A PHASE II LAND CONTAMINATION ASSESSMENT FOR THE PROPOSED EXTENSION OF THE ANAEROBIC DIGESTION PLANT AT:

ELLINGHAM ROAD, ATTLEBOROUGH, NORFOLK, NR17 1AE

CLIENT:	**Privilege Finance Services**
REFERENCE:	**JAH/19.287/PhaseII/Rev01**
DATE:	**5 May 2020**

A F Howland Associates Limited
The Old Exchange
Newmarket Road
Cringleford
Norwich
NR4 6UF

Tel: 01603 250754
Email: admin@howland.co.uk
Website: www.howland.co.uk

A F Howland Associates

CONTENTS

CONTENTS (CONTINUED)

APPENDICES

1. INTRODUCTION AND TERMS OF REFERENCE

A F Howland Associates Limited (AFHA) was instructed by Privilege Finance Services (the "Client") to carry out a Phase II Land Contamination Assessment for the proposed extension to the anaerobic digestion plant at Ellingham Road, Attleborough, NR17 1AE (Drawing 19.287/PhaseII/01). The proposed plans are indicated on the BioConstruct drawing in Appendix G.

The planning application, currently under consideration, includes the construction of a reception building, tanks (digestate, pasteurisation, propane, etc.), a gas upgrading unit, a grid entry unit, a gas flare, a site office and parking spaces, and a weighbridge.

This assessment was required to address the comments from the Environment Agency, contained within correspondence referenced AE/2019/124747/02-L01, dated 19 February 2020, and specifically assesses the potential risks identified within the previous preliminary risk assessment (RSK, 2020).

This report was prepared for the use of the Client and its advisors. Other parties using the contained information do so at their own risk and any duty of care to those parties is specifically excluded. The report has been carried out in general accordance with accepted best practice and methodologies (BSI, 2017; DEFRA, 2004; DCLG, 2010).

2. BACKGROUND INFORMATION

2.1 PREVIOUS REPORTS

Several stages of investigation and reporting have already been carried out at the site including;

- Ground Investigation Report (AFHA, 2019)
- Flood Risk Assessment (RSK, 2019)
- Preliminary Risk Assessment (RSK, 2020)

Summaries of these reports are provided in the following sections together with pertinent contemporary information. The full reports should be referred to for more detailed information.

2.1.1 Ground Investigation Report (AFHA, 2019)

This report focuses on the southern part of the site where the proposed buildings, tanks, and ancillary equipment will be constructed. An intrusive investigation was undertaken to provide geotechnical and geo-environmental parameters relating to the proposed development and comprised of;

- Two cable percussive boreholes (referenced BH01 and BH02) to a maximum depth of 8.00 m;
- Six windowless dynamic sample holes (referenced WS01 through to WS06) to a maximum depth of 5.00 m; and
- Five plate load tests (referenced PLT01 through to PLT05).

Subsequent geotechnical and contamination testing was undertaken on collected soil and groundwater samples. The contamination testing consisted of heavy metals, polycyclic aromatic hydrocarbons (PAH), phenol, cyanide, petroleum hydrocarbons (TPH) and asbestos screening/identification.

The intrusive investigation identified made ground soils overlying River Terrace Deposits/Alluvium and the Lowestoft Formation (granular and cohesive proportions). Potential asbestos containing materials (ACM) were noted within the made ground soils of WS06.

Groundwater strikes were recorded within WS01 and WS02 at 1.95 and 2.10 m, respectively, within the River Terrace Deposits/Alluvium. Chemical testing undertaken on shallow soils identified that that tested contaminants were below the respective adopted screening criteria. Loose Chrysotile asbestos fibres were identified within the made ground in WS05 and WS06. Additionally, the potential ACM was tested and confirmed the presence of cement binding chrysotile asbestos fibres.

Interpretation of the geotechnical parameters confirmed that the proposed tanks should be founded upon the dense to very dense granular soils of the Lowestoft Formation.

Granular material at 1.00 m within the footprint of the proposed buildings/ancillary plant would have an allowable bearing capacity of 33kNm^{-2}. Therefore, given the low bearing capacity, consideration of improving the ground or using alternative founding solutions (i.e. piling) was recommended.

A design sulphate class of DS-1 and ACEC classification of AC-1 was derived.

2.1.2 Flood Risk Assessment (RSK, 2019)

This report covers the entire footprint of the site to establish the flood risk associated with the proposed development.

The proposed development will only result in a negligible increase to the impermeable area on-site. Therefore, surface water from the proposed development will follow the existing regime and be attenuated within the existing on-site reservoir.

2.1.3 Preliminary Risk Assessment (RSK, 2020)

This report covers the entire footprint of the site, to identify any land contamination constraints to the proposed development, and the need for further investigation/remediation to ensure that the site is suitable for its proposed use.

This assessment included the completion of an initial conceptual model, to identify potential contamination linkages for potential contaminants with a subsequent risk assessment based upon uncertainties and associated risk. The following potential sources of contamination were identified;

- Above ground storage of potentially hazardous materials/chemicals (such as fuel tanks, propane tanks, and various IBCs and drums of unknown contents);
- Storage of organic waste/effluent in the north-west area of the site;
- Made ground associated with the site construction over time (such as backfill beneath foundations, in buried service trenches, and within the bund along the northern site boundary);
- Confirmed and potential asbestos containing materials within the poultry farm buildings and buried within the made ground; and,
- A historic landfill site located off site adjacent to the north-eastern site boundary.

Following the completion of the risk assessment within this report and in conjunction with the findings of the previous investigation (AFHA, 2019), the following potential risks were identified as requiring further assessment;

- Potential risks to current and future site staff and visitors from the inhalation of asbestos fibres;
- Potential risks to groundwater aquifers and surface waters from lateral migration of leaked contaminants stored on site, and leaching/percolation of site run-off through the made ground; and,
- Potential risks to current and future site staff, visitors, and buildings from the historic landfill off site, via explosion or asphyxiation from ground gas accumulation and build up in confined spaces.

2.2 SITE GEOLOGY, HYDROGEOLOGY, AND HYDROLOGY

2.2.1 Geology

The regional geology as mapped for the area by the British Geological Survey (BGS, 2020) shows a bedrock geology of the White Chalk Subgroup. Various superficial deposits were mapped across the site, with River Terrace Deposits/Alluvium mapped along the southern site boundary, and an outcrop of the Lowestoft Formation (sand and gravel) mapped in the north east corner of the site. The superficial deposits across the remainder of the site were mapped as Lowestoft Formation (Diamicton).

None of the previous exploratory holes on site reached the White Chalk Subgroup, with penetration refused within the competent Lowestoft Formation. A historic borehole

located approximately 640 m to the north-east of the site (BGS, 2020)[1], situated within the mapped Lowestoft Fomation/White Chalk Subgroup, encountered the Lowestoft Formation (sand and gravel) down to 8.84 m bgl (below ground level), the Lowestoft Formation (diamicton) down to 56.08 m bgl, and underlying chalk down to at least 60.35 m bgl. Given the elevation of the site is noted to fluctuate between 38.06 and 31.99 m aOD (above Ordnance Datum), the White Chalk Subgroup is anticipated to be present from between 48.45 and 54.52 m bgl on site.

The **White Chalk Subgroup**[2] is a carbonate rock made up from the debris of microfossil skeletal material laid down during the Cretaceous Period. It contains beds of flint nodules, which developed during early diagenesis. It is also very susceptible to freeze-thaw action and its upper levels may show the evidence of severe disruption and fracturing as a result of the climatic changes in the geologic past. Besides an increase in the frequency of fracturing this disruption also allowed an increase in the moisture content producing a softer material, generally referred to as 'putty chalk'. In the disrupted state the chalk was subject to remoulding and transport by hillslope processes and may have produced a mantle of material very different to the underlying intact material.

Weathering effects can manifest in the form of dissolution features where the flow of water has historically been concentrated in certain areas, for example, along joints. Such features are not uncommon in East Anglia and are often present as distinct solution pipes partially or wholly infilled with the unconsolidated superficial deposits. Where only partially infilled, meta-stable cavities may be present. The engineering behaviour of the Chalk is strongly influenced by weathering, which may extend to depths of several metres.

The **Alluvium** comprises a sequence of recent silty clays, silts and sands which can be found interspersed with subordinate and sometimes extensive peats. The Alluvium has been laid down since the end of the Pleistocene some 10,000 years ago following the associated general rise in sea level. It is typically normally consolidated and therefore in a soft condition, but at surface the effects of desiccation caused by intermittent drying by weather and vegetation often produces a firmer crust.

[1] BGS Borehole reference TM09NW2, drilled in July 1940 at an approximate elevation of 39.62 m aOD (above Ordnance Datum) [measurements in feet converted to metres using a conversion factor of 0.304785]
[2] Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (undifferentiated)

The **River Terrace Deposits** were derived from the chalk and younger Eocene deposits during the Pleistocene and laid down while rivers were flowing with greater discharges than today. Subsequent readjustment has left these deposits as terraces along valley sides or as lag deposits along the floor of present day valleys. They comprise a superficial sequence of flint sand and gravel, locally displaying vertical sorting. Terraces may be capped by finer alluvium, but often this has been removed by later erosion. Towards the edges of the terraces the material has often been reworked and transported so that it may be found draped over lower levels than those at which it was originally deposited.

The **Lowestoft Formation** of the Anglian stage glaciation includes a variable sequence of granular deposits (the Sand and Gravel) and cohesive material (the Diamicton, which is a pebbly chalky clay). In its unweathered state, it cohesive material comprises typically bluish grey, variably sandy and silty clay, with abundant flint and chalk gravel. Other gravel lithologies may also be found and fine-grained chalk may be present within the matrix of the deposit. At surface the material may be decalcified, weathering to yellowish brown or brownish grey with a noticeable absence of chalk.

The whole is generally stiff with apparent high degrees of overconsolidation, although it may contain or overlie other glacial materials which can be very much softer. Glacial deposits are irregular in deposition so that extrapolation is not always reliable. Bands of sand and gravel may be found within or above the general sequence and can often be water bearing.

More substantial granular deposits are also present in the Lowestoft Formation. Although such materials are commonly associated with the Diamicton, they can be found separately as a result of deposition by glacial meltwater. Consequently the sand and gravel may vary in grading according to the previous depositional setting. The materials derived from glacial deposits may have travelled long distances and therefore contain exotic material. However, the bulk has been found to comprise predominantly flint.

2.2.2 Hydrogeology and Hydrology

The site is underlain by unconfined shallow aquifers and a deeper aquifer.

The shallow aquifers of the Lowestoft Formation (sand and gravel), River Terrace Deposits, and Alluvium are classified by the Environment Agency as secondary A aquifers. With the Lowestoft Formation (diamicton) classified as a secondary undifferentiated aquifer. The

deeper aquifer, related to the White Chalk Subgroup, is classified as a principal aquifer. The site is not located within a designated source protection zone.

A tributary river was located approximately 80 m to the south of the site, flowing in a north-easterly to south-westerly direction. Publically available information from the Environment Agency[3] identifies the River Thet and adjoining tributary is of 'poor' grade with respect to ecology parameters and a 'good' grade with respect to chemical parameters.

Given the general topography of the area, shallow groundwater is anticipated to flow in a south-westerly direction (towards and in the direction of the flow of the tributary river to the River Thet).

The Preliminary Risk Assessment (RSK, 2020) reported that the closest groundwater abstraction licences were located 157 m to the east and 198 m to the north-west of the site. However, neither of these licences are still active, with the closer licence only being temporary during a construction project and the second being revoked[4]. The closest active groundwater abstraction licence was located approximately 2.66 km to the south-east of the site[5], and as such is unlikely to be at risk from potential contamination migration from the site given the distance.

The Preliminary Risk Assessment (RSK, 2020) reported that the closest surface water abstraction licences were both located 109 m to the east. However, neither of these licences are still active, as they were temporary during a construction project. The closest active surface water abstraction licence was located approximately 1.98 km to the south-west of the site, downstream along the tributary river, for use in spray irrigation[6].

Most of the site is currently covered with buildings and hardstanding and therefore this will limit infiltration to ground and groundwater recharge, except where SUDS are present/proposed. Surface drainage from the site appears to be discharged into the adjacent drainage ditch running along the boundaries of the access track in the north.

[3] EA Data Catchment Explorer [Accessed 28/04/2020]
[4] Abstraction licence information provided by the Environment Agency for use under a conditional licence [version AfA135 - dated February 2020]
[5] Licence No. 6/33/44/*G/0218
[6] Licence No. 6/33/44/*S/0299

Drainage within the remainder of the site is likely to comprise throughflow towards the tributary river of the River Thet located in the south.

3. INTRUSIVE INVESTIGATION

3.1 STRATEGY

The fieldwork was carried out between 9 and 10 March 2020 and comprised six machine dug trial pits and eight windowless dynamic sampler holes.

The fieldwork locations were situated in areas of suspected contamination and in areas where sensitive receptors are already located/will be located as part of the development, and to allow subsequent ground gas and groundwater monitoring.

3.2 FIELDWORK

The National Grid references, and the elevations of the fieldwork locations relative to Ordnance Datum, were measured using a Hemisphere S320 VRS GPS (RTK) system and are shown on drawing 19.287/PhaseII/02, in Appendix G. Prior to any excavation, a cable avoidance tool (CAT) was used to sweep the positions and the immediate surrounding area to locate any potential services and the location adjusted as necessary. Hand dug inspection pits were carried out in advance of the windowless dynamic sample holes.

Six trial pits, referenced TP101 to TP106, were carried out using a tracked excavator with a 0.30 m wide bucket. The trial pits were all taken to a depth of 1.00 m in order to prove the full thickness of the made ground. The pits were logged and sampled *in situ*, with material from greater depths sampled and described from surface.

The windowless dynamic sample holes, referenced WS101 to WS106, were advanced with a tracked sampling rig to a depth of 4.00 m. The sampling system utilises a 63.5 kg weight falling a distance of 750 mm to drive rods and sampling tubes into the ground which are then extracted and the continuous samples described. Standard penetration tests (SPT) were carried out at regular intervals in materials using a split barrel sampler. The N value was taken as the number of blows for 300 mm of penetration, following a seating drive of 150 mm or 25 blows.

On completion of WS102, WS103, WS104, WS105, WS106, and WS107, standpipes were installed. These comprised a 50 mm internal diameter PVC access tube, slotted at the base surrounded by a granular filter, and sealed at the top with bentonite. A bung was attached

to the top of each installation to allow gas and groundwater monitoring to take place. The remaining locations were backfilled with arisings.

Sampling and soil descriptions were carried out in general accordance with BS EN 1997-2:2007 Eurocode 7 and its UK National Annex supported by BS 5930:2015. Representative disturbed samples, together with specialist environmental samples, were collected for subsequent laboratory analysis. The environmental samples were placed in amber glass jars and plastic tubs, stored in cool boxes and delivered to a UKAS accredited facility for analysis of possible contaminants.

Details of the strata encountered, the sampling, and *in situ* testing are shown on records in appendices B and C.

3.3 MONITORING

Subsequent to the completion of the fieldwork, AFHA returned to site to carry out ground gas, groundwater, and surface water monitoring.

The installations in WS102, WS106, and WS107 were monitored for ground gases and groundwater, and the installations within WS103, WS104, and WS105 were only monitored for groundwater. The installation details are presented in Table 1 below.

Fieldwork Location	Standpipe Response Zone (m bgl)	Target Stratum
WS102	1.00-4.00	Alluvium / River Terrace Deposits
WS103	0.90-3.90	Alluvium / River Terrace Deposits
WS104	0.30-3.30	Lowestoft Formation (Sand and Gravel) / Lowestoft Formation Diamicton
WS105	0.50-3.25	Alluvium / River Terrace Deposits
WS106	0.90-3.90	Lowestoft Formation (Sand and Gravel)
WS107	0.75-3.15	Lowestoft Formation (Sand and Gravel)

Table 1 – Summary of the standpipe installation details

Gas monitoring was carried out on six occasions[7], using a Geotechnical Instruments GA5000 portable gas analyser, in general accordance with the guidelines presented in

[7] Between 13 March 2020 and 15 April 2020

CIRIA C665 (Wilson *et al*, 2007) and BS 8576:2013 (BSI, 2013) and involved the following steps:

- Average flow was monitored for a period of one minute;
- Gases (methane (CH_4), carbon dioxide (CO_2), oxygen (O_2), carbon monoxide (CO), and hydrogen sulphide (H_2S)) were monitored for a minimum period of three minutes, if any significant readings were noted (≥0.5% CH_4, ≥2.0% CO_2); the period was extended to ten minutes;
- Over the respective monitoring period, gas readings were logged every thirty seconds; and,
- Record of groundwater level (if any).

Groundwater monitoring was undertaken on seven occasions, with samples taken upon the final visit[8]. During sampling, water was purged from each monitoring standpipe on the first monitoring visit, prior to monitoring, to ensure that the water within the installations was in hydraulic conductivity with the surrounding groundwater. The groundwater level and standpipe base level was taken in each monitoring standpipe.

Samples of the surface water were also taken during the monitoring. The samples, referenced SW01 through to SW03, were taken from the tributary river to the south of the site. SW01 was located downstream of the site[9], SW02 was located adjacent to the site[10], and SW03 was located upstream[11] at the locations shown on Drawing 19.278/PhaseII/02 The groundwater and surface water samples were stored in appropriate containers and placed in a cool box for transportation to a UKAS accredited laboratory for analysis.

3.4 GROUND CONDITIONS

3.4.1 Soils

The investigation found a ground profile consistent with the previous investigation and the anticipated geological succession.

<u>Made Ground</u>

Made ground was encountered from surface at each of the exploratory holes.

The made ground in WS101, WS102, TP101, and TP103 extended to depths of between 0.15 and 0.65 m and comprised an initial layer of sandy flint gravel with rare fragments of

[8] Between 13 March 2020 and 17 April 2020
[9] NGR 603248, 295290
[10] NGR 603440, 295414
[11] NGR 603693, 295505

brick, concrete, and tarmacadam (hardcore) overlying a slightly silty sandy gravelly clay with fragments of brick, concrete, and tarmacadam.

WS103, WS104, WS105, TP104, TP105, were all located within the areas of soft landscaping immediately surrounding the poultry farm sheds. Each of these positions recorded a thin layer of topsoil-like material overlying a slightly clayey silty slightly gravelly sand, with base depths of between 0.10 and 0.40 m. No bulk ACMs were identified within the made ground.

Within WS106, WS107, WS108, and TP106 the made ground comprised a slightly sandy flint gravel/gravelly sand, which had been compacted to form a hardcore, with base depths between 0.10 and 0.40 m.

TP102 was the only position undertaken within one of the poultry farm sheds, due to access constraints. Below the concrete floor slab, this trial pit found a clayey slightly gravelly sand over a plastic membrane to a depth of 0.35 m.

River Terrace Deposits / Alluvium

River Terrace Deposits / Alluvium were encountered within WS102, WS103, WS104, WS105, TP101, TP103, TP104, and TP105, directly beneath the made ground down to the base of the excavations (4.00 m in the windowless sample holes and 1.00 m in the trial pits).

This geological strata was noted to comprise predominantly granular deposits with interspersed cohesive layers and pockets, with these layers increasing in occurrence and size the further southwards the fieldwork positions were located.

Lowestoft Formation

The Lowestoft Formation was encountered beneath the made ground down to the base of the excavations within WS101, WS106, WS107, WS108, and TP106.

The Lowestoft Formation (sand and gravel) was recorded within the full depths of WS106, WS107, and TP106, and comprised a slightly clayey gravelly sand/slightly clayey sand and gravel. The gravel consisted of flint.

The Lowestoft Formation (diamicton) was recorded within the full depth of WS101 and WS108, and comprised a firm to stiff silty slightly sandy slightly gravelly clay. The gravel consisted of flint and chalk.

3.4.2 Groundwater

Groundwater was encountered during the drilling in the windowless dynamic sample holes. Records of the groundwater levels throughout the fieldwork and the monitoring are presented in Table 2 below.

Location	Groundwater Level (m bgl)		
	During Fieldwork		Range during monitoring
	Struck	Rose to after 20 minutes	
WS101	Dry	-	*No installation*
WS102	2.40	2.18	1.05-1.45
WS103	2.35	2.45	1.05-1.30
WS104	2.60	2.28	1.00-2.10
WS105	1.95	1.55	0.92-1.15
WS106	Dry	-	Dry
WS107	Dry	-	Dry
WS108	Dry	-	*No installation*

Table 2 – Summary of water level observations during the fieldwork and monitoring

Observations reported during fieldwork will have been affected by the permeability of the ground, the rate of progress of the hole and the techniques used. The general procedures in operation do not allow precise measurements of the groundwater conditions but give only a general guide to the overall situation. Fluctuations in any water table will occur as a result of seasonal or climatic effects, as well as other outside influence.

Details of the groundwater monitoring and sampling are provided on the instrumentation records in Appendix B.

4. LABORATORY TESTING

4.1 SUITE SPECIFICATIONS

The laboratory analysis broadly comprised two suites of contaminants; a generic suite and a poultry farm suite.

The generic suite included the following contaminants;

- Heavy metals/metalloids (antimony, arsenic, beryllium, cadmium, chromium (III and VI), copper, lead, mercury, nickel, selenium, vanadium and zinc);
- Cyanide (total, free, and complex) and thiocyanate;
- Phenol (total monohydric);
- Polycyclic aromatic hydrocarbons (PAHs) (total and speciated - USEPA-16);
- BTEX (benzene, toluene, ethylbenzene and xylene);
- MTBE (methyl tertiary butyl ether);
- Petroleum hydrocarbons (Criteria Working Group bandings between C_5 and C_{35}); and,
- pH.

The poultry farm suite includes numerous contaminants associated with poultry farms including;

- Ammoniacal nitrogen, ammonia, and ammonium (all expressed as NH_4);
- Metals (arsenic, cadmium, chromium (III and VI), and potassium);
- Phosphorus;
- Nitrate and Nitrite (all expressed as N);
- Phenol (total monohydric);
- Sulphate (expressed as SO_4) and sulphur (total); and,
- pH.

4.2 SOIL

The total concentrations within selected samples of soil were analysed.

Eight samples of made ground and four of natural soil were analysed for the generic suite of contaminants. This generic suite also included an asbestos screen and identification, and the soil organic matter percentage.

Three samples of made ground were analysed for the poultry farm suite of contaminants.

The results of the laboratory testing and the chosen analytical methods are provided in the analytical report referenced 20-03250 included in Appendix D.

4.3 SOIL LEACHATE

The soil derived leachate concentrations of contaminants were determined on selected samples.

Two samples of made ground and one of the natural soil were analysed for leachate concentrations of the generic suite of contaminants.

Three samples of made ground were analysed for the leachate concentrations of the poultry farm suite.

The results of the laboratory testing and the chosen analytical methods are provided in the analytical report referenced 20-03250 included in Appendix D.

4.4 GROUNDWATER AND SURFACE WATER

The total and dissolved concentrations within selected water samples were analysed.

Two surface water samples and a groundwater sample were subject to the analysis of the generic suite of contaminants.

Two samples of groundwater and one surface water sample were subject to the analysis of the poultry farm suite.

Additionally, the surface water samples were all analysed for alkalinity (expressed as $CaCO_3$) and dissolved organic carbon.

The results of the laboratory testing and the chosen analytical methods are provided in the analytical report referenced 20-04564 included in Appendix D.

5. GENERIC QUANTITATIVE RISK ASSESSMENT - HUMAN HEALTH (SOIL)

5.1 DIRECT CONTACT, INHALATION, AND INGESTION ASSESSMENT

5.1.1 Land-use Scenarios

In order to provide an assessment of the condition of the site as part of the development, the soil contamination results have been assessed against generic assessment criteria (GAC) values which have been developed for various land-use scenarios.

The scenario used within this assessment is presented within industry accepted guidance (EA, 2009a) and is described below;

- A commercial scenario which assumes the following key features;
    - The critical receptor is a working female adult aged 16-65, with a working lifetime of 49 years;
    - The exposure pathways include direct soil and indoor dust ingestion, skin contact with soils and dusts, and inhalation of dusts and vapours; and,
    - The building on site is a three-storey office building (pre-1970s).

This generic scenario is considered to be most pertinent as it reflects the proposed end use of the site.

5.1.2 Generic Assessment Criteria (GAC)

The results of chemical analysis have been assessed against GAC for the protection of human health produced by Land Quality Management Limited (LQM) in association with the Chartered Institute of Environmental Health (CIEH) (LQM, 2015) and which are referred to as 'suitable for use levels' (S4ULs). The S4ULs provide GAC values from a risk based approach to human exposure through the pathways of inhalation, ingestion, and dermal contact which have been derived using the CLEA software version 1.06 and Environment Agency guidance (Environment Agency, 2009a, 2009b, and 2009c). A soil organic matter content of 1.0% has been assumed based on the results of laboratory testing[12]. When relevant S4ULs were unavailable, such as in the case of antimony, lead, and cyanide, the results were compared to alternative screening values. For antimony and cyanide, Soil Screening Values (SSVs) have been derived by WS Atkins Consultants Limited (W S Atkins, 2017), using the ATRISKsoil programme. For lead, Category 4 Screening Levels

[12] Average soil organic matter for the made ground of 1.6% (n = 8)
Average soil organic matter for the natural soil of 0.7% (n = 4)

(C4SLs) were used, developed by Contaminated Land: Applications in Real Environments (CL:AIRE, 2014), using the CLEA software version 1.06. The derivation of C4SLs uses the concept of a low level of toxicological concern (LLTC), which represents the estimated concentration of a contaminant that would pose an 'acceptably low' risk to human health.

The results of the asbestos screening are assessed on a qualitative basis of, present or absent.

5.1.3 Assessment Results

The results can be summarised as follows:

- Concentrations of all metals/metalloids tested were below their respective GACs;
- Cyanides and phenol were not identified in any sample analysed;
- Concentrations of all PAHs (USEPA-16) were below their respective GACs;
- Concentrations of BTEX, MTBE, and petroleum hydrocarbons were below their respective GACs;
- Asbestos fibres were detected within a single sample of made ground;
- Bulk asbestos material was not detected in any of the remaining samples analysed or during investigation.

5.1.4 Discussion

Loose chrysotile asbestos fibres were recorded within the made ground at WS103. The previous investigation also found loose chrysotile asbestos fibres along with bulk asbestos materials within the made ground of a similar composition, within WS05 and WS06.

5.2 WATER SUPPLY PIPE ASSESSMENT

An assessment of the laboratory results with respect to UKWIR guidance (2010) suggests that the concentrations of PAHs within the made ground may be above threshold values for polyethylene (PE) and polyvinyl chloride (PVC) pipe, resulting in the potential for permeation and impact upon human health through any future development.

6. GENERIC QUANTITATIVE RISK ASSESSMENT – CONTROLLED WATERS (TIER 1)

6.1 GENERAL

A generic appraisal of the groundwater analysis results with respect to pertinent quality standards is presented below. This allows identification of those contaminants which present the greatest risk to the selected receptors (compliance points), and is the first stage of an assessment of the risk to controlled waters.

6.2 COMPLIANCE POINTS

The superficial deposits are designated secondary A and secondary (undifferentiated) aquifer status whilst the bedrock chalk is designated principal aquifer status. The site is not within a groundwater source protection zone and the nearest licenced groundwater abstraction is located around 2.66 km to the south-east of the site. Given the location of the site, on the periphery of a major settlement (Attleborough), it is assumed that mains water supply predominates and private potable abstractions are unlikely.

The groundwater below the site is considered to be sensitive, and the potential impact on this has been assessed below. For the purposes of the assessment, it is considered that the water bearing River Terrace Deposits/Alluvium form a shallow, unconfined, aquifer which supplies baseflow to, and is in hydraulic continuity with, the tributary river of the River Thet. The underlying Lowestoft Formation (diamicton) provides a low permeability confining layer, which will preclude a contaminant pathway between the shallow aquifer of the River Terrace Deposits/Alluvium and the deeper aquifer of the White Chalk Subgroup.

Based on the anticipated ground model of the site and surrounding area, it is understood that the shallow aquifer and any connected surface waters are likely to be preferentially impacted by site derived contamination. In the absence of a pathway for this potential contamination to enter the deep aquifer of the White Chalk Subgroup it is not considered to be at risk. Therefore only the risks to the superficial aquifer and surface waters are considered further within this assessment.

6.3 ASSESSMENT CRITERIA

The screening criteria used in the assessment are compliant with the EU Water Framework Directive, as provided in guidance prepared by the Department of the Environment, Food and Rural Affairs (DEFRA, 2015). Where these are not available, UK Drinking Water Standards (UKDWS) (DWI, 2010) or World Health Organisation (WHO) Drinking Water Standards (WHO, 2003a; WHO, 2003b; WHO, 2008) have been used.

In order to allow a comparison of copper, nickel, zinc, and lead concentrations with pertinent screening criteria, calculation of the bioavailable fraction is required. Where necessary, this has been carried out using the United Kingdom Target Advisory Group (UKTAG) bioavailability assessment tool (UKTAG, 2014). The alkalinity[13] and dissolved organic carbon concentrations within the tributary river have been measured at concentrations of 429 to 438 mg/l and 5.9 to 6.1 mg/l, respectively, with a pH of 8.2 to 8.3.

Where the assessment methodology considers the results of the soil leachate analysis and compares these results to pertinent groundwater quality standards, this assumes that the contaminants are liberated within the environment to the same degree as within the laboratory. Also it is assumed that the contaminants are able to migrate with no attenuation or dilution either during transport, or upon entry into the aquifer or surface water course.

6.4 RISK ASSESSMENT

6.4.1 Superficial Aquifer

For the purposes of assessing the superficial aquifer, the analysis of the groundwater samples and the total and leachate analysis of the soil samples, collected from site, have been utilised.

In general the total soil concentrations do not indicate any elevated concentrations of the potential contaminants of concern. The results of the soil leachate analysis also show that in general, low concentrations of contaminants are present within the eluate. The

[13] Expressed as $CaCO_3$

groundwater concentrations only recorded ammonia to be in excess of the adopted screening criteria[14].

6.4.2 Tributary River

The tributary river is understood to be in hydraulic conductivity with the superficial aquifer. Surface water samples were taken from the river, in upstream and downstream locations of the site, as well as adjacent to the site.

The surface water concentrations were compared to surface water screening criteria. The following contaminants, presented in Table 3, were recorded below the detection limit of the analytical method, which is greater than their respective screening criteria.

Contaminant	Detection limit of the analytical method (µg/l)	Screening criteria (µg/l)
Cadmium	<0.4	0.25
Chromium (III)	<5	4.7
Chromium (VI)	<20	3.4
Fluoranthene	<0.01	0.0063
Benzo(a)pyrene	<0.01	0.0002

Table 3 – Summary of the detection limits in excess of the respective adopted surface water EQS

During the migration of any leachable contamination through the soil profile, it is likely that the organic content of the underlying soils, along with the physiochemical attributes of the contaminants, would allow significant attenuation. Combined with the potential for significant dilution upon entry into the aquifer and in turn the river, the concentrations of these compounds are likely to be negligible in practice and unlikely to result in an adverse impact on the quality of the tributary river.

6.4.3 Discussion

Whilst the leachate and groundwater concentrations of ammonia on site are in excess of their adopted screening criteria, there is no evidence of ammonia impacting upon the water quality of the tributary river, with the concentrations within the groundwater being at least 988% greater than that of the surface water. This supports the role of natural attenuation within the unsaturated zone of the superficial aquifer and/or dilution within the surface water.

[14] Conversions for the reported ammonia (expressed as NH_4) to ammonia (expressed as N) for direct comparison to the adopted screening criteria, are presented in Appendix E

It is considered that concentration of ammonia present within the made ground and groundwater on site, does not pose a significant risk to surface water.

It is also understood that the SUDS design for the proposed extension includes collecting all the site surface water run-off within the on site reservoir, rather than utilising the various drainage ditches around the site, thereby minimising the probability of mobilising any potential contaminants within the made ground.

Considering the results of the generic quantitative risk assessment, the contaminant levels recorded in the made ground and groundwater below the site are not considered to pose a risk to any of the identified receptors, and therefore, it is considered that there is a very low risk to controlled waters.

7. GENERIC QUANTITATIVE RISK ASSESSMENT - GROUND GASES

7.1 GENERAL

A historic landfill, is located adjacent to the north/eastern site boundary. Alluvium is also noted to be present along the southern site boundary. Both the landfill and Alluvium are potential sources of ground gases that may migrate and accumulate within buildings/confined spaces. Such gases may lead to the asphyxiation of the site users and/or explosion.

WS102 was located within the area of Alluvium mapped on site, and within the footprint of the proposed buildings on site. WS106 and WS107 were located on the site boundary to assess the potential for lateral migration from the adjacent landfill site.

7.2 ASSESSMENT CRITERIA

The risks associated with ground gases have been assessed in general accordance with BS8485:2015+A1:2019 (BSI, 2019) and CIRIA C665 (Wilson *et al*, 2007). These describe a characterisation system and provide a risk based approach designed to allow gas protection measures to be selected appropriately. The process begins by the calculation of a hazardous gas flow rate (Q_{hg}) or gas screening value (GSV), both calculated in the same manner. Q_{hg} is derived from the maximum recorded steady state borehole flow (l/hr) and maximum concentration of a particular ground gas (% (v/v)), either methane or carbon dioxide. The Q_{hg} is calculated as follows:

$$Q_{hg} = q \times (\frac{C_{hg}}{100})$$

Where,

Q = borehole flow rate
C_{hg} = maximum gas concentration

For example, monitoring data giving a maximum flow rate of 3.5 l/hr and a maximum concentration of 4.0% (v/v) methane would have a Q_{hg} of 0.14 l/hr [3.5 x (4.0/100)].

The Q_{hg} is then utilised in order to assign a characteristic value to the site. The characteristic value ranges from CS1 to CS6 which correspond to a very low to very high risk as shown in Table 2 of BS8485:2015+A1:2019 (BSI, 2019).

In order to inform a choice of ground gas protection measures, BS8485:2015+A1:2019 (BSI, 2019) uses a pre-determined building type and the determined characteristic value to derive a gas protection score. This takes into account the differing types of development which may occur on a given site and their relative sensitivities. The development proposed at this site mostly closely fits the following description.

- Type C – Commercial building with full building management controls. Single occupancy of ground floor and basement areas. Small to large rooms with active ventilation or good passive ventilation. Probably civil engineering construction. E.g schools, offices, hospitals, leisure centres)

After the derivation of the gas protection score, gas protection measures, comprising structural barriers, ventilation measures and gas protection membranes, are chosen to meet the required score for the development. Each protection measure has its own score. This allows greater flexibility and choice over the gas protection measures employed in order to take into account construction methods or other site constraints. Gas protection scores and associated protection measures can be found in Tables 4 to 7 of BS8485:2015+A1:2019.

7.3 RISK ASSESSMENT

A summary of the monitoring data collected, and the corresponding calculated characteristic situation for each monitoring location is presented in Table 4 below. A full record of all the monitoring data is provided in Appendix F.

Location	Peak methane (%)	Peak carbon dioxide (%)	Range of steady state flow (l/hr)	Q_{hg} methane	Q_{hg} carbon dioxide	Characteristic situation (CS)
WS102	1.6	13.0	-0.7 – -0.1	0.005[15]	0.039[15]	CS1
WS106	0.0	14.5	-0.1 – 1.2	0	0.174	CS2
WS107	0.0	7.0	-0.4 – 0.5	0	0.035	CS1

Table 4 – Calculated Q_{hg} and CS values

It is likely that the negative flow readings recorded at WS102 are as a results of hydraulic action caused by the fluctuating groundwater level of the superficial aquifer. CL:AIRE Research Bulletin 17 (CL:AIRE, 2012) discusses the effects of high or falling groundwater levels and the interactions this may have with ground gas concentrations. It is considered

[15] The flow rate detection limit of the GA5000 (0.3 l/hr) has been used in the calculation of Q_{hg}

that the comments regarding dissolved carbon dioxide and limited headspace are particularly applicable in this case. Given the mechanisms of gas flow within the ground, it is considered that negative flow rates in insolation would not result in the accumulation of ground gases within the subfloor or indoor air of the proposed buildings. Despite carbon dioxide concentrations in excess of 5.0%, it is not considered necessary to upgrade the characteristic situation. In addition, the structure is likely to incorporate measures to reduce moisture build up and condensation within the subfloor, and have a 'well sealed' floor slab to meet the airtightness requirements of the Building Regulations. These will both provide a degree of inherent protection against ground gas ingress.

Therefore, no gas protection measures are considered necessary for the new buildings/structures as part of the proposed extension plans. Should the development plans alter, or further development be considered, particularly along the northern and eastern site boundaries then consideration should be given to classifying the site as characteristic situation 2, and installing the necessary gas protection measures, given the positive flow readings and high carbon dioxide concentrations recorded within WS106 and WS107.

7.4 RADON

The site is not located within a radon affected area and so it can be concluded that the risk of significant ingress of radon into structures is low, and radon protection measures are not required.

8. REVISED CONCEPTUAL MODEL AND RISK ASSESSMENT

Following the previous assessments a revised conceptual model is presented in Table 5 below. Risk management and remediation measures are discussed in Section 9, where appropriate. Risk assessment classification is presented in Appendix H.

Source of Contamination	Pathway	Receptor	Probability and Reasoning	Consequence and Reasoning	Risk Classification
Asbestos within the building fabric and within the made ground	Inhalation of fibres	Human end users	**Low Likelihood** – Bulk ACMs and loose chrysotile asbestos fibres were recorded within the topsoil-like made ground located around the poultry farm sheds. No asbestos was recorded across the remainder of the site.	**Severe** – Chronic damage to human health	**Moderate Risk**
		Construction workers		**Severe** – Potential short term exposure	**Moderate Risk**
Potentially contaminated soils (near surface soil impacted by historical and recent land use)	Direct contact, inhalation (dusts and vapours), ingestion	Human end-users	**Unlikely** – Chemical testing confirmed the absence of any gross chemical contamination across the site within the made ground and superficial natural soils.	**Medium** – Chronic damage to human health	**Low Risk**
		Construction workers		**Mild** – Potential short term exposure	**Very Low Risk**
	Permeation through water supply pipes	Human end-users	**Low Likelihood -** Organic contaminants that could permeate through plastic water supply pipe have been recorded within the made ground.	**Medium** – Chronic damage to human health from permeation of plastic water supply pipes	**Low/Moderate Risk**
	Percolation of leachate / mobile contaminants	Groundwater	**Unlikely** – Elevated concentrations of ammonia were recorded within the soil leachate and shallow ground water on site, however no elevated concentrations were recorded within the tributary river to the south of the site, indicating it is being attenuated within the aquifer and/or diluted upon entry to the river.	**Medium** – The site is noted to overlie secondary A and principal aquifers.	**Low Risk**
		Surface water		**Medium** – A tributary river for the River Thet was noted 80 m to the south of the site	**Low Risk**
Historic landfill (off site)	Gas migration through permeable strata, ingress, accumulation in structures, and potential explosion	Human end-users and buildings/structures	A ground gas risk assessment carried out based on monitoring data, has confirmed the risk to the buildings of the proposed development can be classified as characteristic situation 1 (CS1) [a site of low hazard potential][16]		
Radon Gas		Human end-users	**Unlikely** – The site is not located within a radon affected area	**Medium** – Chronic risk to human end users	**Low Risk**

Table 5: Revised conceptual model and risk assessment

[16] BS 8485:2015+A1:2019 (BSI, 2019)

9. RISK MANAGEMENT AND MITIGATION MEASURES

9.1 INTRODUCTION

The review of risk and assessment of appropriate management or remediation is based on the presence of a "source-pathway-receptor". In the absence of the linkage, the risk is eliminated. The discussion below is based on the findings of the investigation and is therefore limited to these areas. If any suspected contamination is encountered during the construction phase then this should be evaluated and appropriate action taken.

9.2 CHEMICAL CONTAMINATION – HUMAN HEALTH

9.2.1 Human End-Users – Soil

There is a low risk to human end-users of the development from the direct contact, inhalation (dusts and vapours), and ingestion of potentially contaminated made ground on site. There is also a moderate risk to human end-users from the potential inhalation of asbestos fibres within the made ground.

Multiple fieldwork locations were carried out through the topsoil-like made ground surrounding the poultry farm sheds, with all these samples being screened for asbestos. Only one sample was detected as containing asbestos fibres (WS103). Fibres and bulk ACMs were recorded during the previous investigation within this material at the locations of WS05 and WS06. Given that asbestos was not detected throughout this material, it is not considered to be widespread across the site.

WS05, WS06, and WS103 were all located in areas of grass covered soft landscaping and this is to remain after development. No plant or machinery is known to track over these locations, given the hardstanding paths/roads around the site. As such it is likely that the only disturbance within this area will be light landscaping, such as grass trimming, which is unlikely to create dust which could release significant quantities of respirable asbestos fibres. Furthermore, the vegetation cover will help to reduce dust generation further whilst also maintaining moisture within the soil therefore reducing the likelihood of fibres becoming airborne further. The fibres were also noted to be chrysotile asbestos, typically the lowest risk form of asbestos fibres. The bulk ACMs were also noted to be cement board, which is the lowest risk form of ACMs from which fibres are not readily released.

9.2.2 Construction Workers – Soil

There is a very low risk to construction workers from the direct contact, inhalation (dusts and vapours), and ingestion of potentially contaminated made ground on site. There is also a moderate risk to construction workers from the potential inhalation of asbestos fibres within the made ground.

It is understood that the areas where bulk ACM and asbestos fibres were recorded are going to be retained as their current usage with no proposed alterations. As such there are no plans for any excavations within this made ground, which may facilitate the release of potential fibres. Regardless, in accordance with normal construction practice, dust suppression methods should be adopted throughout the development across the whole site. All construction workers should be informed of the potential presence of asbestos containing materials and soils on site, prior to commencing work. In accordance with the Control of Asbestos Regulations 2012 (as discussed in CL:AIRE, 2016), a duty is placed on the employer or Principal Contractor to prevent the exposure of their employees and members of the public to asbestos fibres, so far as is reasonably practicable, and this should be the first consideration. Any residual risks from handling soil can be addressed by usual hygiene precautions (such as washing hands before eating) and standard personal protective equipment.

The poultry farm sheds were noted to all have corrugated cement board roofs, which are suspected to contain asbestos. The roofs were all in a good condition, with no obvious signs of excessive degradation. It is understood that the development proposals include the demolition of the most westerly shed. It is recommended that the removal of the cement board roof is carried out by a licenced contractor with disposal off site.

If any additional suspected ACMs are reported on site during the construction, they should be removed and disposed of in an appropriate manner, in line with the following discovery strategy:

- Stop works in the vicinity of the suspected location;
- Inform the site manager;
- Damp and cover the location to prevent the release of asbestos fibres; and
- A risk assessment should be carried out to ascertain the safest method of work to proceed.

9.2.3 Human End-Users – Water Supply Pipework

There is a low/moderate risk to human end-users from the potential permeation of contamination through plastic water supply pipework.

Where any buried pipework is to be laid within the made ground, then consideration should be given to upgrading the material to aluminium barrier pipework. Alternatively, any new pipework could be laid within a clean surround or the underlying natural soils, where polyethylene or polyvinyl chloride pipework should be sufficient.

The specification of any buried pipework should be agreed with the local water utility provider prior to installation.

9.3 CHEMICAL CONTAMINATION – CONTROLLED WATERS

Considering the results of the generic quantitative risk assessment, the contaminant levels recorded in the groundwater below the site are not considered to pose a risk to any of the identified receptors, and therefore, it is considered that there is a low risk to controlled waters.

9.4 CHEMICAL CONTAMINATION – GROUND GASES

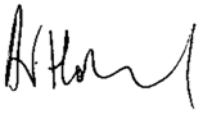
The proposed development site is classified as of low hazard potential (CS1) for the potential generation of ground gases (BS 8485:2015+A1:2019), and as such no ground gas protection measures are required.

The site is not located within a radon affected area and radon protection measures are not required.

10. SUMMARY

1. A Phase II Land Contamination Assessment was carried out for the proposed extension of the anaerobic digestion plant at Ellingham Road, Attleborough, Norfolk, NR17 1AE.
2. A review of a Preliminary Risk Assessment already carried out for the site identified several potential sources of contamination that may impact upon sensitive receptors.
3. Chemical analysis revealed no elevated concentrations of chemical contaminants within the made ground on site. Loose asbestos fibres were positively detected within a single location, within the topsoil-like made ground surrounding the poultry farm sheds.
4. The risk to human end-users from potential chemical contamination within the near surface soils on site was considered to be low. The risk to human end-users from asbestos within the made ground was considered to be moderate, however, given the nature, form, and frequency of asbestos encountered it is unlikely to be released from within the made ground (see Section 9.2.1).
5. The risk to construction workers from potential chemical contamination within the near surface soils on site was considered to be very low. The risk to construction workers from asbestos within the made ground was considered to be moderate. It is proposed that various mitigation measures, including toolbox talks, suitable PPE, good hygiene practices, and dust suppression techniques should mitigate these risks. It is recommended that construction workers are vigilant for suspected ACM or asbestos containing soil (as detailed in Section 9.2.2).
6. The risk to human end-users from potential organic contaminants that could permeate through plastic water supply pipes was considered to be low/moderate. The risk can be mitigated by either placing the pipework within the 'clean' natural soil or within a 'clean surround', or upgrading pipework material to barrier pipework for any pipes laid within the made ground. The specification of any buried pipework should be agreed with the local water utility prior to installation.
7. Based upon the analysis of the soil, soil leachate, groundwater, and surface water concentrations the risk to groundwater and surface waters was considered to be low.
8. A ground gas risk assessment carried out based on monitoring data, has confirmed the risk to the buildings of the proposed development can be classified as characteristic situation 1 (CS1), a site of low hazard potential.

Mr J A Hallier
BSc (Hons) FGS



Dr A F Howland
MSc PhD DIC CEng FIMMM CGeol FGS

A F HOWLAND ASSOCIATES
5 May 2020

APPENDIX A: REFERENCES

A F HOWLAND ASSOCIATES (AFHA). 2019. A report on a ground investigation for a proposed anaerobic digestion plant at SS Agri, Ellingham Road, Attleborough, Norfolk, NR17 1AE. Report reference JAH/19.287, dated 7 October 2019.

BRITISH GEOLOGICAL SURVEY (BGS). 2020. British Geological Survey OpenGeoscience Website. Geology of Britain Viewer (www.bgs.ac.uk/opengeoscience)

BRITISH STANDARDS INSTITUTION (BSI). 2007. Eurocode 7 – Geotechnical Design. Part 2: Ground investigation and testing. British Standards Institution. London.

BRITISH STANDARDS INSTITUTION (BSI). 2013. BS 8576:2013. Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs). British Standards Institution. London.

BRITISH STANDARDS INSTITUTION (BSI). 2015. BS 5930:2015 Code of practice for ground investigations. British Standards Institution. London.

BRITISH STANDARDS INSTITUTION (BSI). 2017. BS 10175:2011+A2:2017. Code of practice for investigation of potentially contaminated sites. British Standards Institution. London.

BRITISH STANDARDS INSTITUTION (BSI). 2019. BS 8485:2015+A1:2019. Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. British Standards Institution. London.

CIRIA. 2009. C682 - The VOCs Handbook. Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination. CIRIA, London.

CONTAMINATED LAND: APPLICATIONS IN REAL ENVIRONMENTS (CL:AIRE). 2012. A Pragmatic Approach to Ground Gas Risk Assessment. RESEARCH BULLETIN 17 (NOVEMBER 2012).

CONTAMINATED LAND: APPLICATIONS IN REAL ENVIRONMENTS (CL:AIRE). 2014. SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination.

CONTAMINATED LAND: APPLICATIONS IN REAL ENVIRONMENTS (CL:AIRE). 2017. Petroleum Hydrocarbons in Groundwater: Guidance of Assessing Petroleum Hydrocarbons Using Existing Hydrogeological Risk Assessment Methodologies. CL:AIRE, London.

DEPARTMENT FOR COMMUNITIES AND LOCAL GOVERNMENT (DCLG). 2010. The Building Regulations 2010 (England). Approved Document C: Site preparation and resistance to contaminants and moisture, 2004 and incorporating 2010 and 2013 amendments.

DEPARTMENT FOR THE ENVIRONMENT, FOOD & RURAL AFFAIRS (DEFRA). 2004. Model Procedures for the Management of Land Contamination. Contaminated Land Report 11. Environment Agency, Bristol.

DEPARTMENT FOR THE ENVIRONMENT, FOOD & RURAL AFFAIRS (DEFRA). 2015. Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. London.

DRINKING WATER INSPECTORATE (DWI). 2010. UK Drinking Water Standards. DWI, London.

ENVIRONMENT AGENCY (EA). 2002. Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of the Soil Guideline Values and Related Research. Environment Agency, Bristol.

ENVIRONMENT AGENCY (EA). 2009a. Human health toxicological assessment of contaminants in soil. Science Report – Final SC050021/SR2.

ENVIRONMENT AGENCY (EA). 2009b. Soil Guideline Values in soil. Arsenic SGV / Nickel SGV / Mercury SGV / Selenium SGV / Benzene SGV / Toluene SGV / Ethylbenzene SGV / Xylenes SGV / Cadmium SGV / Phenol SGV. Science Report SC050021.

ENVIRONMENT AGENCY (EA). 2009c. Updated technical background to the CLEA model. Environment Agency, Bristol.

LAND QUALITY MANAGEMENT LIMITED (LQM). 2015. S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.

RSK ENVIRONMENT LIMITED (RSK). 2020. Preliminary Risk Assessment: SS Agri Power AD Facility Extension, Attleborough. Report reference 340150-R01(00)-PRA, dated January 2020.

RSK LAND AND DEVELOPMENT LIMITED (RSK). 2019. Flood Risk Assessment (FRA): SS Agri Power AD Facility Extension, Attleborough. Report reference 881835-R1(04)-FRA, revision 04, dated November 2019.

UK WATER INDUSTRY RESEARCH LIMITED (UKWIR). 2010. Report reference no. 10/WM/03/21 Guidance for the selection of water supply pipes to be used in brownfield sites.

UNITED KINGDOM TARGET ADVISORY GROUP (UKTAG). 2014. Metal Bioavailability Assessment Tool – MBAT. Available at: http://www.wfduk.org/resources/tags/bioavailability-assessment-tool-205 [last updated 6 February 2015].

W S ATKINS CONSULTANTS LIMITED. 2017. ATRISKsoil Soil Screening Values (SSVs). March 2017. www.atrisksoil.co.uk.

WILSON, S., OLIVER, S., MALLETT, H., HUTCHINGS, H. and CARD, G. 2007. Assessing risks posed by hazardous ground gases to buildings, CIRIA C665.

WORLD HEALTH ORGANISATION (WHO). 2008. Petroleum Products in Drinking-Water. Background Document for Development of WHO Guidelines for Drinking Water Quality. WHO/SDE.WSH.05.08/123. World Health Organisation, Geneva.

WORLD HEALTH ORGANISATION, 2003a. Antimony in drinking-water. Background document for development of WHO guidelines for drinking water quality. WHO/SDE/WSH/03.04/17. World Health Organisation, Geneva.

WORLD HEALTH ORGANISATION, 2003b. Zinc in drinking-water. Background document for development of WHO guidelines for drinking water quality. WHO/SDE/WSH/03.04/74. World Health Organisation, Geneva.

APPENDIX B: WINDOWELSS SAMPLE HOLE AND INSTRUMENTATION RECORDS

KEY

ES	Environmental sample
D	Small disturbed sample
B	Bulk disturbed sample
SPT	Standard penetration test using a split spoon sampler. N Value is uncorrected, but the hammer energy ratio is given where known (in remarks).
IP xx	Initial penetration during the SPT recorded in millimetres. If initial penetration equals or exceeds 450 mm the test is aborted.
S x,x	SPT seating drive blow count given by the summation of the blows 'X' required to drive the seating length
T x,x,x,x	SPT test drive blow count 'N' given by the summation of the blows 'X' required to drive the seating length (300 mm)
X*Y	Incomplete standard penetration test where the seating/test drive could not be completed. The blows 'X' represent the total blows for the given length of seating drive 'Y' (mm)
dd/mm/yy: 1.0 **dd/mm/yy: dry**	Date, water level at the window sample hole depth at the end of shift and the start of the following shift

Each sample type is numbered sequentially with depth and relates to the depth range quoted

All depths and measurements are given in metres, except as noted

Strata descriptions compiled by visual examination after BS 5930:2015 and modified in accordance with laboratory test results where applicable

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Number** WS101
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	**Dimensions** 87mm to 2.00m 75mm to 3.00m 65mm to 4.00m	**Ground Level (mOD)** 34.53	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603259 E 295610 N	**Dates** 09/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				34.48	0.05	MADE GROUND (Multicoloured sandy angular to subrounded fine to medium flint gravel with rare brick and concrete fragments)		
0.10-0.30	ES1				(0.40)	MADE GROUND (Brown slightly silty sandy gravelly clay. Gravel is angular to subrounded fine to coarse flint with fragments of brick, concrete, and rare tarmacadam)		
				34.08	0.45			
0.50-0.80	ES2					Firm brown mottled greyish brown silty slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium flint		
0.80-1.00	D1				(0.55)			
						...subrounded flint cobble at 0.90 m		
1.00-1.20	D2			33.53	1.00	Brown slightly clayey silty slightly gravelly fine to medium SAND. Gravel is angular to subrounded fine to medium flint		
					(0.25)			
				33.28	1.25	Soft becoming firm brown silty slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium flint		
1.30-1.50	D3				(0.30)			
						...pocket of brown fine to coarse sand at 1.35 m		
1.50-1.80	D4			32.98	1.55	Dark brown clayey slightly gravelly fine to coarse SAND. Gravel fine occasionally medium subangular to subrounded flint		
1.80-2.00	D5				(0.65)	...becoming clayey slightly silty from 1.80 m		
				32.33	2.20	Firm greyish brown mottled brown silty slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine chalk and rare angular to subangular fine to medium flint		
2.40-2.60	D6				(0.85)			
				31.48	3.05	Stiff fissured greyish brown mottled grey and orange-brown silty CLAY		
3.10-3.30	D7					...subrounded flint cobble at 3.30 m		
					(0.95)			
3.70-3.90	D8							
			09/03/2020:DRY	30.53	4.00	Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. No groundwater encountered
4. Exploratory hole backfilled with arisings upon completion

Scale (approx)	Logged By
1:25	JAH

Figure No. 19.287.WS101

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Number** WS102
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	**Dimensions** 87mm to 3.00m 75mm to 4.00m	**Ground Level (mOD)** 31.99	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603329 E 295534 N	**Dates** 09/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.05-0.15	ES1			31.84	(0.15) 0.15	MADE GROUND (Brown sandy angular to subangular fine to coarse flint gravel)		
0.20-0.60	D1					MADE GROUND (Dark brown slightly clayey silty slightly gravelly fine to medium sand. Gravel is angular to subrounded fine occasionally medium flint with rare fragments of brick. With rare rootlets)		
0.30-0.50	ES2				(0.50)			
0.70-1.00	D2			31.34	0.65	Medium dense greyish brown mottled brown silty slightly gravelly fine to medium SAND. Gravel is angular to subrounded fine flint		
1.20-1.65	SPT N=11	DAMP	IP 0/S 2,4 T 3,2,3,3		(0.75)			
1.20-1.40	D4							
1.20-1.65	D3			30.59	1.40	Loose grey with rare brown mottle silty fine to coarse SAND. With rare pockets (<10 mm) of clay		
1.50-2.00	D5					...decayed roots and rootlets at 1.70 m		
2.00-2.45	SPT N=4	DAMP	IP 0/S 1,2 T 2,1,1,0		(1.10)	...rare gravels noted from 1.90 m. Gravel is angular to subangular fine to medium flint ...decayed roots and rootlets at 1.95 m		
2.00-2.50	D6							▼1
			Moderate(1) at 2.40m, rose to 2.18m in 20 mins.					▽1
2.50-2.80	D7			29.49	2.50	Brown silty slightly gravelly fine to coarse SAND. Gravel is angular to subrounded fine to medium flint and rare subangular to rounded fine quartz		
					(0.30)	...gravelly from 2.70 m		
2.80-3.00	D8			29.19	2.80	Very loose grey mottled brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to rounded fine flint and chalk. With rare pockets (<5 mm) orange-brown silty fine to medium sand		
					(0.25)			
3.00-3.45	SPT N=0	2.38	IP 450 Test Failed	28.94	3.05	Very loose brown mottled orange-brown slightly clayey silty fine to medium SAND		
3.00-3.45	D9					...rare dark brown streaks between 3.10 and 3.50 m		
3.00-4.00	D10				(0.95)			
			09/03/2020:2.26m	27.99	4.00	Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 2.40 m and rose to 2.38 m in 5 mins, 2.35 m in 10 mins, 2.28 m in 15 mins and 2.18 m in 20 mins
4. Slotted standpipe installed between 1.00 and 4.00 m
5. SPT Hammer Energy Ratio = 68.30%

Scale (approx)	Logged By
1:25	JAH

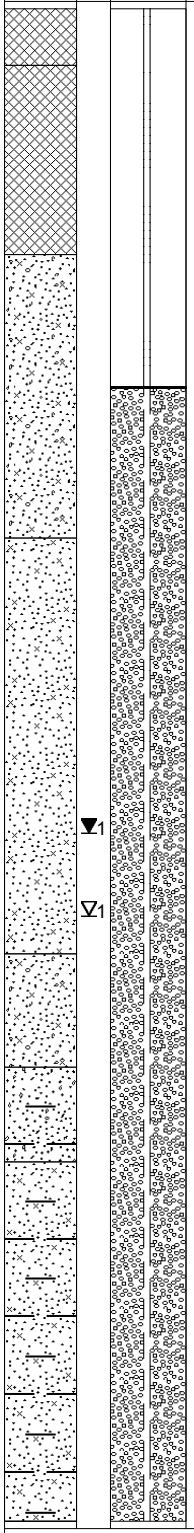
Figure No. 19.287.WS102

A F Howland Associates
Geotechnical Engineers

Site	Borehole Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	WS102

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 150 mm	Privilege Finance Services	19.287

Location	Ground Level (mOD)	Agent	Sheet
603329 E 295534 N	31.99		1/1



Instr (A)	Level (mOD)	Depth (m)	Description
	30.99	1.00	Bentonite Seal
	27.99	4.00	Slotted Standpipe

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
09/03/20		2.40	2.00	Moderate	2.38	2.35	2.28	2.18	

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)
09/03/20							4.00	4.00	2.26	29.73

Instrument Groundwater Observations

Inst. [A] Type : Standpipe

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks
13/03/20	10:00	1.05	30.94	Plumb - 3.87 m
13/03/20	12:23	1.20	30.79	After developing, 10 litres removed untill borehole dry
20/03/20	10:28	1.27	30.72	
27/03/20	12:36	1.27	30.72	Plumb - 3.85 m
02/04/20	13:04	1.30	30.69	Plumb - 3.85 m
08/04/20	11:08	1.37	30.62	Plumb - 3.82 m
15/04/20	09:54	1.44	30.55	
17/04/20	09:45	1.45	30.54	

Remarks

A F Howland Associates
Geotechnical Engineers

Site	Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	**WS103**

Machine / Method	Dimensions	Ground Level (mOD)	Client	Job Number
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	87mm to 3.00m 75mm to 4.00m	31.19	Privilege Finance Services	19.287
	Location 603422 E 295550 N	**Dates** 10/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.30	ES1				(0.32)	MADE GROUND (Grass overlying slightly clayey silty slightly gravelly fine to medium sand. Gravel is angular to subrounded fine occasionally medium flint with rare fragments of brick. With rootlets)		
				30.87	0.32			
0.40-0.50	ES2				(0.18)	Firm orange-brown mottled light brown and light grey silty slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine occasionally medium flint		
				30.69	0.50			
0.60-1.20	D1				(0.55)	Dark brown mottled reddish brown clayey slightly silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium flint		
				30.14	1.05			
1.20-1.90	B1				(0.85)	Orange-brown slightly clayey silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine occasionally medium flint. With rare pockets (<8 mm) of light grey silty clay		
				29.29	1.90			
2.00-2.35	D2				(0.45)	Orange-brown mottled light grey slightly clayey sandy SILT		
				28.84	2.35			▼1 ▽1
2.40-2.80	D3		Moderate/Slow(1) at 2.45m, rose to 2.35m in 20 mins.		(0.50)	Orange-brown silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine flint		
				28.34	2.85			
2.85-3.00	D4					Light brown slightly clayey sandy SILT		
3.00-3.20	D5				(0.40)			
				27.94	3.25	Soft light grey silty slightly sandy CLAY		
3.60-3.70	D6				(0.75)			
			10/03/2020:3.49m	27.19	4.00	Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 2.45 m and rose to 2.35 m in 20 mins
4. Slotted standpipe installed between 0.90 and 3.90 m

Scale (approx)	Logged By
1:25	JAH

Figure No.
19.287.WS103

A F Howland Associates
Geotechnical Engineers

Site	Borehole Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	WS103

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 150 mm	Privilege Finance Services	19.287

Location	Ground Level (mOD)	Agent	Sheet
603422 E 295550 N	31.19		1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
			30.29	0.90	Bentonite Seal
	▼1 ▽1				Slotted Standpipe
			27.29	3.90	

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
		2.45		Moderate/Slow				2.35	

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)
10/03/20							4.00	4.00	3.49	27.70

Instrument Groundwater Observations

Inst. [A] Type : Standpipe

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks
13/03/20	10:15	1.05	30.14	Plumb - 3.87 m
13/03/20	11:05	1.05	30.14	After developing, 14 litres removed untill borehole dry
27/03/20	10:10	1.18	30.01	Plumb - 3.87 m
02/04/20	12:00	1.20	29.99	Plumb - 3.87 m
08/04/20	11:17	1.21	29.98	Plumb - 3.84 m
15/04/20	09:58	1.25	29.94	Plumb - 3.94 m
17/04/20	10:06	1.30	29.89	

Remarks

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Number** WS104
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	**Dimensions** 87mm to 3.00m 75mm to 4.00m	**Ground Level (mOD)** 33.16	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603478 E 295601 N	**Dates** 10/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.20	ES1				(0.25)	MADE GROUND (Grass overlying dark brown slightly clayey slightly silty slightly gravelly fine to medium sand. Gravel is angular to subangular fine to medium flint. With rootlets)		
				32.91	0.25			
0.40-0.50	ES2				(0.60)	Brown silty slightly gravelly fine to coarse SAND. Gravel is angular to subrounded fine to medium flint		
0.90-1.20	D1			32.31	0.85	Orange-brown mottled reddish brown and greyish brown slightly silty gravelly fine to coarse SAND. Gravel is subangular to rounded fine to coarse flint		
1.20-1.50	D2				(0.65)			
1.50-2.00	D3			31.66	1.50	Brown mottled light brown slightly clayey silty fine to coarse SAND		
						...with black streaks between 1.70 and 1.85 m		
2.00-3.00	B1				(1.50)	...with black streaks between 2.20 and 2.40 m		▼1
			Moderate(1) at 2.60m, rose to 2.28m in 20 mins.					▽1
3.00-4.00	D4			30.16	3.00	Brown mottled light brown silty fine to coarse SAND		
					(1.00)			
			10/03/2020:2.43m	29.16	4.00	Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 2.60 m and rose to 2.54 m in 5 mins, 2.42 m in 10 mins, 2.33 m in 15 mins and 2.28 m in 20 mins
4. Slotted standpipe installed between 0.30 and 3.30 m

Scale (approx)	Logged By
1:25	JAH

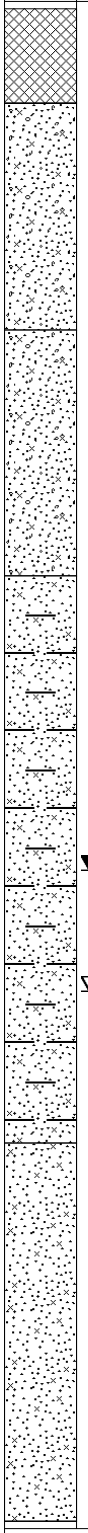
Figure No. 19.287.WS104

A F Howland Associates
Geotechnical Engineers

Site	Borehole Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	WS104

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 150 mm	Privilege Finance Services	19.287

Location	Ground Level (mOD)	Agent	Sheet
603478 E 295601 N	33.16		1/1



Instr (A)	Level (mOD)	Depth (m)	Description
	32.86	0.30	Bentonite Seal
	29.86	3.30	Slotted Standpipe

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)
					5 min	10 min	15 min	20 min	
10/03/20		2.60	3.00	Moderate	2.54	2.42	2.33	2.28	

Groundwater Observations During Drilling

Date	Start of Shift					End of Shift				
	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
10/03/20							4.00	4.00	2.43	30.73

Instrument Groundwater Observations

Inst. [A] Type : Standpipe

Date	Instrument [A]			Remarks
	Time	Depth (m)	Level (mOD)	
13/02/20	10:50	1.60	31.56	Plumb - 3.25 m
13/02/20	12:00	1.65	31.51	After developing, 8 litres removed untill borehole dry
27/03/20	10:20	1.86	31.30	Plumb - 3.25 m
02/04/20	12:10	1.90	31.26	Plumb - 3.25 m
08/04/20	11:22	1.00	32.16	Plumb - 3.19 m
15/04/20	10:08	2.10	31.06	Plumb - 3.32 m

Remarks

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Number** WS105
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	**Dimensions** 87mm to 3.00m 75mm to 4.00m	**Ground Level (mOD)** 31.94	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603574 E 295576 N	**Dates** 10/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	MADE GROUND (Grass overlying slightly clayey silty slightly gravelly fine to medium sand. Gravel is angular to subrounded fine occasionally medium flint with rare fragments of brick. With rootlets)		
0.10	ES1			31.79	0.15			
						Orange-brown mottled light brown and light grey clayey silty slightly slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine occasionally medium flint		
0.50-0.60	ES2				(0.75)			
0.70-0.90	D1							
0.90-1.10	D2			31.04	0.90			
					(0.25)	Dark brown mottled reddish brown clayey slightly silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium flint		
1.20-1.60	D3			30.79	1.15			
						Brown slightly clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine occasionally medium flint		
					(0.50)			
1.60-1.90	D4			30.29	1.65			
					(0.30)	Dark grey slightly clayey silty slightly gravelly fine to coarse SAND. Gravel is angular to subrounded fine to medium flint. With rare dark brown streaks and a slight organic odour		
2.00-2.70	D5		Moderate(1) at 1.95m, rose to 1.55m in 20 mins.	29.99	1.95			
						Brown slightly clayey slightly silty gravelly fine to coarse SAND. Gravel is very angular to subangular fine to medium flint		
					(0.75)			
2.70-3.00	D6			29.24	2.70			
						Brown slight silty slightly gravelly fine to coarse SAND. Gravel is subangular occasionally angular and subrounded fine occasionally medium flint		
3.00-4.00	D7							
					(1.30)	...pocket of grey clay at 3.30 m		
						...pocket of grey clay at 3.45 m		
			10/03/2020:1.82m	27.94	4.00			
						Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. Groundwater struck at 1.95 m and rose to 1.79 m in 5 mins, 1.61 m in 10 mins, 1.55 m in 15 mins and 20 mins
4. Slotted Standpipe installed between 0.50 and 3.25 m

Scale (approx)	Logged By
1:25	JAH

Figure No. 19.287.WS105

A F Howland Associates
Geotechnical Engineers

Site	Borehole Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	WS105

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 150 mm	Privilege Finance Services	19.287

Location	Ground Level (mOD)	Agent	Sheet
603574 E 295576 N	31.94		1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
			31.44	0.50	Bentonite Seal
	▼1				
	▽1				Slotted Standpipe
			28.69	3.25	

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
10/03/20		1.95	2.00	Moderate	1.79	1.61	1.55	1.55	

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)
10/03/20							4.00	4.00	1.82	30.12

Instrument Groundwater Observations

Inst. [A] Type : Standpipe

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks
13/03/20	10:30	1.05	30.89	Plumb - 3.26 m
13/03/20	11:00	0.92	31.02	After developing, 40 litres removed, water still remaining in borehole
27/03/20	10:15	0.95	30.99	Plumb - 3.26 m
02/04/20	12:10	0.98	30.96	Plumb - 3.26 m
08/04/20	11:27	1.98	29.96	Plumb - 3.24 m
15/04/20	10:02	1.09	30.85	Plumb - 3.30 m
17/04/20	10:18	1.15	30.79	

Remarks

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Number** WS106
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	**Dimensions** 87mm to 2.00m 75mm to 4.00m	**Ground Level (mOD)** 38.06	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603352 E 295710 N	**Dates** 09/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.10	ES1			37.96	(0.10) 0.10	MADE GROUND (Orange-brown slightly clayey sandy angular to subangular fine to medium flint gravel)		
0.20-0.50	D1				(0.40)	Dark brown silty slightly gravelly fine to coarse SAND. Gravel is angular to subrounded fine to medium occasionally coarse flint		
0.30-0.40	ES2			37.56	0.50	Brown silty slightly gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse flint		
0.60-1.20	D2							
1.20-2.00	D3				(1.55)	...rare gravels between 1.30 and 1.50 m ...very gravelly from 1.60 m		
2.10-3.00	B1			36.01	2.05	Orange-brown slightly clayey fine to coarse SAND and angular to subangular fine to coarse flint GRAVEL		
3.00-4.00	D4				(1.95)			
			09/03/2020:DRY	34.06	4.00	Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. No groundwater encountered
4. Slotted standpipe installed to installed between 0.90 and 3.90 m

Scale (approx)	Logged By
1:25	JAH

Figure No. 19.287.WS106

A F Howland Associates
Geotechnical Engineers

Site	Borehole Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	WS106

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 150 mm	Privilege Finance Services	19.287

Location	Ground Level (mOD)	Agent	Sheet
603352 E 295710 N	38.06		1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
			37.16	0.90	Bentonite Seal
			34.16	3.90	Slotted Standpipe

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)
					5 min	10 min	15 min	20 min	

Groundwater Observations During Drilling

Date	Start of Shift					End of Shift				
	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
09/03/20							4.00	4.00	DRY	

Instrument Groundwater Observations

Inst. [A] Type : Standpipe

Date	Instrument [A]			Remarks
	Time	Depth (m)	Level (mOD)	
13/03/20	11:38	DRY		Plumb - 3.95 m
20/03/20	09:36	DRY		
27/03/20	11:59	DRY		Plumb - 3.95 m
02/04/20	12:30	DRY		Plumb - 3.95 m
08/04/20	10:30	DRY		Plumb - 3.95 m
15/04/20	09:14	DRY		

Remarks

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Number** WS107
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	**Dimensions** 87mm to 2.00m 75mm to 4.00m	**Ground Level (mOD)** 37.73	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603398 E 295706 N	**Dates** 09/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	MADE GROUND (Dark brown silty slightly gravelly fine to medium sand. Gravel is angular to subangular fine to medium flint. With rare rootlets)		
0.05-0.10	ES1			37.58	0.15			
0.20-0.30	ES2				(0.20)	Brown silty gravelly fine to coarse SAND. Gravel is angular to subrounded fine to medium occasionally coarse flint		
				37.38	0.35			
0.50-1.00	D1					Orange-brown slightly clayey gravelly fine to coarse SAND. Gravel is angular to subrounded fine to medium occasionally coarse flint		
						...very gravelly from 1.00 m		
1.20-2.00	B1					...subrounded flint cobble at 1.30 m		
						...subrounded flint cobble at 1.90 m		
2.00-3.00	D2				(3.65)			
3.00-3.70	D3							
3.75-3.80	D4					...pocket of soft brown silty clay between 3.75 and 3.80 m		
			09/03/2020:DRY	33.73	4.00	Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. No groundwater encountered
4. Slotted standpipe installed to installed between 0.75 and 3.15 m

Scale (approx)	Logged By
1:25	JAH

Figure No. 19.287.WS107

A F Howland Associates
Geotechnical Engineers

Site	Borehole Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	WS107

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 150 mm	Privilege Finance Services	19.287

Location	Ground Level (mOD)	Agent	Sheet
603398 E 295706 N	37.73		1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
			36.98	0.75	Bentonite Seal
			34.58	3.15	Slotted Standpipe

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)
					5 min	10 min	15 min	20 min	

Groundwater Observations During Drilling

Date	Start of Shift					End of Shift				
	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
09/03/20							4.00	4.00	DRY	

Instrument Groundwater Observations

Inst. [A] Type : Standpipe

Date	Instrument [A]			Remarks
	Time	Depth (m)	Level (mOD)	
13/03/20	11:47	DRY		Plumb - 3.15 m
20/03/20	09:55	DRY		
27/03/20	12:19	DRY		Plumb - 3.15 m
02/04/20	12:47	DRY		Plumb - 3.12 m
08/04/20	10:47	DRY		Plumb - 3.16 m
15/04/20	09:32	DRY		

Remarks

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Number** WS108
Machine : Dando Terrier 2002 **Method :** Windowless Dynamic Sampling	**Dimensions** 87mm to 2.00m 75mm to 3.00m 65mm to 4.00m	**Ground Level (mOD)** 35.63	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603469 E 295683 N	**Dates** 09/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.30	ES1				(0.35)	MADE GROUND (Dark brown slightly clayey silty slightly gravelly fine to medium sand. Gravel is angular to subangular fine to medium flint with rare brick fragments)		
				35.28	0.35			
0.50-0.60	ES2				(0.35)	Brown slightly clayey silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse flint. Damp		
				34.93	0.70			
0.80-1.20	D1				(0.70)	Firm light brown mottled orange-brown silty slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium flint		
1.20-1.40	D2							
1.40-1.50	D3			34.23	1.40 (0.10)			
				34.13	1.50	Brown silty slightly gravelly fine to medium SAND. Gravel is angular fine to medium flint		
1.60-1.70	D4				(0.25)	Firm fissured greyish brown mottled light brown silty slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium flint		
				33.88	1.75			
2.10-2.30	D5				(2.25)	Stiff fissured greyish brown mottled orange-brown silty slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium chalk and rare angular to subangular fine flint		
2.70-2.80	D6							
3.10-3.20	D7							
3.70-3.80	D8							
			09/03/2020:DRY	31.63	4.00	Complete at 4.00m		

Remarks
1. Location CAT scanned prior to excavation
2. Hand dug inspection pit to 1.20 m
3. No groundwater encountered
4. Exploratory hole backfilled with arisings upon completion

Scale (approx)	Logged By
1:25	JAH

Figure No. 19.287.WS108

APPENDIX C: TRIAL PIT RECORDS

KEY

ES	Environmental sample
D	Small disturbed sample
dd/mm/yy: 1.0 **dd/mm/yy: dry**	Date, water level at the trial pit depth at the end of shift and the start of the following shift

Each sample type is numbered sequentially with depth and relates to the depth range quoted

All depths and measurements are given in metres, except as noted

Strata descriptions compiled by visual examination after BS 5930:2015 and modified in accordance with laboratory test results where applicable

A F Howland Associates
Geotechnical Engineers

Site	Trial Pit Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	TP101

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Machine excavated pit (JCB 3CX)	L 1.2 m x W 0.4 m x D 1.0 m	32.40	Privilege Finance Services	19.287
	Location 603288 E 295539 N	**Dates** 09/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.20 0.10-0.20	D1 ES1				(0.20)	MADE GROUND (Orange brown to dark grey slightly silty to silty sand and gravel. Gravel is subangular to subrounded fine to medium flint) ...becoming less gravelly		
0.20-0.40 0.20-0.40	D2 ES2			32.20	0.20	Light brown silty gravelly fine to medium, with a little coarse SAND. Gravel is subangular to subrounded fine to coarse flint. Occasional clay lenses		
			09/03/2020:DRY	31.40	(0.80) 1.00	Complete at 1.00m		

Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Figure No.
1:10	PJM	19.287.TP101

A F Howland Associates
Geotechnical Engineers

Site	Trial Pit Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	TP102

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Machine excavated pit (JCB 3CX)	L 1.3 m x W 0.4 m x D 1.0 m	33.12	Privilege Finance Services	19.287
	Location	**Dates**	**Agent**	**Sheet**
	603296 E 295574 N	09/03/2020		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	CONCRETE		
0.20-0.35 0.20-0.35	D1 ES1			32.92	0.20 (0.15)	MADE GROUND (Dark brown clayey slightly gravelly fine to medium sand. Gravel is subangular to subrounded fine to medium flint) ...plastic membrane		
0.35-0.50 0.35-0.50	D2 ES2			32.77	0.35 (0.65)	Dark orange brown slightly clayey gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse flint with occasional rounded cobbles ...with much flint gravel		
			09/03/2020:DRY	32.12	1.00	Complete at 1.00m		

Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Figure No.
1:10	PJM	19.287.TP102

A F Howland Associates
Geotechnical Engineers

Site Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE			**Trial Pit Number** **TP103**
Excavation Method Machine excavated pit (JCB 3CX)	**Dimensions** L 1.2 m x W 0.4 m x D 1.0 m	**Ground Level (mOD)** 32.73	**Client** Privilege Finance Services	**Job Number** 19.287
	Location 603329 E 295560 N	**Dates** 09/03/2020	**Agent**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.15 0.00-0.15	D1 ES1				(0.15)	MADE GROUND (Loose road-stone chippings over orange brown slightly silty sand and gravel. Gravel is subangular to subrounded fine to coarse flint with occasional flint cobbles and rare red brick fragments)		
0.15-0.30 0.15-0.30	D2 ES2			32.58	0.15	Dark brown slightly silty gravelly fine to medium, with a little coarse SAND. Gravel is subangular to subrounded fine to coarse flint. Occasional silty clay lenses		
0.40-0.60	D3			32.33	(0.25) 0.40	Brown to dark orange brown slightly clayey slightly silty gravelly fine to medium, with a little coarse SAND. Gravel is subangular to subrounded fine to coarse flint. Occasional silt lenses		
			09/03/2020:DRY	31.73	(0.60) 1.00	Complete at 1.00m		

Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Figure No.
1:10	PJM	19.287.TP103

A F Howland Associates
Geotechnical Engineers

Site	Trial Pit Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	TP104

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Machine excavated pit (JCB 3CX)	L 1.0 m x W 0.4 m x D 1.0 m	32.41	Privilege Finance Services	19.287
	Location	**Dates**	**Agent**	**Sheet**
	603403 E 295578 N	09/03/2020		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.10)	MADE GROUND (Dark brown slightly silty slightly gravelly sand. Gravel is subangular to subrounded fine to medium flint. Some roots and rootlets)		
0.10-0.20	D1			32.31	0.10			
0.10-0.20	ES1				(0.10)	Dark brown silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse flint		
0.20-0.40	D2			32.21	0.20			
0.20-0.40	ES2				(0.20)	Dark orange brown silty slightly gravelly fine to medium, with a little coarse SAND. Gravel is subangular to subrounded fine to medium flint		
0.40-0.70	D3			32.01	0.40			
					(0.60)	Orange brown mottled light brown and dark grey slightly clayey silty slightly slightly gravelly fine to medium, with a little coarse SAND. Gravel is subangular to subrounded fine to medium flint		
			09/03/2020:DRY	31.41	1.00	Complete at 1.00m		

Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Figure No.
1:10	PJM	19.287.TP104

A F Howland Associates
Geotechnical Engineers

Site	Trial Pit Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	TP105

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Machine excavated pit (JCB 3CX)	L 1.0 m x W 0.4 m x D 1.0 m	32.77	Privilege Finance Services	19.287
	Location	**Dates**	**Agent**	**Sheet**
	603448 E 295594 N	09/03/2020		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.40 0.10-0.40	D1 ES1				(0.40)	MADE GROUND (Dark brown slightly silty slightly gravelly sand. Gravel is subangular to subrounded fine to medium flint. Some roots and rootlets)		
0.40-0.60 0.40-0.60	D2 ES2			32.37	0.40	Dark orange brown silty gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium flint		
0.60-0.80	D3			32.17	(0.20) 0.60	Light brown mottled dark red brown silty slightly slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium flint. Occasional roots		
			09/03/2020:DRY	31.77	(0.40) 1.00	Complete at 1.00m		

Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Figure No.
1:10	PJM	19.287.TP105

A F Howland Associates
Geotechnical Engineers

Site	Trial Pit Number
Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE	TP106

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Machine excavated pit (JCB 3CX)	L 1.3 m x W 0.4 m x D 1.0 m	36.28	Privilege Finance Services	19.287
	Location	**Dates**	**Agent**	**Sheet**
	603414 E 295666 N	09/03/2020		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40 0.00-0.40	D1 ES1				(0.40)	MADE GROUND (Brown slightly silty slightly gravelly fine to medium, with a little coarse sand. Gravel is subangular to subrounded fine to medium flint)		
0.40-0.70 0.40-0.70	D2 ES2			35.88	0.40 (0.30)	Dark orange brown slightly silty slightly gravelly fine to medium, with a little coarse SAND. Gravel is subangular to subrounded fine to coarse flint		
0.70-1.00	D3			35.58	0.70 (0.30)	Orange brown silty slightly gravelly fine to medium, with a little coarse SAND. Gravel is subangular to subrounded fine to coarse flint		
			09/03/2020:DRY	35.28	1.00	Complete at 1.00m		

Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Figure No.
1:10	PJM	19.287.TP106

APPENDIX D: LABORATORY TESTING

Analytical report 20-03250 – Soil and soil leachate analysis
(Derwentside Environmental Testing Services Limited)

Analytical report 20-04564 – Groundwater and surface water analysis
(Derwentside Environmental Testing Services Limited)

James Hallier
AF Howland Associates Ltd
Cordell Works
Cordell Road
Long Melford
Suffolk
CO10 9EH

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 20-03250

Site Reference:	SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites
Project / Job Ref:	19.287
Order No:	JAH/19.287/01/01
Sample Receipt Date:	12/03/2020
Sample Scheduled Date:	12/03/2020
Report Issue Number:	1
Reporting Date:	19/03/2020

Authorised by:

Dave Ashworth
Technical Manager

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP102	TP103	TP104	TP105
Project / Job Ref: 19.287	Additional Refs	ES2	ES1	ES1	ES1	ES1
Order No: JAH/19.287/01/01	Depth (m)	0.20	0.20	GL	0.10	0.10
Reporting Date: 19/03/2020	DETS Sample No	468229	468230	468231	468233	468235

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected		Not Detected	Not Detected	
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N/a	MCERTS	8.4	7.8	7.8	7.3	6.9
Total Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	
Complex Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	
Free Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	
Thiocyanate as SCN	mg/kg	< 3	NONE	< 3		< 3	< 3	
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS		42			< 10
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS		0.04			< 0.01
Total Sulphur	%	< 0.02	NONE		0.02			< 0.02
Organic Matter	%	< 0.1	MCERTS	0.4		1	1.5	
Ammoniacal Nitrogen as NH_4	mg/kg	< 0.5	NONE		1.3			2
Ammonia as NH_4	mg/kg	< 0.5	NONE		1.3			2
Ammonium as NH_4	mg/kg	< 0.5	NONE		1.3			2
Ammonium as NH_4	mg/l	< 0.05	NONE		0.13			0.20
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS		202			26
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS		101			13.2
Water Soluble Nitrite (2:1) as NO_2	mg/kg	< 4	NONE		< 4			< 4
Antimony (Sb)	mg/kg	< 1	NONE	< 1		< 1	< 1	
Arsenic (As)	mg/kg	< 2	MCERTS	5	6	16	7	7
Beryllium (Be)	mg/kg	< 0.5	NONE	< 0.5		0.6	< 0.5	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	10	10	15	8	9
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	6		8	8	
Lead (Pb)	mg/kg	< 3	MCERTS	8		12	23	
Mercury (Hg)	mg/kg	< 1	NONE	< 1		< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	11		12	6	
Selenium (Se)	mg/kg	< 3	NONE	< 3		< 3	< 3	
Vanadium (V)	mg/kg	< 2	NONE	17		26	15	
Zinc (Zn)	mg/kg	< 3	MCERTS	29		45	40	
Available Phosphorus (P) (S)	mg/l	< 3	NONE		94			31
Available Phosphorus (P) (S)	Index	N/a	NONE		5			5
Available Potassium (K) (S)	mg/l	< 20	NONE		170			140
Available Potassium (K) (S)	Index	N/a	NONE		2-			2-
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP106	WS101	WS102	WS103	WS103
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES1	ES1	ES2
Order No: JAH/19.287/01/01	Depth (m)	GL	0.10	0.05	0.10	0.40
Reporting Date: 19/03/2020	DETS Sample No	468236	468237	468239	468240	468242

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Detected	Not Detected
Sample Matrix (S)	Material Type	N/a	NONE				bundles of Chrysotile	
Asbestos Type (S)	PLM Result	N/a	ISO17025				Chrysotile	
pH	pH Units	N/a	MCERTS	7.9	8.1	7.9	7.2	8.2
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Thiocyanate as SCN	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS					
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS					
Total Sulphur	%	< 0.02	NONE					
Organic Matter	%	< 0.1	MCERTS	1.6	1.2	0.5	1.7	0.2
Ammoniacal Nitrogen as NH_4	mg/kg	< 0.5	NONE					
Ammonia as NH_4	mg/kg	< 0.5	NONE					
Ammonium as NH_4	mg/kg	< 0.5	NONE					
Ammonium as NH_4	mg/l	< 0.05	NONE					
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS					
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS					
Water Soluble Nitrite (2:1) as NO_2	mg/kg	< 4	NONE					
Antimony (Sb)	mg/kg	< 1	NONE	< 1	< 1	1.3	< 1	< 1
Arsenic (As)	mg/kg	< 2	MCERTS	8	8	17	8	7
Beryllium (Be)	mg/kg	< 0.5	NONE	< 0.5	< 0.5	0.7	< 0.5	< 0.5
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	9	14	15	10	10
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	9	9	9	7	5
Lead (Pb)	mg/kg	< 3	MCERTS	17	8	9	19	8
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	7	10	13	6	9
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Vanadium (V)	mg/kg	< 2	NONE	16	20	29	16	18
Zinc (Zn)	mg/kg	< 3	MCERTS	44	37	52	36	19
Available Phosphorus (P) (S)	mg/l	< 3	NONE					
Available Phosphorus (P) (S)	Index	N/a	NONE					
Available Potassium (K) (S)	mg/l	< 20	NONE					
Available Potassium (K) (S)	Index	N/a	NONE					
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 4480

Soil Analysis Certificate						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS104	WS104	WS105	WS108	
Project / Job Ref: 19.287	Additional Refs	ES1	ES2	ES1	ES1	
Order No: JAH/19.287/01/01	Depth (m)	0.10	0.40	0.10	0.10	
Reporting Date: 19/03/2020	DETS Sample No	468243	468244	468245	468247	

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N/a	MCERTS	6.8	7.0	6.6	6.6	
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	
Thiocyanate as SCN	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	< 10				
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	< 0.01				
Total Sulphur	%	< 0.02	NONE	< 0.02				
Organic Matter	%	< 0.1	MCERTS	1.4	0.5	4	1.2	
Ammoniacal Nitrogen as NH_4	mg/kg	< 0.5	NONE	1.6				
Ammonia as NH_4	mg/kg	< 0.5	NONE	1.6				
Ammonium as NH_4	mg/kg	< 0.5	NONE	1.6				
Ammonium as NH_4	mg/l	< 0.05	NONE	0.16				
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	24				
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS	12.1				
Water Soluble Nitrite (2:1) as NO_2	mg/kg	< 4	NONE	< 4				
Antimony (Sb)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Arsenic (As)	mg/kg	< 2	MCERTS	9	4	6	9	
Beryllium (Be)	mg/kg	< 0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (Cr)	mg/kg	< 2	MCERTS	11	15	11	10	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	9	5	7	7	
Lead (Pb)	mg/kg	< 3	MCERTS	96	7	19	17	
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	7	7	6	7	
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	
Vanadium (V)	mg/kg	< 2	NONE	15	12	14	17	
Zinc (Zn)	mg/kg	< 3	MCERTS	50	16	37	39	
Available Phosphorus (P) (S)	mg/l	< 3	NONE	34				
Available Phosphorus (P) (S)	Index	N/a	NONE	3				
Available Potassium (K) (S)	mg/l	< 20	NONE	150				
Available Potassium (K) (S)	Index	N/a	NONE	2-				
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Speciated PAHs							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP103	TP104	TP106	WS101
Project / Job Ref: 19.287	Additional Refs	ES2	ES1	ES1	ES1	ES1
Order No: JAH/19.287/01/01	Depth (m)	0.20	GL	0.10	GL	0.10
Reporting Date: 19/03/2020	DETS Sample No	468229	468231	468233	468236	468237

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.14
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.31
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.25
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.17
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.15
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.25
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.11
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.23
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.16
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.15
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	1.9

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Speciated PAHs							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS102	WS103	WS103	WS104	WS104
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES2	ES1	ES2
Order No: JAH/19.287/01/01	Depth (m)	0.05	0.10	0.40	0.10	0.40
Reporting Date: 19/03/2020	DETS Sample No	468239	468240	468242	468243	468244

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.25	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.15	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.24	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.16	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.12	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20			
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS105	WS108			
Project / Job Ref: 19.287	Additional Refs	ES1	ES1			
Order No: JAH/19.287/01/01	Depth (m)	0.10	0.10			
Reporting Date: 19/03/2020	DETS Sample No	468245	468247			

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	0.17	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	0.90	< 0.1			
Pyrene	mg/kg	< 0.1	MCERTS	0.81	< 0.1			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.58	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	0.59	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.96	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.39	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.67	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.57	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.48	< 0.1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	6.1	< 1.6			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - TPH CWG Banded							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP103	TP104	TP106	WS101
Project / Job Ref: 19.287	Additional Refs	ES2	ES1	ES1	ES1	ES1
Order No: JAH/19.287/01/01	Depth (m)	0.20	GL	0.10	GL	0.10
Reporting Date: 19/03/2020	DETS Sample No	468229	468231	468233	468236	468237

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS102	WS103	WS103	WS104	WS104
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES2	ES1	ES2
Order No: JAH/19.287/01/01	Depth (m)	0.05	0.10	0.40	0.10	0.40
Reporting Date: 19/03/2020	DETS Sample No	468239	468240	468242	468243	468244

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20			
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS105	WS108			
Project / Job Ref: 19.287	Additional Refs	ES1	ES1			
Order No: JAH/19.287/01/01	Depth (m)	0.10	0.10			
Reporting Date: 19/03/2020	DETS Sample No	468245	468247			

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3			
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3			
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10			
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21			
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3			
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10			
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21			
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP103	TP104	TP106	WS101
Project / Job Ref: 19.287	Additional Refs	ES2	ES1	ES1	ES1	ES1
Order No: JAH/19.287/01/01	Depth (m)	0.20	GL	0.10	GL	0.10
Reporting Date: 19/03/2020	DETS Sample No	468229	468231	468233	468236	468237

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS102	WS103	WS103	WS104	WS104
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES2	ES1	ES2
Order No: JAH/19.287/01/01	Depth (m)	0.05	0.10	0.40	0.10	0.40
Reporting Date: 19/03/2020	DETS Sample No	468239	468240	468242	468243	468244

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20			
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS105	WS108			
Project / Job Ref: 19.287	Additional Refs	ES1	ES1			
Order No: JAH/19.287/01/01	Depth (m)	0.10	0.10			
Reporting Date: 19/03/2020	DETS Sample No	468245	468247			

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2			
Toluene	ug/kg	< 5	MCERTS	< 5	< 5			
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2			
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
MTBE	ug/kg	< 5	MCERTS	< 5	< 5			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Leachate Analysis Certificate						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20	09/03/20	09/03/20
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP103	TP104	WS101	WS103
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES1	ES1	ES1
Order No: JAH/19.287/01/01	Depth (m)	0.10	GL	0.10	0.10	0.10
Reporting Date: 19/03/2020	DETS Sample No	468228	468232	468234	468238	468241

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	7.8	8.3	7.0	8.1	7.5
Total Cyanide	ug/l	< 5	NONE	< 5		< 5	< 5	
Complex Cyanide	ug/l	< 5	NONE	< 5		< 5	< 5	
Free Cyanide	ug/l	< 5	NONE	< 5		< 5	< 5	
Thiocyanate as SCN	ug/l	< 10	NONE	< 10		< 10	< 10	
Sulphate as SO_4	mg/l	< 1	ISO17025		2			4
Sulphur	mg/l	< 1	NONE		< 1.0			2.3
Ammoniacal Nitrogen as NH_4	ug/l	< 50	NONE		143			107
Ammonia as NH_4	ug/l	< 50	NONE		143			107
Ammonium as NH_4	ug/l	< 50	NONE		143			107
Nitrate as NO_3	mg/l	< 0.5	ISO17025		0.7			1.3
Nitrite as NO_2	mg/l	< 0.5	NONE		< 0.5			< 0.5
Antimony	ug/l	< 5	ISO17025	< 5		< 5	< 5	
Arsenic	ug/l	< 5	ISO17025	7	< 5	< 5	< 5	< 5
Beryllium	ug/l	< 3	ISO17025	< 3		< 3	< 3	
Cadmium	ug/l	< 0.4	ISO17025	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chromium (hexavalent)	ug/l	< 20	NONE	< 20	< 20	< 20	< 20	< 20
Copper	ug/l	< 5	ISO17025	5		< 5	< 5	
Lead	ug/l	< 5	ISO17025	< 5		< 5	< 5	
Mercury	ug/l	< 0.05	ISO17025	< 0.05		< 0.05	< 0.05	
Nickel	ug/l	< 5	ISO17025	< 5		< 5	< 5	
Phosphorus	ug/l	< 100	NONE		152			233
Selenium	ug/l	< 5	ISO17025	< 5		< 5	< 5	
Vanadium	ug/l	< 5	ISO17025	7		< 5	< 5	
Zinc	ug/l	< 2	ISO17025	3		5	< 2	
Potassium	mg/l	< 0.2	ISO17025		6.6			1.2
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10

Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Leachate Analysis Certificate						
DETS Report No: 20-03250	Date Sampled	09/03/20				
AF Howland Associates Ltd	Time Sampled	None Supplied				
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS105				
Project / Job Ref: 19.287	Additional Refs	ES1				
Order No: JAH/19.287/01/01	Depth (m)	0.10				
Reporting Date: 19/03/2020	DETS Sample No	468246				

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	6.9				
Total Cyanide	ug/l	< 5	NONE					
Complex Cyanide	ug/l	< 5	NONE					
Free Cyanide	ug/l	< 5	NONE					
Thiocyanate as SCN	ug/l	< 10	NONE					
Sulphate as SO_4	mg/l	< 1	ISO17025	2				
Sulphur	mg/l	< 1	NONE	1.4				
Ammoniacal Nitrogen as NH_4	ug/l	< 50	NONE	89				
Ammonia as NH_4	ug/l	< 50	NONE	89				
Ammonium as NH_4	ug/l	< 50	NONE	89				
Nitrate as NO_3	mg/l	< 0.5	ISO17025	1.2				
Nitrite as NO_2	mg/l	< 0.5	NONE	< 0.5				
Antimony	ug/l	< 5	ISO17025					
Arsenic	ug/l	< 5	ISO17025	< 5				
Beryllium	ug/l	< 3	ISO17025					
Cadmium	ug/l	< 0.4	ISO17025	< 0.4				
Chromium	ug/l	< 5	ISO17025	< 5				
Chromium (hexavalent)	ug/l	< 20	NONE	< 20				
Copper	ug/l	< 5	ISO17025					
Lead	ug/l	< 5	ISO17025					
Mercury	ug/l	< 0.05	ISO17025					
Nickel	ug/l	< 5	ISO17025					
Phosphorus	ug/l	< 100	NONE	210				
Selenium	ug/l	< 5	ISO17025					
Vanadium	ug/l	< 5	ISO17025					
Zinc	ug/l	< 2	ISO17025					
Potassium	mg/l	< 0.2	ISO17025	0.9				
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10				

Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Leachate Analysis Certificate - Speciated PAH							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20		
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP104	WS101		
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES1		
Order No: JAH/19.287/01/01	Depth (m)	0.10	0.10	0.10		
Reporting Date: 19/03/2020	DETS Sample No	468228	468234	468238		

Determinand	Unit	RL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	0.04	0.04	0.02		
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthene	ug/l	< 0.01	NONE	0.03	0.02	0.03		
Fluorene	ug/l	< 0.01	NONE	0.04	0.02	0.02		
Phenanthrene	ug/l	< 0.01	NONE	0.10	0.06	0.08		
Anthracene	ug/l	< 0.01	NONE	0.02	0.02	0.02		
Fluoranthene	ug/l	< 0.01	NONE	0.02	0.02	0.08		
Pyrene	ug/l	< 0.01	NONE	0.02	< 0.01	0.07		
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.03		
Chrysene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.03		
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.07		
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.02		
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.05		
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	ug/l	< 0.008	NONE	< 0.008	< 0.008	< 0.008		
Total EPA-16 PAHs	ug/l	< 0.01	NONE	0.27	0.18	0.52		

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Leachate Analysis Certificate - TPH CWG Banded						
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20		
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP104	WS101		
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES1		
Order No: JAH/19.287/01/01	Depth (m)	0.10	0.10	0.10		
Reporting Date: 19/03/2020	DETS Sample No	468228	468234	468238		

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C12 - C16	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70	< 70	< 70		
Aromatic >C5 - C7	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C12 - C16	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C16 - C21	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C21 - C35	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic (C5 - C35)	ug/l	< 70	NONE	< 70	< 70	< 70		
Total >C5 - C35	ug/l	< 140	NONE	< 140	< 140	< 140		

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Leachate Analysis Certificate - BTEX / MTBE							
DETS Report No: 20-03250	Date Sampled	09/03/20	09/03/20	09/03/20		
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	TP101	TP104	WS101		
Project / Job Ref: 19.287	Additional Refs	ES1	ES1	ES1		
Order No: JAH/19.287/01/01	Depth (m)	0.10	0.10	0.10		
Reporting Date: 19/03/2020	DETS Sample No	468228	468234	468238		

Determinand	Unit	RL	Accreditation					
Benzene	ug/l	< 1	ISO17025	< 1	< 1	< 1		
Toluene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Ethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
p & m-xylene	ug/l	< 10	ISO17025	< 10	< 10	< 10		
o-xylene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
MTBE	ug/l	< 10	ISO17025	< 10	< 10	< 10		

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Sample Descriptions
DETS Report No: 20-03250
AF Howland Associates Ltd
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites
Project / Job Ref: 19.287
Order No: JAH/19.287/01/01
Reporting Date: 19/03/2020

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
468229	TP101	ES2	0.20	8.5	Brown loamy sand
468230	TP102	ES1	0.20	8.4	Brown loamy sand with stones
468231	TP103	ES1	GL	7.3	Brown loamy sand with stones
468233	TP104	ES1	0.10	9	Brown sandy clay with vegetation
468235	TP105	ES1	0.10	6.9	Brown loamy sand with vegetation
468236	TP106	ES1	GL	6.1	Brown sandy clay with stones and vegetation
468237	WS101	ES1	0.10	5.3	Brown sandy clay with stones
468239	WS102	ES1	0.05	5.7	Brown sandy clay with stones
468240	WS103	ES1	0.10	10.9	Brown sandy clay
468242	WS103	ES2	0.40	10.1	Brown sandy clay with stones
468243	WS104	ES1	0.10	8.6	Brown sandy clay with stones and vegetation
468244	WS104	ES2	0.40	4.7	Brown sandy clay with stones
468245	WS105	ES1	0.10	15.9	Black loamy sand with vegetation
468247	WS108	ES1	0.10	6	Brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 20-03250
AF Howland Associates Ltd
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites
Project / Job Ref: 19.287
Order No: JAH/19.287/01/01
Reporting Date: 19/03/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 20-03250
AF Howland Associates Ltd
Site Reference: SSAgri AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites
Project / Job Ref: 19.287
Order No: JAH/19.287/01/01
Reporting Date: 19/03/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

James Hallier
AF Howland Associates Ltd
Cordell Works
Cordell Road
Long Melford
Suffolk
CO10 9EH

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 20-04564

Site Reference:	SSagr AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites
Project / Job Ref:	19.287
Order No:	JAH/19.287/01/02
Sample Receipt Date:	21/04/2020
Sample Scheduled Date:	21/04/2020
Report Issue Number:	2
Reporting Date:	29/04/2020

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.
This report supersedes 20-04564, issue no.1.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Water Analysis Certificate						
DETS Report No: 20-04564	Date Sampled	17/04/20	17/04/20	17/04/20	17/04/20	17/04/20
AF Howland Associates Ltd	Time Sampled	1105	1051	1041	0945	1006
Site Reference: SSagr AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	SW01	SW02	SW03	WS102	WS103
Project / Job Ref: 19.287	Additional Refs	W1	W1	W1	W1	W1
Order No: JAH/19.287/01/02	Depth (m)	GL	GL	GL	1.45	1.30
Reporting Date: 29/04/2020	DETS Sample No	473954	473955	473956	473957	473958

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	8.3	8.2	8.3	6.9	7.5
Total Cyanide	ug/l	< 5	NONE	< 5		< 5		< 5
Complex Cyanide	ug/l	< 5	NONE	< 5		< 5		< 5
Free Cyanide	ug/l	< 5	NONE	< 5		< 5		< 5
Thiocyanate as SCN	ug/l	< 10	NONE	< 10		< 10		< 10
Sulphate as SO_4	mg/l	< 1	ISO17025		60		26	
Sulphide	mg/l	< 0.1	NONE		< 0.1		< 0.1	
Ammoniacal Nitrogen as NH_4	ug/l	< 50	NONE		< 50		494	
Ammonia as NH_4	ug/l	< 50	NONE		< 50		494	
Ammonium as NH_4	ug/l	< 50	NONE		< 50		494	
Ammonium as NH_4	mg/l	< 0.05	NONE		< 0.05		0.49	
Nitrate as NO_3	mg/l	< 0.5	ISO17025		14.1		15.2	
Nitrite as NO_2	mg/l	< 0.5	NONE		< 0.5		< 0.5	
Dissolved Organic Carbon (DOC)	mg/l	< 0.1	NONE	5.9	6	6.1		
Hardness - Total	mgCaCO3/l	< 1	NONE	429	438	438		
Antimony (dissolved)	ug/l	< 5	ISO17025	< 5		< 5		< 5
Arsenic (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Beryllium (dissolved)	ug/l	< 3	ISO17025	< 3		< 3		< 3
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chromium (hexavalent)	ug/l	< 20	NONE	< 20	< 20	< 20	< 20	< 20
Copper (dissolved)	ug/l	< 5	ISO17025	< 5		< 5		< 5
Lead (dissolved)	ug/l	< 5	ISO17025	< 5		< 5		< 5
Mercury (dissolved)	ug/l	< 0.05	ISO17025	< 0.05		< 0.05		< 0.05
Nickel (dissolved)	ug/l	< 5	ISO17025	< 5		< 5		< 5
Phosphorus (dissolved)	ug/l	< 100	NONE		< 100		171	
Selenium (dissolved)	ug/l	< 5	ISO17025	< 5		< 5		< 5
Vanadium (dissolved)	ug/l	< 5	ISO17025	< 5		< 5		< 5
Zinc (dissolved)	ug/l	< 2	ISO17025	4		5		4
Potassium (dissolved)	mg/l	< 0.2	ISO17025		4		26.1	
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10

Subcontracted analysis (S)
Insufficient sample I/S
Unsuitable Sample U/S

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Water Analysis Certificate						
DETS Report No: 20-04564	Date Sampled	17/04/20				
AF Howland Associates Ltd	Time Sampled	1018				
Site Reference: SSagr AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	WS105				
Project / Job Ref: 19.287	Additional Refs	W1				
Order No: JAH/19.287/01/02	Depth (m)	1.15				
Reporting Date: 29/04/2020	DETS Sample No	473959				

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	7.0				
Total Cyanide	ug/l	< 5	NONE					
Complex Cyanide	ug/l	< 5	NONE					
Free Cyanide	ug/l	< 5	NONE					
Thiocyanate as SCN	ug/l	< 10	NONE					
Sulphate as SO_4	mg/l	< 1	ISO17025	11				
Sulphide	mg/l	< 0.1	NONE	< 0.1				
Ammoniacal Nitrogen as NH_4	ug/l	< 50	NONE	458				
Ammonia as NH_4	ug/l	< 50	NONE	458				
Ammonium as NH_4	ug/l	< 50	NONE	458				
Ammonium as NH_4	mg/l	< 0.05	NONE	0.46				
Nitrate as NO_3	mg/l	< 0.5	ISO17025	28.6				
Nitrite as NO_2	mg/l	< 0.5	NONE	< 0.5				
Dissolved Organic Carbon (DOC)	mg/l	< 0.1	NONE					
Hardness - Total	mgCaCO3/l	< 1	NONE					
Antimony (dissolved)	ug/l	< 5	ISO17025					
Arsenic (dissolved)	ug/l	< 5	ISO17025	< 5				
Beryllium (dissolved)	ug/l	< 3	ISO17025					
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	< 0.4				
Chromium (dissolved)	ug/l	< 5	ISO17025	< 5				
Chromium (hexavalent)	ug/l	< 20	NONE	< 20				
Copper (dissolved)	ug/l	< 5	ISO17025					
Lead (dissolved)	ug/l	< 5	ISO17025					
Mercury (dissolved)	ug/l	< 0.05	ISO17025					
Nickel (dissolved)	ug/l	< 5	ISO17025					
Phosphorus (dissolved)	ug/l	< 100	NONE	< 100				
Selenium (dissolved)	ug/l	< 5	ISO17025					
Vanadium (dissolved)	ug/l	< 5	ISO17025					
Zinc (dissolved)	ug/l	< 2	ISO17025					
Potassium (dissolved)	mg/l	< 0.2	ISO17025	2.5				
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10				

Subcontracted analysis (S)
Insufficient sample I/S
Unsuitable Sample U/S

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Water Analysis Certificate - Speciated PAH							
DETS Report No: 20-04564	Date Sampled	17/04/20	17/04/20	17/04/20		
AF Howland Associates Ltd	Time Sampled	1105	1041	1006		
Site Reference: SSagr AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	SW01	SW03	WS103		
Project / Job Ref: 19.287	Additional Refs	W1	W1	W1		
Order No: JAH/19.287/01/02	Depth (m)	GL	GL	1.30		
Reporting Date: 29/04/2020	DETS Sample No	473954	473956	473958		

Determinand	Unit	RL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	0.02	0.05	0.04		
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluorene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Phenanthrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Chrysene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	ug/l	< 0.008	NONE	< 0.008	< 0.008	< 0.008		
Total EPA-16 PAHs	ug/l	< 0.01	NONE	0.02	0.05	0.04		

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Water Analysis Certificate - TPH CWG Banded						
DETS Report No: 20-04564	Date Sampled	17/04/20	17/04/20	17/04/20		
AF Howland Associates Ltd	Time Sampled	1105	1041	1006		
Site Reference: SSagr AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	SW01	SW03	WS103		
Project / Job Ref: 19.287	Additional Refs	W1	W1	W1		
Order No: JAH/19.287/01/02	Depth (m)	GL	GL	1.30		
Reporting Date: 29/04/2020	DETS Sample No	473954	473956	473958		

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C12 - C16	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70	< 70	< 70		
Aromatic >C5 - C7	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C12 - C16	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C16 - C21	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C21 - C35	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic (C5 - C35)	ug/l	< 70	NONE	< 70	< 70	< 70		
Total >C5 - C35	ug/l	< 140	NONE	< 140	< 140	< 140		

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Water Analysis Certificate - BTEX / MTBE							
DETS Report No: 20-04564	Date Sampled	17/04/20	17/04/20	17/04/20		
AF Howland Associates Ltd	Time Sampled	1105	1041	1006		
Site Reference: SSagr AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites	TP / BH No	SW01	SW03	WS103		
Project / Job Ref: 19.287	Additional Refs	W1	W1	W1		
Order No: JAH/19.287/01/02	Depth (m)	GL	GL	1.30		
Reporting Date: 29/04/2020	DETS Sample No	473954	473956	473958		

Determinand	Unit	RL	Accreditation					
Benzene	ug/l	< 1	ISO17025	< 1	< 1	< 1		
Toluene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Ethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
p & m-xylene	ug/l	< 10	ISO17025	< 10	< 10	< 10		
o-xylene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
MTBE	ug/l	< 10	ISO17025	< 10	< 10	< 10		

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 20-04564
AF Howland Associates Ltd
Site Reference: SSagr AD Plant, Ellingham Road, Attleborough, NR17 1AE - AFHA Suites
Project / Job Ref: 19.287
Order No: JAH/19.287/01/02
Reporting Date: 29/04/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

APPENDIX E: AMMONIA CONVERSIONS

Location	Sample medium	Ammonia concentration (expressed as NH_4)	Equivalent ammonia concentration (expressed as N)[17]
TP102	Soil	1.3 mg/kg	0.10 mg/l
TP105	Soil	2.0 mg/kg	0.16 mg/l
WS104	Soil	1.6 mg/kg	0.12 mg/l
TP103	Leachate	143 µg/l	0.11 mg/l
WS103	Leachate	107 µg/l	0.08 mg/l
WS105	Leachate	89 µg/l	0.07 mg/l
WS102	Water	494 µg/l	0.38 mg/l
WS105	Water	453 µg/l	0.35 mg/l
SW02	Water	<50 µg/l	<0.04 mg/l

Table E1 – Ammonia concentration conversions

[17] Conversions carried out using the molecular weight of NH4 and N as 18 and 14 g/mol, respectively

APPENDIX F: GROUND GAS MONITORING DATA

A F Howland Associates
Geotechnical Engineers

Ground Gas Monitoring Results

Site : Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE

Client : Privilege Finance Services

Agent :

Job Number 19.287

Sheet 1 / 6

BH/WS	Date / Time	Security Code	Date Last Calibration	Date Factory Calibration	Next Service Due	Operator	Site Condition	Standpipe Condition	Wind Speed (Knots)
WS102	13/03/2020 12:23	[02EB3938]	13/03/2020	14/10/2019	15/10/2020	CJW	Overcast Ground wet	Flooded Tap fully open	25.0
WS102	20/03/2020 10:28	[1DED38E1]	13/03/2020	14/10/2019	15/10/2020	DGWD	Overcast Ground dry		0.8
WS102	27/03/2020 12:36	[04A93B9E]	13/03/2020	14/10/2019	15/10/2020	CJW	Sunny Ground dry	Tap fully open	12.0
WS102	02/04/2020 13:04	[CD445B70]	13/03/2020	14/10/2019	15/10/2020	CJW	Partly cloudy Sunny Ground dry	Tap fully open	17.0
WS102	08/04/2020 11:08	[91FB64CD]	13/03/2020	14/10/2019	15/10/2020	DGWD	Sunny Ground dry	Tap fully open 1.37	3.2
WS102	15/04/2020 09:54	[17892052]	13/03/2020	14/10/2019	15/10/2020	DGWD	Sunny Ground dry	Tap fully closed	2.7
WS106	13/03/2020 11:38	[02EB3938]	13/03/2020	14/10/2019	15/10/2020	CJW	Overcast Ground dry	Tap fully closed Dip - dry	25.0
WS106	20/03/2020 09:36	[1DED38E1]	13/03/2020	14/10/2019	15/10/2020	DGWD	Overcast Ground dry		0.8
WS106	27/03/2020 11:59	[04A93B9E]	13/03/2020	14/10/2019	15/10/2020	CJW	Sunny Ground dry	Tap fully closed Dip - dry	12.0
WS106	02/04/2020 12:30	[CD445B70]	13/03/2020	14/10/2019	15/10/2020	CJW	Partly cloudy Sunny Ground dry	Tap fully closed	17.0
WS106	08/04/2020 10:30	[91FB64CD]	13/03/2020	14/10/2019	15/10/2020	DGWD	Sunny Ground dry	Tap fully closed Dip-dry	3.2
WS106	15/04/2020 09:14	[17892052]	13/03/2020	14/10/2019	15/10/2020	DGWD	Sunny Ground dry	Tap fully closed Dip - dry	2.7
WS107	13/03/2020 11:47	[02EB3938]	13/03/2020	14/10/2019	15/10/2020	CJW	Overcast Ground dry	Tap fully closed Dip - dry	25.0
WS107	20/03/2020 09:55	[1DED38E1]	13/03/2020	14/10/2019	15/10/2020	DGWD	Overcast Ground dry	Tap fully closed	0.8
WS107	27/03/2020 12:19	[04A93B9E]	13/03/2020	14/10/2019	15/10/2020	CJW	Sunny Ground dry	Tap fully closed Dip - dry	12.0
WS107	02/04/2020 12:47	[CD445B70]	13/03/2020	14/10/2019	15/10/2020	CJW	Partly cloudy Sunny Ground dry	Tap fully closed Dip - dry	17.0
WS107	08/04/2020 10:47	[91FB64CD]	13/03/2020	14/10/2019	15/10/2020	DGWD	Sunny Ground dry	Tap fully closed Dip-dry	3.2
WS107	15/04/2020 09:32	[17892052]	13/03/2020	14/10/2019	15/10/2020	DGWD	Sunny Ground dry	Tap fully closed Dip - dry	2.7

Site : Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE

Client : Privilege Finance Services

Agent :

Job Number 19.287

Sheet 2 / 6

BH/WS	Date / Time	Flow Pod (l/h)	CH4 (%)	Peak CH4 (%)	CH4 LEL (%)	CO2 (%)	PEAK CO2 (%)	O2 (%)	Min O2 (%)	Balance (%)	Baro (mb)	Rel Pressure (mb)	CO (ppm)	H2S (ppm)	Temp (°C)
WS102	13/03/2020 12:08:00	-0.1	0.0	0.0	0.0	0.6	0.6	21.0	21.0	78.4	1015	0.0	97.0	0.0	7.0
WS102	13/03/2020 12:09:00		0.0	0.0	0.0	0.6	0.6	20.9	20.9	78.5			73.0	0.0	7.0
WS102	13/03/2020 12:10:00		0.0	0.0	0.0	0.7	0.7	20.9	20.9	78.4			89.0	0.0	7.0
WS102	13/03/2020 12:10:00		0.0	0.0	0.0	0.9	0.9	20.8	20.8	78.3			89.0	0.0	7.0
WS102	13/03/2020 12:11:00		0.0	0.0	0.0	1.3	1.3	20.6	20.6	78.1			92.0	0.0	7.0
WS102	13/03/2020 12:11:00		0.0	0.0	0.0	1.8	1.8	20.4	20.4	77.8			96.0	0.0	7.0
WS102	13/03/2020 12:12:00		0.0	0.0	0.0	2.5	2.5	20.1	20.1	77.4			101.0	1.0	7.0
WS102	13/03/2020 12:12:00		0.0	0.0	0.0	2.8	2.8	19.9	19.9	77.3			90.0	0.0	7.0
WS102	13/03/2020 12:13:00		0.0	0.0	0.0	3.3	3.3	19.8	19.8	76.9			106.0	1.0	7.0
WS102	13/03/2020 12:13:00		0.0	0.0	0.0	3.9	3.9	19.5	19.5	76.6			111.0	1.0	7.0
WS102	13/03/2020 12:14:00		0.1	0.1	2.0	4.5	4.5	19.2	19.2	76.2			114.0	1.0	7.0
WS102	13/03/2020 12:15:00		0.1	0.1	2.0	4.6	4.6	19.0	19.0	76.3			103.0	1.0	7.0
WS102	13/03/2020 12:15:00		0.1	0.1	2.0	4.6	4.7	18.9	18.9	76.4			117.0	1.0	7.0
WS102	13/03/2020 12:16:00		0.1	0.1	2.0	4.5	4.6	19.0	18.9	76.4			115.0	1.0	7.0
WS102	13/03/2020 12:16:00		0.1	0.1	2.0	4.4	4.5	19.0	19.0	76.5			113.0	1.0	7.0
WS102	13/03/2020 12:17:00		0.1	0.1	2.0	4.2	4.4	19.1	19.0	76.6			107.0	1.0	7.0
WS102	13/03/2020 12:17:00		0.1	0.1	2.0	3.9	4.2	19.3	19.1	76.7			100.0	1.0	7.0
WS102	13/03/2020 12:18:00		0.0	0.1	0.0	3.6	3.9	19.5	19.3	76.9			90.0	1.0	7.0
WS102	13/03/2020 12:18:00		0.0	0.0	0.0	3.2	3.6	19.7	19.5	77.1			78.0	1.0	7.0
WS102	13/03/2020 12:19:00		0.0	0.0	0.0	2.8	3.2	19.9	19.7	77.3			64.0	1.0	7.0
WS102	13/03/2020 12:19:00		0.0	0.0	0.0	2.5	2.8	20.2	19.9	77.3			52.0	1.0	7.0
WS102	20/03/2020 10:13:00	-0.1	1.3	1.3	26.0	6.7	6.7	13.2	13.2	78.8	1027	0.2	4.0	0.0	0.8
WS102	20/03/2020 10:14:00		1.2	1.2	24.0	6.6	6.6	12.6	12.6	79.6			3.0	0.0	0.8
WS102	20/03/2020 10:15:00		1.3	1.3	26.0	6.9	6.9	12.4	12.4	79.4			4.0	0.0	0.8
WS102	20/03/2020 10:15:00		1.3	1.3	26.0	7.1	7.1	12.1	12.1	79.5			4.0	0.0	0.8
WS102	20/03/2020 10:16:00		1.3	1.3	26.0	7.4	7.4	11.8	11.8	79.5			4.0	0.0	0.8
WS102	20/03/2020 10:16:00		1.4	1.4	28.0	7.8	7.8	11.4	11.4	79.4			4.0	0.0	0.8
WS102	20/03/2020 10:17:00		1.4	1.4	28.0	8.2	8.2	11.0	11.0	79.4			4.0	0.0	0.8
WS102	20/03/2020 10:17:00		1.5	1.5	30.0	8.6	8.6	10.6	10.6	79.3			4.0	0.0	0.8
WS102	20/03/2020 10:18:00		1.5	1.5	30.0	9.0	9.0	10.2	10.2	79.3			4.0	0.0	0.8
WS102	20/03/2020 10:18:00		1.5	1.5	30.0	9.4	9.4	9.9	9.9	79.2			4.0	0.0	0.8
WS102	20/03/2020 10:19:00		1.6	1.6	32.0	9.6	9.6	9.7	9.7	79.1			4.0	0.0	0.8
WS102	20/03/2020 10:20:00		1.6	1.6	32.0	9.6	9.6	9.6	9.6	79.2			4.0	0.0	0.8
WS102	20/03/2020 10:20:00		1.6	1.6	32.0	9.6	9.7	9.7	9.6	79.1			5.0	0.0	0.8
WS102	20/03/2020 10:21:00		1.5	1.6	30.0	9.3	9.6	10.3	9.7	78.9			5.0	0.0	0.8
WS102	20/03/2020 10:21:00		1.3	1.5	26.0	8.6	9.3	11.2	10.3	78.9			4.0	0.0	0.8
WS102	20/03/2020 10:22:00		1.2	1.3	24.0	7.9	8.6	12.0	11.2	78.9			4.0	0.0	0.8
WS102	20/03/2020 10:22:00		1.0	1.2	20.0	7.1	7.9	13.1	12.1	78.8			4.0	0.0	0.8
WS102	20/03/2020 10:23:00		0.9	1.0	18.0	6.4	7.1	14.1	13.1	78.6			3.0	0.0	0.8
WS102	20/03/2020 10:23:00		0.8	0.9	16.0	5.8	6.4	14.9	14.1	78.5			3.0	0.0	0.8
WS102	20/03/2020 10:24:00		0.7	0.8	14.0	5.3	5.8	15.7	15.0	78.3			2.0	0.0	0.8
WS102	20/03/2020 10:24:00		0.6	0.7	12.0	4.8	5.3	16.4	15.7	78.2			2.0	1.0	0.8
WS102	27/03/2020 12:25:00	0.0	0.5	0.5	10.0	5.4	5.4	13.1	13.1	81.0	1022	0.0	2.0	1.0	9.0
WS102	27/03/2020 12:25:00		0.4	0.4	8.0	5.4	5.4	13.0	13.0	81.2			2.0	1.0	9.0
WS102	27/03/2020 12:26:00		0.5	0.5	10.0	5.6	5.6	12.8	12.8	81.1			2.0	1.0	9.0
WS102	27/03/2020 12:26:00		0.5	0.5	10.0	6.0	6.0	12.3	12.3	81.2			2.0	1.0	9.0
WS102	27/03/2020 12:27:00		0.5	0.5	10.0	6.6	6.6	11.5	11.5	81.4			2.0	1.0	9.0
WS102	27/03/2020 12:27:00		0.6	0.6	12.0	7.3	7.3	10.7	10.7	81.4			2.0	1.0	9.0
WS102	27/03/2020 12:28:00		0.6	0.6	12.0	8.1	8.1	9.7	9.7	81.6			2.0	1.0	9.0
WS102	27/03/2020 12:28:00		0.7	0.7	14.0	8.8	8.8	8.8	8.8	81.7			2.0	1.0	9.0
WS102	27/03/2020 12:29:00		0.7	0.7	14.0	9.6	9.6	7.8	7.8	81.9			2.0	1.0	9.0
WS102	27/03/2020 12:29:00		0.7	0.7	14.0	10.1	10.1	7.1	7.1	82.1			2.0	1.0	9.0
WS102	27/03/2020 12:30:00		0.7	0.7	14.0	10.5	10.5	6.7	6.7	82.1			2.0	1.0	9.0
WS102	27/03/2020 12:30:00		0.7	0.7	14.0	10.5	10.5	6.5	6.5	82.3			2.0	1.0	9.0
WS102	27/03/2020 12:31:00		0.7	0.7	14.0	10.8	10.8	6.2	6.2	82.3			2.0	1.0	9.0
WS102	27/03/2020 12:31:00		0.7	0.8	14.0	11.0	11.0	5.9	5.9	82.4			2.0	1.0	9.0
WS102	27/03/2020 12:32:00		0.7	0.8	14.0	11.0	11.1	5.9	5.8	82.4			2.0	1.0	9.0
WS102	27/03/2020 12:32:00		0.6	0.7	12.0	10.3	11.0	6.9	5.9	82.2			2.0	1.0	9.0
WS102	27/03/2020 12:33:00		0.5	0.6	10.0	9.6	10.3	8.0	6.9	81.9			2.0	1.0	9.0
WS102	27/03/2020 12:33:00		0.5	0.5	10.0	8.8	9.6	9.3	8.0	81.4			2.0	1.0	9.0
WS102	27/03/2020 12:34:00		0.4	0.5	8.0	8.0	8.8	10.6	9.3	81.0			2.0	1.0	9.0
WS102	27/03/2020 12:34:00		0.3	0.4	6.0	7.3	8.0	11.8	10.6	80.6			2.0	1.0	9.0
WS102	27/03/2020 12:35:00		0.3	0.3	6.0	6.6	7.3	12.8	11.8	80.3			2.0	1.0	9.0
WS102	02/04/2020 12:52:00	0.0	0.3	0.3	6.0	10.9	10.9	4.9	4.9	83.9	1011	0.0	2.0	1.0	12.0
WS102	02/04/2020 12:53:00		0.3	0.3	6.0	10.8	10.8	4.7	4.7	84.2			2.0	1.0	12.0
WS102	02/04/2020 12:53:00		0.3	0.3	6.0	11.0	11.0	4.5	4.5	84.2			2.0	1.0	12.0
WS102	02/04/2020 12:54:00		0.3	0.3	6.0	11.2	11.2	4.3	4.3	84.2			2.0	1.0	12.0
WS102	02/04/2020 12:54:00		0.3	0.3	6.0	11.4	11.4	4.0	4.0	84.3			2.0	1.0	12.0
WS102	02/04/2020 12:55:00		0.3	0.3	6.0	11.6	11.6	3.7	3.7	84.4			2.0	1.0	12.0
WS102	02/04/2020 12:55:00		0.3	0.3	6.0	11.9	11.9	3.3	3.3	84.5			2.0	1.0	12.0
WS102	02/04/2020 12:56:00		0.3	0.3	6.0	12.1	12.1	3.0	3.0	84.6			2.0	1.0	12.0
WS102	02/04/2020 12:56:00		0.3	0.3	6.0	12.4	12.4	2.6	2.6	84.7			2.0	1.0	12.0
WS102	02/04/2020 12:57:00		0.3	0.3	6.0	12.6	12.6	2.4	2.4	84.7			2.0	1.0	12.0
WS102	02/04/2020 12:57:00		0.4	0.4	8.0	12.7	12.7	2.2	2.2	84.7			2.0	1.0	12.0
WS102	02/04/2020 12:58:00		0.4	0.4	8.0	12.8	12.8	2.1	2.1	84.7			2.0	1.0	12.0
WS102	02/04/2020 12:59:00		0.4	0.4	8.0	12.9	12.9	2.0	2.0	84.7			2.0	0.0	12.0
WS102	02/04/2020 12:59:00		0.4	0.4	8.0	13.1	13.1	1.8	1.8	84.7			2.0	0.0	12.0
WS102	02/04/2020 13:00:00		0.3	0.4	6.0	13.1	13.2	1.9	1.8	84.7			2.0	0.0	12.0
WS102	02/04/2020 13:00:00		0.3	0.3	6.0	12.3	13.1	3.2	1.9	84.2			2.0	0.0	12.0
WS102	02/04/2020 13:01:00		0.2	0.3	4.0	11.2	12.3	5.1	3.2	83.5			2.0	0.0	12.0
WS102	02/04/2020 13:01:00		0.1	0.2	2.0	10.3	11.2	6.7	5.1	82.9			2.0	0.0	12.0
WS102	02/04/2020 13:02:00		0.1	0.2	2.0	9.5	10.3	8.0	6.8	82.4			2.0	0.0	12.0
WS102	02/04/2020 13:02:00		0.1	0.1	2.0	8.5	9.5	9.6	8.0	81.8			1.0	0.0	12.0
WS102	02/04/2020 13:03:00		0.1	0.1	2.0	7.8	8.5	10.9	9.6	81.2			1.0	0.0	12.0
WS102	08/04/2020 10:55:00	-0.7	0.1	0.1	2.0	10.2	10.2	7.5	7.5	82.2	1023	0.1	3.0	1.0	17.0
WS102	08/04/2020 10:55:00		0.1	0.1	2.0	10.0	10.0	7.5	7.5	82.4			2.0	1.0	17.0

Site : Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE

Client : Privilege Finance Services

Agent :

Job Number 19.287

Sheet 3 / 6

BH/WS	Date / Time	Flow Pod (l/h)	CH4 (%)	Peak CH4 (%)	CH4 LEL (%)	CO2 (%)	PEAK CO2 (%)	O2 (%)	Min O2 (%)	Balance (%)	Baro (mb)	Rel Pressure (mb)	CO (ppm)	H2S (ppm)	Temp (°C)
WS102	08/04/2020 10:56:00		0.1	0.1	2.0	10.3	10.3	7.3	7.3	82.3			2.0	1.0	17.0
WS102	08/04/2020 10:56:00		0.1	0.1	2.0	10.5	10.5	7.1	7.1	82.3			2.0	1.0	17.0
WS102	08/04/2020 10:57:00		0.1	0.1	2.0	10.7	10.7	6.8	6.8	82.4			2.0	1.0	17.0
WS102	08/04/2020 10:57:00		0.0	0.1	0.0	11.0	11.0	6.4	6.4	82.6			2.0	1.0	17.0
WS102	08/04/2020 10:58:00		0.0	0.0	0.0	11.3	11.3	6.0	6.0	82.7			2.0	1.0	17.0
WS102	08/04/2020 10:58:00		0.0	0.0	0.0	11.7	11.7	5.6	5.6	82.7			2.0	1.0	17.0
WS102	08/04/2020 10:59:00		0.0	0.0	0.0	12.0	12.0	5.2	5.2	82.8			2.0	1.0	17.0
WS102	08/04/2020 10:59:00		0.0	0.0	0.0	12.3	12.3	4.9	4.9	82.8			2.0	1.0	17.0
WS102	08/04/2020 11:00:00		0.0	0.0	0.0	12.5	12.5	4.6	4.6	82.9			2.0	1.0	17.0
WS102	08/04/2020 11:01:00		0.0	0.0	0.0	12.4	12.4	4.5	4.5	83.1			2.0	1.0	17.0
WS102	08/04/2020 11:02:00		0.0	0.0	0.0	12.7	12.7	4.4	4.4	82.9			2.0	1.0	17.0
WS102	08/04/2020 11:02:00		0.0	0.0	0.0	12.8	12.8	4.2	4.2	83.0			2.0	1.0	17.0
WS102	08/04/2020 11:03:00		0.0	0.0	0.0	13.0	13.0	4.1	4.1	82.9			2.0	1.0	17.0
WS102	08/04/2020 11:03:00		0.0	0.0	0.0	11.8	13.0	5.7	4.1	82.5			2.0	1.0	17.0
WS102	08/04/2020 11:04:00		0.0	0.0	0.0	10.7	11.8	7.1	5.7	82.2			2.0	1.0	17.0
WS102	08/04/2020 11:04:00		0.0	0.0	0.0	9.8	10.7	8.4	7.1	81.8			2.0	1.0	17.0
WS102	08/04/2020 11:05:00		0.0	0.0	0.0	9.0	9.8	9.6	8.4	81.4			2.0	1.0	17.0
WS102	08/04/2020 11:05:00		0.0	0.0	0.0	8.4	9.0	10.4	9.6	81.2			2.0	1.0	17.0
WS102	08/04/2020 11:06:00		0.0	0.0	0.0	7.8	8.4	11.2	10.4	81.0			2.0	1.0	17.0
WS102	15/04/2020 09:40:34	-0.1	0.0	0.0	0.0	10.7	10.7	9.0	9.0	80.3	1021	0.1	1.0	1.0	7.0
WS102	15/04/2020 09:41:21		0.0	0.0	0.0	10.5	10.5	8.1	8.1	81.4			1.0	1.0	7.0
WS102	15/04/2020 09:41:51		0.0	0.0	0.0	10.7	10.8	8.0	8.0	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:42:21		0.0	0.0	0.0	10.8	10.8	7.9	7.9	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:42:51		0.0	0.0	0.0	10.8	10.8	7.9	7.9	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:43:22		0.0	0.0	0.0	11.0	11.0	7.7	7.7	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:43:52		0.0	0.0	0.0	11.2	11.2	7.4	7.4	81.4			1.0	1.0	7.0
WS102	15/04/2020 09:44:23		0.0	0.0	0.0	11.6	11.6	7.1	7.1	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:44:54		0.0	0.0	0.0	12.1	12.1	6.6	6.6	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:45:23		0.0	0.0	0.0	12.5	12.5	6.2	6.2	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:45:53		0.0	0.0	0.0	12.6	12.6	6.0	6.0	81.4			1.0	1.0	7.0
WS102	15/04/2020 09:46:38		0.0	0.0	0.0	12.6	12.6	5.9	5.9	81.5			1.0	1.0	7.0
WS102	15/04/2020 09:47:08		0.0	0.0	0.0	12.8	12.8	5.7	5.7	81.5			1.0	1.0	7.0
WS102	15/04/2020 09:47:38		0.0	0.0	0.0	12.7	12.9	5.8	5.7	81.5			1.0	1.0	7.0
WS102	15/04/2020 09:48:09		0.0	0.0	0.0	12.0	12.7	6.7	5.9	81.3			1.0	1.0	7.0
WS102	15/04/2020 09:48:40		0.0	0.0	0.0	11.3	12.0	7.5	6.8	81.2			1.0	1.0	7.0
WS102	15/04/2020 09:49:11		0.0	0.0	0.0	10.7	11.3	8.2	7.5	81.1			1.0	1.0	7.0
WS102	15/04/2020 09:49:41		0.0	0.0	0.0	10.0	10.7	9.0	8.2	81.0			1.0	1.0	7.0
WS102	15/04/2020 09:50:11		0.0	0.0	0.0	9.1	10.0	10.1	9.0	80.8			1.0	1.0	7.0
WS102	15/04/2020 09:50:41		0.0	0.0	0.0	8.4	9.1	10.9	10.1	80.7			1.0	1.0	7.0
WS102	15/04/2020 09:51:11		0.0	0.0	0.0	7.7	8.4	11.7	10.9	80.6			1.0	1.0	7.0
WS106	13/03/2020 11:28:00	-0.1	0.0	0.0	0.0	0.7	0.7	20.1	20.1	79.2	1013	0.0	0.0	1.0	7.0
WS106	13/03/2020 11:28:00		0.0	0.0	0.0	0.7	0.7	20.1	20.1	79.2			0.0	1.0	7.0
WS106	13/03/2020 11:29:00		0.0	0.0	0.0	0.7	0.7	20.0	20.0	79.3			0.0	1.0	7.0
WS106	13/03/2020 11:29:00		0.0	0.0	0.0	0.7	0.7	20.0	20.0	79.3			0.0	1.0	7.0
WS106	13/03/2020 11:30:00		0.0	0.0	0.0	0.8	0.8	20.0	20.0	79.2			0.0	1.0	7.0
WS106	13/03/2020 11:30:00		0.0	0.0	0.0	0.8	0.8	20.0	20.0	79.2			0.0	1.0	7.0
WS106	13/03/2020 11:31:00		0.0	0.0	0.0	1.0	1.0	19.8	19.8	79.2			0.0	1.0	7.0
WS106	20/03/2020 09:22:00	0.5	0.0	0.0	0.0	0.2	0.2	20.7	20.7	79.1	1025	0.1	0.0	0.0	0.8
WS106	20/03/2020 09:23:00		0.0	0.0	0.0	0.2	0.2	20.6	20.6	79.2			0.0	0.0	0.8
WS106	20/03/2020 09:23:00		0.0	0.0	0.0	0.3	0.3	20.6	20.6	79.1			0.0	0.0	0.8
WS106	20/03/2020 09:24:00		0.0	0.0	0.0	0.4	0.4	20.5	20.5	79.1			0.0	0.0	0.8
WS106	20/03/2020 09:24:00		0.0	0.0	0.0	0.8	0.8	20.2	20.2	79.0			0.0	0.0	0.8
WS106	20/03/2020 09:25:00		0.0	0.0	0.0	1.5	1.5	19.6	19.6	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:25:00		0.0	0.0	0.0	2.5	2.5	18.7	18.7	78.8			0.0	0.0	0.8
WS106	20/03/2020 09:26:00		0.0	0.0	0.0	2.9	2.9	18.0	18.0	79.1			0.0	0.0	0.8
WS106	20/03/2020 09:27:00		0.0	0.0	0.0	3.4	3.4	17.7	17.7	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:27:00		0.0	0.0	0.0	3.7	3.7	17.4	17.4	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:28:00		0.0	0.0	0.0	3.9	3.9	17.2	17.2	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:28:00		0.0	0.0	0.0	4.0	4.0	17.1	17.1	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:29:00		0.0	0.0	0.0	4.1	4.1	17.0	17.0	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:29:00		0.0	0.0	0.0	4.3	4.3	16.8	16.8	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:30:00		0.0	0.0	0.0	4.4	4.4	16.7	16.7	78.9			0.0	1.0	0.8
WS106	20/03/2020 09:30:00		0.0	0.0	0.0	4.6	4.6	16.6	16.6	78.8			0.0	1.0	0.8
WS106	20/03/2020 09:31:00		0.0	0.0	0.0	4.7	4.7	16.5	16.5	78.8			0.0	1.0	0.8
WS106	20/03/2020 09:31:00		0.0	0.0	0.0	5.0	5.0	16.2	16.2	78.8			0.0	1.0	0.8
WS106	20/03/2020 09:32:00		0.0	0.0	0.0	5.4	5.4	15.9	15.9	78.7			0.0	1.0	0.8
WS106	20/03/2020 09:32:00		0.0	0.0	0.0	5.9	5.9	15.5	15.5	78.6			0.0	1.0	0.8
WS106	20/03/2020 09:33:00		0.0	0.0	0.0	5.8	6.0	15.6	15.4	78.6			0.0	1.0	0.8
WS106	27/03/2020 10:07:00	0.8	0.1	0.1	2.0	0.2	0.2	20.6	20.6	79.1	1019	-0.7	0.0	0.0	9.0
WS106	27/03/2020 11:43:00	0.0	0.0	0.0	0.0	3.8	3.8	15.8	15.8	80.4			1.0	1.0	9.0
WS106	27/03/2020 11:44:00		0.0	0.0	0.0	3.8	3.8	15.7	15.7	80.5			1.0	1.0	9.0
WS106	27/03/2020 11:45:00		0.0	0.0	0.0	4.1	4.1	15.5	15.5	80.4			1.0	1.0	9.0
WS106	27/03/2020 11:45:00		0.0	0.0	0.0	4.8	4.8	14.9	14.9	80.3			1.0	1.0	9.0
WS106	27/03/2020 11:46:00		0.0	0.0	0.0	5.8	5.8	14.0	14.0	80.2			1.0	1.0	9.0
WS106	27/03/2020 11:46:00		0.0	0.0	0.0	7.2	7.2	13.0	13.0	79.8			1.0	1.0	9.0
WS106	27/03/2020 11:47:00		0.0	0.0	0.0	8.6	8.6	11.8	11.8	79.6			0.0	1.0	9.0
WS106	27/03/2020 11:47:00		0.0	0.0	0.0	10.1	10.1	10.7	10.7	79.2			1.0	1.0	9.0
WS106	27/03/2020 11:48:00		0.0	0.0	0.0	11.1	11.1	9.8	9.8	79.1			1.0	1.0	9.0
WS106	27/03/2020 11:48:00		0.0	0.0	0.0	11.4	11.4	9.5	9.5	79.1			1.0	1.0	9.0
WS106	27/03/2020 11:49:00		0.0	0.0	0.0	11.7	11.7	9.3	9.3	79.0			1.0	1.0	9.0
WS106	27/03/2020 11:49:00		0.0	0.0	0.0	11.7	11.7	9.3	9.3	79.0			1.0	1.0	9.0
WS106	27/03/2020 11:50:00		0.0	0.0	0.0	11.9	11.9	9.3	9.3	78.8			1.0	1.0	9.0
WS106	27/03/2020 11:50:00		0.0	0.0	0.0	12.0	12.0	9.2	9.2	78.8			1.0	1.0	9.0
WS106	27/03/2020 11:51:00		0.0	0.0	0.0	12.0	12.0	9.2	9.2	78.8			0.0	1.0	9.0
WS106	27/03/2020 11:51:00		0.0	0.0	0.0	12.0	12.0	9.3	9.2	78.7			0.0	1.0	9.0
WS106	27/03/2020 11:52:00		0.0	0.0	0.0	12.0	12.0	9.3	9.3	78.7			0.0	1.0	9.0

Site : Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE

Client : Privilege Finance Services

Agent :

Job Number 19.287

Sheet 4 / 6

BH/WS	Date / Time	Flow Pod (l/h)	CH4 (%)	Peak CH4 (%)	CH4 LEL (%)	CO2 (%)	PEAK CO2 (%)	O2 (%)	Min O2 (%)	Balance (%)	Baro (mb)	Rel Pressure (mb)	CO (ppm)	H2S (ppm)	Temp (°C)
WS106	27/03/2020 11:52:00		0.0	0.0	0.0	12.0	12.0	9.3	9.3	78.7			0.0	1.0	9.0
WS106	27/03/2020 11:53:00		0.0	0.0	0.0	12.0	12.0	9.3	9.3	78.7			0.0	1.0	9.0
WS106	27/03/2020 11:53:00		0.0	0.0	0.0	12.0	12.0	9.3	9.3	78.7			0.0	1.0	9.0
WS106	27/03/2020 11:54:00		0.0	0.0	0.0	12.2	12.2	9.2	9.2	78.6			0.0	1.0	9.0
WS106	02/04/2020 12:16:00	0.0	0.0	0.0	0.0	14.3	14.3	6.9	6.9	78.8	1010	0.2	1.0	0.0	12.0
WS106	02/04/2020 12:17:00		0.0	0.0	0.0	13.5	13.5	7.0	7.0	79.5			0.0	0.0	12.0
WS106	02/04/2020 12:17:00		0.0	0.0	0.0	14.2	14.2	6.8	6.8	79.0			0.0	0.0	12.0
WS106	02/04/2020 12:18:00		0.0	0.0	0.0	14.4	14.4	6.6	6.6	79.0			0.0	0.0	12.0
WS106	02/04/2020 12:18:00		0.0	0.0	0.0	14.4	14.5	6.6	6.6	79.0			0.0	1.0	12.0
WS106	02/04/2020 12:19:00		0.0	0.0	0.0	14.4	14.4	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:19:00		0.0	0.0	0.0	14.4	14.5	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:20:00		0.0	0.0	0.0	14.5	14.5	6.5	6.5	79.0			0.0	1.0	12.0
WS106	02/04/2020 12:20:00		0.0	0.0	0.0	14.5	14.5	6.5	6.5	79.0			0.0	1.0	12.0
WS106	02/04/2020 12:21:00		0.0	0.0	0.0	14.5	14.5	6.5	6.5	79.0			0.0	1.0	12.0
WS106	02/04/2020 12:21:00		0.0	0.0	0.0	14.5	14.5	6.5	6.5	79.0			0.0	1.0	12.0
WS106	02/04/2020 12:22:00		0.0	0.0	0.0	14.4	14.4	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:22:00		0.0	0.0	0.0	14.4	14.5	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:23:00		0.0	0.0	0.0	14.4	14.5	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:23:00		0.0	0.0	0.0	14.4	14.5	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:24:00		0.0	0.0	0.0	14.5	14.5	6.5	6.5	79.0			0.0	1.0	12.0
WS106	02/04/2020 12:24:00		0.0	0.0	0.0	14.5	14.5	6.5	6.5	79.0			0.0	1.0	12.0
WS106	02/04/2020 12:25:00		0.0	0.0	0.0	14.4	14.5	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:25:00		0.0	0.0	0.0	14.4	14.5	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:26:00		0.0	0.0	0.0	14.4	14.5	6.5	6.5	79.1			0.0	1.0	12.0
WS106	02/04/2020 12:26:00		0.0	0.0	0.0	14.4	14.4	6.5	6.5	79.1			0.0	1.0	12.0
WS106	08/04/2020 10:18:00	0.0	0.0	0.0	0.0	2.3	2.3	18.8	18.8	78.9	1022	-0.1	0.0	1.0	17.0
WS106	08/04/2020 10:19:00		0.0	0.0	0.0	2.3	2.3	18.7	18.7	79.0			0.0	1.0	17.0
WS106	08/04/2020 10:19:00		0.0	0.0	0.0	2.4	2.4	18.6	18.6	79.0			0.0	1.0	17.0
WS106	08/04/2020 10:20:00		0.0	0.0	0.0	2.8	2.8	18.2	18.2	79.0			0.0	1.0	17.0
WS106	08/04/2020 10:20:00		0.0	0.0	0.0	3.3	3.3	17.6	17.6	79.1			0.0	1.0	17.0
WS106	08/04/2020 10:21:00		0.0	0.0	0.0	4.0	4.0	16.9	16.9	79.1			0.0	1.0	17.0
WS106	08/04/2020 10:21:00		0.0	0.0	0.0	4.8	4.8	16.0	16.0	79.2			0.0	1.0	17.0
WS106	08/04/2020 10:22:00		0.0	0.0	0.0	5.8	5.8	14.9	14.9	79.3			0.0	1.0	17.0
WS106	08/04/2020 10:22:00		0.0	0.0	0.0	6.8	6.8	13.9	13.9	79.3			0.0	1.0	17.0
WS106	08/04/2020 10:23:00		0.0	0.0	0.0	7.4	7.4	13.3	13.3	79.3			0.0	1.0	17.0
WS106	08/04/2020 10:23:00		0.0	0.0	0.0	7.5	7.5	13.1	13.1	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:24:00		0.0	0.0	0.0	7.4	7.4	13.1	13.1	79.5			0.0	1.0	17.0
WS106	08/04/2020 10:25:00		0.0	0.0	0.0	7.5	7.5	13.1	13.1	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:25:00		0.0	0.0	0.0	7.6	7.6	13.0	13.0	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:26:00		0.0	0.0	0.0	7.6	7.6	13.0	13.0	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:26:00		0.0	0.0	0.0	7.6	7.6	12.9	12.9	79.5			0.0	1.0	17.0
WS106	08/04/2020 10:27:00		0.0	0.0	0.0	7.7	7.7	12.9	12.9	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:27:00		0.0	0.0	0.0	7.7	7.7	12.9	12.9	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:28:00		0.0	0.0	0.0	7.8	7.8	12.8	12.8	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:28:00		0.0	0.0	0.0	7.9	7.9	12.7	12.7	79.4			0.0	1.0	17.0
WS106	08/04/2020 10:29:00		0.0	0.0	0.0	8.0	8.0	12.6	12.6	79.4			0.0	1.0	17.0
WS106	15/04/2020 09:01:07	1.2	0.1	0.1	2.0	2.6	2.6	19.3	19.3	78.0	1019	0.1	0.0	0.0	7.0
WS106	15/04/2020 09:01:53		0.1	0.1	2.0	2.6	2.6	18.8	18.8	78.5			0.0	0.0	7.0
WS106	15/04/2020 09:02:23		0.1	0.1	2.0	2.7	2.7	18.7	18.7	78.5			0.0	0.0	7.0
WS106	15/04/2020 09:02:54		0.1	0.1	2.0	2.8	2.8	18.6	18.6	78.5			0.0	0.0	7.0
WS106	15/04/2020 09:03:24		0.1	0.1	2.0	3.1	3.1	18.5	18.5	78.3			0.0	0.0	7.0
WS106	15/04/2020 09:03:55		0.1	0.1	2.0	3.2	3.2	18.3	18.3	78.4			0.0	0.0	7.0
WS106	15/04/2020 09:04:24		0.1	0.1	2.0	3.4	3.4	18.2	18.2	78.3			0.0	0.0	7.0
WS106	15/04/2020 09:04:54		0.1	0.1	2.0	3.7	3.7	18.1	18.1	78.1			0.0	1.0	7.0
WS106	15/04/2020 09:05:24		0.1	0.1	2.0	5.4	5.4	17.1	17.1	77.4			0.0	1.0	7.0
WS106	15/04/2020 09:05:55		0.1	0.1	2.0	6.2	6.2	15.9	15.9	77.8			0.0	1.0	7.0
WS106	15/04/2020 09:06:25		0.1	0.1	2.0	6.3	6.3	15.6	15.6	78.0			0.0	1.0	7.0
WS106	15/04/2020 09:07:09		0.1	0.1	2.0	6.2	6.2	15.5	15.5	78.2			0.0	1.0	7.0
WS106	15/04/2020 09:07:39		0.1	0.1	2.0	6.1	6.2	15.5	15.4	78.3			0.0	1.0	7.0
WS106	15/04/2020 09:08:10		0.1	0.1	2.0	6.0	6.1	15.6	15.5	78.3			0.0	1.0	7.0
WS106	15/04/2020 09:08:40		0.0	0.1	0.0	5.8	6.0	15.7	15.6	78.5			0.0	1.0	7.0
WS106	15/04/2020 09:09:10		0.0	0.0	0.0	5.6	5.8	15.8	15.7	78.6			0.0	1.0	7.0
WS106	15/04/2020 09:09:40		0.0	0.0	0.0	5.5	5.6	15.9	15.8	78.6			0.0	1.0	7.0
WS106	15/04/2020 09:10:10		0.0	0.0	0.0	5.5	5.5	16.0	15.9	78.5			0.0	1.0	7.0
WS106	15/04/2020 09:10:40		0.0	0.0	0.0	5.4	5.5	16.0	16.0	78.6			0.0	1.0	7.0
WS106	15/04/2020 09:11:10		0.0	0.0	0.0	5.4	5.4	16.0	16.0	78.6			0.0	1.0	7.0
WS106	15/04/2020 09:11:40		0.0	0.0	0.0	5.4	5.4	16.0	16.0	78.6			0.0	1.0	7.0
WS107	13/03/2020 11:41:00	-0.1	0.0	0.0	0.0	0.2	0.2	20.7	20.7	79.1	1014	0.0	0.0	1.0	7.0
WS107	13/03/2020 11:42:00		0.0	0.0	0.0	0.2	0.2	20.7	20.7	79.1			0.0	1.0	7.0
WS107	13/03/2020 11:43:00		0.0	0.0	0.0	0.2	0.2	20.7	20.7	79.1			0.0	1.0	7.0
WS107	13/03/2020 11:43:00		0.0	0.0	0.0	0.2	0.2	20.7	20.7	79.1			0.0	1.0	7.0
WS107	13/03/2020 11:44:00		0.0	0.0	0.0	0.2	0.2	20.7	20.7	79.1			0.0	1.0	7.0
WS107	13/03/2020 11:44:00		0.0	0.0	0.0	0.2	0.2	20.7	20.7	79.1			0.0	1.0	7.0
WS107	13/03/2020 11:45:00		0.0	0.0	0.0	0.3	0.3	20.7	20.7	79.0			0.0	1.0	7.0
WS107	20/03/2020 09:41:00	0.1	0.0	0.0	0.0	4.1	4.1	14.3	14.3	81.6	1026	0.3	0.0	1.0	0.8
WS107	20/03/2020 09:41:00		0.0	0.0	0.0	4.1	4.1	13.4	13.4	82.5			0.0	1.0	0.8
WS107	20/03/2020 09:42:00		0.0	0.0	0.0	4.2	4.2	13.3	13.3	82.5			0.0	1.0	0.8
WS107	20/03/2020 09:42:00		0.0	0.0	0.0	4.2	4.2	13.2	13.2	82.6			0.0	1.0	0.8
WS107	20/03/2020 09:43:00		0.0	0.0	0.0	4.2	4.2	13.1	13.1	82.7			0.0	1.0	0.8
WS107	20/03/2020 09:43:00		0.0	0.0	0.0	4.3	4.3	12.9	12.9	82.8			0.0	1.0	0.8
WS107	20/03/2020 09:44:00		0.0	0.0	0.0	4.4	4.4	12.8	12.8	82.8			0.0	1.0	0.8
WS107	20/03/2020 09:44:00		0.0	0.0	0.0	4.5	4.5	12.7	12.7	82.8			0.0	1.0	0.8
WS107	20/03/2020 09:45:00		0.0	0.0	0.0	4.5	4.5	12.7	12.7	82.8			0.0	1.0	0.8
WS107	20/03/2020 09:45:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:46:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8

Site : Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE

Client : Privilege Finance Services

Agent :

Job Number 19.287

Sheet 5 / 6

BH/WS	Date / Time	Flow Pod (l/h)	CH4 (%)	Peak CH4 (%)	CH4 LEL (%)	CO2 (%)	PEAK CO2 (%)	O2 (%)	Min O2 (%)	Balance (%)	Baro (mb)	Rel Pressure (mb)	CO (ppm)	H2S (ppm)	Temp (°C)
WS107	20/03/2020 09:47:00		0.0	0.0	0.0	4.4	4.4	12.7	12.7	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:48:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:48:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:49:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:49:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:50:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:50:00		0.0	0.0	0.0	4.6	4.6	12.6	12.6	82.8			0.0	1.0	0.8
WS107	20/03/2020 09:51:00		0.0	0.0	0.0	4.5	4.6	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:51:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	20/03/2020 09:52:00		0.0	0.0	0.0	4.5	4.5	12.6	12.6	82.9			0.0	1.0	0.8
WS107	27/03/2020 12:04:00	0.0	0.0	0.0	0.0	5.6	5.6	10.8	10.8	83.6	1022	0.1	1.0	1.0	9.0
WS107	27/03/2020 12:04:00		0.0	0.0	0.0	5.6	5.6	10.8	10.8	83.6			0.0	1.0	9.0
WS107	27/03/2020 12:05:00		0.0	0.0	0.0	5.7	5.7	10.7	10.7	83.6			1.0	1.0	9.0
WS107	27/03/2020 12:05:00		0.0	0.0	0.0	5.8	5.8	10.6	10.6	83.6			1.0	1.0	9.0
WS107	27/03/2020 12:06:00		0.0	0.0	0.0	6.0	6.0	10.5	10.5	83.5			0.0	1.0	9.0
WS107	27/03/2020 12:06:00		0.0	0.0	0.0	6.3	6.3	10.3	10.3	83.4			0.0	1.0	9.0
WS107	27/03/2020 12:07:00		0.0	0.0	0.0	6.6	6.6	10.1	10.1	83.3			0.0	1.0	9.0
WS107	27/03/2020 12:07:00		0.0	0.0	0.0	6.8	6.8	10.0	10.0	83.2			1.0	1.0	9.0
WS107	27/03/2020 12:08:00		0.0	0.0	0.0	6.9	6.9	10.0	10.0	83.1			0.0	1.0	9.0
WS107	27/03/2020 12:09:00		0.0	0.0	0.0	6.9	6.9	10.0	10.0	83.1			0.0	1.0	9.0
WS107	27/03/2020 12:09:00		0.0	0.0	0.0	6.9	6.9	10.0	10.0	83.1			0.0	1.0	9.0
WS107	27/03/2020 12:10:00		0.0	0.0	0.0	6.9	6.9	10.0	10.0	83.1			0.0	1.0	9.0
WS107	27/03/2020 12:10:00		0.0	0.0	0.0	6.9	6.9	10.0	10.0	83.1			0.0	1.0	9.0
WS107	27/03/2020 12:11:00		0.0	0.0	0.0	6.9	6.9	10.0	10.0	83.1			0.0	1.0	9.0
WS107	27/03/2020 12:11:00		0.0	0.0	0.0	6.9	7.0	10.0	10.0	83.1			0.0	1.0	9.0
WS107	27/03/2020 12:12:00		0.0	0.0	0.0	7.0	7.0	10.0	10.0	83.0			0.0	1.0	9.0
WS107	27/03/2020 12:12:00		0.0	0.0	0.0	7.0	7.0	10.0	10.0	83.0			0.0	1.0	9.0
WS107	27/03/2020 12:13:00		0.0	0.0	0.0	7.0	7.0	10.0	10.0	83.0			0.0	1.0	9.0
WS107	27/03/2020 12:13:00		0.0	0.0	0.0	7.0	7.0	10.0	10.0	83.0			0.0	1.0	9.0
WS107	27/03/2020 12:14:00		0.0	0.0	0.0	7.0	7.0	10.0	10.0	83.0			0.0	1.0	9.0
WS107	27/03/2020 12:14:00		0.0	0.0	0.0	7.0	7.0	10.0	10.0	83.0			0.0	1.0	9.0
WS107	02/04/2020 12:33:00	-0.1	0.0	0.0	0.0	3.3	3.3	17.4	17.4	79.3	1010	0.0	0.0	1.0	12.0
WS107	02/04/2020 12:34:00		0.0	0.0	0.0	3.3	3.3	17.3	17.3	79.4			0.0	0.0	12.0
WS107	02/04/2020 12:34:00		0.0	0.0	0.0	3.4	3.4	17.2	17.2	79.4			0.0	1.0	12.0
WS107	02/04/2020 12:35:00		0.0	0.0	0.0	3.6	3.6	16.9	16.9	79.5			0.0	1.0	12.0
WS107	02/04/2020 12:35:00		0.0	0.0	0.0	3.9	3.9	16.6	16.6	79.5			0.0	1.0	12.0
WS107	02/04/2020 12:36:00		0.0	0.0	0.0	4.2	4.2	16.1	16.1	79.7			0.0	1.0	12.0
WS107	02/04/2020 12:36:00		0.0	0.0	0.0	4.6	4.6	15.5	15.5	79.9			0.0	1.0	12.0
WS107	02/04/2020 12:37:00		0.0	0.0	0.0	5.0	5.0	15.1	15.1	79.9			0.0	1.0	12.0
WS107	02/04/2020 12:37:00		0.0	0.0	0.0	5.3	5.3	14.7	14.7	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:38:00		0.0	0.0	0.0	5.6	5.6	14.3	14.3	80.1			0.0	1.0	12.0
WS107	02/04/2020 12:38:00		0.0	0.0	0.0	5.9	5.9	14.0	14.0	80.1			0.0	1.0	12.0
WS107	02/04/2020 12:40:00		0.0	0.0	0.0	6.0	6.0	13.9	13.9	80.1			0.0	1.0	12.0
WS107	02/04/2020 12:41:00		0.0	0.0	0.0	6.3	6.3	13.7	13.7	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:41:00		0.0	0.0	0.0	6.6	6.6	13.4	13.4	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:42:00		0.0	0.0	0.0	6.7	6.7	13.3	13.3	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:42:00		0.0	0.0	0.0	6.8	6.8	13.2	13.2	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:43:00		0.0	0.0	0.0	6.8	6.8	13.2	13.2	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:43:00		0.0	0.0	0.0	6.8	6.8	13.2	13.2	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:44:00		0.0	0.0	0.0	6.8	6.8	13.2	13.2	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:44:00		0.0	0.0	0.0	6.8	6.8	13.2	13.2	80.0			0.0	1.0	12.0
WS107	02/04/2020 12:45:00		0.0	0.0	0.0	6.8	6.8	13.2	13.2	80.0			0.0	1.0	12.0
WS107	08/04/2020 10:34:00	-0.4	0.0	0.0	0.0	3.7	3.7	17.4	17.4	78.9	1022	0.2	0.0	1.0	17.0
WS107	08/04/2020 10:35:00		0.0	0.0	0.0	3.7	3.7	17.3	17.3	79.0			0.0	1.0	17.0
WS107	08/04/2020 10:35:00		0.0	0.0	0.0	3.8	3.8	17.2	17.2	79.0			0.0	1.0	17.0
WS107	08/04/2020 10:36:00		0.0	0.0	0.0	3.9	3.9	17.1	17.1	79.0			0.0	1.0	17.0
WS107	08/04/2020 10:36:00		0.0	0.0	0.0	4.1	4.1	17.0	17.0	78.9			0.0	1.0	17.0
WS107	08/04/2020 10:37:00		0.0	0.0	0.0	4.4	4.4	16.8	16.8	78.8			0.0	1.0	17.0
WS107	08/04/2020 10:37:00		0.0	0.0	0.0	4.8	4.8	16.6	16.6	78.6			0.0	1.0	17.0
WS107	08/04/2020 10:38:00		0.0	0.0	0.0	5.2	5.2	16.4	16.4	78.4			0.0	1.0	17.0
WS107	08/04/2020 10:38:00		0.0	0.0	0.0	5.3	5.3	16.3	16.3	78.4			0.0	1.0	17.0
WS107	08/04/2020 10:39:00		0.0	0.0	0.0	5.4	5.4	16.3	16.3	78.3			0.0	1.0	17.0
WS107	08/04/2020 10:39:00		0.0	0.0	0.0	5.4	5.4	16.3	16.3	78.3			0.0	1.0	17.0
WS107	08/04/2020 10:40:00		0.0	0.0	0.0	5.4	5.4	16.3	16.3	78.3			0.0	1.0	17.0
WS107	08/04/2020 10:40:00		0.0	0.0	0.0	5.4	5.4	16.3	16.3	78.3			0.0	1.0	17.0
WS107	08/04/2020 10:41:00		0.0	0.0	0.0	5.4	5.4	16.3	16.3	78.3			0.0	1.0	17.0
WS107	08/04/2020 10:41:00		0.0	0.0	0.0	5.4	5.4	16.3	16.3	78.3			1.0	2.0	17.0
WS107	08/04/2020 10:42:00		0.0	0.0	0.0	5.4	5.4	16.3	16.3	78.3			0.0	2.0	17.0
WS107	08/04/2020 10:42:00		0.0	0.0	0.0	5.3	5.4	16.3	16.3	78.4			0.0	2.0	17.0
WS107	08/04/2020 10:43:00		0.0	0.0	0.0	5.3	5.3	16.3	16.3	78.4			1.0	2.0	17.0
WS107	08/04/2020 10:43:00		0.0	0.0	0.0	5.2	5.3	16.3	16.3	78.5			0.0	2.0	17.0
WS107	08/04/2020 10:44:00		0.0	0.0	0.0	5.2	5.2	16.3	16.3	78.5			0.0	2.0	17.0
WS107	08/04/2020 10:44:00		0.0	0.0	0.0	5.3	5.3	16.3	16.3	78.4			0.0	2.0	17.0
WS107	15/04/2020 09:18:34	0.5		0.0		4.0	4.0	17.4	17.4		1020	0.0	0.0	1.0	7.0
WS107	15/04/2020 09:19:14			0.0		4.0	4.0	17.0	17.0				0.0	1.0	7.0
WS107	15/04/2020 09:19:44			0.0		3.9	4.0	17.0	17.0				0.0	1.0	7.0
WS107	15/04/2020 09:20:15		0.0	0.0	0.0	3.9	3.9	17.0	17.0	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:20:45		0.0	0.0	0.0	3.8	3.9	17.1	17.0	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:21:15		0.0	0.0	0.0	3.8	3.8	17.1	17.1	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:21:45		0.0	0.0	0.0	3.7	3.8	17.2	17.1	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:22:15		0.0	0.0	0.0	3.7	3.7	17.2	17.2	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:22:46		0.0	0.0	0.0	3.7	3.7	17.2	17.2	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:23:17		0.0	0.0	0.0	3.7	3.7	17.2	17.2	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:23:47		0.0	0.0	0.0	3.7	3.7	17.2	17.2	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:24:37		0.0	0.0	0.0	3.7	3.7	17.2	17.2	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:25:07		0.0	0.0	0.0	3.8	3.8	17.1	17.1	79.1			0.0	1.0	7.0

A F Howland Associates
Geotechnical Engineers

Ground Gas Monitoring Results

Site : Anaerobic Digestor Plant Extension at Ellingham Road, Attleborough, NR17 1AE

Client : Privilege Finance Services

Agent :

Job Number 19.287

Sheet 6 / 6

BH/WS	Date / Time	Flow Pod (l/h)	CH4 (%)	Peak CH4 (%)	CH4 LEL (%)	CO2 (%)	PEAK CO2 (%)	O2 (%)	Min O2 (%)	Balance (%)	Baro (mb)	Rel Pressure (mb)	CO (ppm)	H2S (ppm)	Temp (°C)
WS107	15/04/2020 09:25:37		0.0	0.0	0.0	3.9	3.9	17.1	17.1	79.0			0.0	1.0	7.0
WS107	15/04/2020 09:26:07		0.0	0.0	0.0	4.0	4.0	17.0	17.0	79.0			0.0	1.0	7.0
WS107	15/04/2020 09:26:37		0.0	0.0	0.0	4.0	4.0	16.9	16.9	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:27:07		0.0	0.0	0.0	4.0	4.1	16.9	16.9	79.1			0.0	1.0	7.0
WS107	15/04/2020 09:27:37		0.0	0.0	0.0	4.1	4.1	16.9	16.9	79.0			0.0	1.0	7.0
WS107	15/04/2020 09:28:07		0.0	0.0	0.0	4.1	4.1	16.9	16.9	79.0			0.0	1.0	7.0
WS107	15/04/2020 09:28:37		0.0	0.0	0.0	4.1	4.1	16.9	16.9	79.0			0.0	1.0	7.0
WS107	15/04/2020 09:29:07		0.0	0.0	0.0	4.2	4.2	16.8	16.8	79.0			0.0	1.0	7.0

APPENDIX G: DRAWINGS

Drawing 19.287/PhaseII/01	Site Location Plan
Drawing 19.287/PhaseII/02	Exploratory Hole Location Plan
Proposed Site Layout (Revision G)	BioConstruct, dated 30 August 2019

North

Circle indicates approximate location of site

Scale 1: 50,000 @ A4

A F Howland Associates
Geotechnical Engineers

Site: AD Plant at Ellingham Road, Attleborough

SITE LOCATION PLAN

Client : Privilege Finance Services

Date : April 2020 **Dwg :** 19.287/PhaseII/01

Key:

- Window sample exploratory hole location and reference (including groundwater monitoring installation)
- Window sample exploratory hole location and reference (including ground gas monitoring installation)
- Window sample exploratory hole location and reference (including combined groundwater and ground gas monitoring installation)
- Window sample exploratory hole location and reference
- Trial pit location and reference
- Surface water sampling location and reference
- Previous ground investigation (AFHA, 2019)

Rev	Date	Revision Description	Drwn	Chkd

A F Howland Associates
Geotechnical Engineers

A F Howland Associates Ltd
The Old Exchange
Newmarket Road
Cringleford
Norwich
NR4 6UF

Tel: 01603 250754 Fax: 01603 250749

web: www.howland.co.uk
mail: admin@howland.co.uk

Client: Privilege Finance Services

Site:
AD Plant at Ellingham Road, Attleborough

Job No.: 19.278

Drawing Title:

EXPLORATORY HOLE LOCATION PLAN

Date: April 2020

Drawing No: 19.287/PhaseII/02

Scale: 1:1,750 @ A3

BIOCONSTRUCT

building owner:	plan drafter:
SS Agri Power Ltd Ellingham Road, Attleborough, Norfolk, NR17 1AE	BioConstruct GmbH Wellingstraße 66 D-49328 Melle Tel.: +49 (0)5226 / 5932-0 Fax: +49 (0)5226 / 5932-11

place: Ellingham Road, Attleborough, Norfolk, NR17 1AE

SS Agri Power AD Facility Extension

proposed site plan

filename:
plant layout_SS Agri (Privilege)_JAS_190927.dwg

project-nr. / plan-nr.:	scale:	plan size:
figure 3	1:500	DIN A1

		date:	name:
designed:		12.07.19	M.Jenkner
changed:			
nr.	kind of change:	date:	name:
a	revision layout	17.07.19	S.Striewski
b	revision layout	23.07.19	M.Jenkner
c	revision layout	31.07.19	M.Jenkner
d	revision layout	09.08.19	M.Jenkner
e	revision layout	26.08.19	M.Jenkner
f	revision layout	29.08.19	M.Jenkner
g	revision layout	30.08.19	M.Jenkner

APPENDIX H: RISK ASSESSMENT CLASSIFICATION

Classification	Definition	Examples
High Likelihood	There is a pollution linkage and an event which would either appear very likely in the short term and almost inevitable over the long term, or, there is evidence at the receptor of harm or pollution.	Free product visible on surface of sensitive water body or in the soil. On site or adjacent gassing 'landfill site'.
Likely	There is a pollution linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.	Potentially contaminative land use i.e. 'Brownfield' site, fuel storage depot, factory, petrol station etc. Sensitive receptors to be introduced as part of site redevelopment. Potentially infilled land identified on site or off-site with credible migration pathway.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.	Potential source of contamination identified i.e. historical land use as allotments or domestic above ground fuel storage tanks, areas of burning garden waste. Possible off-site infilled land.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.	No significant potential sources of contamination identified e.g. 'Greenfield' site. No potential sources of ground gas.

TABLE H1: CLASSIFICATION OF PROBABILITY

Classification	Definition	Examples
Severe	**Short term (acute) risk to human health.** Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short term risk to a particular ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Credible source of ground gas.
Medium	**Chronic damage to Human Health.** **Pollution of sensitive water resources.** A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of a contaminant from site exceeds the generic, or site specific assessment criteria. Leaching of contaminants from a site to a Secondary or Principal aquifer or watercourse.
Mild	**Pollution of non-sensitive water resources.** Significant damage to buildings/structures and crops ("significant harm" as defined in the Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures or the environment.	Concentrations of a contaminant do not exceed the generic, or site specific assessment criteria. Leaching of contaminants from a site to an Unproductive Aquifer. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as Personal Protective Equipment, etc).	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme.

TABLE H2: CLASSIFICATION OF CONSEQUENCE

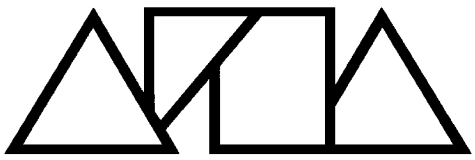
Classification	Definition
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is occurring. The risk, if realised, is likely to result in a substantial liability. **Urgent investigation and remediation will be required.**
High Risk	Harm or chronic damage is likely to arise to a designated receptor from an identified hazard. **Investigation is required and remediation is likely to be required** to ensure the site is suitable for a proposed use.
Moderate Risk	It is possible that harm or chronic damage could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe. **Investigation and remediation are likely to be required** to ensure the site is suitable for a proposed use.
Low/Moderate Risk	It is possible that harm or chronic damage could arise to a designated receptor from an identified hazard. **Investigation is likely to be required.** However, circumstances are such that investigation may prove the consequence to be mild and the site suitable for use without remediation.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that this harm, if realised, would at worst be mild. **Investigation is unlikely to be required.**
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. **Investigation is not required.**

TABLE H3: DESCRIPTION OF RISK

		CONSEQUENCE			
		Severe	**Medium**	**Mild**	**Minor**
PROBABILITY	**High likelihood**	**Very High**	**High**	**Moderate**	**Low/Moderate**
	Likely	**High**	**Moderate**	**Low/Moderate**	**Low**
	Low likelihood	**Moderate**	**Low/Moderate**	**Low**	**Very Low**
	Unlikely	**Low/Moderate**	**Low**	**Very Low**	**Very Low**

TABLE H4: DETERMINATION OF RISK

Risk assessment classification v1.1 dated 08/03/2019



A F Howland Associates
The Old Exchange
Newmarket Road
Cringleford
Norwich
NR4 6UF

Tel: 01603 250754
Fax: 01603 250749
Email: admin@howland.co.uk
www: http://www.howland.co.uk