AN ADDENDUM CONTAMINATION ASSESSMENT TO SUPPORT THE CONSTRUCTION OF A RESIDENTIAL DEVELOPMENT AT:

LAND ADJACENT TO 72 STATION ROAD, SURFLEET



CLIENT:	**Mike Yould Developments Limited**
REFERENCE:	**TJS/22.067**
DATE:	**24 May 2022**

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1. INTRODUCTION

A F Howland Associates Limited was instructed by Mike Yould Developments Limited (the "Client") to carry out an addendum contamination assessment to support the construction of a residential development at Land Adjacent to 72 Station Road, Surfleet, Lincolnshire, PE11 4DB (Drawing 22.067/01).

This report was prepared for the use of the Client and its advisors to support the proposed construction of ten dwellings, consented under planning permission referenced H17-0810-21. 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 (DCLG, 2013; BSI, 2017; EA, 2020) and with due regard to the requirements of the National Planning Policy Framework (MHCLG, 2021).

The addendum contamination assessment follows on from a Phase 1 Desk Study (AFHA, 2017a) and a Phase II Contamination Report (AFHA, 2017b), and presents the findings of an additional phase of ground investigation carried out in order to provide a higher resolution dataset and provide a 'plot specific' assessment where possible.

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2. BACKGROUND INFORMATION

The Phase I Desk Study (AFHA, 2017a) should be referred to for detailed background and historical information pertinent to the site. A summary is provided below, and is updated with additional background information where applicable.

2.1 LOCATION & SITE DESCRIPTION

The site is located off Station Road in the village of Surfleet, approximately 590 m to the north east of the village centre (Drawing 22.067/01). The site lies at an elevation of approximately 3 to 4 m above Ordnance Datum (aOD).

At the time of the desk study (AFHA, 2017a) and initial phase of ground investigation (AFHA, 2017b), the site included small arable fields, a large, centrally positioned glasshouse, and several sheds and out-buildings. At the time of the addendum investigation, the glasshouse had been demolished and removed from site, along with many of the sheds and out-buildings. However, some buildings remained in the south and north west of the site, along with a former boiler house in the north.

2.2 GEOLOGY

The regional geology is mapped for the area by the British Geological Survey (BGS) as bedrock of the Oxford Clay Formation overlain by superficial Tidal Flat Deposits (clay and silt).

This is supported by archive ground investigation records held by the BGS (TF22NE50 to TF22NE61), which are located to the north of the site. These record variable deposits, which mainly consisted of clay or silt, which gave way to silty sand with depth. This is considered to be typical of a tidal flat sequence and would be expected to display variation both spatially and with depth, given the depositional environment these deposits would have been formed in. Archive borehole TF22NE39 to the west of the site recorded glacial diamicton to underlie the tidal flat deposits at approximately 18.20 m depth, which extended to the base of the borehole at 25 m bgl – bedrock was not encountered.

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2.3 LAND-USE INFORMATION

A review of historical and contemporary archives recorded that the site was fields until the early-1900s when it was developed as a nursery with two glasshouses. The site was reconfigured by the mid-1900s, with a single glasshouse positioned in a central location. It is understood that two coal-fired boiler houses were located in the north of the site which were used to heat the glasshouses. The site remained in use as a nursery in 2017, with small arable plots used to cultivate vegetables.

The site ceased agricultural production prior to 2022, and the majority of the nursery buildings have been recently demolished and cleared from site. A row of new-build detached dwellings is present between the site and Station Road.

2.4 PREVIOUS GROUND INVESTIGATION

A ground investigation was undertaken in March 2017 and consisted of a single windowless sampler hole and twenty two hand dug trial pits. The exploratory hole locations were set out to provide a broad coverage of the site, whilst also targeting specific potential sources of contamination such as above ground fuel storage tanks, buildings with degraded asbestos containing materials within their fabric and the boiler house and piles of soil and ash in the north of the site.

The investigation recorded concentrations of lead within the shallow soil at concentrations greater than pertinent screening levels, generally in the northern, central and eastern parts of the site. It was considered that the elevated lead concentrations were likely to be associated with the historical application of lead based pesticide products.

In addition, the investigation recorded a potential ‘hotspot’ of contamination associated with the diesel powered fan heater located in the south of the central greenhouse building.

Potential risks to human health, construction workers and water supply pipes were identified as a result of the concentrations of contaminants recorded. In contrast, controlled waters were considered to be at low to very low risk of impact, while risks to end-users from radon and hazardous ground gas were able to be discounted. Whilst organochlorine pesticides were recorded at trace concentrations marginally above

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detection limits, none were detected at concentrations which would cause an impact on the identified receptors.

It was recommended that further sampling was undertaken followed the removal of the diesel powered generator and the removal of all impacted soil. A similar exercise was recommended where the above ground fuel tanks were removed to confirm the absence of hydrocarbon contamination. Given the elevated concentrations of lead recorded across the site, a cover system was recommended in each of the garden areas unless further investigation and assessment was undertaken. The aim of any additional testing would be to reduce the area requiring remediation, target remediation to specific plots, or provide justification for a reduced thickness of cover.

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3. FIELDWORK

Fieldwork was carried on 30 and 31 March 2022 and comprised twenty two machine dug trial pits and eight sets of excavation validation samples. The trial pits were located in order to provide an increased resolution of data points across the site, and to target potential source areas of contamination where this was found previously. The excavation validation samples were taken from the sidewalls of excavations dug by the Client to remove and dispose of hydrocarbon impacted soil at the location of the diesel powered generator and above ground fuel storage tanks following their removal.

The National Grid references, and the elevations of the positions relative to Ordnance Datum, were measured using a Hemisphere S320 VRS GPS (RTK) system. The locations are shown on Drawing 22.067/02, presented in Appendix E.

Prior to breaking ground, a cable avoidance tool (CAT) was used to sweep the location of each of the exploratory holes and the surrounding area to locate any potential services.

The **trial pits**, referenced TP101 to TP122, were excavated by a tracked excavator and were taken to depths between 1.0 and 1.5 m. They were logged *in situ* to about 1.0 m bgl, with soil below this depth described at surface from excavated material.

The **excavation validation** samples, referenced TP123 to TP130, were obtained using hand tools from the sidewalls of the existing excavations. Two samples were taken at each location, one from the made ground and one from the natural soil. Disturbed samples of the recovered material were also subject to **headspace screening** for volatile organic compounds (VOCs) by use of a MiniRAE 3000 portable photo-ionisation detector (PID). The test involves placing a sample of soil into a sealed plastic bag, which is left for 10-15 minutes at ambient air temperature. The headspace above the soil is then analysed for 2 minutes using the PID and the maximum value observed recorded.

Sampling and soil descriptions were carried out in accordance with BS EN1997-2:2007 Eurocode 7 and its UK National Annex supported by BS 5930:2015+A1:2020. Representative specialist environmental samples were also collected for subsequent laboratory analysis. The environmental samples were placed in dedicated containers, temporarily stored in cool boxes and delivered to a UKAS accredited facility for analysis.

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The exploratory holes were monitored for **groundwater** ingress during advance, but none was encountered in this instance.

Details of the strata encountered, the sampling, *in situ* and laboratory testing are shown on records appended to this report.

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4. LABORATORY TESTING

4.1 KEY CONTAMINANTS

Subsequent to the fieldwork, a programme of laboratory analysis was undertaken on selected samples of soil. The analysis was undertaken by a UKAS and MCERTS accredited environmental laboratory, and a full set of results is included in Appendix C.

The previous investigation indicated that lead was elevated at various locations across the north, centre and east of the site, whilst potential hotspots of asbestos and petroleum hydrocarbons were recorded in the south of the site. On this basis, the following analysis strategy was developed for these key contaminants:

- Sixteen samples were analysed for lead,
- Twenty four samples were analysed for petroleum hydrocarbons (LQM bandings between C_5 and C_{44} – using Criteria Working Group methodologies), BTEX (benzene, toluene, ethylbenzene and xylene) and MTBE (methyl tertiary butyl ether),
- Three samples were analysed for asbestos fibres,
- Sixteen samples were analysed for organic matter content.

In addition, in order to increase the available dataset across the site for all potential contaminants of concern (except pesticides), the following generic suite of determinands was analysed for in fifteen additional samples:

- Metals/metalloids (antimony, arsenic, beryllium, cadmium, chromium, hexavalent chromium, copper, iron, lead, mercury, nickel, selenium, vanadium and zinc),
- Cyanide (total, free, and complex) and thiocyanate,
- Polycyclic aromatic hydrocarbons (PAHs) (total and speciated - USEPA-16) and monohydric phenols,
- Petroleum hydrocarbons (LQM bandings between C_5 and C_{44} – using Criteria Working Group methodologies), BTEX (benzene, toluene, ethylbenzene and xylene) and MTBE (methyl tertiary butyl ether),
- Asbestos bulk material and loose fibre screen,
- pH & organic matter content.

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5. GROUND CONDITIONS

5.1 MADE GROUND

Made ground was found from surface in trial pits generally around the periphery of the site –TP105, TP107, TP110 to TP124, and TP130. Where encountered it extended to depths between 0.2 and 1.0 m below ground level.

The made ground was found to vary across the site, but can be broadly split into the following material types:

- Dark greyish brown or dark brown slightly clayey silty variably gravelly fine sand with fragments of rope, wood, brick, plastic, concrete, glass and ceramic;
- Dark brown or brown sandy variably gravelly silt with fragments of ceramic, brick, plastic, metal and limestone;
- Dark brown very silty fine sand with fragments of metal and plastic bag;
- Black clayey sandy silt with fragments of brick, metal, glass, plastic and concrete.

Apart from the inclusion of anthropogenic constituents within the made ground, no other visual or olfactory indicators of potential contamination were noted during excavation. Headspace testing of samples of the made ground taken from the excavations in the south of the site recorded a maximum VOC concentration of 0.2 ppm.

5.2 TOPSOIL

Topsoil was found to extend from surface in trial pits TP101 to TP104, TP106, TP108 to TP110, and TP125 to TP129. Where encountered it extended to a depth between 0.2 m and 0.6 m bgl.

The topsoil comprised a brown or dark brown variably clayey sandy silt. It was recorded as desiccated in TP125 to TP129. The topsoil occasionally contained rootlets and rare fine flint gravel.

No visual or olfactory indicators of potential contamination were noted during excavation.

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5.3 NATURAL SOIL

Natural soil, considered to be representative of Tidal Flat Deposits, was found to underlie the made ground and topsoil and generally comprised either a silt or a fine sand.

A brown, light brown or rarely greyish brown variably clayey sandy silt was recorded across the majority of the west and south of the site. This material was relatively consistent across the area, with any variation in the material coming from differences in structure or minor constituents. For example, on occasion, the material included rare fine flint gravel, rare shell fragments, partings of fine sand or very thin laminations of clay. The exception to this is TP107 in the north of the site, where the natural soil graded to a soft brown silty slightly sandy clay with partings of fine sand.

In addition, granular soil was encountered across the eastern and south eastern parts of the site, sometimes underlying the silt described above. This material generally consisted of a light brown variably silty fine sand, which was noted to be clayey on occasion, or contain very thin laminations of soft silty clay (TP116). This material was generally free of gravel.

The deeper glacial deposits or the bedrock of Oxford Clay were not recorded within the depth of the investigation.

No visual or olfactory indicators of potential contamination were noted in the natural soil. Headspace testing of samples of the natural soil taken from the excavations in the south of the site did not record concentrations of VOC to exceed the equipment limit of detection (LOD) (±0.1 ppm. Results reported as 0.0 ppm where LOD not exceeded).

5.4 GROUNDWATER

Groundwater was not encountered within the depth of investigation. However, observations reported during advancement of the holes will have been affected by the permeability of the ground, the rate of progress of the hole and the techniques in operation. The general procedures used do not allow precise measurements of the groundwater conditions, but give only a general guide to the overall situation. Fluctuations in any groundwater table will also occur as a result of seasonal or climatic effects, as well as other outside influences.

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6. GENERIC QUANTITATIVE CONTAMINATION RISK ASSESSMENT

6.1 HUMAN HEALTH RISK ASSESSMENT

6.1.1 Methodology

The potential hazards to human health associated with contamination arising from the historical use of the site have been assessed against generic assessment criteria (GAC) pertinent to the proposed residential end-use of the development.

The proposals are for the construction of a residential development consisting of nine residential dwellings. Therefore, the primary scenario used within this assessment is "residential with plant uptake", as presented within industry accepted guidance (EA, 2009c and LQM, 2015). This generic scenario is considered to be most pertinent as it reflects the proposed residential end use of the site, including the establishment of flower beds and a small vegetable patch by the ends-user.

6.1.2 Generic Assessment Criteria

The generic assessment criteria used have been 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). Based on the results of laboratory testing[1], a conservative soil organic matter content of 2.5% has been used in the assessment of contaminant concentrations recorded in the made ground and topsoil. A value of 1% has been used for the natural soil. 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, with a 1.0% soil organic matter content adopted for Antinomy. For lead, Category 4 Screening Levels (C4SLs) were used, which have been developed by Department for Environment, Food and Rural Affairs (DEFRA, 2014), using the Environment Agency Contaminated Land Exposure Assessment (CLEA) model. 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. These allow a higher (though still 'acceptably low') level of risk

[1] Average soil organic matter content is 4.8% for the made ground/topsoil (n=20) and 1.6% for natural soil (n=11)

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while maintaining a precautionary approach. These assessment criteria are also for a "residential with plant uptake" land use scenario.

For the purposes of a generic risk assessment, the risk from asbestos fibres has been considered using the empirical exposure modelling approach provided in CIRIA C733 (2014), and using pertinent exposure parameters consistent with the generic land-use scenario outlined above. This model will provide a risk statement with regards to the estimated lifetime risk of developing mesothelioma and lung cancer (given as an incidence rate per 100 000). This will be contextualised and assessed using published metrics for "minimal risk", which align with those used for the assessment of risk from other carcinogenic contaminants (e.g. genotoxic polyaromatic hydrocarbons). For the purposes of a generic risk assessment, the risk from fragments of asbestos containing material (ACM) has been considered on a binary basis – present or absent.

6.1.3 Assessment Results

The results of the addendum assessment can be summarised as follows:

- Lead was recorded at elevated concentrations above GAC (200 mg/kg) in six samples, where concentrations ranged between 200 and 1200 mg/kg. The highest concentration was recorded in TP111, which also recorded elevated concentrations of arsenic (41 mg/kg reported; GAC - 37 mg/kg) and beryllium (2.9 mg/kg reported; GAC – 1.7 mg/kg). All other metals/metalloids in all other samples were recorded at concentrations below GAC.
- Cyanides were not identified above MDL in any sample analysed,
- Monohydric phenols were not identified above MDL in any sample analysed,
- Polyaromatic hydrocarbons (PAH) were identified above MDL in a number of samples. However, in all cases, the reported concentrations were below GAC,
- Concentrations of BTEX and MTBE were below MDL in all cases,
- Petroleum hydrocarbons were recorded above MDL in seven samples of made ground taken from locations in the south of the site. However, in all cases, the values reported were below GAC.
- Fragments of asbestos containing material were not recorded in any sample analysed during fieldwork. However, the laboratory identified visible asbestos board debris in sample TP111 ES1 at 0.2 m depth.
- Loose asbestos fibres were recorded in four samples, as detailed in Table 1 below.

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Sample	Depth	Asbestos fibre type	Loose asbestos fibre concentration	ACM identified?
TP102	0.15	Chrysotile	0.004%	None recorded
TP105	0.45	Amosite	<0.001%	None recorded
TP111	0.20	Amosite	0.006%	Visible board debris
TP116	0.15	Chrysotile	0.007%	None recorded

Table 1. Results of the laboratory asbestos screen analysis

6.1.4 Discussion

Metals

Elevated concentrations of lead have been found across areas the centre south and east of the site, as shown on Drawing 22.067/03. Including the results of the previous investigation (AFHA, 2017b), elevated concentrations of lead ranged between 200 mg/kg and 1200 mg/kg.

The elevated lead concentrations are generally clustered around the trackways in the south and east of the site, 'yard' area in the north of the site and the eastern field. Whilst it is not possible to be conclusive, it is considered that the historical use of leaded petroleum may explain why lead is elevated around the trackways in particular. Also, the historical use of lead based pesticides, combustion residues from the burning of coal, leaded paints (equipment & greenhouse metalwork), and the historical importation of material to surface the tracks may all contribute to form a mixed source elsewhere.

Arsenic and beryllium have also found to be elevated in TP111 in the north of the site. Arsenic and beryllium are both associated with the burning of coal (along with lead), and the building adjacent to TP111 was a coal fired boiler house. Also, it is likely that the yard area around TP111 has been used for the historical storage or preparation of agrochemicals, such as metal based pesticides.

In any case, the data demonstrates that the elevated concentrations of metals are limited to the south and east of the site respectively, and do not extend across the entire site. Therefore, it is considered that the risks to human health identified in the risk assessment can be mitigated on an area specific basis. Outline recommendations for mitigation are provided in Section 7 below.

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Asbestos

Four samples analysed have reported loose asbestos fibre concentrations. Two samples positively identified chrysotile asbestos, and two samples recorded amosite asbestos fibres. Only one sample recorded the presence of visible ACM (TP111). The trial pits which recorded the positive detections are generally where made ground is present close to the locations of old sheds or within trackways. The desk study (AFHA, 2017a) identified that the agricultural packing shed adjacent to TP105 was constructed of cement board panels and corrugated cement board roofing (constructed ~1940s); whilst TP111 was located adjacent to a dilapidated former boiler house which had a corrugated asbestos cement board roof found to be in a poor condition; and numerous small sheds were located through the south of the site adjacent to TP116, all of which had corrugated cement board roofing. Therefore, it is not unexpected that asbestos fibres or fragments of ACM have been recorded in these locations. Given the length of time the site was occupied by the nursery, it is likely that several of these buildings would have suffered storm damage and needed to be repaired or re-roofed, activities which could have resulted in the dispersal of asbestos fibres into the surrounding soil. Chrysotile is most commonly used in cement board products, and is consistent with the presence of corrugated roofing material.

The presence of loose chrysotile fibres in the far east of the site in TP02 is likely to be an anomalous occurrence, and given the extensive sample collection in the surrounding area over both phases of investigation, is unlikely to be widespread.

Adjacent to the oldest buildings on the site – the agricultural packing shed and dilapidated boiler house - amosite asbestos fibres were recorded. It is unclear from background information and anecdotal information if the fabric of either building includes asbestos insulation board (AIB), or whether the pipework exiting the boiler house was lagged with asbestos containing material. However these are two likely potential sources of amosite fibres based on the historical context of the site.

Nevertheless, there is no known safe threshold of exposure to airborne asbestos fibres, but the risk is proportional to the level of exposure. Inhalation of asbestos fibres is linked to an increased risk of lung cancer and mesothelioma although there is often a long latency period between exposure and the onset of disease.

The quantitative asbestos risk assessment outlined below has been carried out following the empirical exposure assessment approach presented in CIRIA C733. This uses asbestos

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fibre quantity in soil to predict cumulative exposures to airborne asbestos fibres together with risk prediction models to provide an estimate of the likelihood that such exposures would cause, or contribute to the cause of, asbestos related diseases. The risk is a function of the composition and quantity of fibres released from the soil, the exposure scenario and the critical receptor. The exposure parameters used in the assessment are commensurate with those for a standard "residential" land-use scenario (EA, 2009c), and the estimated excess lifetime cancer risks (ELCR) are presented and discussed below. The model output is presented in Appendix D.

Following the derivation of the ELCR, an assessment of toxicological risk should be based, where possible, on published metrics for 'acceptable risk'. It is considered that an equivalent hazard assessment is that for carcinogenic soil contaminants (e.g. benzo[a]pyrene), where either "minimal/tolerable risk" or "lowest level of toxicological concern" (LLTC) (based on benchmark doses or lowest observable effect levels) can be considered acceptable - depending on the conservatism required. Within pertinent guidance documents (LQM, 2015; DEFRA, 2014), these carcinogenic toxicological risk levels are quantified as "acceptable" at 1 per 100,000 where the exposure threshold considers "minimal risk" to the end-user, and 1 per 50,000 as a upper bound for a "lowest level of toxicological concern".

The loose asbestos fibre concentration data, as summarised in Table 1 above and presented in Appendix C, has been used in the assessment, and an individual ELCR has been estimated for each occurrence. Loose asbestos fibres were not identified in any sample during previous investigation (AFHA, 2017b).

The exposure model presented in Appendix E indicates that exposure to loose chrysotile asbestos fibre concentrations in a residential setting with a maximum soil concentration of 0.007% or below generally results in an "insignificant" excess lifetime cancer risk. On the basis that this is approximately equivalent to an ELCR of 1 per 100 000, this is considered to be an acceptable risk.

However, where loose amosite asbestos fibres were recorded, an ELCR of between 9 and 11 per 100 000 has been estimated. Due to the increased potency of amosite asbestos fibres at causing asbestos related disease when compared to chrysotile asbestos, even a very low loose asbestos fibre concentration of 0.001% (laboratory MDL) still has the potential to present a carcinogenic hazard.

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It should be noted that this risk estimation exercise relates to loose fibres within the made ground and does not estimate potential long-term risks from the disturbance, disaggregation or fibre release from fragments of bulk ACM which have been identified in or on the soil surface in the north (TP111) of the site. The presence of ACM, and the likely disturbance which would be created during construction gives rise to the potential for additional and on-going asbestos fibre release into the soil and increases the potential respirable airborne fibre concentration. Therefore, a qualitative assessment would indicate that the presence of ACM poses a long-term risk to end-users of the development and should be dealt with appropriately.

6.2 CONSTRUCTION WORKER RISK ASSESSMENT

An assessment of risk to construction workers suggests that only chemical contamination of acute toxicity might represent an unacceptable risk to the health of construction workers, but which can be largely mitigated through the adoption of health and safety management practices in accordance with CDM Regulations 2015 and the Health and Safety at Work Act 1974.

Based on the results of the laboratory analysis, a qualitative assessment suggests that concentrations of contaminants are unlikely to present an acute risk to construction workers, provided that suitable measures are taken to reduce any residual chronic risks.

Loose asbestos fibres and fragments of ACM have been identified during ground investigation, and this should be considered by the Principal Contractor or any Sub-contractor undertaking work which would result in disturbance of the soil. A full risk assessment should be undertaken prior to the commencement of any works which may disturb soil in accordance with the Control of Asbestos Regulations (2012). This should consider both risks to on-site and off-site receptors.

6.3 WATER SUPPLY PIPE ASSESSMENT

An assessment of the laboratory results with respect to UKWIR guidance (2010) suggests that the concentrations of organic contaminants within the made ground are generally acceptable for the use of standard polyethylene (PE) or PVC pipework.

Marginal concentrations of long chain aliphatic and aromatic hydrocarbons, with chain lengths >C16, have been recorded in the shallow made ground within the sidewalls of the excavations to remove impacted soil from the historical location of the fan heaters and

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above ground fuel tanks. However, the underlying natural soil at a nominal pipe depth of 0.7 – 0.8 m bgl appears to be un-impacted by hydrocarbon contamination.

6.4 REVISED CONCEPTUAL MODEL AND RISK ASSESSMENT

Following assessment of the laboratory analysis, the conceptual model presented within the previous contamination assessment (AFHA, 2017b) has been revised and is presented in Table 2 below. Risk management and remediation measures are discussed in Section 7, where appropriate.

A risk category is determined for the potential linkages and an assessment made of risk and the significance of that risk from professional judgement. A risk matrix is presented in Appendix F.

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Source of Contamination	Pathway	Receptor	Probability and Reasoning	Consequence and Reasoning	Risk Classification
Soils (contaminated with metals and asbestos fibres)	Direct contact (inhalation/ ingestion)	Human end-users	**Likely** – concentrations of lead above screening levels found in north east, east and central south parts of the site. Arsenic and beryllium elevated in north east of site. Loose amosite fibres recorded in south and north east of the site. ACM recorded in soils in the north of site. Petroleum hydrocarbons no longer a contaminant of concern as source areas have been removed.	**Medium** – residential development proposed. Chronic damage to human health	**Moderate Risk**
		Construction workers		**Medium –** chronic damage to health from asbestos fibres exposure. Appropriate PPE and hygiene measures recommended.	**Moderate Risk**
	Direct Contact	Water supply pipes	**Unlikely** – Marginal concentrations of long chain petroleum hydrocarbons recorded in samples taken from the shallow soil in the south of the site. The underlying natural soil at a nominal pipe depth (0.7 m – 0.8 m bgl) appears to be un-impacted.	**Medium –** potable water supply pipes within a housing development	**Low Risk**

Table 2: Revised conceptual model

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7. RISK MANAGEMENT AND MITIGATION MEASURES

7.1 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.

7.2 CHEMICAL CONTAMINATION – HUMAN END-USERS

The human health risk assessment presented in Section 6 above indicates that the main contaminant of concern is lead, which was found at concentrations up to 1200 mg/kg within the made ground or topsoil. In addition, arsenic and beryllium were elevated at the location of TP111, and amosite asbestos fibres were found to pose an excess carcinogenic risk in samples of soil taken from TP111 and TP105 in the north and south of the site respectively. Fragments of asbestos containing materials were also recorded in TP111 in the north of the site. The plots where remediation is required are shown on Drawing 22.067/04.

Given the potential risks to future end-users, remediation is recommended to facilitate the safe development of the site. It is considered that the spatial resolution of the data and the clustering of the concentrations of lead in excess of GAC allows for the remediation requirement to be targeted on a 'plot-specific' basis.

It should be noted that a targeted approach to remediation requires integration with the proposed construction practices, as the movement of soil around the site *via* the stripping of the plot before construction, or subsequent large scale ploughing, ripping or harrowing of the topsoil or made ground may allow cross contamination of other areas of the site. If this was to occur, further investigation and re-assessment would be required, or all plots would be subject to remediation.

On the premise that the receptor cannot be removed, the remediation requires either that the pathway is broken or the source is removed – as outlined in the options presented below. Although, in practice, a combination of approaches may be required. The preferred remediation scheme should be applied to all areas of potential exposure, specifically all garden areas and areas of soft landscaping.

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Option 1 – Cover System

This option seeks to break the exposure pathway through the provision of a thickness of clean cover. Using the approach provided by BRE 465 (BRE, 2004), it is recommended that a simple cover system (without a geotextile break layer) of a minimum thickness of 480 mm is applied to sufficiently mitigate the 'worst-case' concentration of lead recorded outside of Plot 5 (680 mg/kg - calculation sheets presented in Appendix D).

Given that the concentration of lead in the made ground recorded in Plot 5 is significant (1200 mg/kg) and amosite asbestos fibres have been recorded within the made ground in Plot 5 and Plot 1, it is considered that a simple cover system *without* a break layer is not sufficient to mitigate the contamination recorded in the area covered by these plots. Therefore, if a cover system is the preferred methodology in these locations, an engineered system would be required. A geotextile break layer would need to be placed at the interface with the made ground, overlain by a minimum of 600 mm of clean cover. This would need to be deepened within the maximum rooting zone of any of the proposed trees or hedges which have root penetration depth greater than 600 mm below finished site level.

In all plots where a cover system is to be constructed, the clean cover can comprise a combination of certified 'suitable for use' topsoil whilst the remainder of the material can comprise 'as-dug' soil or 'suitable for use' subsoil. However, the topsoil layer should be no less than 150 mm in thickness.

If finished site levels cannot accommodate a rise in finished level by approximately 500 - 600 mm, the made ground should be partially removed so that the cover system can be constructed to the appropriate finished levels. The excavated soil should then be removed from site by a licenced waste carrier for disposal at a suitably permitted waste facility.

In this instance it is understood that the site is likely to be raised to a finished level of 5 m OD, and thus soil disposal is unlikely to pose an issue. However, it should be noted that in order to limit the remediation requirement to plots 1, 5, 6 and 7, all soil imported to raise levels across the site should also be 'suitable for use' and contain acceptable concentrations of potential contaminants (as per the requirements for the soil to be used within the cover system) Failure to source 'suitable for use' material may result in human health risks which have not been taken into account in this report.

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Option 2 – Source Removal

The premise of this strategy is to completely remove the contaminated made ground. As a result, the source of the contamination will be removed. It is considered that this strategy is potentially viable as the made ground has been found to generally extend to depths between 0.2 and 0.6 m bgl, with thicknesses greater than this only recorded in isolated areas.

In practice, this strategy requires the excavation and disposal of all of the made ground, present within affected garden areas or areas of soft landscaping. The excavation will only be considered complete once natural soils are exposed throughout the base of the excavation (Light brown to brown clayey silt, silty clay or silty fine sand), which will require validation by the supervising geo-environmental engineer.

All soil disposal will be removed from site by a licenced waste carrier and taken to a suitability permitted facility for disposal.

It is anticipated that soil will then be imported to bring the affected areas to a finished level of 5 m OD. All imported soil used for reinstatement of the plots which require remediation should be 'suitable for use' or 'as-dug' material as outlined below. The Client should also ensure that soil imported or used to raise levels in plots 2, 3 , 4, 8 and 9, is also 'suitable for use' and contain acceptable concentrations of potential contaminants to prevent additional human health risks which have not been highlighted within this report.

Documentation and Verification

It is recommended that a Remediation Method Statement is prepared and submitted to the Local Planning Authority prior to the implementation of a remediation scheme. This document should detail the Client's preferred remediation strategy, and state the appropriate validation control points.

Once the construction phase is underway, all affected areas will need to be marked out on-site to ensure that the area requiring remediation is known and agreed by all parties. Inspections should be carried out at the appropriate control points by a geo-environmental engineer who should provide a full photographic record of the process and obtain any other necessary information to confirm the successful completion of the scheme.

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All imported soils will need to be confirmed as 'suitable for use', with all documentation submitted to the supervising geo-environmental engineer for approval before the soils are imported. Where the soil is not supplied with this documentation sufficient testing will need to be completed at source, and a chain of custody system implemented for the transfer of the material. Furthermore, the contractor will need to retain copies of all soil waste transfer notes/consignment notes pertaining to the remediation for inclusion within the verification report.

7.3 CHEMICAL CONTAMINATION – CONSTRUCTION WORKERS

It is considered that general risks from occupational exposure to contaminated soil can be largely mitigated through construction best practice and the adoption of standard health and safety management practices in accordance with CDM Regulations 2015 and the Health and Safety at Work Act 1974. This includes wearing gloves whilst handling soil and employing suitable hygiene procedures such as washing hands before eating.

Due to the presence of asbestos containing soil, and the likely disturbance of the made during remediation and/or groundwork, additional mitigation is considered to be necessary. In accordance with the Control of Asbestos Regulations (CAR) (2012), a duty is placed on the Client and 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. If this is not possible, the exposure must be reduced to the lowest level reasonably practicable.

Typical control measures may include:

- damping down of the soil surface and wetting roadways and hardstanding, particularly during dry weather, and when excavations and vehicle movements are taking place,
- covering and damping down of stockpiled soil,
- for those in direct contact with asbestos containing soils carrying out work which may result in soil dust generation, disposable coveralls and appropriate respiratory protective equipment (RPE) should be used to reduce the likelihood of asbestos fibre inhalation (subject to the Contractor's risk assessment for the task),
- the excavation, storage and removal of the soil should be carried out in a safe manner, to ensure that dust generation is minimised.

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It should be noted that the control measures outlined above are not exhaustive and are provided as examples only. It is the responsibility of the Client and Contractor carrying out the work to ensure that a CAR 2012 compliant risk assessment and method statement is developed prior to any groundworks which may disturb asbestos containing soils. Subsequently, the Contractor is to employ all necessary control measures, as determined through the risk assessment, for the duration of the work.

7.4 WATER SUPPLY PIPES

Across the majority of the site, petroleum hydrocarbons and polyaromatic hydrocarbons have not been recorded above threshold levels for standard polyethylene water supply pipes. However, marginal concentrations of long chain aliphatic and aromatic hydrocarbons have been recorded in the shallow soil in the south of the site (<0.3 m depth).

Testing of the underlying natural soil at a nominal depth of 0.7 to 0.8 m (below existing ground level) has demonstrated that this material is un-impacted. Therefore, it is recommended that water supply pipes are installed within the natural soil where possible. Where installation in made ground is necessary, a clean fill surround should be used to prevent direct contact with the pipe material.

In any case, the specification for the installation of any buried water supply pipework should be agreed with the local water utility provider prior to installation.

7.5 UNEXPECTED CONTAMINATION

If during development any soil is found to contain previously unidentified contamination (e.g. significant discolouration, hydrocarbon odours, or asbestos containing materials), the materials should be left *in situ*, the work in the affected area should cease, and suitable guidance should be sought. A site visit and further investigation and assessment may be required depending on the nature of the contamination encountered. The Local Planning Authority will also expect to be notified of any unexpected contamination identified, and the steps to be taken to deal with the discovery.

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8. SUMMARY

1. A Contamination Assessment was carried to support the construction of a residential development of nine dwellings at: Land Adjacent to 72 Station Road, Surfleet, Lincolnshire, PE11 4DB.
2. Geological mapping recorded the underlying geology to comprise Tidal Flat Deposits overlying bedrock of the Oxford Clay. Nearby archive borehole record the Tidal Flat Deposits to be underlain by glacial deposits.
3. Historically, the site was a nursery from the early 1900s, with two glasshouses occupying the site. The site was reconfigured by the mid-1900s to include a single central glasshouse surrounded by small fields. The site also included two boiler houses and numerous sheds and outbuildings, many of which contained asbestos containing materials within their fabric. Production ceased between 2017 and 2022, with the majority of the structures demolished by the time of this addendum investigation.
4. This phase of investigation was carried out in order to increase the resolution of the data collected previously and allow the development of a targeted or 'plot-specific' assessment. Depending on the results of the assessment, a refined remediation approach could potentially be outlined.
5. Both topsoil and made ground were found across the site and were proven to extend to depths between 0.20 and 1.0 m. Both the made ground and topsoil were underlain by superficial deposits representative of the mapped Tidal Flat Deposits.
6. With the exception of lead, arsenic and beryllium, all potential contaminants were recorded below generic assessment criteria or laboratory limits of quantification respectively. Loose asbestos fibres were recorded in four samples, and fragments of asbestos containing materials were found in a single sample. Therefore, it is considered that there is a moderate risk to the chronic health of future end-users.
7. Given the absence of significant chemical contamination, construction workers are considered to be at generally low risk from chemical contamination. However, asbestos containing soils have been identified and a moderate risk to construction workers has been concluded. In accordance with CDM Regulations (2015) and the Control of Asbestos Regulations (2012), consideration should be given to the risks from the disturbance of asbestos containing soil. However, the risks are manageable, and typical control measures to reduce any residual risk should align with construction best practice, such as damping down of soils to prevent dust generation and the appropriate provision of PPE, RPE and welfare facilities.
8. Generally low concentration of contaminants which could permeate water supply pipes were found, although marginal concentrations of long chain hydrocarbons were recorded in the shallow soil south of the site. No further mitigation is considered to be required where pipework is installed in the natural soil, but where pipes are to be installed in made ground, a clean fill surround should be used to

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prevent direct contact. The details for the installation of water supply pipes should be agreed with the Local Water Authority in advance.

9. Based on the findings of the assessment, remediation is considered to be required in plots 1, 5, 6 and 7. Two options for remediation have been outlined in Section 7 above, either the construction of a clean cover system, or the excavation and disposal of contaminated soil (source removal). It is understood that site levels are likely to be raised to enable construction, such that a cover system may be able to be accommodated without the need to excavate and dispose of material.
10. If any unexpected contamination is encountered during demolition or redevelopment, specialist advice should be sought with respect to appropriate actions in accordance with the developer's duty of care.

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A F HOWLAND ASSOCIATES
24 May 2022

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APPENDIX A: REFERENCES

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APPENDIX B: EXPLORATORY HOLE RECORDS

Records for trial pits TP101 to TP130

KEY

D	Small disturbed sample
ES	Environmental sample
PID	Photo-ionisation detector reading

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 complied by visual examination of samples obtained during excavation, after BS 5930:2015+A1:2020 and modified in accordance with laboratory test results where applicable

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP101
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.40	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525639 E 328581 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	TOPSOIL (Brown slightly sandy silt. With occasional rootlets)		
0.20	ES1			3.10	0.30			
0.30-0.70	D2				(0.40)	Greyish brown clayey slightly sandy SILT		
0.50	ES2			2.70	0.70			
0.70-1.00	D3				(0.30)	Brown mottled orange brown clayey slightly sandy SILT		
			30/03/2022:DRY	2.40	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.
1:20	TJS	22.067.TP101

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP102
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.24	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525624 E 328575 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.35	D1				(0.30)	TOPSOIL (Brown slightly sandy silt. With rare subangular fine flint gravel)		
0.15	ES1			2.94	0.30			
0.40	ES2				(0.70)	Brown clayey slightly sandy SILT. With occasional partings of fine sand and very thin laminations of clay		
0.60-0.80	D2		30/03/2022:DRY	2.24	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.
1:20	TJS	22.067.TP102

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP103
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.56	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525638 E 328549 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.35	D1					TOPSOIL (Dark brown clayey slightly sandy silt. With rare rootlets)		
0.10	ES1				(0.30)			
				3.26	0.30	Brown clayey slightly sandy SILT		
0.45	ES2							
0.60-0.80	D2				(0.70)			
			30/03/2022:DRY	2.56	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.
1:20	TJS	22.067.TP103

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP104
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.37	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525661 E 328557 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.50	D1					TOPSOIL (Dark brown clayey slightly sandy silt. With rare rootlets)		
0.25	ES1				(0.50)			
				2.87	0.50	Brown clayey slightly sandy SILT. With rare subangular fine gravel and shell fragments		
0.60	ES2							
0.70	D2				(0.50)			
			30/03/2022:DRY	2.37	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.
1:20	TJS	22.067.TP104

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP105
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 4.08	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525671 E 328542 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1					MADE GROUND (Dark greyish brown slightly clayey silty fine sand. With occasional fragments of wood, brick, plastic and concrete)		
0.20	ES1				(0.60)			
0.45	ES2							
				3.48	0.60	Light brown very silty fine SAND		
0.70	ES3							
0.80	D2				(0.65)			
1.20	D3		30/03/2022:DRY	2.83	1.25	Complete at 1.25m		



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.
1:20	TJS	22.067.TP105

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP106
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.30	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525661 E 328578 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1					TOPSOIL (Dark brown clayey sandy silt)		
0.15	ES1				(0.40)			
				2.90	0.40	Light brown clayey sandy SILT		
0.50	ES2							
0.60-0.80	D2				(0.60)			
			30/03/2022:DRY	2.30	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.
1:20	TJS	22.067.TP106

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP107
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.39	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525678 E 328586 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1					MADE GROUND (Dark brown sandy slightly gravelly silt. Gravel is subangular fine to coarse flint gravel with fragments of ceramic and brick)		
0.20	ES1				(0.60)			
0.40-0.60	D2							
0.50	ES2			2.79	0.60			
0.70	ES3					Soft brown silty slightly sandy CLAY. With occasional partings of silt and fine sand		
0.70-1.00	D3				(0.40)			
			30/03/2022:DRY	2.39	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.
1:20	TJS	22.067.TP107

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP108
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.26	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525700 E 328578 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.35	D1					TOPSOIL (Dark brown clayey sandy silt)		
0.15	ES1				(0.35)			
				2.91	0.35	Brown clayey slightly sandy SILT		
0.40-0.70	D2							
0.50	ES2				(0.45)			
				2.46	0.80	Light brown mottled orange brown silty fine SAND		
0.80-1.00	D3				(0.20)			
			30/03/2022:DRY	2.26	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.
1:20	TJS	22.067.TP108

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP109
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.37	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525704 E 328560 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.35	D1					TOPSOIL (Dark brown clayey sandy silt)		
0.20	ES1				(0.35)			
				3.02	0.35	Brown slightly clayey silty fine SAND		
0.40	ES2							
0.40-0.70	D2				(0.65)			
			30/03/2022:DRY	2.37	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.
1:20	TJS	22.067.TP109

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP110
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.34	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525717 E 328583 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						MADE GROUND (Dark brown sandy silt. With rare fragments of plastic)		
0.15	ES1							
0.30-0.50	D1				(0.70)			
0.40	ES2							
				2.64	0.70			
						Light brown slightly clayey silty fine SAND		
0.80	ES3				(0.30)			
0.80-1.00	D2							
			30/03/2022:DRY	2.34	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.
1:20	TJS	22.067.TP110

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP111
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.52	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525733 E 328594 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.55	D1					MADE GROUND (Dark brown silty gravelly fine sand. Gravel is subangular fine to coarse flint with frequent fragments of glass, plastic and brick. With frequent roots and rootlets)		
0.20	ES1				(0.55)	... ceramic pipe @ 0.4 m depth		
				2.97	0.55	Brown clayey sandy SILT		
0.60	ES2				(0.45)			
0.80-1.00	D2							
			30/03/2022:DRY	2.52	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.
1:20	TJS	22.067.TP111

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP112
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.42	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525749 E 328598 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.50	D1					MADE GROUND (Dark brown slightly clayey silty fine sand. With rare fragments of brick)		
0.15	ES1							
					(0.90)	... with rare fragments of plastic bag		
0.50-0.90	D2					... becoming compact and grading to a sandy silt in places		
0.60	ES2							
				2.52	0.90	Light brown very silty fine SAND		
1.00	ES3							
1.00-1.20	D3							
					(0.50)			
			30/03/2022:DRY	2.02	1.40	Complete at 1.40m		



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.
1:20	TJS	22.067.TP112

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP113
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.21	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525746 E 328575 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.55	D1					MADE GROUND (Dark brown very silty fine sand)		
0.20	ES1				(0.55)	... with a fragment of metal pipe		
				2.66	0.55	... with fragments of plastic bag		
0.65	ES2					Light brown silty fine SAND		
0.70-0.90	D2				(0.45)			
			30/03/2022:DRY	2.21	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.
1:20	TJS	22.067.TP113

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP114
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.26	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525740 E 328561 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1				(0.40)	MADE GROUND (Dark brown very silty fine sand. With rare subangular fine flint gravel)		
0.10	ES1			2.86	0.40			
0.45	ES2				(0.60)	Light brown silty fine SAND		
0.60-0.80	D2			2.26	1.00			
			30/03/2022:DRY			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.
1:20	TJS	22.067.TP113

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP115
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.81	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525756 E 328553 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	MADE GROUND (Dark brown slightly clayey silty fine sand. With occasional fragments of brick and plastic)		
0.15	ES1			3.51	0.30			
0.40	ES2				(0.70)	Light brown very silty fine SAND		
0.50-0.70	D2			2.81	1.00			
			30/03/2022:DRY			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.
1:20	TJS	22.067.TP115

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP116
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.56	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525736 E 328551 N	**Dates** 30/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				3.50	(0.06) 0.06	CONCRETE		
0.10-0.30 0.15	D1 ES1				(0.29)	MADE GROUND (Black slightly clayey sandy silt. With frequent fragments of brick, metal, glass, plastic and concrete)		
				3.21	0.35			
0.40	ES2					Light brown clayey fine SAND. With very thin laminations of clay in places		
0.50-0.70	D2				(0.65)			
			30/03/2022:DRY	2.56	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.
1:20	TJS	22.067.TP116

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP117
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.94	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525719 E 328542 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.40	D1					MADE GROUND (Light brown laminated dark brown sandy silt . With rare fragments of brick and glass)		
0.30	ES1				(1.00)			
						... with a whole glass bottle at 0.9 m		
				2.94	1.00	Light brown slightly clayey silty fine SAND		
1.10	ES2							
1.10-1.30	D2				(0.50)			
			31/03/2022:DRY	2.44	1.50	Complete at 1.50m		



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.
1:20	TJS	22.067.TP117

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP118
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.75	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525724 E 328547 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15 0.20-0.40	ES1 D1				(0.80)	MADE GROUND (Brown very silty fine to medium sand. With occasional fragments of brick and glass)		
0.80-1.00 0.85	D2 ES2			2.95	0.80	Light brown sandy SILT		
			31/03/2022:DRY	2.55	(0.40) 1.20	Complete at 1.20m		



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.
1:20	TJS	22.067.TP118

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP119
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.68	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525720 E 328548 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	ES1				(0.85)	MADE GROUND (Dark brown very silty slightly gravelly fine to medium sand. Gravel is medium subangular flint gravel with occasional fragments of glass, tile and ceramic)		
0.30-0.50	D1							
0.50	ES2							
0.85	ES3			2.83	0.85	Light brown mottled orange brown sandy SILT		
0.90-1.00	D2				(0.65)			
			31/03/2022:DRY	2.18	1.50	Complete at 1.50m		



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.
1:20	TJS	22.067.TP119

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP120
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.86	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525716 E 328546 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1					MADE GROUND (Dark brown very silty fine to medium sand. With rare subangular fine flint gravel and occasional brick and ceramic)		
0.20	ES1				(0.70)			
0.70-1.00	D2			3.16	0.70	Light brown sandy SILT. With partings of fine sand in places		
0.75	ES2				(0.80)			
			31/03/2022:DRY	2.36	1.50	Complete at 1.50m		



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.
1:20	TJS	22.067.TP120

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP121
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.40	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525704 E 328551 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1					MADE GROUND (Dark brown sandy silt. With rare fragments of glass)		
0.10	ES1				(0.35)			
				3.05	0.35			
0.35	ES2					Light brown mottled orange brown sandy SILT. Bioturbated in places with partings of silty fine sand		
0.40-0.60	D2				(0.65)			
			31/03/2022:DRY	2.40	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.
1:20	TJS	22.067.TP121

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP122
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.5 m L x 0.6 m W	**Ground Level (mOD)** 3.43	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525698 E 328552 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	MADE GROUND (Dark brown sandy silt. With rare fragments of glass)		
0.20	ES1			3.13	0.30			
0.40-0.60	D2					Light brown mottled orange brown sandy SILT. Bioturbated in places with partings of silty fine sand		
0.50	ES2				(0.70)			
			31/03/2022:DRY	2.43	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.
1:20	TJS	22.067.TP122

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP123
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.48	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525696 E 328548 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1					MADE GROUND (Dark grey silty gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse flint with fragments of concrete brick, glass and rope)		
0.15	ES1		PID = 0.1 ppm		(0.30)			
				3.18	0.30	Light brown very sandy SILT		
					(0.50)			
0.70	D2		PID = 0.0 ppm					
0.70	ES2		31/03/2022:DRY	2.68	0.80	Complete at 0.80m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of southern sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP123

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP124
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.30	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525699 E 328549 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	MADE GROUND (Dark brown sandy SILT. Rare fragments of brick and plastic)		
0.10	ES1		PID = 0.0 ppm	3.10	0.20			
					(0.60)	Light brown very sandy SILT		
0.70	D2		PID = 0.0 ppm					
0.70	ES2		31/03/2022:DRY	2.50	0.80	Complete at 0.80m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of eastern sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP124

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP125
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.48	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525696 E 328550 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	TOPSOIL (Desiccated dark brown sandy silt)		
0.10	ES1		PID = 0.0 ppm	3.28	0.20	Light brown sandy SILT		
					(0.60)			
0.70	D2		PID = 0.0 ppm					
0.70	ES2		31/03/2022:DRY	2.68	0.80	Complete at 0.80m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of northern sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP125

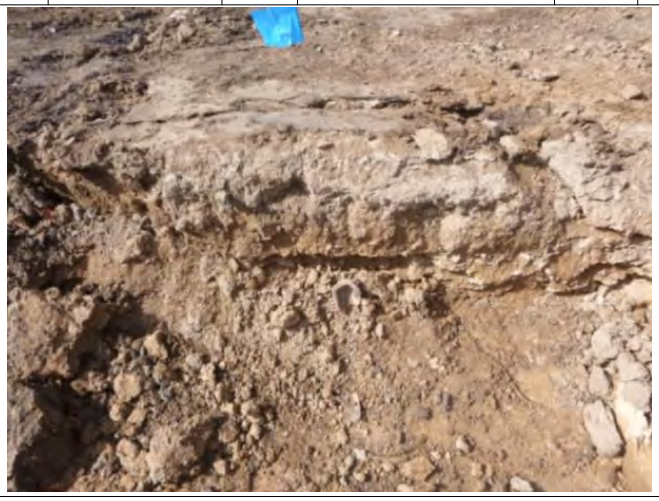
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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP126
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.53	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525692 E 328549 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	TOPSOIL (Desiccated dark brown sandy silt)		
0.10	ES1		PID = 0.0 ppm	3.33	0.20	Light brown sandy SILT		
					(0.60)			
0.70	D2		PID = 0.0 ppm					
0.70	ES2		31/03/2022:DRY	2.73	0.80	Complete at 0.80m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of western sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP126

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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP127
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.57	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525686 E 328549 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	TOPSOIL (Desiccated dark brown sandy silt)		
0.10	ES1		PID = 0.0 ppm	3.37	0.20	Light brown sandy SILT		
					(0.50)			
0.60	D2		PID = 0.0 ppm					
0.60	ES2		31/03/2022:DRY	2.87	0.70	Complete at 0.70m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of eastern sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP127

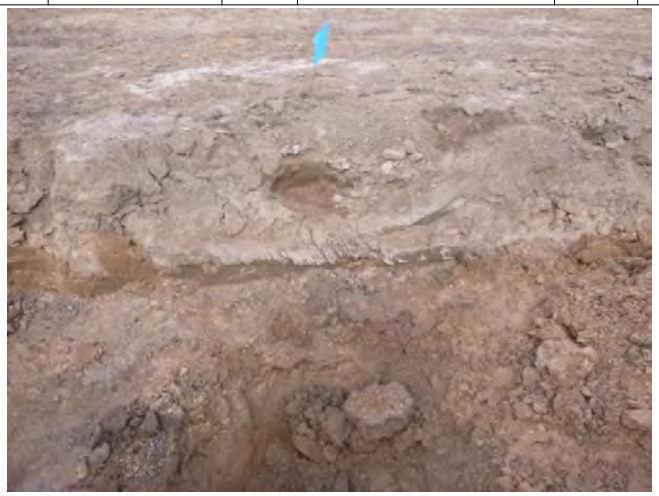
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Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP128
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.51	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525684 E 328550 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	TOPSOIL (Desiccated dark brown sandy silt)		
0.10	ES1		PID = 0.0 ppm	3.31	0.20	Light brown sandy SILT		
					(0.50)			
0.60	D2		PID = 0.0 ppm					
0.60	ES2		31/03/2022:DRY	2.81	0.70	Complete at 0.70m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of northern sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP128

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Geotechnical Engineers

Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP129
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.56	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525681 E 328549 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1		PID = 0.0 ppm		(0.20)	TOPSOIL (Desiccated dark brown sandy silt. Rare fine gravel sized fragments of brick)		
0.20	ES1			3.36	0.20	Light brown sandy SILT		
					(0.50)			
0.60 0.60	D2 ES2		PID = 0.0 ppm 31/03/2022:DRY	2.86	0.70	Complete at 0.70m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of western sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP129

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A F Howland Associates
Geotechnical Engineers

Site Station Road, Surfleet, PE11 4DB			**Trial Pit Number** TP130
Machine : Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 3.65	**Client** Mike Yould Plumbing and Heating Limited	**Job Number** 22.067
	Location 525684 E 328548 N	**Dates** 31/03/2022	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1					MADE GROUND (Dark brown sandy silt with fragments of limestone, concrete and brick)		
0.10	ES1		PID = 0.2 ppm		(0.30)			
				3.35	0.30	Light brown sandy SILT		
					(0.40)			
0.60	D2		PID = 0.0 ppm					
0.60	ES2		31/03/2022:DRY	2.95	0.70	Complete at 0.70m		



Remarks

1. Location CAT scanned prior to excavation
2. No groundwater encountered
3. Trial pit remained open and sidewalls stable during excavation.
4. Log of southern sidewall of excavation to remove hydrocarbon impacted soil

Scale (approx)	Logged By	Figure No.
1:20	TJS	22.067.TP130

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APPENDIX C: LABORATORY TESTING

Laboratory analysis report 22-03124	Soil analysis results
Laboratory analysis report 22-03498	Asbestos quantification results

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Toby Skinner
AF Howland Associates Ltd
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Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 22-03124

Site Reference:	Station Road, Surfleet, PE11 4DB
Project / Job Ref:	22.067
Order No:	TJS/22.067/00/01
Sample Receipt Date:	05/04/2022
Sample Scheduled Date:	05/04/2022
Report Issue Number:	1
Reporting Date:	13/04/2022

Authorised by:

Nick Watson
General Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

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: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP101	TP101	TP102	TP103	TP103
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.20	0.20	0.15	0.10	0.45
Reporting Date: 13/04/2022	DETS Sample No	593315	593316	593317	593318	593319

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025			Detected		
Sample Matrix (S)	Material Type	N/a	NONE			Bundles of Chrysotile fibres		
Asbestos Type (S)	PLM Result	N/a	ISO17025			Chrysotile		
pH	pH Units	N/a	MCERTS			7.8		
Total Cyanide	mg/kg	< 2	NONE			< 2		
Complex Cyanide	mg/kg	< 2	NONE			< 2		
Free Cyanide	mg/kg	< 2	NONE			< 2		
Thiocyanate as SCN	mg/kg	< 3	NONE			< 3		
Organic Matter (SOM)	%	< 0.1	MCERTS	3.3	1.6	2.8		
Antimony (Sb) (S)	mg/kg	< 1	NONE			1.2		
Arsenic (As) (S)	mg/kg	< 2	MCERTS			10		
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS			< 0.5		
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS			0.2		
Chromium (Cr) (S)	mg/kg	< 2	MCERTS			18		
Chromium (hexavalent)	mg/kg	< 2	NONE			< 2		
Copper (Cu) (S)	mg/kg	< 4	MCERTS			23		
Lead (Pb) (S)	mg/kg	< 3	MCERTS	64	15	55	28	13
Mercury (Hg) (S)	mg/kg	< 1	MCERTS			< 1		
Nickel (Ni) (S)	mg/kg	< 3	MCERTS			13		
Selenium (Se) (S)	mg/kg	< 2	MCERTS			< 3		
Vanadium (V) (S)	mg/kg	< 1	MCERTS			27		
Zinc (Zn) (S)	mg/kg	< 3	MCERTS			59		
Total Phenols (monohydric)	mg/kg	< 2	NONE			< 2		
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE			< 10		
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE			< 10		
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE			< 42		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
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: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP104	TP104	TP105	TP105	TP106
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES2	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.25	0.60	0.20	0.45	0.15
Reporting Date: 13/04/2022	DETS Sample No	593320	593321	593322	593323	593324

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025			Not Detected	Detected	Not Detected
Sample Matrix (S)	Material Type	N/a	NONE				Small bundle of Amosite fibres	
Asbestos Type (S)	PLM Result	N/a	ISO17025				Amosite	
pH	pH Units	N/a	MCERTS			7.4	7.3	7.4
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
Organic Matter (SOM)	%	< 0.1	MCERTS	3.1	1.6	7	6.1	3.7
Antimony (Sb) (S)	mg/kg	< 1	NONE			1.5	1.5	1.8
Arsenic (As) (S)	mg/kg	< 2	MCERTS			12	12	16
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS			0.5	0.6	0.5
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS			1.1	0.5	0.5
Chromium (Cr) (S)	mg/kg	< 2	MCERTS			20	19	23
Chromium (hexavalent)	mg/kg	< 2	NONE			< 2	< 2	< 2
Copper (Cu) (S)	mg/kg	< 4	MCERTS			47	31	45
Lead (Pb) (S)	mg/kg	< 3	MCERTS	35	13	110	67	90
Mercury (Hg) (S)	mg/kg	< 1	MCERTS			< 1	4	< 1
Nickel (Ni) (S)	mg/kg	< 3	MCERTS			14	14	15
Selenium (Se) (S)	mg/kg	< 2	MCERTS			< 3	< 3	< 3
Vanadium (V) (S)	mg/kg	< 1	MCERTS			27	28	29
Zinc (Zn) (S)	mg/kg	< 3	MCERTS			130	91	120
Total Phenols (monohydric)	mg/kg	< 2	NONE			< 2	< 2	< 2
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE			< 10	< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE			< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE			< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
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Soil Analysis Certificate						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP107	TP107	TP107	TP108	TP108
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES3	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.20	0.50	0.70	0.15	0.50
Reporting Date: 13/04/2022	DETS Sample No	593325	593326	593327	593328	593329

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	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	7.5		7.9		
Total Cyanide	mg/kg	< 2	NONE	< 2		< 2		
Complex Cyanide	mg/kg	< 2	NONE	< 2		< 2		
Free Cyanide	mg/kg	< 2	NONE	< 2		< 2		
Thiocyanate as SCN	mg/kg	< 3	NONE	< 3		< 3		
Organic Matter (SOM)	%	< 0.1	MCERTS	3.6		1.3	3	1.5
Antimony (Sb) (S)	mg/kg	< 1	NONE	1.4		< 1		
Arsenic (As) (S)	mg/kg	< 2	MCERTS	12		11		
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS	< 0.5		< 0.5		
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS	0.2		< 0.2		
Chromium (Cr) (S)	mg/kg	< 2	MCERTS	18		13		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2		
Copper (Cu) (S)	mg/kg	< 4	MCERTS	30		12		
Lead (Pb) (S)	mg/kg	< 3	MCERTS	60	89	24	58	17
Mercury (Hg) (S)	mg/kg	< 1	MCERTS	< 1		< 1		
Nickel (Ni) (S)	mg/kg	< 3	MCERTS	14		12		
Selenium (Se) (S)	mg/kg	< 2	MCERTS	< 3		< 3		
Vanadium (V) (S)	mg/kg	< 1	MCERTS	26		24		
Zinc (Zn) (S)	mg/kg	< 3	MCERTS	80		42		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2		
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10		< 10		
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10		< 10		
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42		< 42		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Soil Analysis Certificate						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP109	TP110	TP110	TP111	TP111
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES2	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.20	0.15	0.40	0.20	0.60
Reporting Date: 13/04/2022	DETS Sample No	593330	593331	593332	593333	593334

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected			Detected	Not Detected
Sample Matrix (S)	Material Type	N/a	NONE				Amosite fibres present in visible board debris & loose bundles of Amosite fibres	
Asbestos Type (S)	PLM Result	N/a	ISO17025				Amosite	
pH	pH Units	N/a	MCERTS	7.5			7.6	8.0
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
Organic Matter (SOM)	%	< 0.1	MCERTS	3.1			7	2
Antimony (Sb) (S)	mg/kg	< 1	NONE	1.5			5.5	1.4
Arsenic (As) (S)	mg/kg	< 2	MCERTS	15			41	14
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS	0.5			2.9	0.6
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS	0.3			0.6	< 0.2
Chromium (Cr) (S)	mg/kg	< 2	MCERTS	21			28	22
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2			< 2	< 2
Copper (Cu) (S)	mg/kg	< 4	MCERTS	34			76	14
Lead (Pb) (S)	mg/kg	< 3	MCERTS	76	140	170	1200	170
Mercury (Hg) (S)	mg/kg	< 1	MCERTS	< 1			< 1	< 1
Nickel (Ni) (S)	mg/kg	< 3	MCERTS	16			34	21
Selenium (Se) (S)	mg/kg	< 2	MCERTS	< 3			< 3	< 3
Vanadium (V) (S)	mg/kg	< 1	MCERTS	31			44	40
Zinc (Zn) (S)	mg/kg	< 3	MCERTS	90			300	120
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2			< 2	< 2
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10			< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10			< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42			< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP112	TP112	TP113	TP114	TP114
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.60	0.20	0.10	0.45
Reporting Date: 13/04/2022	DETS Sample No	593335	593336	593337	593338	593339

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	7.8	7.7	7.5		
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		
Organic Matter (SOM)	%	< 0.1	MCERTS	3.4	2.4	3.4	4	1
Antimony (Sb) (S)	mg/kg	< 1	NONE	1.4	1.2	1.9		
Arsenic (As) (S)	mg/kg	< 2	MCERTS	16	12	19		
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS	< 0.5	0.5	< 0.5		
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS	0.4	< 0.2	0.5		
Chromium (Cr) (S)	mg/kg	< 2	MCERTS	18	17	27		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu) (S)	mg/kg	< 4	MCERTS	23	15	33		
Lead (Pb) (S)	mg/kg	< 3	MCERTS	160	59	210	200	13
Mercury (Hg) (S)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
Nickel (Ni) (S)	mg/kg	< 3	MCERTS	14	16	15		
Selenium (Se) (S)	mg/kg	< 2	MCERTS	< 3	< 3	< 3		
Vanadium (V) (S)	mg/kg	< 1	MCERTS	28	32	27		
Zinc (Zn) (S)	mg/kg	< 3	MCERTS	69	62	83		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10		
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10		
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42	< 42	< 42		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
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: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP115	TP116	TP116	TP117	TP118
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES2	ES1	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.15	0.40	0.30	0.15
Reporting Date: 13/04/2022	DETS Sample No	593340	593341	593342	593343	593344

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Detected	Not Detected		
Sample Matrix (S)	Material Type	N/a	NONE		Bundles of Chrysotile fibres			
Asbestos Type (S)	PLM Result	N/a	ISO17025		Chrysotile			
pH	pH Units	N/a	MCERTS	7.4	7.3	7.8		
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		
Organic Matter (SOM)	%	< 0.1	MCERTS	4.8	14.1	1.7		
Antimony (Sb) (S)	mg/kg	< 1	NONE	1.6	5.5	1.2		
Arsenic (As) (S)	mg/kg	< 2	MCERTS	17	33	10		
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS	0.5	1.6	< 0.5		
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS	0.5	1.8	< 0.2		
Chromium (Cr) (S)	mg/kg	< 2	MCERTS	25	34	16		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu) (S)	mg/kg	< 4	MCERTS	33	130	13		
Lead (Pb) (S)	mg/kg	< 3	MCERTS	680	580	130		
Mercury (Hg) (S)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
Nickel (Ni) (S)	mg/kg	< 3	MCERTS	14	59	12		
Selenium (Se) (S)	mg/kg	< 2	MCERTS	< 3	< 3	< 3		
Vanadium (V) (S)	mg/kg	< 1	MCERTS	28	29	25		
Zinc (Zn) (S)	mg/kg	< 3	MCERTS	99	1300	56		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	80

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
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: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP119	TP119	TP119	TP120	TP120
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES3	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.20	0.50	0.85	0.20	0.75
Reporting Date: 13/04/2022	DETS Sample No	593345	593346	593347	593348	593349

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					
Total Cyanide	mg/kg	< 2	NONE					
Complex Cyanide	mg/kg	< 2	NONE					
Free Cyanide	mg/kg	< 2	NONE					
Thiocyanate as SCN	mg/kg	< 3	NONE					
Organic Matter (SOM)	%	< 0.1	MCERTS	7.1		1.3		
Antimony (Sb) (S)	mg/kg	< 1	NONE					
Arsenic (As) (S)	mg/kg	< 2	MCERTS					
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS					
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS					
Chromium (Cr) (S)	mg/kg	< 2	MCERTS					
Chromium (hexavalent)	mg/kg	< 2	NONE					
Copper (Cu) (S)	mg/kg	< 4	MCERTS					
Lead (Pb) (S)	mg/kg	< 3	MCERTS	180				
Mercury (Hg) (S)	mg/kg	< 1	MCERTS					
Nickel (Ni) (S)	mg/kg	< 3	MCERTS					
Selenium (Se) (S)	mg/kg	< 2	MCERTS					
Vanadium (V) (S)	mg/kg	< 1	MCERTS					
Zinc (Zn) (S)	mg/kg	< 3	MCERTS					
Total Phenols (monohydric)	mg/kg	< 2	NONE					
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10		< 10	< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10		< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42		< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
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: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP121	TP121	TP122	TP122	TP123
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES2	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.10	0.35	0.20	0.50	0.15
Reporting Date: 13/04/2022	DETS Sample No	593350	593351	593352	593353	593354

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025					
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N/a	MCERTS					
Total Cyanide	mg/kg	< 2	NONE					
Complex Cyanide	mg/kg	< 2	NONE					
Free Cyanide	mg/kg	< 2	NONE					
Thiocyanate as SCN	mg/kg	< 3	NONE					
Organic Matter (SOM)	%	< 0.1	MCERTS			3.8	1	8.4
Antimony (Sb) (S)	mg/kg	< 1	NONE					
Arsenic (As) (S)	mg/kg	< 2	MCERTS					
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS					
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS					
Chromium (Cr) (S)	mg/kg	< 2	MCERTS					
Chromium (hexavalent)	mg/kg	< 2	NONE					
Copper (Cu) (S)	mg/kg	< 4	MCERTS					
Lead (Pb) (S)	mg/kg	< 3	MCERTS			130		260
Mercury (Hg) (S)	mg/kg	< 1	MCERTS					
Nickel (Ni) (S)	mg/kg	< 3	MCERTS					
Selenium (Se) (S)	mg/kg	< 2	MCERTS					
Vanadium (V) (S)	mg/kg	< 1	MCERTS					
Zinc (Zn) (S)	mg/kg	< 3	MCERTS					
Total Phenols (monohydric)	mg/kg	< 2	NONE					
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	109

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
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: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP123	TP124	TP125	TP125	TP126
Project / Job Ref: 22.067	Additional Refs	ES2	ES1	ES1	ES2	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.70	0.10	0.10	0.70	0.10
Reporting Date: 13/04/2022	DETS Sample No	593355	593356	593357	593358	593359

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025					
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N/a	MCERTS					
Total Cyanide	mg/kg	< 2	NONE					
Complex Cyanide	mg/kg	< 2	NONE					
Free Cyanide	mg/kg	< 2	NONE					
Thiocyanate as SCN	mg/kg	< 3	NONE					
Organic Matter (SOM)	%	< 0.1	MCERTS	1.7				
Antimony (Sb) (S)	mg/kg	< 1	NONE					
Arsenic (As) (S)	mg/kg	< 2	MCERTS					
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS					
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS					
Chromium (Cr) (S)	mg/kg	< 2	MCERTS					
Chromium (hexavalent)	mg/kg	< 2	NONE					
Copper (Cu) (S)	mg/kg	< 4	MCERTS					
Lead (Pb) (S)	mg/kg	< 3	MCERTS					
Mercury (Hg) (S)	mg/kg	< 1	MCERTS					
Nickel (Ni) (S)	mg/kg	< 3	MCERTS					
Selenium (Se) (S)	mg/kg	< 2	MCERTS					
Vanadium (V) (S)	mg/kg	< 1	MCERTS					
Zinc (Zn) (S)	mg/kg	< 3	MCERTS					
Total Phenols (monohydric)	mg/kg	< 2	NONE					
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10	18	< 10	< 10	22
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42	84	< 42	< 42	106

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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

Soil Analysis Certificate						
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP127	TP127	TP128	TP128	TP129
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES2	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.10	0.60	0.10	0.60	0.20
Reporting Date: 13/04/2022	DETS Sample No	593360	593361	593362	593363	593364

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025					
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N/a	MCERTS					
Total Cyanide	mg/kg	< 2	NONE					
Complex Cyanide	mg/kg	< 2	NONE					
Free Cyanide	mg/kg	< 2	NONE					
Thiocyanate as SCN	mg/kg	< 3	NONE					
Organic Matter (SOM)	%	< 0.1	MCERTS					
Antimony (Sb) (S)	mg/kg	< 1	NONE					
Arsenic (As) (S)	mg/kg	< 2	MCERTS					
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS					
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS					
Chromium (Cr) (S)	mg/kg	< 2	MCERTS					
Chromium (hexavalent)	mg/kg	< 2	NONE					
Copper (Cu) (S)	mg/kg	< 4	MCERTS					
Lead (Pb) (S)	mg/kg	< 3	MCERTS					
Mercury (Hg) (S)	mg/kg	< 1	MCERTS					
Nickel (Ni) (S)	mg/kg	< 3	MCERTS					
Selenium (Se) (S)	mg/kg	< 2	MCERTS					
Vanadium (V) (S)	mg/kg	< 1	MCERTS					
Zinc (Zn) (S)	mg/kg	< 3	MCERTS					
Total Phenols (monohydric)	mg/kg	< 2	NONE					
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) - Total	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°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
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Maidstone
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Soil Analysis Certificate						
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22		
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP129	TP130	TP130		
Project / Job Ref: 22.067	Additional Refs	ES2	ES1	ES2		
Order No: TJS/22.067/00/01	Depth (m)	0.60	0.10	0.60		
Reporting Date: 13/04/2022	DETS Sample No	593365	593366	593367		

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025					
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N/a	MCERTS					
Total Cyanide	mg/kg	< 2	NONE					
Complex Cyanide	mg/kg	< 2	NONE					
Free Cyanide	mg/kg	< 2	NONE					
Thiocyanate as SCN	mg/kg	< 3	NONE					
Organic Matter (SOM)	%	< 0.1	MCERTS		4.4	0.8		
Antimony (Sb) (S)	mg/kg	< 1	NONE					
Arsenic (As) (S)	mg/kg	< 2	MCERTS					
Beryllium (Be) (S)	mg/kg	< 0.5	MCERTS					
Cadmium (Cd) (S)	mg/kg	< 0.2	MCERTS					
Chromium (Cr) (S)	mg/kg	< 2	MCERTS					
Chromium (hexavalent)	mg/kg	< 2	NONE					
Copper (Cu) (S)	mg/kg	< 4	MCERTS					
Lead (Pb) (S)	mg/kg	< 3	MCERTS		120			
Mercury (Hg) (S)	mg/kg	< 1	MCERTS					
Nickel (Ni) (S)	mg/kg	< 3	MCERTS					
Selenium (Se) (S)	mg/kg	< 2	MCERTS					
Vanadium (V) (S)	mg/kg	< 1	MCERTS					
Zinc (Zn) (S)	mg/kg	< 3	MCERTS					
Total Phenols (monohydric)	mg/kg	< 2	NONE					
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10		
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10	42	< 10		
TPH - Aliphatic / Aromatic (C6 - C40) - Total	mg/kg	< 42	NONE	< 42	250	< 42		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP102	TP105	TP105	TP106	TP107
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES2	ES1	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.20	0.45	0.15	0.20
Reporting Date: 13/04/2022	DETS Sample No	593317	593322	593323	593324	593325

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	0.17	0.12	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.13	0.36	0.40	0.37	0.16
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.28	0.35	0.30	0.12
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	0.13	0.14	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.12	0.15	0.14	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.16	0.17	0.21	< 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	< 0.1	0.12	0.14	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 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	< 0.1	< 0.1	< 0.1	< 0.1
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7

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Maidstone
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Soil Analysis Certificate - Speciated PAHs							
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP107	TP109	TP111	TP111	TP112
Project / Job Ref: 22.067	Additional Refs	ES3	ES1	ES1	ES2	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.70	0.20	0.20	0.60	0.15
Reporting Date: 13/04/2022	DETS Sample No	593327	593330	593333	593334	593335

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	0.73	< 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	0.22	1.22	< 0.1	0.14
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.17	0.99	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.45	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.52	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.62	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.16	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.36	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.25	< 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	< 0.1	0.25	< 0.1	< 0.1
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1	2.4	< 1	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1	3.9	< 1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	5.5	< 1.6	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7	5.5	< 1.7	< 1.7

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP112	TP113	TP115	TP116	TP116
Project / Job Ref: 22.067	Additional Refs	ES2	ES1	ES1	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.60	0.20	0.15	0.15	0.40
Reporting Date: 13/04/2022	DETS Sample No	593336	593337	593340	593341	593342

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	0.16	0.21	< 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	0.23	0.38	0.48	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	0.31	0.44	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.16	0.19	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.16	0.41	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	0.21	0.40	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.22	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.14	0.25	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.15	< 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	< 0.1	< 0.1	0.15	< 0.1
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	1.6	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1	1	2.1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	2.9	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7	< 1.7	2.9	< 1.7

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Soil Analysis Certificate - TPH LQM Banded						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP102	TP105	TP105	TP106	TP107
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES2	ES1	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.20	0.45	0.15	0.20
Reporting Date: 13/04/2022	DETS Sample No	593317	593322	593323	593324	593325

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 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
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 >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	< 60	< 60	< 60

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Soil Analysis Certificate - TPH LQM Banded							
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP107	TP109	TP111	TP111	TP112
Project / Job Ref: 22.067	Additional Refs	ES3	ES1	ES1	ES2	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.70	0.20	0.20	0.60	0.15
Reporting Date: 13/04/2022	DETS Sample No	593327	593330	593333	593334	593335

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 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
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	8	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	19	< 10	< 10
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	< 60	< 60	< 60

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Soil Analysis Certificate - TPH LQM Banded							
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP112	TP113	TP115	TP116	TP116
Project / Job Ref: 22.067	Additional Refs	ES2	ES1	ES1	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.60	0.20	0.15	0.15	0.40
Reporting Date: 13/04/2022	DETS Sample No	593336	593337	593340	593341	593342

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 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
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 >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	< 60	< 60	< 60

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Soil Analysis Certificate - TPH LQM Banded							
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP117	TP118	TP119	TP119	TP120
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES1	ES3	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.30	0.15	0.20	0.85	0.20
Reporting Date: 13/04/2022	DETS Sample No	593343	593344	593345	593347	593348

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 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
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	24	3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	54	< 10	< 10	27
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	78	< 30	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	< 60	78	< 60	< 60	< 60

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Soil Analysis Certificate - TPH LQM Banded							
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP120	TP121	TP121	TP122	TP122
Project / Job Ref: 22.067	Additional Refs	ES2	ES1	ES2	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.75	0.10	0.35	0.20	0.50
Reporting Date: 13/04/2022	DETS Sample No	593349	593350	593351	593352	593353

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 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
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 >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	< 60	< 60	< 60

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Soil Analysis Certificate - TPH LQM Banded							
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP123	TP123	TP124	TP125	TP125
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.70	0.10	0.10	0.70
Reporting Date: 13/04/2022	DETS Sample No	593354	593355	593356	593357	593358

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 - C35	mg/kg	< 10	MCERTS	44	< 10	40	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	44	< 30	40	< 30	< 30
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	15	< 3	4	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	49	< 10	20	< 10	< 10
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	18	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	64	< 30	42	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	108	< 60	82	< 60	< 60

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Soil Analysis Certificate - TPH LQM Banded							
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP126	TP127	TP127	TP128	TP128
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES2	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.10	0.10	0.60	0.10	0.60
Reporting Date: 13/04/2022	DETS Sample No	593359	593360	593361	593362	593363

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 - C35	mg/kg	< 10	MCERTS	60	< 10	< 10	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	60	< 30	< 30	< 30	< 30
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	20	< 10	< 10	< 10	< 10
Aromatic >C35 - C44	mg/kg	< 10	NONE	22	< 10	< 10	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	42	< 30	< 30	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	101	< 60	< 60	< 60	< 60

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Soil Analysis Certificate - TPH LQM Banded							
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP129	TP129	TP130	TP130	
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES2	
Order No: TJS/22.067/00/01	Depth (m)	0.20	0.60	0.10	0.60	
Reporting Date: 13/04/2022	DETS Sample No	593364	593365	593366	593367	

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	
Aliphatic >C16 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	4	< 2	
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	106	< 3	
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	98	< 10	
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	42	< 10	
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	250	< 30	
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	250	< 60	

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP102	TP105	TP105	TP106	TP107
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES2	ES1	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.20	0.45	0.15	0.20
Reporting Date: 13/04/2022	DETS Sample No	593317	593322	593323	593324	593325

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

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP107	TP109	TP111	TP111	TP112
Project / Job Ref: 22.067	Additional Refs	ES3	ES1	ES1	ES2	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.70	0.20	0.20	0.60	0.15
Reporting Date: 13/04/2022	DETS Sample No	593327	593330	593333	593334	593335

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

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 22-03124	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	30/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP112	TP113	TP115	TP116	TP116
Project / Job Ref: 22.067	Additional Refs	ES2	ES1	ES1	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.60	0.20	0.15	0.15	0.40
Reporting Date: 13/04/2022	DETS Sample No	593336	593337	593340	593341	593342

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

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Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP117	TP118	TP119	TP119	TP120
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES1	ES3	ES1
Order No: TJS/22.067/00/01	Depth (m)	0.30	0.15	0.20	0.85	0.20
Reporting Date: 13/04/2022	DETS Sample No	593343	593344	593345	593347	593348

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

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Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP120	TP121	TP121	TP122	TP122
Project / Job Ref: 22.067	Additional Refs	ES2	ES1	ES2	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.75	0.10	0.35	0.20	0.50
Reporting Date: 13/04/2022	DETS Sample No	593349	593350	593351	593352	593353

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

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP123	TP123	TP124	TP125	TP125
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.70	0.10	0.10	0.70
Reporting Date: 13/04/2022	DETS Sample No	593354	593355	593356	593357	593358

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

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	31/03/22
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP126	TP127	TP127	TP128	TP128
Project / Job Ref: 22.067	Additional Refs	ES1	ES1	ES2	ES1	ES2
Order No: TJS/22.067/00/01	Depth (m)	0.10	0.10	0.60	0.10	0.60
Reporting Date: 13/04/2022	DETS Sample No	593359	593360	593361	593362	593363

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

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 22-03124	Date Sampled	31/03/22	31/03/22	31/03/22	31/03/22	
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP129	TP129	TP130	TP130	
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES2	
Order No: TJS/22.067/00/01	Depth (m)	0.20	0.60	0.10	0.60	
Reporting Date: 13/04/2022	DETS Sample No	593364	593365	593366	593367	

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

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 22-03124	
AF Howland Associates Ltd	
Site Reference: Station Road, Surfleet, PE11 4DB	
Project / Job Ref: 22.067	
Order No: TJS/22.067/00/01	
Reporting Date: 13/04/2022	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
593315	TP101	ES1	0.20	14	Brown sandy clay
593316	TP101	ES2	0.20	19.8	Brown sandy clay
593317	TP102	ES1	0.15	14	Brown sandy clay
593318	TP103	ES1	0.10	16.7	Brown sandy clay
593319	TP103	ES2	0.45	19.1	Brown sandy clay
593320	TP104	ES1	0.25	13.4	Brown sandy clay
593321	TP104	ES2	0.60	16.3	Brown sandy clay with stones
593322	TP105	ES1	0.20	18.6	Brown sandy clay
593323	TP105	ES2	0.45	18	Brown sandy clay
593324	TP106	ES1	0.15	10.3	Brown sandy clay
593325	TP107	ES1	0.20	17.3	Brown sandy clay
593326	TP107	ES2	0.50	18.9	Brown sandy clay
593327	TP107	ES3	0.70	18.9	Brown sandy clay
593328	TP108	ES1	0.15	13.9	Brown sandy clay
593329	TP108	ES2	0.50	17.2	Brown sandy clay
593330	TP109	ES1	0.20	15.4	Brown sandy clay with stones
593331	TP110	ES1	0.15	17.3	Brown sandy clay with stones
593332	TP110	ES2	0.40	16.6	Brown sandy clay
593333	TP111	ES1	0.20	14.8	Brown sandy clay with vegetation
593334	TP111	ES2	0.60	19.7	Brown sandy clay
593335	TP112	ES1	0.15	13.5	Brown sandy clay
593336	TP112	ES2	0.60	16.9	Brown sandy clay with stones
593337	TP113	ES1	0.20	14.3	Brown sandy clay with stones
593338	TP114	ES1	0.10	14.7	Brown sandy clay
593339	TP114	ES2	0.45	21.1	Brown sandy clay
593340	TP115	ES1	0.15	15.1	Brown sandy clay
593341	TP116	ES1	0.15	27.7	Brown sandy clay with stones
593342	TP116	ES2	0.40	21	Brown sandy clay
593343	TP117	ES1	0.30	20.5	Brown sandy clay
593344	TP118	ES1	0.15	24.4	Brown sandy clay
593345	TP119	ES1	0.20	17.8	Brown sandy clay with stones
593347	TP119	ES3	0.85	19.4	Brown sandy clay
593348	TP120	ES1	0.20	18.2	Brown sandy clay with stones
593349	TP120	ES2	0.75	19.9	Brown sandy clay
593350	TP121	ES1	0.10	15.5	Brown sandy clay
593351	TP121	ES2	0.35	20.3	Brown sandy clay
593352	TP122	ES1	0.20	13.7	Brown sandy clay
593353	TP122	ES2	0.50	20.6	Brown sandy clay
593354	TP123	ES1	0.15	20.2	Brown sandy clay
593355	TP123	ES2	0.70	20.7	Brown sandy clay
593356	TP124	ES1	0.10	16.9	Brown sandy clay
593357	TP125	ES1	0.10	13.4	Brown sandy clay
593358	TP125	ES2	0.70	18.8	Brown sandy clay
593359	TP126	ES1	0.10	12.9	Brown sandy clay
593360	TP127	ES1	0.10	11.7	Brown sandy clay
593361	TP127	ES2	0.60	17.3	Brown sandy clay
593362	TP128	ES1	0.10	11.8	Brown sandy clay
593363	TP128	ES2	0.60	18.8	Brown sandy clay
593364	TP129	ES1	0.20	9.5	Brown sandy clay
593365	TP129	ES2	0.60	17.9	Brown sandy clay
593366	TP130	ES1	0.10	14.1	Brown sandy clay
593367	TP130	ES2	0.60	20.9	Brown sandy clay

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

Insufficient Sample I/S

Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 22-03124
AF Howland Associates Ltd
Site Reference: Station Road, Surfleet, PE11 4DB
Project / Job Ref: 22.067
Order No: TJS/22.067/00/01
Reporting Date: 13/04/2022

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	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
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

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DETS Report No: 22-03498

Site Reference:	Station Road, Surfleet, PE11 4DB
Project / Job Ref:	22.067
Order No:	TJS/22.067/00/01
Sample Receipt Date:	19/04/2022
Sample Scheduled Date:	19/04/2022
Report Issue Number:	2
Reporting Date:	26/04/2022

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.
This report supersedes 22-03498, issue no.1.

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UKAS TESTING 4480

Soil Analysis Certificate						
DETS Report No: 22-03498	Date Sampled	30/03/22	30/03/22	30/03/22	30/03/22	
AF Howland Associates Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Station Road, Surfleet, PE11 4DB	TP / BH No	TP102	TP105	TP111	TP116	
Project / Job Ref: 22.067	Additional Refs	ES1	ES2	ES1	ES1	
Order No: TJS/22.067/00/01	Depth (m)	0.15	0.45	0.20	0.15	
Reporting Date: 26/04/2022	DETS Sample No	594870	594871	594872	594873	

Determinand	Unit	RL	Accreditation					
Asbestos Quantification (S)	%	< 0.001	ISO17025	0.004	< 0.001	0.551	0.007	
Visible Board Debris (S)	%	< 0.001	ISO17025			0.545		
Asbestos Fibre Bundles (S)	%	< 0.001	ISO17025			0.006		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 22-03498
AF Howland Associates Ltd
Site Reference: Station Road, Surfleet, PE11 4DB
Project / Job Ref: 22.067
Order No: TJS/22.067/00/01
Reporting Date: 26/04/2022

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	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
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

APPENDIX D: CALCULATION SHEETS

Asbestos Exposure Risk Model

BRE Cover system calculation

The adopted cover concentration of lead is assumed and is considered a conservative value for imported topsoil. It is expected that the actual concentration will be lower.

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Asbestos exposure risk model *(following guidance set out in CIRIA C733)*

Land use scenario modelled	Residential	Residential	Residential	Residential		
Position/Sample/Depth	TP102 ES1 @ 0.15 m	TP105 ES1 @ 0.45 m	TP111 ES1 @ 0.20 m	TP116 ES1 @ 0.15 m		
Bulk asbestos type	Miscellaneous	Miscellaneous	Cement board	Miscellaneous		
Asbestos fibre type in soil matrix	Chrysotile	Amosite	Amosite	Chrysotile		
Soil type	Intermediate	Intermediate	Intermediate	Intermediate		
Fibre quantity %	0.004	0.001	0.006	0.007		
Exposure Parameters						
Exposure/year (days)	365	365	365	365	-	-
Exposure/day (hours)	1	1	1	1	-	-
Exposure duration/year	365	365	365	365	-	-
Exposure duration (years) (Y_i)	20	20	20	20	-	-
Default occupational year [1] (hours per year)	1920	1920	1920	1920	-	-
If multiple types of asbestos, which has been determined as the risk driver?	Chrysotile	Amosite	Amosite	Chrysotile	-	-
Concentration in air of the main risk driver [2] (fibre/ml/mg/m^3)	0.004	0.02	0.0185	0.007	-	-
Ambient respirable dust levels [3] (mg/m^3)	0.1	0.1	0.1	0.1	-	-
Concentration of fibres in air Ci (fibre/ml)	0.000	0.002	0.002	0.001	-	-
Annual exposure Ei (fibre/ml.hours/year	0.146	0.73	0.67525	0.2555	-	-
Cumulative exposure CEi (fibre/ml/hours)	2.92	14.60	13.51	5.11	-	-
Cumulative exposure based on default occupational year (fibre/ml.years)	0.002	0.008	0.007	0.003	-	-
Mesothelioma Risk						
Lifetime risk for mesothelioma per 100 000 exposed [4]	Insignificant	3 (highest 20)	3 (highest 20)	Insignificant	-	-
Adopted value based on assessment of above result	Insignificant	3	3	Insignificant	-	-
Age at which exposure commences (years)	0	0	0	0		
Taking risk as persisting for 60 or 80 years?	60 years	60 years	60 years	60 years		
Age adjustment factor [5]	2.8	2.8	2.8	2.8		
Adjusted lifetime risk for mesothelioma per 100 000 people exposed [4]	Insignificant	8	8	Insignificant	-	-
Lung Cancer Risk						
Lifetime risk for asbestos related lung cancer per 100 000 people exposed [6]	Probably Insignificant (mesothelioma now dominant)	1 to 3 (mesothelioma now dominant)	1 to 3 (mesothelioma now dominant)	Probably Insignificant (mesothelioma now dominant)	-	-

[1] Based upon land use as specified [Environment Agency *(SR3)* , 2009; CIRIA C733]

[2] Figures 3 to 6 [Addison et al., 1998]

[3] Values based upon example scenarios [CIRIA C733 Box 13.3 and Box 13.4]
(conservative values adopted for allotment and commercial scenarios)

[4] [CIRIA C733 Table 14.1 and Hodgson and Darnton (2000)]

[5] [CIRIA C733 Table 14.2]

[6] Risks below 1 per 100,000 people are described as probably insignificant [CIRIA C733 Table 14.3 and Hodgson and Darnton (2000)]

= User specified data

= Calculated risk statements for asbestos exposure risk

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APPENDIX E: DRAWINGS

Drawing 22.067/01	Site location plan
Drawing 22.067/02	Exploratory hole location plan
Drawing 22.067/03	Spatial distribution of contaminants
Drawing 22.067/04	Proposed remediation plan
Remway 3086 - S01 rev J	Development setting out plan

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North

Circle indicates approximate location of site

Scale 1: 50,000 @ A4

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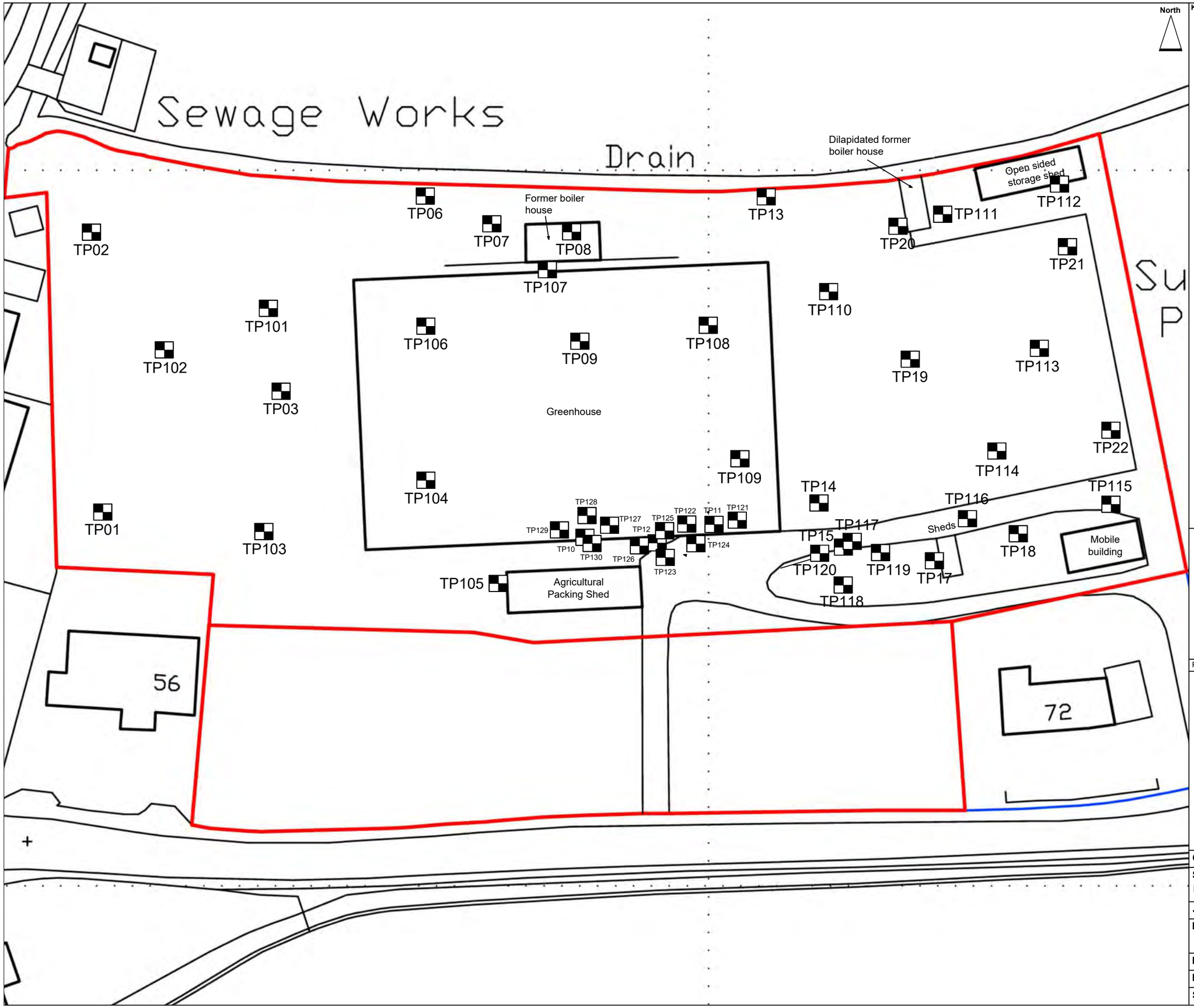
A F Howland Associates
Geotechnical Engineers

Site: Land Adjacent to 72 Station Road, Surfleet, PE11 4DB

SITE LOCATION PLAN

Client : Mike Yould Developments Limited

Date : May 2022 **Dwg :** 22.067/01



Key:

Trial pit location and reference

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mail: admin@howland.co.uk

Client: Mike Yould Developments Limited

Site:
Land Adjacent to 72 Station Road, Surfleet, PE11 4DB

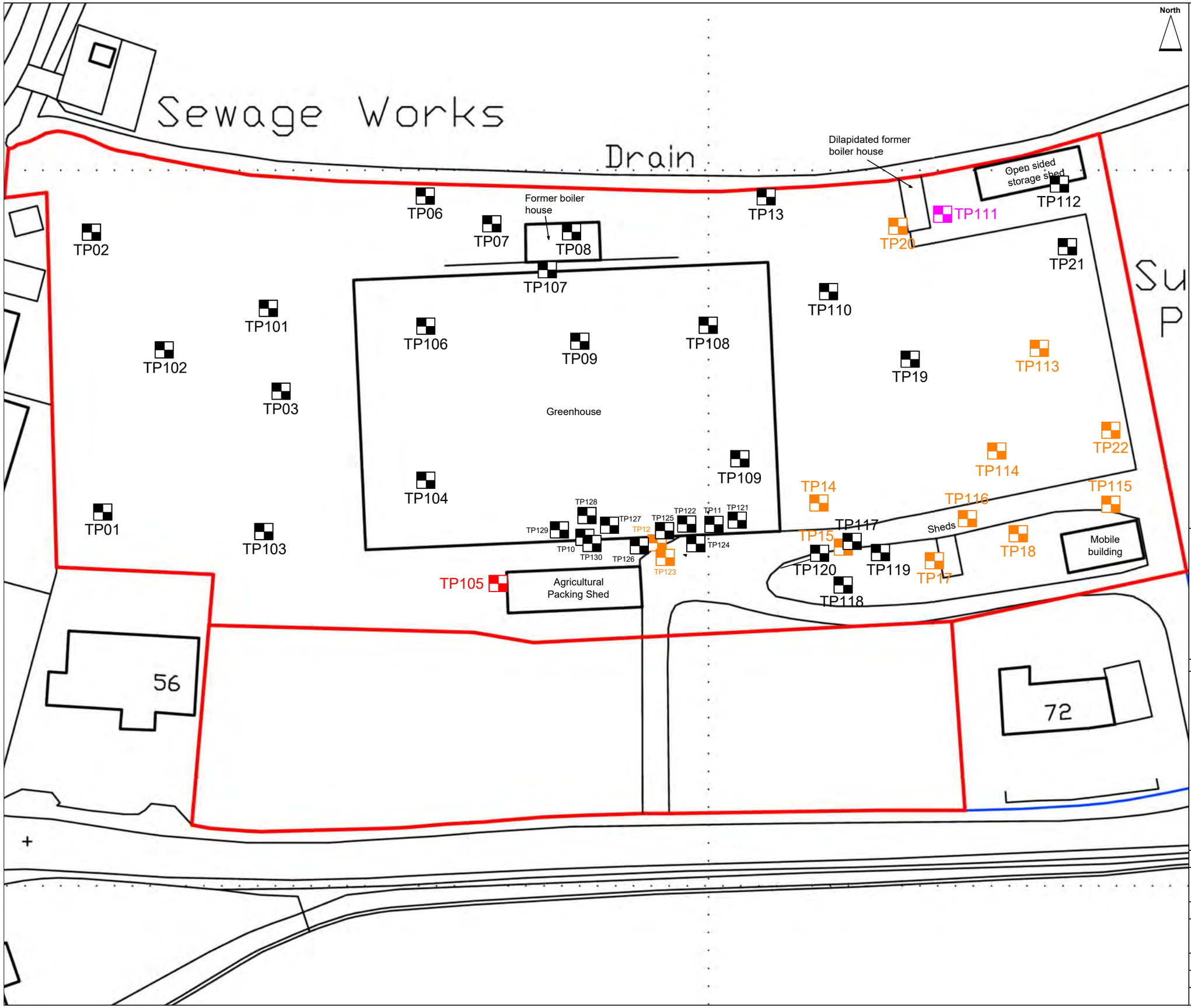
Job No.: 22.067

Drawing Title:
EXPLORATORY HOLE LOCATION PLAN

Date: May 2022

Drawing No: 22.067/02

Scale: 1:500 @ A3



Key:

- Trial pit location and reference where lead is the main contaminant of concern
- Trial pit location and reference where loose amosite fibres are the main contaminant of concern
- Trial pit location and reference where loose amosite fibres and ACM are the main contaminants of concern

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Rev	Date	Revision Description	Drwn	Chkd

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mail: admin@howland.co.uk

Client: Mike Yould Developments Limited

Site:
Land Adjacent to 72 Station Road, Surfleet, PE11 4DB

Job No.: 22.067

Drawing Title:
SPATIAL DISTRIBUTION OF CONTAMINANTS

Date: May 2022

Drawing No: 22.067/03

Scale: 1:500 @ A3

North

VISUAL SCALE 1:500 @ a3

- The finished floor levels of the properties should be set +5.15 AOD
- The minimum finished ground level on the site should be +5.0m AOD which matches the level of Station Road and graded to existing site levels at overall site boundaries.

Dilapidated former boiler house

Open sided storage shed

PLOT 1 Alconbury

PLOT 2 Alconbury Handed

PLOT 3 Barnwell

PLOT 4 Alconbury

PLOT 5 Cambourne

PLOT 6 Badby

PLOT 7 Barnwell Handed

PLOT 8 Foxton

PLOT 9 Elsworth

TP01 TP02 TP03 TP04 TP05 TP06 TP07 TP08 TP09 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27 TP28 TP29 TP30 TP101 TP102 TP103 TP104 TP105 TP106 TP107 TP108 TP109 TP110 TP111 TP112 TP113 TP114 TP115 TP116 TP117 TP118 TP119 TP120 TP121 TP122 TP123

Greenhouse

Agricultural Packing Shed

Sheds

Private Drive

Private road & footpath

ANGLIAN WATER FOUL SEWER

1.6 m 13.8 m 7.5 m 4.5 m 4.5 m 13.3 m 14.3 m 4.5 m 4.5 m 4.5 m 13.1 m 1755 1615 15933 12325 1.8 m 5.5 m

Access Road to be constructed via 225mm limestone, 80mm Tarmac Base Layer with 25mm Wearing Top Layer to accomodate a 18tonne Fire Applicance.

All refuse will be collected via a Private Waste Collection Company

Access to be constructed strictly in accordance with the LCC specification.

External Materials Schedule:

Plots 1, 3 , 5, 7 & 9
- TBS Traditional Red Blend
- Sandtoft 20/20 Antique Slate

Plots 2, 4, 6 & 8
- TBS Euphoria
- Sandtoft 20/20 Flanders

All Plots:
- Cream uPVC Windows
- Dark Grey uPVC Doors
- Black R/W Goods
- Brindle Paving to Drives
- 600 x 600 Red Textured Slabs to all Paths & Patios

Keynote Legend

Key Value	Keynote Text
A	1800mm high close boarded timber fence
C	Existing Boundary Planting / Hedge to remain and be enchanced where required
K	Robin Hill Tree
L	Sheerwater Seedling Tree

Key:

Trial pit location and reference

Area where remediation is required

Notes:

1. Remediation strategy to be finalised and agreed with the Local Planning Authority prior to construction.

2. This remediation plan is specific to remediation in garden area and does not include any remediation to protect any other receptor outlined int he assessment report.

3. Plot 5 front garden area not included as this area is outside of anticipated extent of asbestos contaminated made ground.

4. The Client is to ensure that cross contamination cannot occur between he areas requiring remediation and the areas where contamination has not been recorded.

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Rev	Date	Revision Description	Drwn	Chkd

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

Client: Mike Yould Developments Limited

Site: Land Adjacent to 72 Station Road, Surfleet, PE11 4DB

Job No.: 22.067

Drawing Title: PROPOSED REMEDIATION PLAN

Date: May 2022

Drawing No: 22.067/04

Scale: 1:500 @ A3

Contractors are responsible for checking all dimensions on site prior to work commencing.Due to areas of the structure being covered, unexposed or otherwise inaccessible the notes / specifications of existing materials are subject to confirmation of site when it is feasible to expose the relevant areas of construction. All material schedules are given in good faith and for pricing purposes only. It is the responsibility of the contractor to check their accuracy before ordering any materials.

0m 10m 20m 30m 40m 50m

VISUAL SCALE 1:500 @ a3

- The finished floor levels of the properties should be set +5.15 AOD
- The minimum finished ground level on the site should be +5.0m AOD which matches the level of Station Road and graded to existing site levels at overall site boundaries.

PLOT 1 Alconbury
PLOT 2 Alconbury Handed
PLOT 3 Barnwell
PLOT 4 Alconbury
PLOT 5 Cambourne
PLOT 6 Badby
PLOT 7 Barnwell Handed
PLOT 8 Foxton
PLOT 9 Elm

Private Drive
Private road & footpath
ANGLIAN WATER FOUL SEWER
SCHOOL GROUNDS
PALE BUNGALOW

1.6 m
6.2 m
9.9 m
13.1 m
13.8 m
7.5 m
4.5 m
4.5 m
13.3 m
14.3 m
1755
5503
1615
15933
12325
1.8 m
5.5 m

External Materials Schedule:

Plots 1, 3 , 5, 7 & 9
- TBS Traditional Red Blend
- Sandtoft 20/20 Antique Slate

Plots 2, 4, 6 & 8
- TBS Euphoria
- Sandtoft 20/20 Flanders

All Plots:
- Cream uPVC Windows
- Dark Grey uPVC Doors
- Black R/W Goods
- Brindle Paving to Drives
- 600 x 600 Red Textured Slabs to all Paths & Patios

Access Road to be constructed via 225mm limestone, 80mm Tarmac Base Layer with 25mm Wearing Top Layer to accomodate a 18tonne Fire Applicance.

All refuse will be collected via a Private Waste Collection Company

Access to be constructed strictly in accordance with the LCC specification.

Keynote Legend

Key Value	Keynote Text
A	1800mm high close boarded timber fence
C	Existing Boundary Planting / Hedge to remain and be enchanced where required
K	Robin Hill Tree
L	Sheerwater Seedling Tree

Setting Out Plan

Drg No

3086 - S01 rev J

remway Design Ltd

72 Station Road | Surfleet

APPENDIX F: 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 F1: 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 F2: CLASSIFICATION OF CONSEQUENCE

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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.**

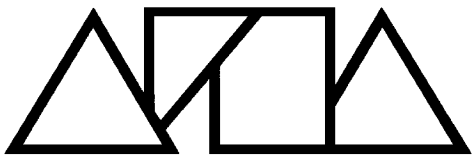
TABLE F3: DESCRIPTION OF RISK

		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 F4: DETERMINATION OF RISK

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

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