67
Cobalt	TM152	**100.0** 85.01 : 114.87	**96.33** 88.00 : 112.00	**97.67** 88.00 : 112.00
Copper	TM152	**100.5** 89.87 : 119.73	**98.0** 92.47 : 118.11	**98.5** 92.47 : 118.11
Iron	TM152	**100.67** 93.02 : 113.86	**98.67** 92.00 : 113.00	**100.0** 92.00 : 113.00
Lead	TM152	**100.67** 91.11 : 116.98	**102.17** 88.00 : 112.00	**100.67** 88.00 : 112.00
Lithium	TM152	**104.33** 91.30 : 123.00	**96.67** 98.47 : 115.47	**102.17** 98.47 : 115.47
Magnesium	TM152	**102.67** 89.60 : 116.61	**102.67** 96.42 : 115.52	**104.0** 96.42 : 115.52
Manganese	TM152	**100.67** 93.97 : 112.46	**99.17** 97.94 : 109.97	**100.0** 97.94 : 109.97
Molybdenum	TM152	**99.5** 89.07 : 110.96	**98.83** 88.00 : 112.00	**95.33** 88.00 : 112.00
Nickel	TM152	**99.33** 93.70 : 112.15	**96.5** 88.00 : 112.00	**96.5** 88.00 : 112.00
Phosphorus	TM152	**97.83** 89.24 : 114.18	**96.17** 88.00 : 112.00	**98.5** 88.00 : 112.00
Potassium	TM152	**104.0** 97.98 : 117.40	**103.33** 98.67 : 116.86	**104.0** 98.67 : 116.86
Selenium	TM152	**102.67** 91.69 : 117.12	**98.83** 91.58 : 115.98	**102.17** 91.58 : 115.98
Silver	TM152	**98.33** 93.77 : 110.37	**96.67** 94.91 : 114.41	**95.83** 94.91 : 114.41
Sodium	TM152	**101.33** 92.42 : 113.24	**102.67** 95.92 : 112.85	**103.33** 95.92 : 112.85
Strontium	TM152	**101.0** 92.14 : 116.24	**98.33** 88.00 : 112.00	**98.33** 88.00 : 112.00
Tellurium	TM152	**97.33** 89.88 : 111.78	**99.0** 93.32 : 114.66	**98.33** 93.32 : 114.66
Thallium	TM152	**91.17** 82.43 : 113.83	**83.0** 88.00 : 112.00	**89.67** 88.00 : 112.00
Tin	TM152	**104.67** 91.00 : 109.00	**104.17** 91.00 : 109.00	**101.67** 91.00 : 109.00
Titanium	TM152	**106.83** 90.29 : 115.23	**104.67** 95.58 : 111.68	**103.17** 95.58 : 111.68
Tungsten	TM152	**96.83** 77.61 : 132.31	**100.67** 81.32 : 124.72	**98.33** 81.32 : 124.72
Uranium	TM152	**94.83** 86.97 : 115.76	**99.33** 88.00 : 112.00	**97.5** 88.00 : 112.00
Vanadium	TM152	**99.5** 89.61 : 115.48	**98.17** 88.00 : 112.00	**98.5** 88.00 : 112.00
Zinc	TM152	**102.33** 87.51 : 116.26	**101.0** 92.98 : 118.95	**100.0** 92.98 : 118.95

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EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2191	QC 2110	QC 2138
Total Aliphatics >C10-C40	TM174	**103.14** 69.79 : 134.39	**107.1** 68.59 : 134.82	**86.63** 0.00 : 0.00

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2118	QC 2136	QC 2149
Total Aromatics >EC10-EC40	TM174	**88.78** 59.92 : 128.54	**91.71** 60.75 : 129.09	**78.78** 60.75 : 129.09

GRO by GC-FID (W)

Component	Method Code	QC 2141
Benzene by GC	TM245	**95.5** 83.48 : 117.21
Ethylbenzene by GC	TM245	**94.5** 84.11 : 114.89
m & p Xylene by GC	TM245	**93.75** 83.73 : 116.33
MTBE GC-FID	TM245	**95.0** 84.42 : 117.50
o Xylene by GC	TM245	**95.5** 85.03 : 117.59
QC	TM245	**108.47** 60.71 : 137.65
Toluene by GC	TM245	**95.5** 84.73 : 116.85

Mercury Dissolved

Component	Method Code	QC 2140	QC 2176
Mercury Dissolved (CVAF)	TM183	**100.0** 76.80 : 117.12	**97.3** 76.80 : 117.12

pH Value

Component	Method Code	QC 2199	QC 2128
pH	TM256	**100.94** 100.00 : 102.43	**101.35** 100.00 : 102.43

Phosphate by Kone (w)

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Phosphate by Kone (w)

Component	Method Code	QC 2130
Phosphate (Ortho as PO4)	TM184	**100.4** 96.40 : 109.60

Sulphide

Component	Method Code	QC 2138
Sulphide	TM101	**101.33** 88.90 : 112.50

Total Metals by ICP-MS

Component	Method Code	QC 2162
Aluminium	TM152	**95.0** 89.90 : 110.02
Antimony	TM152	**101.5** 80.45 : 122.65
Arsenic	TM152	**97.0** 85.20 : 116.13
Barium	TM152	**99.5** 92.02 : 112.48
Beryllium	TM152	**94.83** 83.72 : 109.12
Bismuth	TM152	**98.83** 93.28 : 110.08
Boron	TM152	**94.0** 86.68 : 117.67
Cadmium	TM152	**99.5** 92.07 : 109.87
Calcium	TM152	**104.0** 81.38 : 119.09
Chromium	TM152	**94.83** 90.87 : 108.50
Cobalt	TM152	**95.33** 84.39 : 114.26
Copper	TM152	**94.67** 84.61 : 114.08
Iron	TM152	**95.33** 90.35 : 109.13
Lead	TM152	**101.0** 85.65 : 113.58
Lithium	TM152	**95.17** 89.26 : 119.04
Magnesium	TM152	**94.0** 88.20 : 114.65
Manganese	TM152	**95.33** 90.63 : 109.13

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Total Metals by ICP-MS

		QC 2162
Molybdenum	TM152	**96.0** 87.00 : 108.89
Nickel	TM152	**93.67** 88.26 : 111.14
Phosphorus	TM152	**94.17** 88.05 : 104.32
Potassium	TM152	**97.33** 86.97 : 112.46
Selenium	TM152	**98.17** 88.44 : 113.86
Silver	TM152	**96.83** 95.12 : 112.92
Sodium	TM152	**93.33** 84.47 : 113.44
Strontium	TM152	**99.33** 90.72 : 114.82
Tellurium	TM152	**96.0** 86.97 : 108.87
Thallium	TM152	**95.0** 80.92 : 114.72
Tin	TM152	**104.33** 93.70 : 111.83
Titanium	TM152	**95.17** 90.30 : 110.00
Uranium	TM152	**97.67** 90.58 : 113.28
Vanadium	TM152	**99.17** 88.43 : 114.30
Zinc	TM152	**101.67** 86.52 : 115.27

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

Appendix General

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. **Sample Deviations**

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

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

19. **Asbestos**

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

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

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

Appendix D
Comparison of Results Against Trigger Values

WS001 Biomethane Upgrade Plant (General) and Chemical Storage
Baseline Groundwater Data and EMP Trigger Levels

Assessed by:	Lynne Gemmell
Reviewed by:	Laurence Munden

Below Control and Compliance Levels
Above Control Level
Above Compliance Level

				Round 1	Round 2	Round 3				Control Level	Compliance Level					
			Customer Sample ID	WS001	WS001	WS001										
			Depth	1.78-	1.11-	1.17-										
			Sampled Date	18/03/2016	30/03/2016	15/04/2016										
Test	Method	Units	LOD				Max	Min	Mean	Trigger 1	Trigger 2	Notes	Jan-18	Mar-19	Jan-20	Jan-20 (duplicate)
Inorganics																
Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	1.94	1.91	1.93	1.94	1.91	1.927	n/a	n/a		1.96	1.6	1.08	1.34
Nitrite as NO2	TM184	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	0.50	WQT (Trigger 2)	<0.05	<0.05	<0.05	<0.05
pH	TM256	pH Units	<1	7.65	7.52	7.59	7.65	7.52	7.587	n/a	n/a		7.58	7.77	7.57	7.29
Sulphate	TM184	mg/l	<2	245	265	268	268	245	259.333	268.00	268.00	Max used *** (Mean + 1.2 x Variance >WQT)	274.00	224.00	137.00	174.00
Sulphide	TM101	mg/l	<0.01	<0.01	0.089	<0.01	0.089	0.089	0.089	0.09	0.18	No standard	<0.01	<0.01	<0.01	<0.01
Chloride	TM184	mg/l	<2	102	110	119	119	102	110.333	120.73	238.00	Trigger 2 < WQT	125.00	78.60	41.70	66.90
COD, unfiltered	TM107	mg/l	<7	96.4	218	71.8	218	71.8	128.733	n/a	n/a		144	26	25.7	27.9
Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	7.52	5.39	5.08	7.52	5.08	5.997	7.52	7.52	Max used *** (Mean + 1.2 x Variance >WQT)	4.92	4.63	3.00	2.64
Phosphate (ortho) as PO4	TM184	mg/l	<0.05	0.371	0.202	0.288	0.371	0.202	0.287	0.39	0.70	WQT (Trigger 2)	0.24	0.25	0.13	0.21
Nitrate as NO3	TM184	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.60	3.00	Trigger 2 < WQT	<0.3	<0.3	1.04	0.49
Filtered (Dissolved) Metals																
Mercury (diss.filt)	TM183	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	n/a	No triggers set - Data for baseline	<0.00001	<0.00001	<0.00001	<0.00001
Arsenic (diss.filt)	TM152	mg/l	<0.00012	0.00282	0.00395	0.00759	0.00759	0.00282	0.005	n/a	n/a	No triggers set - Data for baseline	0.00	0.00	0.00	0.00
Sodium (diss.filt)	TM228	mg/l	<0.076	181	189	197	197	181	189.000	198.60	200.00	WQT (Trigger 2)	219.00	182.00	101.00	105.00
Potassium (diss.filt)	TM228	mg/l	<1	38.9	37.9	34.8	38.9	34.8	37.200	39.24	77.80	No Standard	38.2	36.3	23.2	24.3
Hardness, Total as CaCO3	TM228	mg/l	<1	600	614	588	614	588	600.667	n/a	n/a	No triggers set - Data for baseline	852	655	512	518
Cadmium (diss.filt)	TM152	mg/l	<0.0001	<0.0001	<0.0001	0.000129	0.000129	0.000129	0.0001290	n/a	n/a	No triggers set - Data for baseline	0.0003	<0.00008	<0.00008	<0.00008
Chromium (diss.filt)	TM152	mg/l	<0.00022	0.000417	0.0138	0.00851	0.0138	0.000417	0.0075757	n/a	n/a	No triggers set - Data for baseline	<0.001	<0.001	<0.001	<0.001
Copper (diss.filt)	TM152	mg/l	<0.00085	0.00136	0.0017	0.00209	0.00209	0.00136	0.0017167	n/a	n/a	No triggers set - Data for baseline	0.0021	<0.0003	<0.0003	<0.0003
Lead (diss.filt)	TM152	mg/l	<0.00002	0.000039	0.000227	0.000297	0.000297	0.000039	0.0001877	n/a	n/a	No triggers set - Data for baseline	<0.0002	0.0002	<0.0002	<0.0002
Nickel (diss.filt)	TM152	mg/l	<0.00015	0.00513	0.00716	0.00563	0.00716	0.00513	0.0059733	n/a	n/a	No triggers set - Data for baseline	0.0039	0.0032	0.0024	0.0026
Selenium (diss.filt)	TM152	mg/l	<0.00039	0.00101	0.00251	0.00319	0.00319	0.00101	0.0022367	n/a	n/a	No triggers set - Data for baseline	<0.0005	<0.001	<0.001	<0.001
Zinc (diss.filt)	TM152	mg/l	<0.00041	0.011	0.00693	0.0107	0.011	0.00693	0.0095433	n/a	n/a	No triggers set - Data for baseline	0.01	0.0014	0.0220	0.0196
TPH Criteria Working Group (TPH CWG)																
GRO >C5-C12	TM245	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n/a	n/a	No triggers set - Data for baseline	<0.05	<0.05	<0.05	<0.05
Methyl tertiary butyl ether (MTBE)	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	LOD **	<0.003	<0.003	<0.003	<0.003
Benzene	TM245	mg/l	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007	0.007	LOD **	<0.007	<0.007	<0.007	<0.007
Toluene	TM245	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.004	MRV * / LOD **	<0.004	<0.004	<0.004	<0.004
Ethylbenzene	TM245	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.005	LOD **	<0.005	<0.005	<0.005	<0.005
m,p-Xylene	TM245	mg/l	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	0.008	LOD **	<0.008	<0.008	<0.008	<0.008
o-Xylene	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	MRV * / LOD **	<0.003	<0.003	<0.003	<0.003
Sum of detected Xylenes	TM245	mg/l	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	0.011	LOD **	<0.011	<0.011	<0.011	<0.011
Sum of detected BTEX	TM245	mg/l	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	0.028	0.028	LOD **	<0.028	<0.028	<0.028	<0.028
Aliphatics >C5-C6	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aliphatics >C12-C16 (aq)	TM174	mg/l	<0.01	0.01	<0.01	<0.01	0.01	0.01	0.010	n/a	n/a	No triggers set - Data for baseline	0.023	<0.01	<0.01	<0.01
Aliphatics >C16-C21 (aq)	TM174	mg/l	<0.01	0.232	0.132	0.138	0.232	0.132	0.167	n/a	n/a	No triggers set - Data for baseline	0.077	<0.01	<0.01	<0.01
Aliphatics >C21-C35 (aq)	TM174	mg/l	<0.01	0.248	0.169	0.161	0.248	0.161	0.193	n/a	n/a	No triggers set - Data for baseline	0.128	<0.01	<0.01	<0.01
Total Aliphatics >C12-C35 (aq)	TM174	mg/l	<0.01	0.49	0.301	0.299	0.49	0.299	0.363	n/a	n/a	No triggers set - Data for baseline	0.228	<0.01	<0.01	<0.01
Aromatics >EC5-EC7	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aromatics >EC12-EC16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aromatics >EC16-EC21 (aq)	TM174	mg/l	<0.01	0.044	0.028	0.023	0.044	0.023	0.032	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01
Aromatics >EC21-EC35 (aq)	TM174	mg/l	<0.01	0.112	0.083	0.066	0.112	0.066	0.087	n/a	n/a	No triggers set - Data for baseline	0.027	<0.01	<0.01	<0.01
Total Aromatics >EC12-EC35 (aq)	TM174	mg/l	<0.01	0.156	0.111	0.089	0.156	0.089	0.119	n/a	n/a	No triggers set - Data for baseline	0.027	<0.01	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/l	<0.01	0.646	0.412	0.405	0.646	0.405	0.488	n/a	n/a	No triggers set - Data for baseline	0.255	<0.01	<0.01	0.010

Notes

Trigger values applied associated with monitoring location
Hazardous substances with Minimum Reporting Value (MRV)

* Environment Agency MRV for Hazardous Substances used as Control Level and Compliance Level

** LOD - Limit of Detection used as Control Level and Compliance Level where above the MRV used

*** Maximum concentration used as Control Level and Trigger Level where MRV exceeded from historical contamination, or where no MRV published for hydrocarbons.

Environment Agency MRV: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values [last accessed 29/06/16]

WS002 Former Condensate Soakaways and Anaerobic Digester Tanks
Baseline Groundwater Data and EMP Trigger Levels

Assessed by:	Lynne Gemmell
Reviewed by:	Laurence Munden

Below Control and Compliance Levels
Above Control Level
Above Compliance Level

Test	Method	Units	LOD	Round 1	Round 2	Round 3	Round 3	Max	Min	Mean	Control Level Trigger 1	Compliance Level Trigger 2	Notes	Jan-18	Jan-18 DUP1	Mar-19	Mar-19 DUP1	Jan-20
Customer Sample ID				WS002	WS002	WS002	DUP (WS002)											
Depth				1.68-	1.47-	1.73-	-											
Sampled Date				18/03/2016	30/03/2016	15/04/2016	15/04/2016											
Inorganics																		
Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	1.62	1.71	1.51	1.5	1.71	1.5	1.585	n/a	n/a		1.04	1.07	0.792	0.824	0.599
Nitrite as NO2	TM184	mg/l	<0.05	<0.05	<0.05	0.147	0.149	0.149	0.147	0.148	0.15	0.50	WQT (Trigger 2)	<0.05	<0.05	<0.05	<0.05	<0.05
pH	TM256	pH Units	<1	7.9	7.84	7.9	7.77	7.9	7.77	7.853	n/a	n/a		7.87	7.68	7.87	7.87	7.89
Sulphate	TM184	mg/l	<2	78.2	323	174	192	323	78.2	191.800	323.00	323.00	Max used *** (Mean + 1.2 x Variance >WQT)	102.00	110.00	63.40	64.30	53.80
Sulphide	TM101	mg/l	<0.01	<0.01	0.0267	<0.01	<0.01	0.0267	0.0267	0.027	0.03	0.05	No standard	<0.01	<0.01	<0.01	<0.01	<0.01
Chloride	TM184	mg/l	<2	105	86.4	81	85.6	105	81	89.500	108.10	210.00	Trigger 2 < WQT	29.10	31.50	21.10	22.90	14.40
COD, unfiltered	TM107	mg/l	<7	147	179	113	113	179	113	138.000	n/a	n/a		51.6	42.7	24.4	29.7	15.7
Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	5.77	8.43	7.48	7.08	8.43	5.77	7.190	8.43	8.43	Max used *** (Mean + 1.2 x Variance >WQT)	4.27	4.27	4.23	4.11	3.47
Phosphate (ortho) as PO4	TM184	mg/l	<0.05	3.94	1.11	2	1.56	3.94	1.11	2.153	3.94	3.94	Max used *** (Mean + 1.2 x Variance >WQT)	0.47	0.55	1.42	1.38	0.58
Nitrate as NO3	TM184	mg/l	<0.3	0.903	<0.3	0.902	0.613	0.903	0.613	0.806	0.92	1.81	Trigger 2 < WQT	<0.3	<0.3	<0.3	0.44	0.85
Filtered (Dissolved) Metals																		
Mercury (diss.filt)	TM183	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	n/a	No triggers set - Data for baseline	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Arsenic (diss.filt)	TM152	mg/l	<0.00012	0.109	0.0389	0.119	0.0888	0.119	0.0389	0.089	n/a	n/a	No triggers set - Data for baseline	0.05	0.06	0.04	0.05	0.01
Sodium (diss.filt)	TM228	mg/l	<0.076	260	249	252	234	260	234	248.750	260.00	260.00	Max used *** (Mean + 1.2 x Variance >WQT)	118.00	130.00	74.00	83.90	28.80
Potassium (diss.filt)	TM228	mg/l	<1	34.6	38.1	32.8	34.7	38.1	32.8	35.050	38.71	76.20	No Standard	25.8	26.7	20.9	22.1	13.5
Hardness, Total as CaCO3	TM228	mg/l	<1	224	330	246	265	330	224	266.250	n/a	n/a	No triggers set - Data for baseline	383	361	340	321	337
Cadmium (diss.filt)	TM152	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	n/a	n/a	No triggers set - Data for baseline	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Chromium (diss.filt)	TM152	mg/l	<0.00022	0.00041	0.00917	0.00632	0.00876	0.00917	0.00041	0.006165	n/a	n/a	No triggers set - Data for baseline	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (diss.filt)	TM152	mg/l	<0.00085	<0.00085	0.0016	0.00115	0.00167	0.00167	0.00115	0.001473	n/a	n/a	No triggers set - Data for baseline	0.0006	<0.0003	<0.0003	<0.0003	0.01
Lead (diss.filt)	TM152	mg/l	<0.00002	0.000229	0.000223	0.000211	0.000329	0.000329	0.000211	0.000248	n/a	n/a	No triggers set - Data for baseline	<0.0002	<0.0002	0.0003	0.0003	0.0006
Nickel (diss.filt)	TM152	mg/l	<0.00015	0.00846	0.0135	0.00802	0.0106	0.0135	0.00802	0.010145	n/a	n/a	No triggers set - Data for baseline	0.0024	0.0019	0.0016	0.0013	0.0020
Selenium (diss.filt)	TM152	mg/l	<0.00039	0.00299	0.00911	0.00636	0.00515	0.00911	0.00299	0.005903	n/a	n/a	No triggers set - Data for baseline	<0.0005	<0.0005	<0.001	<0.001	0.00
Zinc (diss.filt)	TM152	mg/l	<0.00041	0.00203	0.0061	0.0175	0.012	0.0175	0.00203	0.009408	n/a	n/a	No triggers set - Data for baseline	0.0036	0.0032	0.0034	0.0028	0.0204
TPH Criteria Working Group (TPH CW																		
GRO >C5-C12	TM245	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n/a	n/a	No triggers set - Data for baseline	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tertiary butyl ether (MTBE)	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	LOD **	<0.003	<0.003	<0.003	<0.003	<0.003
Benzene	TM245	mg/l	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007	0.007	LOD **	<0.007	<0.007	<0.007	<0.007	<0.007
Toluene	TM245	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.004	MRV * / LOD **	<0.004	<0.004	<0.004	<0.004	<0.004
Ethylbenzene	TM245	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.005	LOD **	<0.005	<0.005	<0.005	<0.005	<0.005
m,p-Xylene	TM245	mg/l	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	0.008	LOD **	<0.008	<0.008	<0.008	<0.008	<0.008
o-Xylene	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	MRV * / LOD **	<0.003	<0.003	<0.003	<0.003	<0.003
Sum of detected Xylenes	TM245	mg/l	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	0.011	LOD **	<0.011	<0.011	<0.011	<0.011	<0.011
Sum of detected BTEX	TM245	mg/l	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	0.028	0.028	LOD **	<0.028	<0.028	<0.028	<0.028	<0.028
Aliphatics >C5-C6	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C12-C16 (aq)	TM174	mg/l	<0.01	0.057	<0.01	<0.01	<0.01	0.057	0.057	0.057	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C16-C21 (aq)	TM174	mg/l	<0.01	0.343	0.107	0.044	0.02	0.343	0.02	0.129	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C21-C35 (aq)	TM174	mg/l	<0.01	0.327	0.124	0.07	0.011	0.327	0.011	0.133	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aliphatics >C12-C35 (aq)	TM174	mg/l	<0.01	0.727	0.231	0.114	0.031	0.727	0.031	0.276	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC5-EC7	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC12-EC16 (aq)	TM174	mg/l	<0.01	0.02	<0.01	<0.01	<0.01	0.02	0.02	0.020	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC16-EC21 (aq)	TM174	mg/l	<0.01	0.07	0.024	<0.01	<0.01	0.07	0.024	0.047	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC21-EC35 (aq)	TM174	mg/l	<0.01	0.151	0.065	<0.01	<0.01	0.151	0.065	0.108	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aromatics >EC12-EC35 (aq)	TM174	mg/l	<0.01	0.241	0.089	<0.01	<0.01	0.241	0.089	0.165	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/l	<0.01	0.968	0.322	0.132	0.031	0.968	0.031	0.363	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01	<0.01	0.012

Notes

Trigger values applied associated with monitoring location

Hazardous substances with Minimum Reporting Value (MRV)

* Environment Agency MRV for Hazardous Substances used as Control Level and Compliance Level

** LOD - Limit of Detection used as Control Level and Compliance Level where above the MRV used

*** Maximum concentration used as Control Level and Trigger Level where MRV exceeded from historical contamination, or where no MRV published for hydrocarbons.

Environment Agency MRV: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values [last accessed 29/06/16]

WS003 Former Condensate Soakaways and Anaerobic Digester Tanks
Baseline Groundwater Data and EMP Trigger Levels

Assessed by:	Lynne Gemmell
Reviewed by:	Laurence Munden

Below Control and Compliance Levels
Above Control Level
Above Compliance Level

Avonmouth STW				Round 1	Round 2	Round 3				Control Level	Compliance Level				
			Customer Sample ID	WS003	WS003	WS003									
			Depth	1.91-	1.76-	1.82-									
			Sampled Date	18/03/2016	30/03/2016	15/04/2016									
Test	**Method**	**Units**	**LOD**				**Max**	**Min**	**Mean**	**Trigger 1**	**Trigger 2**	**Notes**	**Jan-18**	**Mar-19**	**Jan-20**
Inorganics															
Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	1.39	1.44	1.44	1.44	1.39	1.423	n/a	n/a		1.56	1.51	1.45
Nitrite as NO2	TM184	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	0.50	WQT (Trigger 2)	<0.05	<0.05	<0.05
pH	TM256	pH Units	<1	7.72	7.66	7.76	7.76	7.66	7.713	n/a	n/a		7.59	7.9	7.59
Sulphate	TM184	mg/l	<2	<2	<2	<2	<2	<2	<2	4.00	20.00	Trigger 2 < WQT	<2	<2	<2
Sulphide	TM101	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.10	No standard	<0.01	<0.01	<0.01
Chloride	TM184	mg/l	<2	90.1	95.5	102	102	90.1	95.867	103.23	204.00	Trigger 2 < WQT	111.00	106.00	105.00
COD, unfiltered	TM107	mg/l	<7	259	129	98.4	259	98.4	162.133	n/a	n/a		98.4	41.3	30.2
Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	3.51	2.65	3	3.51	2.65	3.053	3.51	3.51	Max used *** (Mean + 1.2 x Variance >WQT)	2.80	2.78	2.42
Phosphate (ortho) as PO4	TM184	mg/l	<0.05	2.37	4.64	4.94	4.94	2.37	3.983	4.94	4.94	Max used *** (Mean + 1.2 x Variance >WQT)	1.23	4.16	3.61
Nitrate as NO3	TM184	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.60	3.00	Trigger 2 < WQT	<0.3	<0.3	<0.3
Filtered (Dissolved) Metals															
Mercury (diss.filt)	TM183	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	n/a	No triggers set - Data for baseline	<0.00001	<0.00001	<0.00001
Arsenic (diss.filt)	TM152	mg/l	<0.00012	0.0987	0.145	0.206	0.206	0.0987	0.150	n/a	n/a	No triggers set - Data for baseline	0.12	0.15	0.06
Sodium (diss.filt)	TM228	mg/l	<0.076	204	214	232	232	204	216.667	232	232	Max used *** (Mean + 1.2 x Variance >WQT)	257.00	242.00	258.00
Potassium (diss.filt)	TM228	mg/l	<1	32.6	31.9	32.7	32.7	31.9	32.400	32.8	65.4	No standard	35.5	33.1	29.4
Hardness, Total as CaCO3	TM228	mg/l	<1	258	296	282	296	258	278.667	n/a	n/a	No triggers set - Data for baseline	398	374	326
Cadmium (diss.filt)	TM152	mg/l	<0.0001	<0.0001	<0.0001	0.00275	0.00275	0.00275	0.002750	n/a	n/a	No triggers set - Data for baseline	0.0001	<0.00008	<0.00008
Chromium (diss.filt)	TM152	mg/l	<0.00022	0.000233	0.0113	0.0131	0.0131	0.000233	0.008211	n/a	n/a	No triggers set - Data for baseline	<0.001	<0.001	<0.001
Copper (diss.filt)	TM152	mg/l	<0.00085	<0.00085	0.00225	0.00831	0.00831	0.00225	0.005280	n/a	n/a	No triggers set - Data for baseline	0.0008	<0.0003	<0.0003
Lead (diss.filt)	TM152	mg/l	<0.00002	0.00198	0.00317	0.00145	0.00317	0.00145	0.002200	n/a	n/a	No triggers set - Data for baseline	0.0003	0.0004	0.0002
Nickel (diss.filt)	TM152	mg/l	<0.00015	0.01	0.0125	0.00973	0.0125	0.00973	0.010743	n/a	n/a	No triggers set - Data for baseline	0.01	0.01	0.01
Selenium (diss.filt)	TM152	mg/l	<0.00039	0.00248	0.00407	0.00882	0.00882	0.00248	0.005123	n/a	n/a	No triggers set - Data for baseline	0.0007	<0.001	<0.001
Zinc (diss.filt)	TM152	mg/l	<0.00041	0.00914	0.0236	0.0317	0.0317	0.00914	0.021480	n/a	n/a	No triggers set - Data for baseline	0.01	0.0014	0.0015
TPH Criteria Working Group (TPH CW															
GRO >C5-C12	TM245	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.050	0.050	LOD **	<0.05	<0.05	<0.05
Methyl tertiary butyl ether (MTBE)	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	LOD **	<0.003	<0.003	<0.003
Benzene	TM245	mg/l	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007	0.007	LOD **	<0.007	<0.007	<0.007
Toluene	TM245	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.004	MRV * / LOD **	<0.004	<0.004	<0.004
Ethylbenzene	TM245	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.005	LOD **	<0.005	<0.005	<0.005
m,p-Xylene	TM245	mg/l	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	0.008	LOD **	<0.008	<0.008	<0.008
o-Xylene	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	MRV * / LOD **	<0.003	<0.003	<0.003
Sum of detected Xylenes	TM245	mg/l	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	0.011	LOD **	<0.011	<0.011	<0.011
Sum of detected BTEX	TM245	mg/l	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	0.028	0.028	LOD **	<0.028	<0.028	<0.028
Aliphatics >C5-C6	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C6-C8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C8-C10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C10-C12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C12-C16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C16-C21 (aq)	TM174	mg/l	<0.01	0.118	0.05	0.033	0.118	0.033	0.067	n/a	n/a	No triggers set - Data for baseline	0.015	<0.01	<0.01
Aliphatics >C21-C35 (aq)	TM174	mg/l	<0.01	0.132	0.063	0.032	0.132	0.032	0.076	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Total Aliphatics >C12-C35 (aq)	TM174	mg/l	<0.01	0.25	0.113	0.065	0.25	0.065	0.143	n/a	n/a	No triggers set - Data for baseline	0.015	<0.01	<0.01
Aromatics >EC5-EC7	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC12-EC16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC16-EC21 (aq)	TM174	mg/l	<0.01	0.021	0.01	<0.01	0.021	0.01	0.016	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC21-EC35 (aq)	TM174	mg/l	<0.01	0.072	0.039	<0.01	0.072	0.039	0.056	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Total Aromatics >EC12-EC35 (aq)	TM174	mg/l	<0.01	0.093	0.049	<0.01	0.093	0.049	0.071	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/l	<0.01	0.343	0.162	0.065	0.343	0.065	0.190	n/a	n/a	No triggers set - Data for baseline	0.015	<0.01	0.010

Notes

Trigger values applied associated with monitoring location
Hazardous substances with Minimum Reporting Value (MRV)

* Environment Agency MRV for Hazardous Substances used as Control Level and Compliance Level

** LOD - Limit of Detection used as Control Level and Compliance Level where above the MRV used

*** Maximum concentration used as Control Level and Trigger Level where MRV exceeded from historical contamination, or where no MRV published for hydrocarbons.

Environment Agency MRV: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values [last accessed 29/06/16]

WS005 Sludge Drying, Anaerobic Digesters and Proposed Pumping Station
Baseline Groundwater Data and EMP Trigger Levels

Assessed by:	Lynne Gemmell
Reviewed by:	Laurence Munden

Below Control and Compliance Levels
Above Control Level
Above Compliance Level

				Round 1	Round 2	Round 3				Control Level	Compliance Level				
			Customer Sample ID	WS005	WS005	WS005									
			Depth	1.71-	1.55-	1.66-									
Avonmouth STW			Sampled Date	18/03/2016	30/03/2016	15/04/2016									
Test	**Method**	**Units**	**LOD**				**Max**	**Min**	**Mean**	**Trigger 1**	**Trigger 2**	**Notes**	**Jan-18**	**Mar-19**	**Jan-20**
Inorganics															
Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	1.79	0.548	0.93	1.79	0.548	1.089	n/a	n/a		1.51	1.65	1.4
Nitrite as NO2	TM184	mg/l	<0.05	0.249	0.281	0.423	0.423	0.249	0.318	0.44	0.50	WQT (Trigger 2)	<0.05	<0.05	<0.05
pH	TM256	pH Units	<1	8.06	7.8	7.87	8.06	7.8	7.910	n/a	n/a		7.56	7.69	7.35
Sulphate	TM184	mg/l	<2	67.4	40.6	61.9	67.4	40.6	56.633	69.55	134.80	Trigger 2 < WQT	37.20	39.20	35.10
Sulphide	TM101	mg/l	<0.01	<0.01	0.077	0.182	0.182	0.077	0.130	0.19	0.36	No standard	0.02	<0.01	<0.01
Chloride	TM184	mg/l	<2	281	40.5	109	281	40.5	143.500	281.00	281.00	Max used *** (Mean + 1.2 x Variance >WQT)	191.00	244.00	189.00
COD, unfiltered	TM107	mg/l	<7	-	79	47.2	79	47.2	63.100	n/a	n/a		89.8	55.1	45.2
Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	3.12	<0.3	1.3	3.12	1.3	2.210	3.12	3.12	Max used *** (Mean + 1.2 x Variance >WQT)	1.66	1.57	1.28
Phosphate (ortho) as PO4	TM184	mg/l	<0.05	0.12	0.251	0.103	0.251	0.103	0.158	0.27	0.50	Trigger 2 < WQT	<0.02	<0.05	<0.05
Nitrate as NO3	TM184	mg/l	<0.3	0.72	24	6.68	24	0.72	10.467	26.71	48.00	Trigger 2 < WQT	0.69	<0.3	<0.3
Filtered (Dissolved) Metals															
Mercury (diss.filt)	TM183	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	n/a	No triggers set - Data for baseline	<0.00001	<0.00001	<0.00001
Arsenic (diss.filt)	TM152	mg/l	<0.00012	0.00543	0.00728	0.00439	0.00728	0.00439	0.006	n/a	n/a	No triggers set - Data for baseline	0.002	0.003	0.008
Sodium (diss.filt)	TM228	mg/l	<0.076	171	29.2	67	171	29.2	89.067	187	200	WQT (Trigger 2)	131.00	163.00	132.00
Potassium (diss.filt)	TM228	mg/l	<1	15.3	8.59	8.95	15.3	8.59	10.947	16.2	30.6	No standard	8	7.88	5.89
Hardness, Total as CaCO3	TM228	mg/l	<1	567	209	350	567	209	375.333	n/a	n/a	No triggers set - Data for baseline	635.000	707.000	625.000
Cadmium (diss.filt)	TM152	mg/l	<0.0001	<0.0001	<0.0001	0.000414	0.000414	0.000414	0.000414	n/a	n/a	No triggers set - Data for baseline	0.001	<0.00008	<0.00008
Chromium (diss.filt)	TM152	mg/l	<0.00022	0.0172	0.00393	0.00527	0.0172	0.00393	0.008800	n/a	n/a	No triggers set - Data for baseline	<0.001	<0.001	<0.001
Copper (diss.filt)	TM152	mg/l	<0.00085	0.00989	0.00705	0.00784	0.00989	0.00705	0.008260	n/a	n/a	No triggers set - Data for baseline	0.0092	<0.0003	<0.0003
Lead (diss.filt)	TM152	mg/l	<0.00002	0.000298	0.000274	0.000114	0.000298	0.000114	0.000229	n/a	n/a	No triggers set - Data for baseline	<0.0002	0.0003	<0.0002
Nickel (diss.filt)	TM152	mg/l	<0.00015	0.0121	0.00282	0.00447	0.0121	0.00282	0.006463	n/a	n/a	No triggers set - Data for baseline	0.0101	0.0089	0.0081
Selenium (diss.filt)	TM152	mg/l	<0.00039	0.00435	0.00777	0.00741	0.00777	0.00435	0.006510	n/a	n/a	No triggers set - Data for baseline	0.0017	<0.001	<0.001
Zinc (diss.filt)	TM152	mg/l	<0.00041	0.00463	0.0411	0.0419	0.0419	0.00463	0.029210	n/a	n/a	No triggers set - Data for baseline	0.0673	0.0044	0.0074
TPH Criteria Working Group (TPH CW															
GRO >C5-C12	TM245	mg/l	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	n/a	n/a	No triggers set - Data for baseline	<0.05	<0.05	<0.05
Methyl tertiary butyl ether (MTBE)	TM245	mg/l	<0.003	-	<0.003	<0.003	<0.003	<0.003	<0.003	n/a	n/a	No triggers set - Data for baseline	<0.003	<0.003	<0.003
Benzene	TM245	mg/l	<0.007	-	<0.007	<0.007	<0.007	<0.007	<0.007	n/a	n/a	No triggers set - Data for baseline	<0.007	<0.007	<0.007
Toluene	TM245	mg/l	<0.004	-	<0.004	<0.004	<0.004	<0.004	<0.004	n/a	n/a	No triggers set - Data for baseline	<0.004	<0.004	<0.004
Ethylbenzene	TM245	mg/l	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	n/a	n/a	No triggers set - Data for baseline	<0.005	<0.005	<0.005
m,p-Xylene	TM245	mg/l	<0.008	-	<0.008	<0.008	<0.008	<0.008	<0.008	n/a	n/a	No triggers set - Data for baseline	<0.008	<0.008	<0.008
o-Xylene	TM245	mg/l	<0.003	-	<0.003	<0.003	<0.003	<0.003	<0.003	n/a	n/a	No triggers set - Data for baseline	<0.003	<0.003	<0.003
Sum of detected Xylenes	TM245	mg/l	<0.011	-	<0.011	<0.011	<0.011	<0.011	<0.011	n/a	n/a	No triggers set - Data for baseline	<0.011	<0.011	<0.011
Sum of detected BTEX	TM245	mg/l	<0.028	-	<0.028	<0.028	<0.028	<0.028	<0.028	n/a	n/a	No triggers set - Data for baseline	<0.028	<0.028	<0.028
Aliphatics >C5-C6	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C6-C8	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C8-C10	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C10-C12	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aliphatics >C12-C16 (aq)	TM174	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	0.019	<0.01	<0.01
Aliphatics >C16-C21 (aq)	TM174	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	0.029	<0.01	<0.01
Aliphatics >C21-C35 (aq)	TM174	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	0.148	<0.01	<0.01
Total Aliphatics >C12-C35 (aq)	TM174	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	0.196	<0.01	<0.01
Aromatics >EC5-EC7	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	TM245	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC12-EC16 (aq)	TM174	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Aromatics >EC16-EC21 (aq)	TM174	mg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	0.024	<0.01	<0.01
Aromatics >EC21-EC35 (aq)	TM174	mg/l	<0.01	-	0.039	<0.01	0.039	0.039	0.039	n/a	n/a	No triggers set - Data for baseline	0.074	<0.01	<0.01
Total Aromatics >EC12-EC35 (aq)	TM174	mg/l	<0.01	-	0.039	<0.01	0.039	0.039	0.039	n/a	n/a	No triggers set - Data for baseline	0.098	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/l	<0.01	-	0.04	<0.01	0.04	0.04	0.040	n/a	n/a	No triggers set - Data for baseline	0.294	<0.01	<0.01

Notes

Trigger values applied associated with monitoring location

Hazardous substances with Minimum Reporting Value (MRV)

* Environment Agency MRV for Hazardous Substances used as Control Level and Compliance Level

** LOD - Limit of Detection used as Control Level and Compliance Level where above the MRV used

*** Maximum concentration used as Control Level and Trigger Level where MRV exceeded from historical contamination, or where no MRV published for hydrocarbons.

Environment Agency MRV: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values [last accessed 29/06/16]

WS006 Former Condensate Soakaway and Standby Boiler
Baseline Groundwater Data and EMP Trigger Levels

Assessed by:	Lynne Gemmell
Reviewed by:	Laurence Munden

Below Control and Compliance Levels
Above Control Level
Above Compliance Level

				Round 1	Round 2	Round 3										
			Customer Sample ID	WS006	WS006	WS006										
			Depth	1.66-	1.78-	1.77-										
Avonmouth STW			Sampled Date	18/03/2016	30/03/2016	15/04/2016				Control Level	Compliance Level			WS006 Repeat Sample		
Test	Method	Units	LOD				Max	Min	Mean	Trigger 1	Trigger 2	Notes	Jan-18	Apr-18	Mar-19	Jan-20
Inorganics																
Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	1.16	1.14	1.12	1.16	1.12	1.140	n/a	n/a	No triggers set - Data for baseline	1.18		0.973	0.606
Nitrite as NO2	TM184	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n/a	n/a	No triggers set - Data for baseline	<0.05		0.05	0.15
pH	TM256	pH Units	<1	7.42	7.37	7.33	7.42	7.33	7.373	n/a	n/a	No triggers set - Data for baseline	7.27		7.63	7.25
Sulphate	TM184	mg/l	<2	54.4	60.1	59.5	60.1	54.4	58.000	n/a	n/a	No triggers set - Data for baseline	29.10		69.00	38.90
Sulphide	TM101	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	No triggers set - Data for baseline	<0.01		<0.01	<0.01
Chloride	TM184	mg/l	<2	58.8	60.7	59.3	60.7	58.8	59.600	n/a	n/a	No triggers set - Data for baseline	65.50		32.00	18.00
COD, unfiltered	TM107	mg/l	<7	115	73.1	40.4	115	40.4	76.167	n/a	n/a	No triggers set - Data for baseline	121		61.1	18
Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	1.81	1.94	1.75	1.94	1.75	1.833	n/a	n/a	No triggers set - Data for baseline	2.48		0.95	<0.3
Phosphate (ortho) as PO4	TM184	mg/l	<0.05	<0.05	<0.05	0.05	0.05	0.05	0.050	n/a	n/a	No triggers set - Data for baseline	<0.02		<0.05	<0.05
Nitrate as NO3	TM184	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	n/a	n/a	No triggers set - Data for baseline	<0.3		22.90	27.30
Filtered (Dissolved) Metals																
Mercury (diss.filt)	TM183	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	n/a	No triggers set - Data for baseline	<0.00001		<0.00001	<0.00001
Arsenic (diss.filt)	TM152	mg/l	<0.00012	0.00213	0.00248	0.00315	0.00315	0.00213	0.003	n/a	n/a	No triggers set - Data for baseline	0.00		0.00	0.00
Sodium (diss.filt)	TM228	mg/l	<0.076	85.6	81.3	81.6	85.6	81.3	82.833	n/a	n/a	No triggers set - Data for baseline	96.70	74.5	88	49.3
Potassium (diss.filt)	TM228	mg/l	<1	7.59	7.29	7.32	7.59	7.29	7.400	n/a	n/a	No triggers set - Data for baseline	7.36		5.56	4.22
Hardness, Total as CaCO3	TM228	mg/l	<1	459	444	445	459	444	449.333	n/a	n/a	No triggers set - Data for baseline	670		438	300
Cadmium (diss.filt)	TM152	mg/l	<0.0001	0.000332	0.000562	0.000841	0.000841	0.000332	0.000578	n/a	n/a	No triggers set - Data for baseline	0.0005		<0.00008	0.0001
Chromium (diss.filt)	TM152	mg/l	<0.00022	0.00028	0.00972	<0.00022	0.00972	0.00028	0.005000	n/a	n/a	No triggers set - Data for baseline	<0.001		<0.001	<0.001
Copper (diss.filt)	TM152	mg/l	<0.00085	0.0091	0.0116	0.00572	0.0116	0.00572	0.008807	n/a	n/a	No triggers set - Data for baseline	0.0071		0.0040	0.0073
Lead (diss.filt)	TM152	mg/l	<0.00002	0.000359	0.000119	0.000168	0.000359	0.000119	0.000215	n/a	n/a	No triggers set - Data for baseline	<0.0002		0.0003	0.0003
Nickel (diss.filt)	TM152	mg/l	<0.00015	0.00713	0.0055	0.00452	0.00713	0.00452	0.005717	n/a	n/a	No triggers set - Data for baseline	0.0061		0.0042	0.0042
Selenium (diss.filt)	TM152	mg/l	<0.00039	0.00193	0.00333	0.00352	0.00352	0.00193	0.002927	n/a	n/a	No triggers set - Data for baseline	0.0008		0.0016	0.0015
Zinc (diss.filt)	TM152	mg/l	<0.00041	0.0174	0.0363	0.0198	0.0363	0.0174	0.024500	n/a	n/a	No triggers set - Data for baseline	0.0292		0.0050	0.0084
TPH Criteria Working Group (TPH CW																
GRO >C5-C12	TM245	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.050	0.050	LOD **	<0.05	<0.05	<0.05	<0.05
Methyl tertiary butyl ether (MTBE)	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	LOD **	<0.003	<0.003	<0.003	<0.003
Benzene	TM245	mg/l	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007	0.007	LOD **	<0.007	<0.007	<0.007	<0.007
Toluene	TM245	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.004	MRV * / LOD **	<0.004	<0.004	<0.004	<0.004
Ethylbenzene	TM245	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.005	LOD **	<0.005	<0.005	<0.005	<0.005
m,p-Xylene	TM245	mg/l	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	0.008	LOD **	<0.008	<0.008	<0.008	<0.008
o-Xylene	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	MRV * / LOD **	<0.003	<0.003	<0.003	<0.003
Sum of detected Xylenes	TM245	mg/l	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	0.011	LOD **	<0.011	<0.011	<0.011	<0.011
Sum of detected BTEX	TM245	mg/l	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	0.028	0.028	LOD **	<0.028	<0.028	<0.028	<0.028
Aliphatics >C5-C6	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aliphatics >C12-C16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	0.033	0.010	<0.01	<0.01
Aliphatics >C16-C21 (aq)	TM174	mg/l	<0.01	0.09	0.042	0.031	0.09	0.031	0.054	0.090	0.090	Max detected ***	0.365	0.027	0.028	0.026
Aliphatics >C21-C35 (aq)	TM174	mg/l	<0.01	0.097	0.054	<0.01	0.097	0.054	0.076	0.097	0.097	Max detected ***	0.344	<0.01	0.033	0.014
Total Aliphatics >C12-C35 (aq)	TM174	mg/l	<0.01	0.187	0.096	0.031	0.187	0.031	0.105	0.187	0.187	Max detected ***	0.742	0.037	0.061	0.040
Aromatics >EC5-EC7	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aromatics >EC12-EC16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01	<0.01
Aromatics >EC16-EC21 (aq)	TM174	mg/l	<0.01	0.015	0.01	<0.01	0.015	0.01	0.013	0.015	0.015	Max detected ***	0.024	<0.01	<0.01	<0.01
Aromatics >EC21-EC35 (aq)	TM174	mg/l	<0.01	0.046	0.044	<0.01	0.046	0.044	0.045	0.046	0.046	Max detected ***	0.109	<0.01	<0.01	<0.01
Total Aromatics >EC12-EC35 (aq)	TM174	mg/l	<0.01	0.061	0.054	<0.01	0.061	0.054	0.058	0.061	0.061	Max detected ***	0.133	<0.01	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/l	<0.01	0.248	0.15	0.031	0.248	0.031	0.143	0.248	0.248	Max detected ***	0.875	0.037	0.063	0.042

Notes

Trigger values applied associated with monitoring location

Hazardous substances with Minimum Reporting Value (MRV)

* Environment Agency MRV for Hazardous Substances used as Control Level and Compliance Level

** LOD - Limit of Detection used as Control Level and Compliance Level where above the MRV used

*** Maximum concentration used as Control Level and Trigger Level where MRV exceeded from historical contamination, or where no MRV published for hydrocarbons.

Environment Agency MRV: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values [last accessed 29/06/16]

WS007 Fuel Storage, Workshop and Engines
Baseline Groundwater Data and EMP Trigger Levels

Assessed by:	Lynne Gemmell
Reviewed by:	Laurence Munden

				Round 1	Round 2	Round 3									
			Customer Sample ID	WS007	WS007	WS007									
			Depth	2.24-	2.00-	2.15-									
Avonmouth STW			Sampled Date	18/03/2016	30/03/2016	15/04/2016				Control Level	Compliance Level				
Test	Method	Units	LOD				Max	Min	Mean	Trigger 1	Trigger 2	Notes	Jan-18	Mar-19	Jan-20
Inorganics															
Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	1.81	1.7	1.58	1.81	1.58	1.697	n/a	n/a	No triggers set - Data for baseline	1.39	1.32	1.24
Nitrite as NO2	TM184	mg/l	<0.05	<0.05	<0.05	0.143	0.143	0.143	0.143	n/a	n/a	No triggers set - Data for baseline	<0.05	<0.05	<0.05
pH	TM256	pH Units	<1	7.94	7.43	7.44	7.94	7.43	7.603	n/a	n/a	No triggers set - Data for baseline	7.59	7.72	7.42
Sulphate	TM184	mg/l	<2	412	345	326	412	326	361.000	n/a	n/a	No triggers set - Data for baseline	178.00	185.00	166.00
Sulphide	TM101	mg/l	<0.01	0.0895	0.149	<0.01	0.149	0.0895	0.119	n/a	n/a	No triggers set - Data for baseline	<0.01	<0.01	<0.01
Chloride	TM184	mg/l	<2	193	168	139	193	139	166.667	n/a	n/a	No triggers set - Data for baseline	112.00	132.00	112.00
COD, unfiltered	TM107	mg/l	<7	203	49	72.6	203	49	108.200	n/a	n/a	No triggers set - Data for baseline	113	34.1	24.9
Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	2.4	2.11	2.2	2.4	2.11	2.237	n/a	n/a	No triggers set - Data for baseline	2.94	1.38	1.50
Phosphate (ortho) as PO4	TM184	mg/l	<0.05	0.142	0.063	0.059	0.142	0.059	0.088	n/a	n/a	No triggers set - Data for baseline	0.16	0.31	0.35
Nitrate as NO3	TM184	mg/l	<0.3	0.385	5.47	2.77	5.47	0.385	2.875	n/a	n/a	No triggers set - Data for baseline	5.36	2.30	1.13
Filtered (Dissolved) Metals										n/a	n/a	No triggers set - Data for baseline			
Mercury (diss.filt)	TM183	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	n/a	No triggers set - Data for baseline	<0.00001	<0.00001	<0.00001
Arsenic (diss.filt)	TM152	mg/l	<0.00012	0.00859	0.00373	0.00295	0.00859	0.00295	0.005	n/a	n/a	No triggers set - Data for baseline	0.01	0.00	0.00
Sodium (diss.filt)	TM228	mg/l	<0.076	112	103	96.1	112	96.1	103.700	n/a	n/a	No triggers set - Data for baseline	96.60	73.50	81.40
Potassium (diss.filt)	TM228	mg/l	<1	27	25.6	24.6	27	24.6	25.733	n/a	n/a	No triggers set - Data for baseline	23.9	20.8	23.4
Hardness, Total as CaCO3	TM228	mg/l	<1	708	675	649	708	649	677.333	n/a	n/a	No triggers set - Data for baseline	699	558	577
Cadmium (diss.filt)	TM152	mg/l	<0.0001	<0.0001	0.000214	0.000825	0.000825	0.000214	0.000520	n/a	n/a	No triggers set - Data for baseline	0.000114	<0.00008	<0.00008
Chromium (diss.filt)	TM152	mg/l	<0.00022	0.00958	0.00823	0.000419	0.00958	0.000419	0.006076	n/a	n/a	No triggers set - Data for baseline	<0.001	<0.001	<0.001
Copper (diss.filt)	TM152	mg/l	<0.00085	0.003	0.00268	0.00257	0.003	0.00257	0.002750	n/a	n/a	No triggers set - Data for baseline	0.0012	0.0005	<0.0003
Lead (diss.filt)	TM152	mg/l	<0.00002	0.00129	0.000502	0.000295	0.00129	0.000295	0.000696	n/a	n/a	No triggers set - Data for baseline	0.0004	0.0003	0.0003
Nickel (diss.filt)	TM152	mg/l	<0.00015	0.0142	0.0133	0.0119	0.0142	0.0119	0.013133	n/a	n/a	No triggers set - Data for baseline	0.0044	0.0024	0.0023
Selenium (diss.filt)	TM152	mg/l	<0.00039	0.00194	0.00352	0.00332	0.00352	0.00194	0.002927	n/a	n/a	No triggers set - Data for baseline	0.0010	0.0015	<0.001
Zinc (diss.filt)	TM152	mg/l	<0.00041	0.0102	0.0507	0.0463	0.0507	0.0102	0.035733	n/a	n/a	No triggers set - Data for baseline	0.0337	0.0160	0.0096
TPH Criteria Working Group (TPH CW															
GRO >C5-C12	TM245	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.050	0.050	LOD **	<0.05	<0.05	<0.05
Methyl tertiary butyl ether (MTBE)	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	LOD **	<0.003	<0.003	<0.003
Benzene	TM245	mg/l	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007	0.007	LOD **	<0.007	<0.007	<0.007
Toluene	TM245	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.004	MRV * / LOD **	<0.004	<0.004	<0.004
Ethylbenzene	TM245	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.005	LOD **	<0.005	<0.005	<0.005
m,p-Xylene	TM245	mg/l	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	0.008	LOD **	<0.008	<0.008	<0.008
o-Xylene	TM245	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.003	MRV * / LOD **	<0.003	<0.003	<0.003
Sum of detected Xylenes	TM245	mg/l	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	0.011	LOD **	<0.011	<0.011	<0.011
Sum of detected BTEX	TM245	mg/l	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	0.028	0.028	LOD **	<0.028	<0.028	<0.028
Aliphatics >C5-C6	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01
Aliphatics >C6-C8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.020	0.020	LOD **	<0.01	<0.01	<0.01
Aliphatics >C8-C10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.020	0.020	LOD **	<0.01	<0.01	<0.01
Aliphatics >C10-C12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.020	0.020	LOD **	<0.01	<0.01	<0.01
Aliphatics >C12-C16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.020	0.020	LOD **	<0.01	<0.01	<0.01
Aliphatics >C16-C21 (aq)	TM174	mg/l	<0.01	0.058	0.014	0.019	0.058	0.014	0.030	0.058	0.058	Max detected ***	0.024	<0.01	<0.01
Aliphatics >C21-C35 (aq)	TM174	mg/l	<0.01	0.089	0.024	0.01	0.089	0.01	0.041	0.089	0.089	Max detected ***	<0.01	<0.01	<0.01
Total Aliphatics >C12-C35 (aq)	TM174	mg/l	<0.01	0.147	0.038	0.029	0.147	0.029	0.071	0.147	0.147	Max detected ***	0.024	<0.01	<0.01
Aromatics >EC5-EC7	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	TM245	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01
Aromatics >EC12-EC16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	LOD **	<0.01	<0.01	<0.01
Aromatics >EC16-EC21 (aq)	TM174	mg/l	<0.01	0.017	<0.01	<0.01	0.017	0.017	0.017	0.017	0.017	Max detected ***	<0.01	<0.01	<0.01
Aromatics >EC21-EC35 (aq)	TM174	mg/l	<0.01	0.06	0.02	<0.01	0.06	0.02	0.040	0.060	0.060	Max detected ***	<0.01	<0.01	<0.01
Total Aromatics >EC12-EC35 (aq)	TM174	mg/l	<0.01	0.077	0.02	<0.01	0.077	0.02	0.049	0.077	0.077	Max detected ***	<0.01	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/l	<0.01	0.249	0.058	0.029	0.249	0.029	0.112	0.249	0.249	Max detected ***	0.024	<0.01	<0.01

Notes

Trigger values applied associated with monitoring location
Hazardous substances with Minimum Reporting Value (MRV)

* Environment Agency MRV for Hazardous Substances used as Control Level and Compliance Level

** LOD - Limit of Detection used as Control Level and Compliance Level where above the MRV used

*** Maximum concentration used as Control Level and Trigger Level where MRV exceeded from historical contamination, or where no MRV published for hydrocarbons.

Environment Agency MRV: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values [last accessed 29/06/16]