



LUSTRE
CONSULTING

JACKSONS FENCING - ASHFORD

PHASE 2 SITE INVESTIGATION





NON-TECHNICAL SUMMARY

Lustre Consulting Limited (Lustre) has been commissioned by HS Jackson and Sons (Fencing) Ltd (the Client) to undertake a Phase 2 Site Investigation with geoenvironmental reporting only for the proposed office extension at a site located off Lymbridge Green, in Stowting Common, Ashford, Kent. The site currently forms part of an operational timber yard and merchants, located within an agricultural land use area. It is understood that the Client requires this Site Investigation to work towards discharging part of condition 3 of the decision notice (ref: Y17/0754/SH), to comprise of a two-storey office extension to the existing offices. The site of the office extension is expected to require a reduction in existing ground levels by up to 1m.

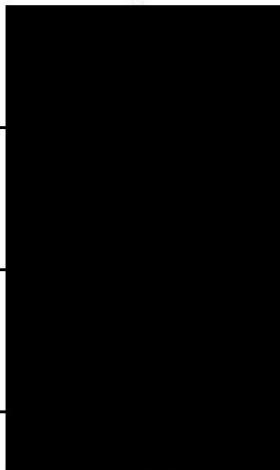
This Site Investigation has been designed to address the risks based on the historic/ current use of the site, and the proposed commercial land use. The investigation comprised five trial pits within the footprint of the extension. Twelve samples were analysed for a range of contaminants. The investigation found ground conditions to generally comprise Anthropogenic Ground (up to 0.7 m deep), over Head deposits (depths ranging from 1.3m bgl to 2m bgl) overlying the Clay-with-flints Formation (depth not proven).

The chemical results detected no exceedance of contaminants above the relevant human health threshold values for commercial use in any of the samples collected from Anthropogenic Ground or natural soils. The risk assessment identified an overall low residual risk to future occupants and site visitors. However shallow soils were found to pose a risk to potable water pipes due to elevated concentrations of petroleum hydrocarbons. The need to remove the Anthropogenic ground recorded up to 0.7m bgl within the footprint of the office expansion will be drawn by the need to reduce ground levels by up to 1m bgl.

The works will therefore generate waste soils requiring removal. From a waste assessment perspective, both the Anthropogenic Ground and natural ground samples were screened in a propriety hazardous waste assessment tool (CatWasteSoil) which indicates that this material is non-hazardous.

Based on the information collected as part of this investigation, the contaminative status of the site is not considered to be prohibitive to the proposed redevelopment of the site. Only limited remedial actions are considered necessary which, together with the groundworks should be detailed in a Remediation Strategy.



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DRAWING 2011-001

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REGISTRATION OF AMENDMENTS

Revision and Date	Amendment Details	Revision Author	Revision Reviewer





1.0 INTRODUCTION

- 1.1 Lustre Consulting Limited (Lustre) has been commissioned by H S Jackson and Son (Fencing) Ltd (the Client) to undertake a Phase 2 Site Investigation with environmental reporting only for the proposed office extension of a site located off Lymbridge Green, in Stowting Common, Ashford, Kent. The assessment has been undertaken in accordance with our fee proposal and scope of works dated 11/12/2017, which was formally approved by H S Jackson and Son (Fencing) Ltd **Error! Reference source not found.** on 18/01/2018.
- 1.2 The site is centered at National Grid Reference 612814,143798 and occupies an approximate area of 0.02ha, as shown in Figure 1. The site is part of an operational timber yard and merchants, located within a predominantly agricultural land use area. It is understood that the Client requires this Phase 2 Site Investigation to work towards discharging part of condition 3 of the decision notice (ref: Y17/0754/SH), for the proposed use. The development is to comprise a two-storey office extension noted as building 'L' within the redline boundary on Figure 1 to the existing offices (shown as building J). The proposed development and its location relative to the wider timber yard area is illustrated in Figure 2. It is noted that the site of the office extension is expected to require a reduction in existing ground levels by up to 1m to accommodate the new structure. This will require the removal of shallow soils to set formation levels.

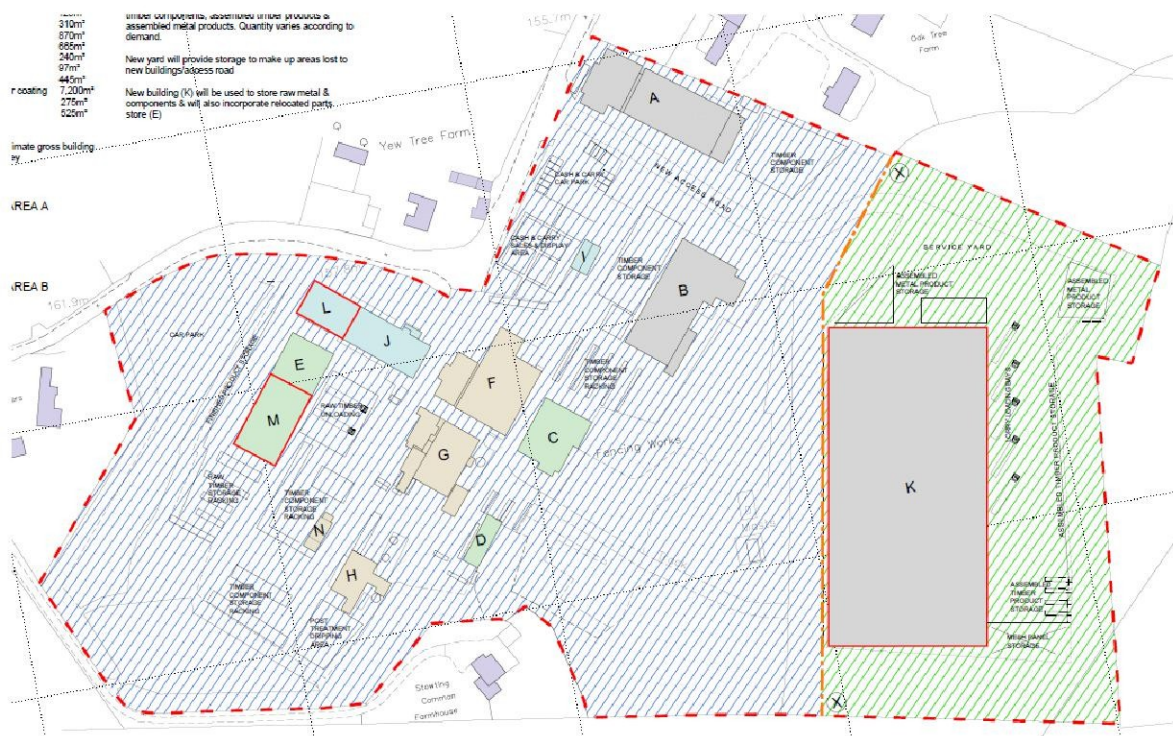


Figure 1: Site Location Plan



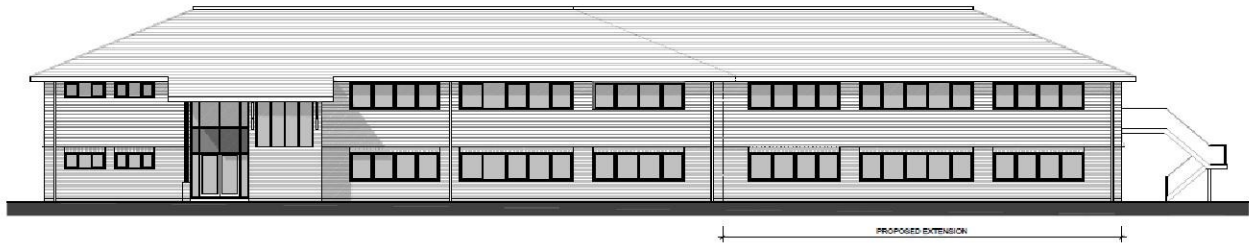


Figure 2: Proposed Site Layout (building L and J)

Scope of Works

- 1.3 The scope of works has been based on the findings of a Phase 1 Desk Study¹. Full reference should be made to the desk study to understand the preliminary conceptual model and basis of this investigation.
- 1.4 The scope of work adopted to meet the above objectives employed a non-targeted approach, is summarised below:
- Ascertain the geological and hydrogeological conditions present at the site by excavating five trial pits;
 - Identify the chemical quality of soils / groundwater underlying the site with reference to current and historical land uses and determine the presence of any unacceptable risks through sample recovery, chemical analysis and assessment;
 - Validate the preliminary conceptual site model and re-assess the risk ratings using the source – pathway – receptor methodology; and
 - Provide conclusions and recommendations to effectively manage and mitigate any unacceptable geoenvironmental risks or liabilities.
- 1.5 The Phase 2 Site Investigation has been prepared in keeping with best practice and current planning guidance, where practicable and in accordance with the approved scope of work. *The National Planning Policy Framework (NPPF)*² advises regulatory consultees to ensure that adequate site investigation information is provided at the initial planning stage, whilst the Environment Agency's *Model Procedures for the Management of Land Contamination*

¹ Preliminary Land Quality Risk Assessment, Stowing Common, Ashford, SLR, Ref: 409.07845.00001, November 2017

² Department for Communities and Local Government, National Planning Policy Framework, March 2012.





(CLR11³) requires a phased, risk based approach when dealing with land affected by contamination in the UK.

- 1.6 This Phase 2 site investigation forms the second stage of an iterative contaminated land assessment, to further investigate the potential sources of contamination and unacceptable risks identified during the Phase 1 Desk Study. The methodology adopted in this Phase 2 site investigation is based on the source-pathway-receptor model as set out in CLR11². More information on Lustre's approach to such assessments can be found at the following link: www.lustreconsulting.com/Services/ContaminatedLandAssessment.aspx and in Appendix A.

Statutory Guidance

- 1.7 References to the term "contaminated land" in this report relate to the statutory definition of contaminated land under the recently published Contaminated Land Statutory Guidance unless otherwise stated (also known as Category 1 and 2 under Part 2A). That definition is: *"any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances on in or under the land that –*
- a) Significant harm is being caused or there is a significant possibility of such harm being caused; or*
 - b) Significant pollution of water environment is being caused or there is significant possibility of such pollution being caused".*
- 1.8 Other terms such as "land affected by contamination" or "land contamination" refer to the much broader categories of land where contaminants are present but usually not at a significant level of risk to be classified as contaminated land under the definition Part 2A (also known as Category 3 or Category 4 under Part 2A).

Report Structure

- 1.9 Chapter 2 presents the intrusive site investigation methodology. The ground conditions encountered during the site works are set out in Chapter 3. Chapter 4 presents a geoenvironmental assessment of the analytical data gathered and Chapter 5 includes a

³ DEFRA/Environment Agency, Model Procedures for the Management of Land Contamination, CLR11, September 2004.





conceptual model based on the findings of the intrusive site investigation works. Chapter 6 presents a summary of conclusions drawn from the investigation and any consequent recommendations are detailed in Chapter 7. An updated qualitative risk assessment is included after the report text.





2.0 SITE INVESTIGATION METHODOLOGY

Introduction

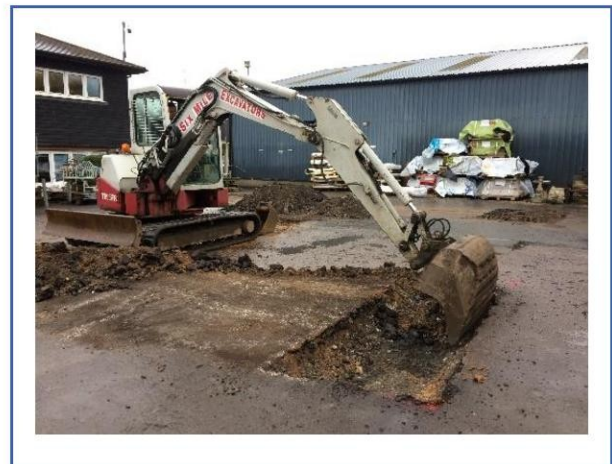
- 2.1 The intrusive site investigation works were undertaken on 24th January 2018 under the direct co-ordination of a suitably trained and qualified consultant employed by Lustre. The intrusive works were carried out with due regard to existing standards and good practice guidelines including *BS10175: 2011+ A1:2013*⁴, *BS5930: 2015*⁵ and guidance produced by the AGS⁶.

Preparatory Works

- 2.2 Prior to commencing with the intrusive works each exploratory location was checked for any readily detectable shallow services. The method employed to avoid buried services involved on-site checking for shallow services detectible by a Cable Avoidance Tool, firstly by the Client and double checked by Lustre.
- 2.3 Exploratory holes were located to obtain the required information to meet the project objectives, whilst avoiding services, access and egress routes and providing a reasonable coverage across the site. Drawing 2011-001 shows the positions of all exploratory locations.



Trial pitting on site



Trial pitting on site

⁴ British Standard – Code of Practice for Investigation of potentially contaminated sites. BS 10175: 2011 + A1:2013.

⁵ British Standard – Code of Practice for Site Investigation. BS 5930: 2015.

⁶ Association of Geotechnical & Geoenvironmental Specialists, AGS Guide to Environmental Sampling, 2010.





Trial Pits

- 2.4 A total of five trial pits (TP1 to TP5) were excavated using a tracked excavator to depths of between 2m bgl and 2.7m bgl. Trial pits extended through the tarmac/Anthropogenic Ground and proved natural strata for at least 1m. Trial pits were positioned to provide good coverage across the site.
- 2.5 Upon completion, all excavations were backfilled with arisings and soils compacted with the excavator bucket.

Field Observations & Soil Sampling

- 2.6 All soil arisings recovered from the Anthropogenic Ground and underlying natural soils were logged to *BS5930: 2015*⁷. Where possible, observations on groundwater ingress and excavation stability were made.
- 2.7 Soil arisings were inspected for visual and olfactory evidence of contamination with samples recovered at varying depths for chemical analysis. Disturbed samples were deposited in suitable containers, prepared and dispatched to a UKAS (United Kingdom Accreditation Service) accredited laboratory in accordance with good practice guidelines.

In-Situ Field Tests

- 2.8 At appropriate depths, soil samples were deposited in sealable plastic bags to allow on-site headspace analysis. Samples were left for at least 20 minutes before analysis. A photo-ionisation detector (PID) with 10.6eV lamp was used to measure the concentration of volatile organic compounds (VOC) within the headspace. Soil samples were agitated during analysis to encourage the release of any volatiles.

⁷ British Standard – Code of Practice for Site Investigation. BS 5939: 2015.





Chemical Analysis (Environmental)

2.9 A total of 12 soil samples were scheduled for chemical testing. Samples were analysed for a range of determinands, which considers the potential contaminants associated with the current/historical site uses, as follows:

- Metals: arsenic, cadmium, chromium (inc. hexavalent), mercury, lead, nickel, selenium, water soluble boron, copper and zinc;
- pH and water soluble sulphate;
- Total phenols;
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs, total and speciated EPA 16);
- Speciated Total Petroleum Hydrocarbons (TPH CWG);
- BTEX (including MTBE);
- Volatile Organic Compounds (VOC);
- Asbestos screen;
- Total Organic Carbon (TOC).

NB: Not all samples were analysed for the full suite of determinands listed above.

2.10 The environmental analysis was undertaken by QTS Environmental Limited at their UKAS accredited laboratory in Lenham Heath, Kent. The results of the chemical analysis are reported in Chapter 5 and copies of the laboratory test certificates are included in Appendix D.





3.0 GROUND CONDITIONS

Introduction

- 3.1 This chapter collates all the factual information from the site investigation, including field observations and in-situ testing, to present a summary of the ground conditions encountered during the intrusive works.

Ground Cover

- 3.2 Ground cover across the entire investigation area comprised bituminous material in the form of tarmacadam to 0.05m bgl.

Anthropogenic Ground

- 3.3 Anthropogenic Ground was encountered in all exploratory locations with recorded depths ranging from 0.4m bgl to 0.7m bgl (average thickness of 0.5m). The thickest area of Anthropogenic Ground was recorded towards the southern site boundary (TP1 and TP2). The ground conditions varied across the site but were similar in composition. Underlying the tarmacadam, sub-base material comprising black slightly sandy angular to subrounded fine to coarse gravel of flint and tarmacadam, which extended to 0.15m bgl across the site.
- 3.4 At TP1, greyish brown slightly silty gravelly sand with a low cobbles content was noted to extend to 0.55m bgl. Gravel was recorded as flint, brick, clinker, concrete and coal, with cobbles described as concrete, brick and possible clinker. Rare plastic and a large textiles membrane were also present. Dark greyish brown slightly sandy gravelly clay to 0.7m bgl was present underlying the sandy material.
- 3.5 Light brown sandy gravel of flint was noted to underlie the sub-base at TP4 and TP5, extending to 0.2m and 0.25m bgl respectively.
- 3.6 Underlying the sub-base material at TP2 and TP3, and the light brown sandy gravel at TP4 and TP5, dark brownish / greyish black (slightly silty at TP5 only) sandy gravel with a low to medium cobble content was encountered. Gravels were described as tarmacadam, limestone, brick, concrete, flint, clinker and coal, with cobbles noted as tarmacadam, concrete and clinker. A textile membrane was noted at the base of the Anthropogenic Ground at TP3, TP4 and TP5. Rare cobble-sized wood fragments were noted within TP1 and TP3. At TP4 and TP5, sand was noted as ash.





- 3.7 No significant visual or olfactory evidence of hydrocarbon or solvent-type contamination was noted within the Anthropogenic Ground.
- 3.8 In-situ headspace readings within the Anthropogenic Ground did not indicate the presence of volatile compounds. Readings of 0ppm recorded within the Anthropogenic Ground at all locations using the handheld PID field equipment.



Anthropogenic Ground at TP1



Anthropogenic Ground at TP4

Head Deposits

- 3.9 Head was encountered in all locations to depths ranging from 1.3m bgl to 2m bgl, with an average maximum thickness of 1.6m. The Head deposits typically comprised yellowish brown sandy clayey SILT with fine sand. Yellowish brown slightly silty fine SAND was present between 1.0m to 1.4m bgl at TP5.
- 3.10 No visual or olfactory evidence of contamination was noted within the Head. Greenish light grey slightly sandy SILT was noted at TP3 between 0.4m and 0.5m.
- 3.11 In-situ headspace readings within the Head did not indicate the presence of volatile compounds with a maximum concentration of 0.1ppm recorded in TP3 between 0.4m and 0.5m bgl, and within TP5 at 0.6m bgl.





Greenish light grey SILT at TP3



Head deposits at TP2

Groundwater

- 3.12 Groundwater strikes were not recorded in the Head Deposits.

Clay-with-flints Formation

- 3.13 Clay-with-flints Formation was encountered in all exploratory locations, recorded to base of the excavations (average thickness of 0.9m). The thickest area of Clay-with-flints Formation was recorded in TP1. The depth to the Clay-with-flints Formation was not proven during the investigation.
- 3.14 The Clay-with-flints Formation was typically encountered as a yellowish brown slightly sandy / slightly gravelly silty CLAY with a low cobble content. Gravel was recorded as subangular to subrounded fine to coarse flint, with cobbles noted at subangular flint.
- 3.15 No visual or olfactory evidence of contamination was noted within the Clay-with-flints Formation.
- 3.16 In-situ headspace readings within the Clay-with-flints Formation did not indicate the presence of volatile compounds with a maximum reading of 0ppm recorded within all locations.





Clay-with-flints Formation at TP4



Clay-with-flints Formation at TP5

Groundwater

- 3.17 Groundwater strikes were not recorded in the Clay-with-flints Formation.





4.0 GEOENVIRONMENTAL ASSESSMENT

4.1 Factual information from the site investigation and subsequent analytical data has been subjected to several semi-quantitative risk assessments. The results of these assessments are presented in Appendix E and summarised in this Chapter. The assessments undertaken include:

- Generic quantitative risk assessment (GQRA, human health);
- Water pipeline suitability test;
- Phytotoxicity assessment;
- Waste classification assessment (WM3);

Generic quantitative risk assessment (GQRA, human health)

4.2 The Environment Agency 'Model Procedures for the Management of Land Contamination, CLR 11' report provides a risk management methodology for identifying hazards and assessing risk associated with land affected by contamination. CLR 11 adopts a tiered approach to determining risk, with the first tier involving the evaluation of pollutant linkages using assessment criteria / screening levels for contamination.

4.3 To determine whether contamination presents an unacceptable level of risk to human health, concentrations of potential contaminants are screened against risk threshold values. Historically, these values had been in the form of Generic Assessment Criteria (GAC) and Soil Guideline Values (SGVs), published by regulatory and advisory bodies. However, in response to revised Part 2A Statutory Guidance, Defra published Category 4 Screening Levels (C4SLs) for six determinands to provide a simple test for deciding when land is 'suitable for use' and demonstrably not 'contaminated land'. The supporting documentation from Defra⁸ acknowledges that where C4SLs exist, these values represent a greater risk threshold (i.e. low risk) rather than the previous SGVs/GACs (i.e. no risk). Acknowledging that the C4SLs were primarily intended for use under Part 2A Statutory Guidance, LQM in collaboration with the Chartered Institute of Environmental Health (CIEH), subsequently published a third set of generic assessment criteria known as LQM/CIEH Suitable 4 Use Levels (S4ULs)⁹. The S4ULs

⁸ SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, March 2014

⁹ The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3455. All rights reserved





are based on the 'minimal or tolerable level of risk' as defined in previous Environment Agency guidance (namely SR2¹⁰) which underpinned all previous SGVs/GACs.

- 4.4 The National Planning Policy Framework (NPPF) ¹¹ requires that planning decisions undertaken by the Local Planning Authority should decide if a site is suitable for its new use and not just whether the site is determinable under Part 2A. Whilst Defra states that the C4SLs could be applied under the planning regime, it is acknowledged that these screening levels were primarily published to support the Part 2A Statutory Guidance. Taking this into account, the S4ULs will be used in the first instance. Where an exceedance above these levels is identified, comparison against C4SLs will be undertaken, with consideration given to the applicability of a less conservative threshold.
- 4.5 Further information on Lustre's approach to human health risk assessment is provided in Appendix A.
- 4.6 SGVs and GACs for a commercial land use scenario have been adopted with a soil organic matter content parameter of 2.5% for the Anthropogenic Ground and 1% for natural soils, based on site-specific organic matter content data. The commercial land use scenario is consistent with the proposed development plans set out in Chapter 1. Chemical analysis data has been compared to these risk thresholds, as presented in the Environmental Assessment Appendix; this screening process forms the generic quantitative risk assessment (GQRA).

Anthropogenic Ground

- 4.7 A total of four samples recovered from the Anthropogenic Ground underwent chemical analysis for a range of general determinands, including asbestos, inorganics, metals, PAH, TPH and VOCs. SVOCs were also analysed for on selected soil samples.
- 4.8 Testing for asbestos was undertaken on all samples analysed from the Anthropogenic Ground, and asbestos was recorded as absent in all samples.
- 4.9 Of the determinands tested, a range of inorganics and metals (cyanide (total), mercury, seleniumnaphthalene, acenaphthylene, acenaphthene, fluorene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, di-benzo(a,h)anthracene, benzo(ghi)perylene), ten

¹⁰ Environment Agency, Human Health Toxicological Assessment of Contaminants in Soil (SR2), January 2009

¹¹ Department for Communities and Local Government, National Planning Policy Framework, March 2012





TPH fractions (out of 14), BTEX (benzene, toluene, ethylbenzene, m & p-xylene, o-xylene), and phenol were **not** recorded above the limit of detection (LOD). Of the VOCs analysed for, the majority were recorded below the limit of detection.

- 4.10 Several determinands limited to TPH and metals (arsenic, chromium, copper, lead, nickel, zinc), were recorded slightly above the limit of detection but **below** their respective threshold, as shown in the Environmental Assessment Appendix. These reading refer to samples taken from depths of 0.2 to 0.3m bgl in TP2, TP3, TP4 and TP5.
- 4.11 In summary, none of the determinands analysed for in the Anthropogenic Ground exceeded the risk thresholds for commercial land use and the chemical quality of the natural ground is not considered to present a risk to human health.

Natural Soils

- 4.12 One sample recovered from the natural soils underwent chemical analysis for a range of general determinands, including and VOCs.
- 4.13 Several determinands limited to metals (arsenic, chromium, copper, lead, nickel, zinc), were recorded slightly above the limit of detection but **below** their respective threshold, as shown in the Environmental Assessment Appendix.
- 4.14 In summary, none of the determinands analysed for in the natural soils exceeded the risk thresholds for commercial land use and the chemical quality of the natural ground is not considered to present a risk to human health.

Water Pipeline Suitability Test

- 4.15 The development may require the installation of new potable water pipes. UK Water Industry Research (UKWIR) guidance¹² sets chemical concentration thresholds that are used to specify a pipe design that is considered safe. Ideally, samples should be taken along the route of the proposed pipeline, but this is not always known or practicable at the time of the investigation. UKWIR also recommends that determinands tested are based on the historical use of the site.

¹² UK Water Industry Research (UKWIR). Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. Ref. 10/WM/03/21. 2010





- 4.16 Available analytical data taken from soils has been compared against the UKWIR thresholds. The assessment of volatile and semi-volatile organic compounds (VOCs/SVOCs) and nitrobenzene has been undertaken based on the historical use of the site. The assessment of mineral oil, in this case, comprises speciated TPH which provides a breakdown of the hydrocarbon fractions.
- 4.17 The available testing results indicate that soil concentrations pose a risk to potable water pipes. Soil data failed the tests relating to PE pipes for Group 3 (Light to mid-range hydrocarbons). In accordance with UKWIR Guidance, PE pipes are not considered suitable for the site and that PVC pipe will be required to prevent contamination of polymeric services.
- 4.18 Water pipes will likely be placed at a minimum depth of 750mm as normally required by UK water authorities and therefore this will most likely be in the Head deposits based on ground conditions.

Phytotoxicity Assessment

- 4.19 The recorded concentrations of copper, nickel and zinc have been compared against the BS3882: 2007¹³ thresholds for phytotoxic contaminants in soils to determine if a potential risk to healthy plant growth exists.
- 4.20 Concentrations of copper, nickel and zinc were recorded below their phytotoxicity threshold values for samples from the Anthropogenic Ground. Concentrations of copper, nickel and zinc were recorded below their phytotoxicity threshold values for samples from the natural soils.

Waste Classification Assessment

- 4.21 The development is likely to require soils to be removed as part of the initial groundworks including but not limited to the installation of services, new foundations or soil remedial action. Bulk excavation of soils is expected at this site during enabling works where final formation levels are subject to change, with excess arisings generated. It is therefore necessary to consider whether soils arising from the site would be re-used on-site or disposed of off-site.

¹³ British Standard BS 3882:2007 (Specification for topsoil and requirements for use)





- 4.22 Guidance set out in the Waste Framework Directive and the Environment Agency's *Technical Guidance WM3 Hazardous Waste*¹⁴, provides information and controls on how sites should manage and control waste soils. For soils to be re-used on site, these must be uncontaminated naturally occurring soils; natural soils are not considered a waste if re-used on the source site for the purposes of development under the Waste Framework Directive. Man-made or contaminated soils must be disposed of off-site. To enable off-site disposal, the waste soils must be assessed against a series of criteria to understand its hazardous properties and determine the most appropriate disposal route. It is also noted that the guidance requires any mixed wastes to be assessed separately and undergo a form of pre-treatment and/or segregation prior to disposal. Mixed wastes could include soils contaminated with ACM – in this case both the ACM fragments and soils would require separate assessment. Mixing of hazardous wastes and soils with different hazardous substances (hydrocarbons, asbestos etc) is prohibited under the Waste Framework Directive.
- 4.23 The first stage of the waste assessment, as set out in Technical Guidance WM3 Hazardous Waste, requires soils to be tested to determine if the material should be classified as hazardous or not hazardous. The analytical suite adopted for the chemical testing was based on the historic and current use of the site and any potential contaminants that may be present.
- 4.24 The results of the laboratory analysis were screened in a propriety hazardous waste assessment tool (CatWasteSoil) to determine if the soils would be considered hazardous from a waste disposal perspective. Concentrations of each contaminant were screened to determine if they exceed any of the sixteen hazardous properties (HP) and/or statements as set out the Environment Agency's Technical Guidance WM3 (Guidance on the classification and assessment of waste, 1st edition 2015).
- 4.25 None of the determinands analysed for were present at concentrations above any hazardous thresholds and, as such, soils from the Anthropogenic Ground and natural soils are considered non-hazardous for waste disposal.

Aggressive Chemical Environment for Buried Concrete

- 4.26 The analytical data for soil pH and water-soluble sulphate is summarised in the Environmental Assessment Appendix, along with the corresponding BRE classification. The 'brownfield'

¹⁴ Technical guidance WM3: Guidance on the Classification and Assessment of Waste (1st Edition 2015). Environment Agency.





scenario was applied to the results from the Anthropogenic Ground and the 'natural' scenario to results from the Head deposits and Clay-with-flints Formation. A static groundwater scenario has been selected for the buried concrete assessment for the Anthropogenic Ground and natural soils based on groundwater conditions observed on site.

- 4.27 From the Anthropogenic Ground, four samples were tested along with four samples from the natural soils. The characteristic values for the Anthropogenic Ground for pH and water-soluble sulphate were determined as 7.4 and 1.78g/l respectively, giving a Design Sulphate (DS) classification of DS1 and an associated Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1s. The characteristic values for the natural soils for pH and water-soluble sulphate were determined as 6 and 0.33g/l respectively, giving a DS classification of DS1 and an associated ACEC classification of AC-1s.





5.0 PHASE 2 CONCEPTUAL MODEL & RISK ASSESSMENT

Introduction

- 5.1 The findings of the site investigation and subsequent semi-quantitative risk assessments have been used to inform the conceptual model and qualitative risk assessment. A summary of the conceptual model is provided below, and the qualitative risk assessment is included at the end of this report.

Conceptual Model

- 5.2 The objective of the conceptual model is to firstly identify potential contaminant sources, pathways and receptors relating to the site and surrounding area based on the findings of this investigation. This information is then collated, and a qualitative risk assessment carried out in line with good practice and current guidance^{15,16} to assess any viable source-pathway-receptor pollution linkages. The potential for a pollution event to occur is then evaluated using a risk classification tool¹⁷. The level of risk is assigned by considering the likelihood that a pollution event might occur with the consequence its occurrence. The consequence is essentially a measurement of the severity of a hazard or source (e.g. contaminated soil) and sensitivity of the receptor (e.g. aquifer type or end user).
- 5.3 A preliminary conceptual site model was included within the previous Preliminary Land Quality Risk Assessment¹⁸, which identified several potential sources of contamination attributable to the historic and current site uses. This Phase 2 Site Investigation was subsequently designed to further assess the identified potential sources of contamination whilst also gathering information on the environmental setting and receptors (e.g. ground conditions, groundwater etc.). A summary of the updated identified sources and receptors have been summarised in the following text.

¹⁵ Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66, NHBC, 2008.

¹⁶ Construction Industry Research and Information Association (CIRIA). Contaminated Land Risk Assessment. A Guide to Good Practice. CIRIA C552 2001.

¹⁷ Department of the Environment, Transport and the Regions, Environment Agency and Institute of Environmental Health. Guidelines for Environmental Risk Assessment and Management. HMSO July 2000.

¹⁸ Stowing Common, Ashford, Preliminary Land Quality Risk Assessment, SLR, 2017, Ref 409.07845.00001





Potential Sources of Contamination

- 5.4 The following potential sources of contamination have been identified based on the findings of the investigation, in-situ testing and laboratory results. The initial sources of contamination identified in the Preliminary Land Quality Risk Assessment report have been referred to below where relevant, with update comments from the Phase 2 findings in italics.
- 5.5 Identified Source: On site - Entire Site Area: The potential presence of ACS including imported sub-base materials and previous renovation works. *No asbestos fibres were detected in any samples analysed, and ACM was not recorded in the investigation. This suggests that asbestos contamination it is unlikely to be widespread throughout the shallow soils.*
- 5.6 Identified Source: On site - Entire Site Area: The historical use of site and current operational use of the site as an operational timber yard and merchants. A layer of anthropogenic soils found below the site of the proposed office extension,
- *No elevated arsenic, lead, and only four PAH compounds (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, di-benzo(a,h)anthracene) and EPH were recorded above the limits of detection but below the commercial end use thresholds on soils analysis from the Anthropogenic Ground..*
 - *No elevated concentrations of metals above the phytotoxicity assessment criteria.*
 - *Elevated concentrations of TPH/EPH above the drinking water assessment criteria for PE pipes. Given that the maximum depth of Anthropogenic Ground at the site is 0.7m bgl and that potable water pipes will be placed at a depth of >0.7m bgl in accordance with water supplier requirements, any new services are likely to be placed in natural soils. Based on the ground profile PE pipes are not considered suitable for the site and that PVC pipe will be required to prevent contamination of polymeric services.*
- 5.7 Identified Source: Off site, industrial operations: Small scale industrial land uses, including the manufacture of wood products, and use of wood preservatives (such as creosote) where used in close proximity to the site. *During the site investigation no groundwater was encountered. As a result, groundwater as a receptor and pathway for migration has been discounted from the risk assessment.*





Identified Receptors and Pollutant Pathways

- 5.8 The majority of receptors and potential pollutant pathways identified in the Preliminary Land Quality Risk Assessment are still considered to be viable. However, as ground water was not encountered during the site investigation, nor is a *continuous body of shallow groundwater* anticipated based on the geology, a lateral pollution pathway is not considered to be viable. As such, off-site sources of potential contamination have been discounted. The Clay-with-flints Formation will also act as a suitable aquitard to prevent vertical migration to the underlying Chalk.
- 5.9 Based on the above, the CSM and qualitative risk assessment is presented at the rear of this report.





6.0 CONCLUSIONS

- 6.1 A Phase 2 Site Investigation has been undertaken to support the proposed office extension at an operational timber yard and merchants located off Lymbridge Green, in Stowting Common Ashford, Kent. The objective of the works was to provide information on the contaminative status of the site whilst obtaining information on the ground conditions.
- 6.2 It is understood that the client requires this Phase 2 Site Investigation to assist in the discharge of planning conditions relating to the proposed development, understood to comprise of an office extension.

Ground Contamination

- 6.3 The risk ratings assigned in the risk assessment table (rear of report) and summarised in this Chapter are based on information obtained from the intrusive works, chemical testing and field monitoring (where carried out). The qualitative nature of the risk assessment is not absolute. Although very low and low risks may have been assigned to various pollutant linkages, the risk cannot be completely eliminated (i.e. "no risk"). Therefore, residual risks will remain which should not be discounted on the basis that the risk is low.
- 6.4 Whilst there was no consummative elevations that exceeded commercial end land use, the residual risk which remains, will be further reduce as it is understood that much of the shallow Anthropogenic Ground (recorded to 0.7m bgl) will require removal to accommodate the office extension, with formation levels up to 1m bgl. The foundations and associated ground floor slabs are likely to be placed within the natural soils. Therefore the management of soils will be driven prudently by waste disposal of the Anthropogenic Ground.

Water Pipeline Suitability Assessment

- 6.5 The available testing results indicate that soil concentrations pose a risk to potable water pipes. Soil data failed the tests relating to PE pipes for Group 3 (Light to mid-range hydrocarbons). In accordance with UKWIR Guidance, PE pipes are not considered suitable for the site and that PVC pipe will be required to prevent contamination of polymeric services. A **moderate/low** risk rating has been assigned to potable water pipes.





Asbestos Containing Materials (ACM) / Asbestos Containing Soils (ACS)

- 6.6 ACM was not recorded within the site investigation in the soils. Testing for asbestos was undertaken on nine samples from the Anthropogenic Ground and was not found to be present in any of the samples tested. As such, a **low** risk rating has been assigned to future occupants and site visitors.

Waste Classification Assessment

- 6.7 The results of the laboratory analysis were screened in a propriety hazardous waste assessment tool (CatWasteSoil) to determine if the soils would be considered hazardous from a waste disposal perspective. Concentrations of each contaminant were screened to determine if they exceed any of the sixteen hazardous properties (HP) and/or statements as set out the Environment Agency's Technical Guidance WM3 (Guidance on the classification and assessment of waste, 1st edition 2015).
- 6.8 None of the determinands analysed for were present at concentrations above any hazardous thresholds and, as such, soils from the Anthropogenic Ground are considered non-hazardous for waste disposal.

Statutory Designation

- 6.9 The *National Planning Policy Framework (NPPF)* states that "land should be suitable for its new use and as a minimum, after carrying out remediation (if required), the land should **not** be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990". It is our opinion that based on the findings of this Phase 2 Site Investigation; it is unlikely the site would be designated as statutory contaminated land by the Local Authority under the provision of the published Statutory Guidance. It is advisable however, that any recommendations made in Chapter 8 are implemented in line with current guidance and good practise, especially where verification of the risk assessment is necessary.





7.0 RECOMMENDATIONS

- 7.1 Based on the information collected as part of this investigation, the contaminative status of the site is not considered to be prohibitive to the proposed development at the site. Based on these findings, specific remedial actions are not considered necessary for this site, and the need to remove the Anthropogenic Ground is driven by the ground works required to accommodate the new office expansion. However, the management of unforeseen contamination requires consideration and remains a possibility until groundworks have been completed. Notwithstanding this limited remediation actions as recommended including the upgrading of potable water pipes if new pipes are to be installed.

Remedial Recommendations

- **Upgrading of Potable Water Pipes:** Potable water pipes will require upgrading to barrier pipe where installed.

- 7.2 Full details of the above remedial measures earthworks strategy and the corresponding validation requirements should be provided within a Remediation Strategy report. This will also cover managing any unforeseen contamination.

Waste Management Recommendations

- 7.3 None of the determinands analysed for were present at concentrations above any WM3 hazardous waste thresholds and as such soils from the Anthropogenic Ground and natural ground are considered not hazardous for waste disposal under WM3. The result of the propriety hazardous waste assessment tool (CatWasteSoil) indicates that this material should be disposed of at a non-hazardous landfill. A WAC test may be requested by the waste carrier and landfill operator in order to verify suitability and acceptance. It is possible that this may change the waste classification status.
- 7.4 Copies of all signed waste disposal conveyance notes clearly showing the waste receivers address and waste licensing details should be kept on file safe and secure in case these require inspection by waste regulators and/or needed as a record for Remediation Validation.
- 7.5 Where waste is to be taken off-site for disposal, waste producers will be liable for landfill tax, chargeable at either a lower rate or a standard rate. The standard landfill rate tax is around £86.10 per tonne. The lower rate landfill tax which applies to less polluting wastes such as naturally occurring soils and rock, concrete etc is around £2.70 per tonne.





Remediation Strategy and Validation Works

- 7.6 This Phase 2 Site Investigation sets out a broad approach to dealing with the contamination issues present at the site and managing any unforeseen contamination. Once this Phase 2 report has been approved by the local authority, a detailed Remediation Strategy, in report format, should be prepared to confirm the works summarised above. The Remediation Strategy would formulate in detail the proposed ground works based on final formation levels depths, site layout etc. During the remedial works, verification may need to be undertaken which would include the soil sampling and inspection/testing of any imported materials/soils used to ensure its suitability for use. Records of any off-site disposal of excavated soils, with the conveyance and waste transfer notes would also be collected. This information would then be documented in a Verification Report in line with the Environment Agency's Evidence, Verification of Remediation of Land Contamination¹⁹ to demonstrate that the remedial works have been undertaken to an acceptable level and in accordance with this report.

Unforeseen Ground Contamination

- 7.7 A reasonable amount of skill and care, as expected, has been used to deliver this investigation in accordance with the agreed scope of work and meet the required objectives. However, the potential for unforeseen contamination to be present, or encountered during future groundworks, maintenance works and/or site clearance/redevelopment works cannot be entirely eliminated. This will be particularly important when working within the vicinity of areas that were not investigated, or the method of investigation employed was limited due to safety (i.e. live underground services), access, financial, public relations, third party intervention and/or risk etc. which influenced the scope of the investigation. A site investigation can only provide a snapshot of the ground conditions encountered at the time covering a relatively small proportion of the site, with samples only representing discrete parcels of ground. Care and diligence is still advised even if a site investigation records a low or very low risk of contamination. Lustre cannot be held responsible for unforeseen contamination that may be present or encountered in the future.

¹⁹ Environment Agency, Evidence, Verification of Remediation of Land Contamination, SC030114/R1, 2010



**CONCEPTUAL
MODEL & RISK
ASSESSMENT**

CONCEPTUAL SITE MODEL & QUALITATIVE RISK ASSESSMENT

2011

Jacksons Fencing - Ashford

Report Ref: 2011_FP01.1-CSM



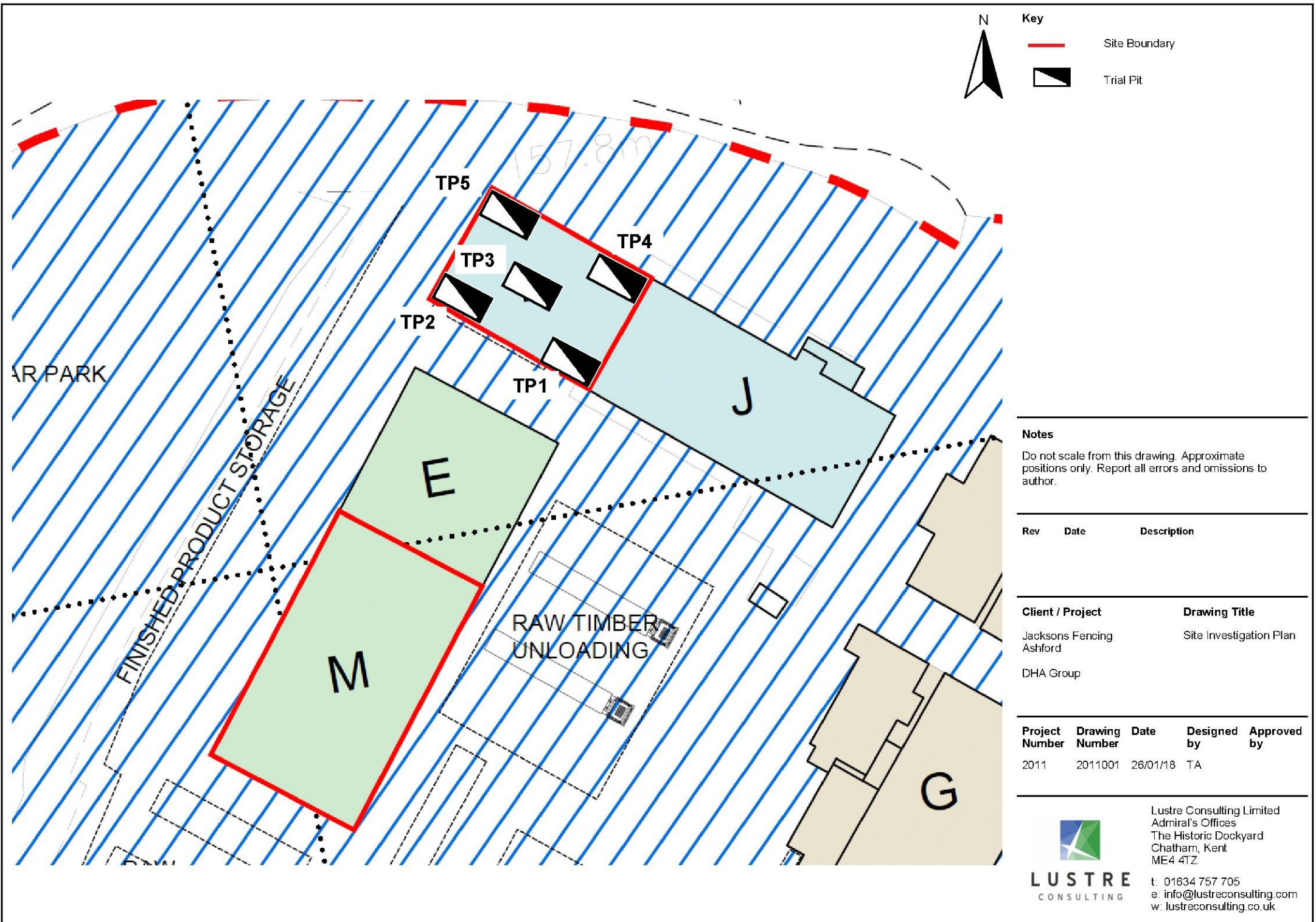
LUSTRE
CONSULTING

CONCEPTUAL SITE MODEL					QUALITATIVE RISK ASSESSMENT			
Source		Pollutant	Pathway	Receptor	Likelihood of Occurrence	Consequence (severity)	Potential Risk	Justification of Risk
On-site	Anthropogenic Ground associated with historical use of site and current operational use of the site as an operational timber yard & merchants	Asbestos, metals, inorganics, PAH, TPH	Inhalation of contaminated dusts, gases and vapours, dermal contact and direct ingestion of contaminated soils	Future site occupants and site visitors	Low Likelihood	Mild	Low	See Notes: 1, 2, 3,
				Ground / construction workers	Unlikely	Minor	Very Low	See Notes: 1, 2, 5,
		Inorganics, Metals, PAH, TPH	Vertical mixing of groundwater	Deep groundwater within the bedrock geology	Unlikely	Mild	Very Low	See Notes: 1, 2, 4, 6, 7, 8
				Surface water runoff	Surface water	Low Likelihood	Mild	Low
			Adjacent land		Low Likelihood	Mild	Low	See Notes: 1, 2, 4, 6, 7
		pH, sulphates, TPH	Chemical attack from aggressive ground conditions (pH and water soluble sulphate) and shallow contamination	Buried services and below ground structures and foundations	Unlikely	Medium	Low	See Notes: 1, 2, 9

JUSTIFICATION NOTES:

- 1 Anthropogenic Ground generated from previous construction on-site
- 2 Contamination likely minor, with possible sporadic localised areas of higher contamination
- 3 Widespread hardstanding breaks pollutant linkages to end users
- 4 No above threshold contaminants noted soil samples tested during Site Investigation works, and it is understood that formation levels will be loved by approximately 1m removing the anthropogenic ground
- 5 Construction workers - use of appropriate PPE and awareness of potential hazards through 'toolbox' talks
- 6 Identified sources likely localised and not significant
- 7 Site is not located in an SPZ, and there are no water abstractions listed within 1km
- 8 Clay-with-flints Formation, forms an aquitard preventing any mixing with deeper groundwater.
- 9 Potable water pipes likely laid in natural soils

DRAWINGS



**APPENDIX A:
CONTAMINATED
LAND NOTES**

CONTAMINATED LAND ASSESSMENT NOTES

LAND USE

This section establishes the former and current land uses which may have caused contamination or given rise to environmental concerns on the site. An inspection of the site has been undertaken to provide further details of the site and neighbouring activities and to observe environmental conditions.

Historical Maps

Information about the history of the site has been obtained primarily through an inspection of historical Ordnance Survey maps. These maps provide an excellent record of the historical uses of a site and can be very important in assessing potential liabilities. Historical maps can show past potentially contaminative uses at a site that would not necessarily be obvious during a site inspection, for example storage tanks or previous usage such as a gas works or quarry.

Public Record Information

Information concerning environmental regulations relating to the site has been obtained from a public register which has been accessed from a commercial database operated by the Landmark Information Group. This is the quickest means of gathering publicly available information. The data is supplied from within a 1km radius of a given National Grid Reference of a site. The database contains information from the Environment Agency (EA) and other statutory authorities responsible for monitoring environmental protection measures within the area of a site under existing legislation (see below).

Information has also been obtained directly from the environmental regulators in order to gauge the environmental characteristics of the site in more detail and to establish whether there have been any breaches of environmental regulations or pollution incidents associated with the site. This is used to support the publicly available information gathered from the commercial database. The time in which responses are returned can vary between statutory authorities.

Environmental Legislation

The principal environmental legislation in England consists of the Environmental Protection Act 1990 (EPA 90), the Water Resources Act 1991 and the Environment Act 1995 (EA 95). These Acts prescribe protection measures for all the environmental media (land, water and air) and are regulated by the EA and the Local Authority. Part 1 of the EPA 1990 sets out the statutory framework for Integrated Pollution Control (IPC) and Air Pollution Control (APC).

ENVIRONMENTAL SETTING

This section assesses the environmental sensitivity of the site location to contamination / pollution. It is important to establish the environmental setting because, irrespective of the level of contamination on the site, if its location is not 'sensitive' to this contamination / pollution there is a reduced risk of an environmental liability arising.

The sensitivity is assessed using British Geological Survey (BGS) information (such as geological maps and data from the EA (<http://www.environment-agency.gov.uk/homeandleisure/117020.aspx>)* on groundwater and surface water. Data on abstractions have been obtained from publicly available sources including information supply companies such as Landmark and GroundSure. The vulnerability of surface waters and groundwater is based on sensitivity to pollution, distance from abstractions, type and nature of groundwater and type of overlying strata.

Aquifer Designations

In 1 April 2010 the EA began using aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

The BGS maps are generally split into two different type of aquifer designation:

- **Superficial (Drift):** permeable unconsolidated (loose) deposits. For example, terrace sands and gravels.
- **Bedrock:** solid permeable formations e.g. sandstone, chalk and limestone.

The maps display the following aquifer designations, and the corresponding colours beside the text are also represented on the Environment Agency's website*:

Principal Aquifers (formally Major Aquifers)

 These are highly permeable layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may be highly productive and able to support large abstractions, public water supply and/or river base flow on a strategic scale.

Secondary Aquifers (formally Minor Aquifers)

These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Although these aquifers will not normally produce large quantities of water for abstraction, they are important for local supplies (such as irrigation) and supplying base flow to rivers. Secondary aquifers are subdivided into two types:

 **Secondary A:** permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers; and

 **Secondary B:** predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

 **Secondary Undifferentiated:** has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata

These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Source Protection Zones (SPZs)

The EA have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. **The closer the activity, the greater the risk.** The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which we occasionally apply, to a groundwater source.

Flood Risk

The Flood Map combines detailed local data with information from a new national model of England and Wales and indicates where flooding from rivers, streams and watercourses is possible. Under Section 105 of the Water Resources Act 1991 the EA has a duty to survey matters relating to flooding.

RISK ASSESSMENT

This section assesses the potential for the site to give rise to environmental risks and whether or not the risks are acceptable or if further assessment or remedial action is required.

The qualitative risk assessment firstly considers the source of contamination and potential contaminants associated with the source(s) (or hazards). As well as the type of source, the extent, concentration and availability of a contaminant is also assessed.

The effect of a hazard on an identified receptor is largely governed by the sensitivity of a receptor. Receptors may typically include people, buildings, animals, plants and local resources (such as groundwater, surface waters, mines etc.).

A change in the receptor should be considered if the end-use of the site changes, for example, if a commercial site is to be redeveloped into a residential housing estate as a residential occupier is considered more sensitive than a commercial occupier.

The presence of contamination (as a potential hazard) does not necessary mean that there is a risk. It is the exposure pathway and the quantity of contamination that reaches the receptor which may determine the effect on a receptor (such as the integrity of a barrier between a contamination source and receptor).

The risk classifications for both likelihood and consequence is based on methodology presented in Contaminated Land Risk Assessment, A Guide to Good Practice (CIRIA C552, 2001) and has been developed from procedures outlined in the EA's CLR11 Model Procedures. The Department for the Environment Transport and the Regions (DETR), with the EA and Institute of Environment & Health, has also published guidance on risk assessment (Guidelines for Environmental Risk Assessment and Management). The guidance states that the designation of risk is based upon a consideration of both:

- The magnitude of the potential consequence (severity) of risk occurring which takes into account both the potential severity of the hazard and the sensitivity of the receptor; and
- The likelihood of an event occurring (probability) which takes into account the both the presence of the hazard and receptor and the integrity of the pathway.

The magnitude of consequence (severity) and likelihood (probability) is defined in the CIRIA guidance, together with examples. The two classifications are then compared (as shown on Table 1) to obtain an estimation of risk for each pollution linkage, ranging from "very high risk" to "very low risk". A description of the risks and likely actions required is presented in Table 2. The benefit of estimating the risk in this way is that it can be revised after each investigation phase as the conceptual model and corresponding pollution linkages are refined.

Table 1: Comparison of Consequence VS. Probability

		Consequence			
		Severe	Medium	Mild	Minor
Likelihood	High likelihood	Very high risk	High risk	Moderate risk	Moderate/ low risk
	Likely	High risk	Moderate risk	Moderate/ low risk	Low risk
	Low likelihood	Moderate risk	Moderate/ low risk	Low risk	Very low risk
	Unlikely	Moderate/ low risk	Low risk	Very low risk	Very low Risk

Table 2: Description of the Classified Risks and Likely Action Required

Level of Risk	Description of Classification
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 to a designated receptor is currently happening. If this risk is realised, it is likely to result in significant environmental and financial liability to current and/ or future site owners/ occupiers. Urgent investigation (if not already undertaken) and remediation is likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. If risk is realised, it is likely to present a sizeable environmental and financial liability to current and/ or future site owners/ occupiers. Urgent investigation is required and remediation work may be necessary in the short term and likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the potential environmental liability. Some remedial works may be required over the longer term.
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 normally be mild. Limited investigation may be recommended to clarify the risk, dependant on the sensitivity of the receptor and view point of those of interest. Any remedial works are likely to be fairly limited.
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 likely to be mild or minor.

The acceptability of risk will always depend upon the view point of those of interest, whether it is an occupier of a site, a regulator or stakeholder. As a result, it could be that action will be required to deal with a level of risk even if it is classified as very low.

**APPENDIX B:
EXPLORATORY
HOLE LOGS**

Trial Pit Log

Trialpit No

TP1

Sheet 1 of 1

Project Name: Jacksons Fencing

Project No. 2011

Co-ords: -
Level:

Date
24/01/2018

Location: Ashford

Dimensions (m):

Scale
1:25

Client: DHA Group

Depth
2.70

Logged
AK

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	D		0.05			TARMACADAM.	
	0.20	D	PID=0	0.15			Black slightly sandy angular to subrounded fine to coarse GRAVEL of flint and tarmacadam. (ANTHROPOGENIC GROUND)	
	0.60	D	PID=0	0.55			Greyish brown slightly silty gravelly fine to medium SAND with a low cobble content. Gravel is angular to subrounded fine to coarse of flint, brick, clinker, concrete and coal. Cobbles are subangular concrete and brick. Rare black cobbles of possible slag or brick. Rare plastic fragments. (ANTHROPOGENIC GROUND)	
	0.75	D	PID=0	0.70			Textile membrane at 0.4m bgl.	
							Soft greyish brown slightly sandy gravelly CLAY. Gravel is angular to rounded fine to coarse of flint. (ANTHROPOGENIC GROUND)	
							Yellowish brown sandy clayey SILT. Sand is fine. (HEAD)	1
	1.50	D	PID=0	1.30			Yellowish brown slightly sandy slightly gravelly silty CLAY with a low cobble content and frequent coarse sand sized specks of organic discolouration. Gravel is angular to subrounded fine to coarse of flint. (CLAY-WITH-FLINTS-FORMATION)	
	2.00	D	PID=0					2
				2.70			End of pit at 2.70 m	3
								4
								5

Remarks:

Stability:

Trial Pit Log

Trialpit No

TP2

Sheet 1 of 1

Project Name: Jacksons Fencing

Project No. 2011

Co-ords: -
Level:

Date
24/01/2018

Location: Ashford

Dimensions (m):

Scale
1:25

Client: DHA Group

Depth
2.00

Logged
AK

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	D		0.05			TARMACADAM.	
	0.20	ES	PID=0	0.15			Black slightly sandy angular to subrounded fine to coarse GRAVEL of flint and tarmacadam. (ANTHROPOGENIC GROUND)	
	0.60	ES	PID=0	0.50			Dark brownish black sandy angular to subrounded fine to coarse GRAVEL of flint, tarmacadam, limestone, brick and concrete with a medium cobble content. Cobbles are subangular of tarmacadam and concrete. (ANTHROPOGENIC GROUND)	
	0.80	ES	PID=0	0.70			Brown silty gravelly fine to coarse SAND with a medium cobble content. Gravel is angular to subrounded of flint, brick, tarmacadam and concrete. Cobbles are subangular of concrete, brick and tarmacadam. (ANTHROPOGENIC GROUND)	
							Yellowish brown sandy clayey SILT. (HEAD)	1
	1.50	D		1.40			Soft to firm yellowish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse of flint. (CLAY-WITH-FLINTS-FORMATION)	
			PID=0	2.00			End of pit at 2.00 m	2
								3
								4
								5

Remarks:

Stability:

Trial Pit Log

Trialpit No

TP3

Sheet 1 of 1

Project Name: Jacksons Fencing

Project No. 2011

Co-ords: -
Level:

Date
24/01/2018

Location: Ashford

Dimensions (m):

Scale
1:25

Client: DHA Group

Depth
2.50

Logged
AK

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	D		0.05			TARMACADAM.	
				0.15			Black slightly sandy angular to subrounded fine to coarse GRAVEL of flint and tarmacadam.	
	0.30	ES					(ANTHROPOGENIC GROUND)	
	0.45	ES	PID=0	0.40			Dark greyish black very sandy angular to subangular fine to coarse GRAVEL of flint, tarmacadam, limestone and concrete. Occasional large wood and textiles fragments.	
	0.60	ES	PID=0	0.50			(ANTHROPOGENIC GROUND)	
							Greenish light grey slightly sandy SILT. (HEAD)	
							Yellowish brown slightly sandy clayey SILT. (HEAD)	
	1.00	D	PID=0					1
				1.80			Yellowish brown slightly sandy very gravelly CLAY/SILT with a low cobble content. Gravel is angular to subangular fine to coarse of flint. (CLAY-WITH-FLINTS-FORMATION)	2
			PID=0	2.50				
							End of pit at 2.50 m	3
								4
								5

Remarks:

Stability:



Trial Pit Log

Trialpit No

TP5

Sheet 1 of 1

Project Name: Jacksons Fencing

Project No. 2011

Co-ords: -

Level:

Date

24/01/2018

Location: Ashford

Dimensions (m):

Depth 2.00

Scale 1:25

Logged AK

Client: DHA Group

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.05			0.05			TARMACADAM.	
	0.15			0.15			Black slightly sandy angular to subrounded fine to coarse GRAVEL of flint and tarmacadam.	
	0.25			0.25			(ANTHROPOGENIC GROUND)	
	0.30	D	PID=0	0.30			Light brown sandy subangular to subrounded fine to coarse GRAVEL of flint. (ANTHROPOGENIC GROUND)	
	0.50			0.50			Dark greyish black slightly silty sandy GRAVEL of flint, clinker, coal and limestone. Sand is fine to medium of ash. (ANTHROPOGENIC GROUND)	
	0.60	D	PID=0	0.60			Yellowish brown slightly sandy silty CLAY. (HEAD)	
							<i>Rare textile membrane at 0.5m bgl</i>	
	1.00			1.00			Yellowish brown slightly silty fine SAND. (HEAD)	1
	1.40			1.40			Soft to firm brownish orange sandy slightly gravelly silty CLAY. (CLAY-WITH-FLINTS-FORMATION)	
	2.00	D	PID=0	2.00			End of pit at 2.00 m	2
								3
								4
								5

Remarks:

Stability:

**APPENDIX C:
LABORATORY
TEST
CERTIFICATES**



Amy Khan
Lustre Consulting Ltd
Admiral's Offices
The Historic Dockyard
Chatham
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ME4 4TZ



DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
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ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 18-69917

Site Reference: Jackson Fencing
Project / Job Ref: 2011
Order No: 2011
Sample Receipt Date: 25/01/2018
Sample Scheduled Date: 26/01/2018
Report Issue Number: 1
Reporting Date: 05/02/2018

Authorised by:



Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



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



Soil Analysis Certificate						
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18	24/01/18	24/01/18	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP1	TP1	TP2	TP2	TP2
Project / Job Ref: 2011	Additional Refs	MG	NAT	MG	MG	NAT
Order No: 2011	Depth (m)	0.20	2.00	0.10	0.20	1.50
Reporting Date: 05/02/2018	QTSE Sample No	313258	313259	313260	313261	313262

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected		Not Detected	Not Detected
pH	pH Units	N/a	MCERTS		7.6		8.6
Total Cyanide	mg/kg	< 2	NONE				< 2
Total Sulphate as SO ₄	mg/kg	< 200	NONE		211		365
Total Sulphate as SO ₄	%	< 0.02	NONE		0.02		0.04
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS		37		60
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS		0.04		0.06
Total Sulphur	%	< 0.02	NONE		< 0.02		< 0.02
Total Organic Carbon (TOC)	%	< 0.1	MCERTS				2.1
Arsenic (As)	mg/kg	< 2	MCERTS				148
W/S Boron	mg/kg	< 1	NONE				1.2
Cadmium (Cd)	mg/kg	< 0.2	MCERTS				0.8
Chromium (Cr)	mg/kg	< 2	MCERTS				101
Chromium (hexavalent)	mg/kg	< 2	NONE				< 2
Copper (Cu)	mg/kg	< 4	MCERTS				143
Lead (Pb)	mg/kg	< 3	MCERTS				21
Mercury (Hg)	mg/kg	< 1	NONE				< 1
Nickel (Ni)	mg/kg	< 3	MCERTS				16
Selenium (Se)	mg/kg	< 3	NONE				< 3
Zinc (Zn)	mg/kg	< 3	MCERTS				100
Total Phenols (monohydric)	mg/kg	< 2	NONE				< 2

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



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Soil Analysis Certificate						
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18	24/01/18	24/01/18	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP3	TP3	TP3	TP4	TP4
Project / Job Ref: 2011	Additional Refs	MG	MG	NAT	MG	MG
Order No: 2011	Depth (m)	0.10	0.30	0.45	0.15	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313263	313264	313265	313266	313267

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS		7.8	7.3		7.4
Total Cyanide	mg/kg	< 2	NONE		< 2	< 2		< 2
Total Sulphate as SO ₄	mg/kg	< 200	NONE					
Total Sulphate as SO ₄	%	< 0.02	NONE					
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS		872	229		1780
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS		0.87	0.23		1.78
Total Sulphur	%	< 0.02	NONE					
Total Organic Carbon (TOC)	%	< 0.1	MCERTS		1.3	0.6		1.8
Arsenic (As)	mg/kg	< 2	MCERTS		49	11		17
W/S Boron	mg/kg	< 1	NONE		1.8	2.3		3.4
Cadmium (Cd)	mg/kg	< 0.2	MCERTS		0.2	< 0.2		< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS		40	24		18
Chromium (hexavalent)	mg/kg	< 2	NONE		< 2	< 2		< 2
Copper (Cu)	mg/kg	< 4	MCERTS		67	11		70
Lead (Pb)	mg/kg	< 3	MCERTS		19	12		20
Mercury (Hg)	mg/kg	< 1	NONE		< 1	< 1		< 1
Nickel (Ni)	mg/kg	< 3	MCERTS		46	12		36
Selenium (Se)	mg/kg	< 3	NONE		< 3	< 3		< 3
Zinc (Zn)	mg/kg	< 3	MCERTS		104	43		83
Total Phenols (monohydric)	mg/kg	< 2	NONE		< 2	< 2		< 2

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



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Soil Analysis Certificate					
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18		
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied		
Site Reference: Jackson Fencing	TP / BH No	TP4	TP5		
Project / Job Ref: 2011	Additional Refs	NAT	MG		
Order No: 2011	Depth (m)	1.30	0.30		
Reporting Date: 05/02/2018	QTSE Sample No	313268	313269		

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025		Not Detected		
pH	pH Units	N/a	MCERTS	6.0	7.4		
Total Cyanide	mg/kg	< 2	NONE		< 2		
Total Sulphate as SO ₄	mg/kg	< 200	NONE	987			
Total Sulphate as SO ₄	%	< 0.02	NONE	0.10			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	333	1560		
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.33	1.56		
Total Sulphur	%	< 0.02	NONE	0.05			
Total Organic Carbon (TOC)	%	< 0.1	MCERTS		1.5		
Arsenic (As)	mg/kg	< 2	MCERTS		17		
W/S Boron	mg/kg	< 1	NONE		2.6		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS		< 0.2		
Chromium (Cr)	mg/kg	< 2	MCERTS		14		
Chromium (hexavalent)	mg/kg	< 2	NONE		< 2		
Copper (Cu)	mg/kg	< 4	MCERTS		48		
Lead (Pb)	mg/kg	< 3	MCERTS		17		
Mercury (Hg)	mg/kg	< 1	NONE		< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS		28		
Selenium (Se)	mg/kg	< 3	NONE		< 3		
Zinc (Zn)	mg/kg	< 3	MCERTS		64		
Total Phenols (monohydric)	mg/kg	< 2	NONE		< 2		

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Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18	24/01/18	24/01/18	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP2	TP3	TP3	TP4	TP5
Project / Job Ref: 2011	Additional Refs	MG	MG	NAT	MG	MG
Order No: 2011	Depth (m)	0.20	0.30	0.45	0.30	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313261	313264	313265	313267	313269

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.14	0.17
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 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
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

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



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Soil Analysis Certificate - TPH CWG Banded

QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18	24/01/18	24/01/18	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP2	TP3	TP3	TP4	TP5
Project / Job Ref: 2011	Additional Refs	MG	MG	NAT	MG	MG
Order No: 2011	Depth (m)	0.20	0.30	0.45	0.30	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313261	313264	313265	313267	313269

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	44	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	44	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	3
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	9
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	88	53
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	88	65
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	132	65

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Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18	24/01/18	24/01/18	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP2	TP3	TP3	TP4	TP5
Project / Job Ref: 2011	Additional Refs	MG	MG	NAT	MG	MG
Order No: 2011	Depth (m)	0.20	0.30	0.45	0.30	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313261	313264	313265	313267	313269

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

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



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Soil Analysis Certificate - Volatile Organic Compounds (VOC)						
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18	24/01/18		
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Jackson Fencing	TP / BH No	TP3	TP3	TP4		
Project / Job Ref: 2011	Additional Refs	MG	NAT	MG		
Order No: 2011	Depth (m)	0.30	0.45	0.30		
Reporting Date: 05/02/2018	QTSE Sample No	313264	313265	313267		

Determinand	Unit	RL	Accreditation				
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Ethyl Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	
m,p-Xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	
o-Xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	

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Soil Analysis Certificate - Volatile Organic Compounds TIC (VOC)		
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP3
Project / Job Ref: 2011	Additional Refs	MG
Order No: 2011	Depth (m)	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313264

Compound No	Compound Name	% Match	Units	RL	Estimated Concentration
1	N/a	N/a	µg/kg	< 10	< 10
2	N/a	N/a	µg/kg	< 10	< 10
3	N/a	N/a	µg/kg	< 10	< 10
4	N/a	N/a	µg/kg	< 10	< 10
5	N/a	N/a	µg/kg	< 10	< 10

There were no / other compounds identified with a match of >90%



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Soil Analysis Certificate - Volatile Organic Compounds TIC (VOC)		
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP3
Project / Job Ref: 2011	Additional Refs	NAT
Order No: 2011	Depth (m)	0.45
Reporting Date: 05/02/2018	QTSE Sample No	313265

Compound No	Compound Name	% Match	Units	RL	Estimated Concentration
1	N/a	N/a	µg/kg	< 10	< 10
2	N/a	N/a	µg/kg	< 10	< 10
3	N/a	N/a	µg/kg	< 10	< 10
4	N/a	N/a	µg/kg	< 10	< 10
5	N/a	N/a	µg/kg	< 10	< 10

There were no / other compounds identified with a match of >90%



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Soil Analysis Certificate - Volatile Organic Compounds TIC (VOC)		
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP4
Project / Job Ref: 2011	Additional Refs	MG
Order No: 2011	Depth (m)	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313267

Compound No	Compound Name	% Match	Units	RL	Estimated Concentration
1	N/a	N/a	µg/kg	< 10	< 10
2	N/a	N/a	µg/kg	< 10	< 10
3	N/a	N/a	µg/kg	< 10	< 10
4	N/a	N/a	µg/kg	< 10	< 10
5	N/a	N/a	µg/kg	< 10	< 10

There were no / other compounds identified with a match of >90%



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Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18	24/01/18	24/01/18		
Lustre Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Jackson Fencing	TP / BH No	TP3	TP4	TP5		
Project / Job Ref: 2011	Additional Refs	MG	MG	MG		
Order No: 2011	Depth (m)	0.30	0.30	0.30		
Reporting Date: 05/02/2018	QTSE Sample No	313264	313267	313269		

Determinand	Unit	RL	Accreditation				
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2,4,5-Trichlorophenol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.1	
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
4-Chloroaniline	mg/kg	< 0.15	NONE	< 0.15	< 0.15	< 0.15	
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Dibenzofuran	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Dibutyl phthalate	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
Carbazole	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
bis(2-ethylhexyl)phthalate	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	

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



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Soil Analysis Certificate - Semi Volatile Organic Compounds TIC (SVOC)		
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP3
Project / Job Ref: 2011	Additional Refs	MG
Order No: 2011	Depth (m)	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313264

Compound No	Compound Name	% Match	Units	RL	Estimated Concentration
1	N/a	N/a	mg/kg	< 0.1	< 0.1
2	N/a	N/a	mg/kg	< 0.1	< 0.1
3	N/a	N/a	mg/kg	< 0.1	< 0.1
4	N/a	N/a	mg/kg	< 0.1	< 0.1
5	N/a	N/a	mg/kg	< 0.1	< 0.1

There were no / other compounds identified with a match of >90%



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Soil Analysis Certificate - Semi Volatile Organic Compounds TIC (SVOC)		
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP4
Project / Job Ref: 2011	Additional Refs	MG
Order No: 2011	Depth (m)	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313267

Compound No	Compound Name	% Match	Units	RL	Estimated Concentration
1	N/a	N/a	mg/kg	< 0.1	< 0.1
2	N/a	N/a	mg/kg	< 0.1	< 0.1
3	N/a	N/a	mg/kg	< 0.1	< 0.1
4	N/a	N/a	mg/kg	< 0.1	< 0.1
5	N/a	N/a	mg/kg	< 0.1	< 0.1

There were no / other compounds identified with a match of >90%



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Soil Analysis Certificate - Semi Volatile Organic Compounds TIC (SVOC)		
QTS Environmental Report No: 18-69917	Date Sampled	24/01/18
Lustre Consulting Ltd	Time Sampled	None Supplied
Site Reference: Jackson Fencing	TP / BH No	TP5
Project / Job Ref: 2011	Additional Refs	MG
Order No: 2011	Depth (m)	0.30
Reporting Date: 05/02/2018	QTSE Sample No	313269

Compound No	Compound Name	% Match	Units	RL	Estimated Concentration
1	N/a	N/a	mg/kg	< 0.1	< 0.1
2	N/a	N/a	mg/kg	< 0.1	< 0.1
3	N/a	N/a	mg/kg	< 0.1	< 0.1
4	N/a	N/a	mg/kg	< 0.1	< 0.1
5	N/a	N/a	mg/kg	< 0.1	< 0.1

There were no / other compounds identified with a match of >90%



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Soil Analysis Certificate - Sample Descriptions

QTS Environmental Report No: 18-69917

Lustre Consulting Ltd

Site Reference: Jackson Fencing

Project / Job Ref: 2011

Order No: 2011

Reporting Date: 05/02/2018

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
313259	TP1	NAT	2.00	15.6	Light brown sandy clay with stones
313261	TP2	MG	0.20	4.4	Black sandy gravel with stones and concrete
313262	TP2	NAT	1.50	14.2	Light brown sandy clay with stones
313264	TP3	MG	0.30	5.3	Black sandy gravel with stones and concrete
313265	TP3	NAT	0.45	11	Brown sandy clay
313267	TP4	MG	0.30	5.4	Black sandy clay with stones and brick
313268	TP4	NAT	1.30	12.9	Light brown sandy clay
313269	TP5	MG	0.30	7.6	Black sandy gravel with stones

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

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 18-69917

Lustre Consulting Ltd

Site Reference: Jackson Fencing

Project / Job Ref: 2011

Order No: 2011

Reporting Date: 05/02/2018

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

D Dried
AR As Received

**APPENDIX E:
ENVIRONMENTAL
ASSESSMENT
TABLES**

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	TP1 0.20	TP2 0.10	TP2 0.20	TP3 0.10	TP3 0.30	TP4 0.15	TP4 0.30	TP5 0.30
Asbestos Screen (Subcon to DETS)	N/A	N/A	N/A	N/A	8	Detected	0	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	no units	7.40	7.80	8.60	4	No Criteria	0	-	-	8.6	-	7.8	-	7.4	7.4
Total Cyanide	mg/kg	<LOD	<LOD	<LOD	4	53.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Total Organic Carbon (TOC)	mg/kg	1.30	1.68	2.10	4	No Criteria	0	-	-	2.1	-	1.3	-	1.8	1.5
Water Soluble Sulphate as SO4 (2:1)	mg/kg	0.06	1.07	1.78	4	No Criteria	0	-	-	0.06	-	0.87	-	1.78	1.56
Arsenic	mg/kg	17.00	57.75	148.00	4	640.00	0	-	-	148	-	49	-	17	17
Cadmium	mg/kg	<LOD	0.38	0.80	4	190.00	0	-	-	0.8	-	0.2	-	<LOD	<LOD
Chromium	mg/kg	14.00	43.25	101.00	4	8600.00	0	-	-	101	-	40	-	18	14
Copper	mg/kg	48.00	82.00	143.00	4	68000.00	0	-	-	143	-	67	-	70	48
Lead	mg/kg	17.00	19.25	21.00	4	2330.00	0	-	-	21	-	19	-	20	17
Mercury	mg/kg	<LOD	<LOD	<LOD	4	3600.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Nickel	mg/kg	16.00	31.50	46.00	4	980.00	0	-	-	16	-	46	-	36	28
Selenium	mg/kg	<LOD	<LOD	<LOD	4	12000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Zinc	mg/kg	64.00	87.75	104.00	4	730000.00	0	-	-	100	-	104	-	83	64
Naphthalene	mg/kg	<LOD	<LOD	<LOD	4	460.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Acenaphthylene	mg/kg	<LOD	<LOD	<LOD	4	97000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Acenaphthene	mg/kg	<LOD	<LOD	<LOD	4	97000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Fluorene	mg/kg	<LOD	<LOD	<LOD	4	68000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Phenanthrene	mg/kg	<LOD	0.10	0.17	4	22000.00	0	-	-	<LOD	-	<LOD	-	0.14	0.17
Anthracene	mg/kg	<LOD	<LOD	<LOD	4	540000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Fluoranthene	mg/kg	<LOD	<LOD	<LOD	4	23000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Pyrene	mg/kg	<LOD	<LOD	<LOD	4	54000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Benzo(a)anthracene	mg/kg	<LOD	<LOD	<LOD	4	170.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Chrysene	mg/kg	<LOD	<LOD	<LOD	4	350.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Benzo(b)fluoranthene	mg/kg	<LOD	<LOD	<LOD	4	44.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Benzo(k)fluoranthene	mg/kg	<LOD	<LOD	<LOD	4	1200.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Benzo(a)pyrene	mg/kg	<LOD	<LOD	<LOD	4	35.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Indeno(1,2,3-cd)pyrene	mg/kg	<LOD	<LOD	<LOD	4	510.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Di-benzo(a,h)anthracene	mg/kg	<LOD	<LOD	<LOD	4	3.60	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Benzo(ghi)perylene	mg/kg	<LOD	<LOD	<LOD	4	4000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aliphatic >C5 - C6	mg/kg	<LOD	<LOD	<LOD	4	5900.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aliphatic >C6 - C8	mg/kg	<LOD	<LOD	<LOD	4	17000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aliphatic >C8 - C10	mg/kg	<LOD	<LOD	<LOD	4	4800.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aliphatic >C10 - C12	mg/kg	<LOD	<LOD	<LOD	4	23000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aliphatic >C12 - C16	mg/kg	<LOD	<LOD	<LOD	4	82000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aliphatic >C16 - C21	mg/kg	<LOD	<LOD	<LOD	4	850000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aliphatic >C21 - C34	mg/kg	<LOD	13.25	44.00	4	850000.00	0	-	-	<LOD	-	<LOD	-	44	<LOD
TPH CWG - Aromatic >C5 - C7	mg/kg	<LOD	<LOD	<LOD	4	46000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aromatic >C7 - C8	mg/kg	<LOD	<LOD	<LOD	4	110000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aromatic >C8 - C10	mg/kg	<LOD	<LOD	<LOD	4	8100.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aromatic >C10 - C12	mg/kg	<LOD	<LOD	<LOD	4	28000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
TPH CWG - Aromatic >C12 - C16	mg/kg	<LOD	1.13	3.00	4	37000.00	0	-	-	<LOD	-	<LOD	-	<LOD	3
TPH CWG - Aromatic >C16 - C21	mg/kg	<LOD	2.63	9.00	4	1400.00	0	-	-	<LOD	-	<LOD	-	<LOD	9
TPH CWG - Aromatic >C21 - C35	mg/kg	<LOD	36.75	88.00	4	1400.00	0	-	-	<LOD	-	<LOD	-	88	53
Benzene	mg/kg	<LOD	<LOD	<LOD	4	47.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Toluene	mg/kg	<LOD	<LOD	<LOD	4	110000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Ethylbenzene	mg/kg	<LOD	<LOD	<LOD	4	13000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
m & p-xylene	mg/kg	<LOD	<LOD	<LOD	4	14000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
o-Xylene	mg/kg	<LOD	<LOD	<LOD	4	15000.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Monohydric Phenols	mg/kg	<LOD	<LOD	<LOD	4	690.00	0	-	-	<LOD	-	<LOD	-	<LOD	<LOD
Dichlorodifluoromethane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
Vinyl Chloride	mg/kg	<LOD	<LOD	<LOD	2	0.08	0	-	-	-	-	<LOD	-	<LOD	-
Chloromethane	mg/kg	<LOD	<LOD	<LOD	2	1.20	0	-	-	-	-	<LOD	-	<LOD	-
Chloroethane	mg/kg	<LOD	<LOD	<LOD	2	1300.00	0	-	-	-	-	<LOD	-	<LOD	-
Bromomethane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
Trichlorofluoromethane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
1,1-Dichloroethene	mg/kg	<LOD	<LOD	<LOD	2	46.00	0	-	-	-	-	<LOD	-	<LOD	-
trans-1,2-Dichloroethene	mg/kg	<LOD	<LOD	<LOD	2	40.00	0	-	-	-	-	<LOD	-	<LOD	-
1,1-Dichloroethane	mg/kg	<LOD	<LOD	<LOD	2	450.00	0	-	-	-	-	<LOD	-	<LOD	-
cis-1,2-Dichloroethene	mg/kg	<LOD	<LOD	<LOD	2	24.00	0	-	-	-	-	<LOD	-	<LOD	-
2,2-Dichloropropane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
Chloroform	mg/kg	<LOD	<LOD	<LOD	2	170.00	0	-	-	-	-	<LOD	-	<LOD	-
Bromochloromethane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	TP1 0.20	TP2 0.10	TP2 0.20	TP3 0.10	TP3 0.30	TP4 0.15	TP4 0.30	TP5 0.30
1,1,1-Trichloroethane	mg/kg	<LOD	<LOD	<LOD	2	1300.00	0	-	-	-	-	<LOD	-	<LOD	-
1,1-Dichloropropene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
Carbon Tetrachloride	mg/kg	<LOD	<LOD	<LOD	2	6.30	0	-	-	-	-	<LOD	-	<LOD	-
1,2-Dichloroethane	mg/kg	<LOD	<LOD	<LOD	2	0.97	0	-	-	-	-	<LOD	-	<LOD	-
1,2-Dichloropropane	mg/kg	<LOD	<LOD	<LOD	2	5.90	0	-	-	-	-	<LOD	-	<LOD	-
Trichloroethene	mg/kg	<LOD	<LOD	<LOD	2	2.60	0	-	-	-	-	<LOD	-	<LOD	-
Bromodichloromethane	mg/kg	<LOD	<LOD	<LOD	2	3.70	0	-	-	-	-	<LOD	-	<LOD	-
Dibromomethane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
TAME	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
cis-1,3-Dichloropropene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
trans-1,3-Dichloropropene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
1,1,2-Trichloroethane	mg/kg	<LOD	<LOD	<LOD	2	90.00	0	-	-	-	-	<LOD	-	<LOD	-
1,3-Dichloropropane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
Tetrachloroethene	mg/kg	<LOD	<LOD	<LOD	2	42.00	0	-	-	-	-	<LOD	-	<LOD	-
Dibromochloromethane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
1,2-Dibromoethane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
Chlorobenzene	mg/kg	<LOD	<LOD	<LOD	2	130.00	0	-	-	-	-	<LOD	-	<LOD	-
1,1,1,2-Tetrachloroethane	mg/kg	<LOD	<LOD	<LOD	2	250.00	0	-	-	-	-	<LOD	-	<LOD	-
m,p-Xylene	mg/kg	<LOD	<LOD	<LOD	2	14000.00	0	-	-	-	-	<LOD	-	<LOD	-
Styrene	mg/kg	<LOD	<LOD	<LOD	2	6500.00	0	-	-	-	-	<LOD	-	<LOD	-
Bromoform	mg/kg	<LOD	<LOD	<LOD	2	1500.00	0	-	-	-	-	<LOD	-	<LOD	-
Isopropylbenzene	mg/kg	<LOD	<LOD	<LOD	2	3300.00	0	-	-	-	-	<LOD	-	<LOD	-
1,1,2,2-Tetrachloroethane	mg/kg	<LOD	<LOD	<LOD	2	550.00	0	-	-	-	-	<LOD	-	<LOD	-
1,2,3-Trichloropropane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
n-Propylbenzene	mg/kg	<LOD	<LOD	<LOD	2	9700.00	0	-	-	-	-	<LOD	-	<LOD	-
Bromobenzene	mg/kg	<LOD	<LOD	<LOD	2	220.00	0	-	-	-	-	<LOD	-	<LOD	-
2-Chlorotoluene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
1,3,5-Trimethylbenzene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
4-Chlorotoluene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
tert-Butylbenzene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
1,2,4-Trimethylbenzene	mg/kg	<LOD	<LOD	<LOD	2	99.00	0	-	-	-	-	<LOD	-	<LOD	-
sec-Butylbenzene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
p-Isopropyltoluene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
1,3-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	2	73.00	0	-	-	-	-	<LOD	-	<LOD	-
1,4-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	2	10000.00	0	-	-	-	-	<LOD	-	<LOD	-
n-Butylbenzene	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
1,2-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	2	4800.00	0	-	-	-	-	<LOD	-	<LOD	-
1,2-Dibromo-3-chloropropane	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	-	-	-	-	<LOD	-	<LOD	-
Hexachlorobutadiene	mg/kg	<LOD	<LOD	<LOD	2	66.00	0	-	-	-	-	<LOD	-	<LOD	-
1,2,4-Trichlorobenzene	mg/kg	<LOD	<LOD	<LOD	3	530.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
2-Nitrophenol	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
Nitrobenzene	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
0-Cresol	mg/kg	<LOD	<LOD	<LOD	3	180000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
bis(2-chloroethoxy)methane	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
bis(2-chloroethyl)ether	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
2,4-Dichlorophenol	mg/kg	<LOD	<LOD	<LOD	3	4000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
2-Chlorophenol	mg/kg	<LOD	<LOD	<LOD	3	4000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
1,3-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	2	73.00	0	-	-	-	-	<LOD	-	<LOD	-
1,4-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	2	10000.00	0	-	-	-	-	<LOD	-	<LOD	-
1,2-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	2	4800.00	0	-	-	-	-	<LOD	-	<LOD	-
2,4-Dimethylphenol	mg/kg	<LOD	<LOD	<LOD	3	24000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
Isophorone	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
Hexachloroethane	mg/kg	<LOD	<LOD	<LOD	3	53.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
p-Cresol	mg/kg	<LOD	<LOD	<LOD	3	180000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
2,4,6-Trichlorophenol	mg/kg	<LOD	<LOD	<LOD	3	4000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
2,4,5-Trichlorophenol	mg/kg	<LOD	<LOD	<LOD	3	4000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
2-Nitroaniline	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
4-Chloro-3-methylphenol	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
2-Methylnaphthalene	mg/kg	<LOD	0.07	0.10	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	0.1
Hexachlorocyclopentadiene	mg/kg	<LOD	<LOD	<LOD	3	14600.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
Hexachlorobutadiene	mg/kg	<LOD	<LOD	<LOD	2	66.00	0	-	-	-	-	<LOD	-	<LOD	-
2,6-Dinitrotoluene	mg/kg	<LOD	<LOD	<LOD	3	1900.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
Dimethyl phthalate	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
2-Chloronaphthalene	mg/kg	<LOD	<LOD	<LOD	3	960.00	0	-	-	-	-	<LOD	-	<LOD	<LOD

HUMAN HEALTH QUANTITATIVE RISK ASSESSMENT - SOILS
MADE GROUND
2011
Jacksons Fencing - Ashford



Assessment Scenario:
Assessment Criteria Source:
Soil Organic Matter (%):

Commercial
SGVs, GACs and S4ULs
SOM = 2.5%

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	TP1	TP2	TP2	TP3	TP3	TP4	TP4	TP5
								0.20	0.10	0.20	0.10	0.30	0.15	0.30	0.30
4-Chloroaniline	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
4-Nitrophenol	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
4-Chlorophenyl phenyl ether	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
3-Nitroaniline	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
4-Nitroaniline	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
4-Bromophenyl phenyl ether	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
Hexachlorobenzene	mg/kg	<LOD	<LOD	<LOD	3	120.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
2,4-Dinitrotoluene	mg/kg	<LOD	<LOD	<LOD	3	3700.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
Diethyl phthalate	mg/kg	<LOD	<LOD	<LOD	3	220000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
Dibenzofuran	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
Azobenzene	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
Dibutyl phthalate	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
Carbazole	mg/kg	<LOD	<LOD	<LOD	3	No Criteria	0	-	-	-	-	<LOD	-	<LOD	<LOD
bis(2-ethylhexyl)phthalate	mg/kg	<LOD	<LOD	<LOD	3	86000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
Benzyl butyl phthalate	mg/kg	<LOD	<LOD	<LOD	3	940000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD
Di-n-octyl phthalate	mg/kg	<LOD	<LOD	<LOD	3	89000.00	0	-	-	-	-	<LOD	-	<LOD	<LOD



DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	TP1 2.00	TP2 1.50	TP3 0.45	TP4 1.30	
pH	no units	6.00	6.95	7.60	4	No Criteria	0	7.6	6.9	7.3	6	-
Total Cyanide	mg/kg	<LOD	<LOD	<LOD	1	53.00	0	-	-	<LOD	-	-
Total Organic Carbon (TOC)	mg/kg	0.60	0.60	0.60	1	No Criteria	0	-	-	0.6	-	-
Total Sulphur (BRE SD1)	%	<LOD	-	0.05	3	No Criteria	0	<LOD	<LOD	-	0.05	-
Water Soluble Sulphate as SO4 (2:1)	mg/kg	0.04	0.18	0.33	4	No Criteria	0	0.04	0.13	0.23	0.33	-
Arsenic	mg/kg	11.00	11.00	11.00	1	640.00	0	-	-	11	-	-
Cadmium	mg/kg	<LOD	<LOD	<LOD	1	190.00	0	-	-	<LOD	-	-
Chromium	mg/kg	24.00	24.00	24.00	1	8600.00	0	-	-	24	-	-
Copper	mg/kg	11.00	11.00	11.00	1	68000.00	0	-	-	11	-	-
Lead	mg/kg	12.00	12.00	12.00	1	2330.00	0	-	-	12	-	-
Mercury	mg/kg	<LOD	<LOD	<LOD	1	3600.00	0	-	-	<LOD	-	-
Nickel	mg/kg	12.00	12.00	12.00	1	980.00	0	-	-	12	-	-
Selenium	mg/kg	<LOD	<LOD	<LOD	1	12000.00	0	-	-	<LOD	-	-
Zinc	mg/kg	43.00	43.00	43.00	1	730000.00	0	-	-	43	-	-
Naphthalene	mg/kg	<LOD	<LOD	<LOD	1	190.00	0	-	-	<LOD	-	-
Acenaphthylene	mg/kg	<LOD	<LOD	<LOD	1	83000.00	0	-	-	<LOD	-	-
Acenaphthene	mg/kg	<LOD	<LOD	<LOD	1	84000.00	0	-	-	<LOD	-	-
Fluorene	mg/kg	<LOD	<LOD	<LOD	1	63000.00	0	-	-	<LOD	-	-
Phenanthrene	mg/kg	<LOD	<LOD	<LOD	1	22000.00	0	-	-	<LOD	-	-
Anthracene	mg/kg	<LOD	<LOD	<LOD	1	520000.00	0	-	-	<LOD	-	-
Fluoranthene	mg/kg	<LOD	<LOD	<LOD	1	23000.00	0	-	-	<LOD	-	-
Pyrene	mg/kg	<LOD	<LOD	<LOD	1	54000.00	0	-	-	<LOD	-	-
Benzo(a)anthracene	mg/kg	<LOD	<LOD	<LOD	1	170.00	0	-	-	<LOD	-	-
Chrysene	mg/kg	<LOD	<LOD	<LOD	1	350.00	0	-	-	<LOD	-	-
Benzo(b)fluoranthene	mg/kg	<LOD	<LOD	<LOD	1	44.00	0	-	-	<LOD	-	-
Benzo(k)fluoranthene	mg/kg	<LOD	<LOD	<LOD	1	1200.00	0	-	-	<LOD	-	-
Benzo(a)pyrene	mg/kg	<LOD	<LOD	<LOD	1	35.00	0	-	-	<LOD	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	<LOD	<LOD	<LOD	1	500.00	0	-	-	<LOD	-	-
Di-benzo(a,h)anthracene	mg/kg	<LOD	<LOD	<LOD	1	3.50	0	-	-	<LOD	-	-
Benzo(ghi)perylene	mg/kg	<LOD	<LOD	<LOD	1	3900.00	0	-	-	<LOD	-	-
TPH CWG - Aliphatic >C5 - C6	mg/kg	<LOD	<LOD	<LOD	1	3200.00	0	-	-	<LOD	-	-
TPH CWG - Aliphatic >C6 - C8	mg/kg	<LOD	<LOD	<LOD	1	7800.00	0	-	-	<LOD	-	-
TPH CWG - Aliphatic >C8 - C10	mg/kg	<LOD	<LOD	<LOD	1	2000.00	0	-	-	<LOD	-	-
TPH CWG - Aliphatic >C10 - C12	mg/kg	<LOD	<LOD	<LOD	1	9700.00	0	-	-	<LOD	-	-
TPH CWG - Aliphatic >C12 - C16	mg/kg	<LOD	<LOD	<LOD	1	59000.00	0	-	-	<LOD	-	-
TPH CWG - Aliphatic >C16 - C21	mg/kg	<LOD	<LOD	<LOD	1	800000.00	0	-	-	<LOD	-	-
TPH CWG - Aliphatic >C21 - C34	mg/kg	<LOD	<LOD	<LOD	1	800000.00	0	-	-	<LOD	-	-
TPH CWG - Aromatic >C5 - C7	mg/kg	<LOD	<LOD	<LOD	1	26000.00	0	-	-	<LOD	-	-
TPH CWG - Aromatic >C7 - C8	mg/kg	<LOD	<LOD	<LOD	1	56000.00	0	-	-	<LOD	-	-
TPH CWG - Aromatic >C8 - C10	mg/kg	<LOD	<LOD	<LOD	1	3500.00	0	-	-	<LOD	-	-
TPH CWG - Aromatic >C10 - C12	mg/kg	<LOD	<LOD	<LOD	1	16000.00	0	-	-	<LOD	-	-
TPH CWG - Aromatic >C12 - C16	mg/kg	<LOD	<LOD	<LOD	1	36000.00	0	-	-	<LOD	-	-
TPH CWG - Aromatic >C16 - C21	mg/kg	<LOD	<LOD	<LOD	1	14000.00	0	-	-	<LOD	-	-
TPH CWG - Aromatic >C21 - C35	mg/kg	<LOD	<LOD	<LOD	1	14000.00	0	-	-	<LOD	-	-
Benzene	mg/kg	<LOD	<LOD	<LOD	1	27.00	0	-	-	<LOD	-	-
Toluene	mg/kg	<LOD	<LOD	<LOD	1	56000.00	0	-	-	<LOD	-	-
Ethylbenzene	mg/kg	<LOD	<LOD	<LOD	1	5700.00	0	-	-	<LOD	-	-
m & p-xylene	mg/kg	<LOD	<LOD	<LOD	1	5900.00	0	-	-	<LOD	-	-
o-Xylene	mg/kg	<LOD	<LOD	<LOD	1	6600.00	0	-	-	<LOD	-	-
Monohydric Phenols	mg/kg	<LOD	<LOD	<LOD	1	440.00	0	-	-	<LOD	-	-
Dichlorodifluoromethane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Vinyl Chloride	mg/kg	<LOD	<LOD	<LOD	1	0.06	0	-	-	<LOD	-	-
Chloromethane	mg/kg	<LOD	<LOD	<LOD	1	1.00	0	-	-	<LOD	-	-
Chloroethane	mg/kg	<LOD	<LOD	<LOD	1	960.00	0	-	-	<LOD	-	-
Bromomethane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Trichlorofluoromethane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
1,1-Dichloroethene	mg/kg	<LOD	<LOD	<LOD	1	26.00	0	-	-	<LOD	-	-
MTBE	mg/kg	<LOD	<LOD	<LOD	1	7900.00	0	-	-	<LOD	-	-
trans-1,2-Dichloroethene	mg/kg	<LOD	<LOD	<LOD	1	22.00	0	-	-	<LOD	-	-
1,1-Dichloroethane	mg/kg	<LOD	<LOD	<LOD	1	280.00	0	-	-	<LOD	-	-
cis-1,2-Dichloroethene	mg/kg	<LOD	<LOD	<LOD	1	14.00	0	-	-	<LOD	-	-
2,2-Dichloropropane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Chloroform	mg/kg	<LOD	<LOD	<LOD	1	99.00	0	-	-	<LOD	-	-
Bromochloromethane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-



Assessment Scenario:
Assessment Criteria Source:
Soil Organic Matter (%):

Commercial
SGVs, GACs and S4ULs
SOM = 1%

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	TP1	TP2	TP3	TP4	
								2.00	1.50	0.45	1.30	
1,1,1-Trichloroethane	mg/kg	<LOD	<LOD	<LOD	1	660.00	0	-	-	<LOD	-	-
1,1-Dichloropropene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Carbon Tetrachloride	mg/kg	<LOD	<LOD	<LOD	1	2.90	0	-	-	<LOD	-	-
1,2-Dichloroethane	mg/kg	<LOD	<LOD	<LOD	1	0.67	0	-	-	<LOD	-	-
Benzene	mg/kg	<LOD	<LOD	<LOD	1	27.00	0	-	-	<LOD	-	-
1,2-Dichloropropane	mg/kg	<LOD	<LOD	<LOD	1	3.30	0	-	-	<LOD	-	-
Trichloroethene	mg/kg	<LOD	<LOD	<LOD	1	1.20	0	-	-	<LOD	-	-
Bromodichloromethane	mg/kg	<LOD	<LOD	<LOD	1	2.10	0	-	-	<LOD	-	-
Dibromomethane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
TAME	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
cis-1,3-Dichloropropene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Toluene	mg/kg	<LOD	<LOD	<LOD	1	56000.00	0	-	-	<LOD	-	-
trans-1,3-Dichloropropene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
1,1,2-Trichloroethane	mg/kg	<LOD	<LOD	<LOD	1	94.00	0	-	-	<LOD	-	-
1,3-Dichloropropane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Tetrachloroethene	mg/kg	<LOD	<LOD	<LOD	1	19.00	0	-	-	<LOD	-	-
Dibromochloromethane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
1,2-Dibromoethane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Chlorobenzene	mg/kg	<LOD	<LOD	<LOD	1	56.00	0	-	-	<LOD	-	-
1,1,1,2-Tetrachloroethane	mg/kg	<LOD	<LOD	<LOD	1	110.00	0	-	-	<LOD	-	-
m,p-Xylene	mg/kg	<LOD	<LOD	<LOD	1	5900.00	0	-	-	<LOD	-	-
o-Xylene	mg/kg	<LOD	<LOD	<LOD	1	6600.00	0	-	-	<LOD	-	-
Styrene	mg/kg	<LOD	<LOD	<LOD	1	3300.00	0	-	-	<LOD	-	-
Bromoform	mg/kg	<LOD	<LOD	<LOD	1	760.00	0	-	-	<LOD	-	-
Isopropylbenzene	mg/kg	<LOD	<LOD	<LOD	1	1400.00	0	-	-	<LOD	-	-
1,1,2,2-Tetrachloroethane	mg/kg	<LOD	<LOD	<LOD	1	270.00	0	-	-	<LOD	-	-
1,2,3-Trichloropropane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
n-Propylbenzene	mg/kg	<LOD	<LOD	<LOD	1	4100.00	0	-	-	<LOD	-	-
Bromobenzene	mg/kg	<LOD	<LOD	<LOD	1	97.00	0	-	-	<LOD	-	-
2-Chlorotoluene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
1,3,5-Trimethylbenzene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
4-Chlorotoluene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
tert-Butylbenzene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
1,2,4-Trimethylbenzene	mg/kg	<LOD	<LOD	<LOD	1	42.00	0	-	-	<LOD	-	-
sec-Butylbenzene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
p-Isopropyltoluene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
1,3-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	1	30.00	0	-	-	<LOD	-	-
1,4-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	1	4400.00	0	-	-	<LOD	-	-
n-Butylbenzene	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
1,2-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	1	2000.00	0	-	-	<LOD	-	-
1,2-Dibromo-3-chloropropane	mg/kg	<LOD	<LOD	<LOD	1	No Criteria	0	-	-	<LOD	-	-
Hexachlorobutadiene	mg/kg	<LOD	<LOD	<LOD	1	31.00	0	-	-	<LOD	-	-
1,3-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	1	30.00	0	-	-	<LOD	-	-
1,4-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	1	4400.00	0	-	-	<LOD	-	-
1,2-Dichlorobenzene	mg/kg	<LOD	<LOD	<LOD	1	2000.00	0	-	-	<LOD	-	-
Hexachlorobutadiene	mg/kg	<LOD	<LOD	<LOD	1	31.00	0	-	-	<LOD	-	-
Total Sulphate as SO4 (BRE SD1)	%	-	-	0.10	3	No Criteria	0	0.02	0.04	-	0.1	-

BURIED CONCRETE ASSESSMENT

2011

Jacksons Fencing - Ashford

**TABLE SHOWING BURIED CONCRETE ASSESSMENT**

SOIL GROUP	DETERMINAND	UNITS	NO. OF TESTS	MIN	MAX	CHARACTERISTIC VALUE	BRE CLASSIFICATION
MADE GROUND (Brownfield)	Total Potential Sulfate	%	-	-	-	-	DS1
	Water Soluble Sulphate as SO4	g/l	4	0.06	1.78	1.78	
	pH	-	4	7.4	8.6	7.4	AC-1s
NATURAL GROUND	Total Potential Sulfate	%	3	<LOD	0.15	0.15	DS1
	Water Soluble Sulphate as SO4	g/l	4	0.04	0.33	0.33	
	pH	-	4	6.0	7.6	6.0	AC-1s
GROUNDWATER	Sulphate as SO4	g/l	-	#VALUE!	#VALUE!	#VALUE!	#VALUE!
	pH	-	-	<LOD	<LOD	<LOD	#VALUE!

OTHER FACTORS CONSIDERED:

Pyritic soils (Made Ground) have not been encountered or considered in this assessment.

Pyritic soils (Natural Ground) have not been encountered in this assessment.

GENERAL NOTES:

Where there are >10 results, the Characteristic Value is based on the mean of the highest 20% of values for SO4, or the mean of the lowest 20% of values for pH. Where there are <10 samples, the Characteristic Value is based on lowest pH value / highest SO4.

Where the DS Class is different for soluble sulphates and total potential sulphates, the highest DS Class is adopted in accordance with BRE Special Digest 1:2005, 3rd Edition, 'Concrete in Aggressive Ground.' However, if the assessment of TPS is not appropriate (owing to low oxidisable sulphates) only the soluble sulphates have been considered.

PHYTOTOXICITY RISK ASSESSMENT

2011

Jacksons Fencing - Ashford

Risk Criteria: British Standard BS 3882:2007 (Specification for topsoil
and requirements for use)**TABLE SHOWING PHYTOTOXICITY ASSESSMENT FOR MADE GROUND**

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	DETAILS
Copper	mg/kg	48.00	82.00	143.00	4	200.00	0	-
Nickel	mg/kg	16.00	31.50	46.00	4	110.00	0	-
Zinc	mg/kg	64.00	87.75	104.00	4	300.00	0	-

TABLE SHOWING PHYTOTOXICITY ASSESSMENT FOR NATURAL SOILS

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	DETAILS
Copper	mg/kg	11.00	11.00	11.00	1	200.00	0	-
Nickel	mg/kg	12.00	12.00	12.00	1	110.00	0	-
Zinc	mg/kg	43.00	43.00	43.00	1	300.00	0	-

POTABLE WATER PIPELINE RISK ASSESSMENT

2011

Jacksons Fencing - Ashford

**TABLE SHOWING WATER PIPELINE ASSESSMENT**

DETERMINAND	UNITS	THRESHOLD		THRESHOLD		MAXIMUM CONCENTRATION
		PE	EXCEEDED	PVC	EXCEEDED	
GROUP 1						
Total VOC (with TICs)*	µg/kg	500.00	NO	125.00	NO	0.10
BTEX & MTBE	µg/kg	100.00	NO	30.00	NO	<LOD
GROUP 2						
**Total SVOC Suite (with TIC)	mg/kg	2.00	NO	1.40	NO	0.10
Phenols	mg/kg	2.00	NO	0.40	NO	<LOD
Cresols & Chlorinated Phenols	mg/kg	2.00	NO	0.04	NO	<LOD
†Ethers	mg/kg	0.50	-	1.00	-	-
†Nitrobenzene	mg/kg	0.50	-	0.40	-	-
†Ketones	mg/kg	0.50	-	0.02	-	-
†Aldehydes	mg/kg	0.50	-	0.02	-	-
GROUP 3						
Mineral Oils (C11 to C20)	mg/kg	10.00	YES	No effect	NO	12.00
GROUP 4						
Mineral Oils (C21 to C40)	mg/kg	500.00	NO	No effect	NO	122.00
GROUP 5^						
Conductivity	µ2/cm	-	-	-	-	-
Redox Potential	mV	-	-	-	-	-
pH	-	-	-	-	-	-
GROUP 6						
†Amines	ug/kg	N/A	-	No effect	-	-

NOTES:

*Minus total concentration of BTEX + MTBE.

**Minus total concentration of phenols, cresols and chlorinated phenols.

†Only required if current or historical site use indicates they may be present.

^Only applicable when selecting suitable barrier pipe (see UKWIR Guidance document)

RISK CRITERIA:

UK Water Industry Research (UKWIR). Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. Ref. 10/WM/03/21. 2010

Site Name	Jacksons Fencing 0 Ashford
Location	
Site ID	
Job Number	2011
Date	2/7/2018
User Name	shauna.panesar@atkinsglobal.com
Company Name	Atkins

Hole ID	Sample Depth	Hazardous Waste Y/N	HP1	HP2	HP3	HP4	HP5	HP6	HP7	HP8	HP9	HP10	HP11	HP12	HP13	HP14	HP15	HP16
TP1	0.20	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP2	0.10	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP2	0.20	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP3	0.10	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP3	0.30	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP4	0.15	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP4	0.30	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP5	0.30	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

**APPENDIX F:
NOTES ON
LIMITATIONS**

LUSTRE CONSULTING, ENVIRONMENTAL AND GEOTECHNICAL CONSULTANCY SERVICES

NOTES ON LIMITATIONS

General

Lustre Consulting have completed the attached report for the use of the Client detailed on the front cover and those parties to whom Lustre Consulting has agreed to provide and has provided an executed warranty agreement, or to whom an assignment of the benefit of this report has been agreed.

Third parties are not entitled to use or rely upon the contents of the report unless written approval has been given by Lustre Consulting; (due to legal requirements, a charge may be levied as a condition of such approval, in which case approval shall not be effective unless and until such a charge has been paid in full).

Lustre Consulting accepts no responsibility or liability for:

- a) any use of this report for any purpose or project other than that for which it was commissioned, and
- b) any use of this report by any third party to whom approval for use has not been given and any conditions applicable to such use have been met.

Phase I Environmental Risk Assessments, Desk Studies and Site Audits

The work completed and utilised to provide this report comprises a study of available documentation. The opinions and results presented in this report have been arrived at by utilising the finite amount of data available at the time of writing and are relevant only to the purpose for which the report was commissioned. The data which has been reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative information pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, Lustre Consulting reserves the right to review this information and, if warranted, to modify the opinions presented in the report accordingly.

It should be noted that the risks which are identified in this report are perceived risks based on the available information at the time of writing and that the actual risks associated can only be assessed following a physical investigation of the site.

Phase II Site Investigations

The intrusive investigation has been completed to provide information concerning the type and degree of contamination present along with ground and groundwater conditions which facilitates a reasonable risk assessment to be completed. The stated objectives of the ground investigation have been limited to assessing the proven risks which are associated with potential human targets, building materials, the environment (including adjacent land), and to surface water and groundwater.

The amount of exploratory work, chemical testing and monitoring completed as part of this project has potentially been restricted by the short timescale available, and the locations of exploratory holes undertaken have potentially been restricted to areas unoccupied by buildings(s) and buried services. A more comprehensive post demolition / decommission investigation may be required if the site is to be redeveloped. For these reasons any costs included in relation to site remediation must be considered as tentative only at this time.

The exploratory holes investigate only a small volume of the ground in relation to the size of the site and therefore, can only provide a "snap shot" or general indication of ground conditions located on the site. The fact that the site has been investigated does not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided in this report take into account currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.



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