Haigh Huddleston & Associates
Civil Structural Engineering Consultants

Firth Buildings, 99-101 Leeds Road, Dewsbury, WF12 7BU t 01924 464342 f 01924 450662
e martin@haighhuddleston.co.uk

REMEDIATION METHOD STATEMENT

FOR DEVELOPMENT OF LAND

AT

ABBEY ROAD NORTH, SHEPLEY, PHASE 2

FOR

YORKSHIRE COUNTRY PROPERTIES LTD

REF: E19/7465/R005A

DATE: NOVEMBER 2022
Rev A

1.0 INTRODUCTION

1.1 Haigh Huddleston & Associates have been requested by Yorkshire Country Properties Ltd to provide a remediation statement for the proposed development at Abbey Road North, Shepley, Phase 2.

1.2 The purpose of the document is to specify the remediation philosophy for the site and to specify fill materials to be used for the controlled backfilling and capping of the site.

1.3 Site investigation works and gas monitoring have been undertaken and are detailed in HHA Report E19/7465/R004 dated February 2021 and HHA Letter E19/7465/JF/012 dated 14 May 2021. These reports have been utilised to compile this Remediation Statement.

1.4 Whilst the report shows contamination it is possible that further unknown contamination exists on site that will be revealed following or during site clearance and construction works commence.

1.5 If during the remediation work or ground works any other suspected contaminated soil/material is found, that has not been identified in the original ground investigation, then remediation works on site should cease and the Local Planning Authority notified in writing within two days. The material should be chemically analysed and its location and extent on site should be accurately surveyed and documented. Any specific remediation proposals should then be agreed with the relevant overseeing bodies, i.e. Warranty Provider, Environment Agency and Local Environmental Health Department, and a revised Remediation Strategy submitted and approved in writing by the Local Planning Authority. The remediation works on site should then proceed in accordance with the approved revised strategy.

1.6 The remediation method statement is subject to the approval of the Local Planning Authority, Warranty Provider and Environment Agency. Approval in writing should be obtained from the above parties prior to work commencing on site.

1.7 The report has been produced on behalf of Yorkshire Country Properties Ltd and no responsibility is accepted to any Third Party. Any Third Party wishing to rely on the

report and its contents should seek express written authorisation from Haigh Huddleston Associates.

2.0 THE SITE

2.1 The site is located to the east of Abbey Road North (A629), Shepley, and is situated around Ordnance Survey grid reference 419950, 410100. The site consists of the second phase of a larger development. A site location plan is included in Appendix A.

2.2 The site is irregular in shape, with the western boundary formed by Abbey Road North, and the north eastern boundary formed by Knowle Road. The southern boundary is formed by adjacent fields. The approximate site area is 1.9ha.

2.3 A dry stone wall crosses the site from south to north dividing the site into a western third and an eastern two-thirds. The watercourse follows the line of the stone wall and exits the site to the north beneath Knowle Road before being culverted beneath the railway embankment.

2.4 The western third of the site is overgrown with long grass and nettles. There is immature tree growth, primarily fir trees, to the western edge and southern third of this field which is fenced off. In the central and eastern areas of the site are several small outbuildings and a concrete floor slab to a former building.

2.5 The eastern two thirds consist of better kept shorter cut grass. At the time of the site investigation, due to the slope and soft nature of the topsoil in this area, it proved difficult to manoeuvre the tracked plant. There is immature tree growth noted to the northern boundary and in the southern third of the field. A single greenhouse is located in the south east of the site.

2.6 The majority of the site boundary is formed by a 1m high dry stone wall. The central area of the southern boundary is formed by a post and wire fence.

2.7 The site slopes from south to north at a grade of approximately 1 in 9, from a high point of 183.75m AOD in the south eastern corner towards a low point of 168.80m AOD in the central northern area. The watercourse is approximately 600-800mm lower than the adjacent ground.

2.8 Overhead electricity lines start in the north west and head eastwards adjacent the northern boundary. A second set of overhead electricity lines start adjacent the western

boundary and head southwards. It is assumed there are underground electricity cables in this area of the site.

2.9 An existing foul sewer enters the site from a property to the south and leaves the northern boundary adjacent the watercourse.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

3.1 In the western third of the site, the trial pits proved a thin layer of topsoils and clays overlying a sandstone bedrock. The sandstone was encountered at 0.2-0.9m below existing ground levels.

3.2 In the eastern two thirds of the site, the trial pits generally proved thin layers of topsoils, clays and made ground overlying a mudstone bedrock. A small area of re-engineered clays extending to a depth of 5.5m was also recorded in the east of the site.

3.3 Six of the original twelve samples proved elevated levels of Arsenic. Five of these were from the topsoil (TP01, TP02, TP03, TP09, TP11), and the sixth was from the re-engineered infill material to the former watercourse alignment (TP04). The peak value of 270 mg/kg is approximately seven times the tier 1 trigger value. A single sample of topsoil from TP15 proved an elevated level of 230 mg/kg of Chromium.

3.4 A further eight samples of topsoil were taken on a second visit to site. This was to determine if the previous Arsenic contamination could be classified as hotspots. These samples proved no further elevated levels of Arsenic or Chromium.

3.5 Four of the samples proved levels of Mercury(Total) of 2.3-16.0 mg/kg, which is above the tier 1 trigger level of 1.2 mg/kg for Elemental Mercury. However, there is not considered to be historical site usage that would result in elemental and methylmercury compounds to be present, so the Inorganic Mercury SGV of 40 mg/kg is being used for comparison as this is the most prevalent form of mercury present in the natural environment.

3.6 None of the samples proved elevated levels of PAH (Total) or PAH compounds.

3.7 No asbestos was recorded in any of the samples taken from site.

3.8 Five gas monitoring stations were installed on site. During the gas monitoring, no methane was detected. Carbon dioxide values were found between 0.1 and 3.6% with oxygen levels between 13.6 and 19.2%. A maximum steady flow rate of 6.9 l/hr has been recorded.

3.9 Based on a high sensitivity end use under the NHBC traffic light system in conjunction with CIRIA C665, the GSV value corresponds to the site being characterised as **Green**, or **CS1** by BS 8485:2015.

3.10 **RECEPTORS**

The possible receptors considered in this report are

i) Residential end users.
ii) Construction and maintenance workers.
iii) Controlled waters.

i) Residential end users.

Based on the chemical results obtained it is considered that there is a **moderate** risk to end users from the contaminants identified in paragraphs 3.3-3.7.

It is proposed to treat the elevated levels of arsenic and chromium as contamination hotspots and remove these areas of topsoil from site, with further sampling to be undertaken of the underlying strata and perimeter of the excavation to confirm the removal of the contaminated material from site.

The remainder of the topsoil on site should be stockpiled and fenced off prior to developing the site to prevent cross contamination. Further testing will be required to provide a robust sample set confirming the topsoil is suitable to remain on site. The topsoil should be screened prior to being re-laid in garden areas to remove any deleterious materials.

In areas where soft landscaping is not proposed, the contamination pathways to site end users will be severed by the hardstanding floor construction.

Due to the low concentrations of gases encountered, and based on a high sensitivity end use under the NHBC traffic light system in conjunction with CIRIA C665, the GSV value corresponds to the site being characterised as **Green**, or **CS1** by BS 8485:2015.

ii) Construction and Maintenance Workers.

It is considered that there is a **low** risk to construction and maintenance workers from the redevelopment of the site.

Construction workers should always wear PPE including overalls, boots and gloves when handling the contaminated materials onsite. In addition eating, drinking and smoking should be restricted to designated areas where the above hygiene facilities are available.

iii) Controlled Waters

The samples of strata both at the surface and infill to the former watercourse showed evidence of contamination, however, there are no incidents of pollution to controlled waters associated with the site. It is therefore considered that there is a negligible risk to groundwater and controlled waters from existing contamination on site.

However, it should be noted that a watercourse is located on site and care should be taken that no contaminants during the construction works are washed by surface water run-off into these.

3.13 From the above it is evident that a source/pathway/receptor linkage is plausible. Therefore further remedial action will be required to either;

i) Break the pathway by providing an effective capping blanket/gas membrane ie encapsulating the contamination.

ii) Remove the contamination from the site.

iii) Treat the contamination on-site to a satisfactory level to ensure it is safe to remain on-site.

4.0 CONTAMINATION ASSESSMENT

4.1 The main risk to the residential end users is the elevated levels of contaminants found within the top soils and infill material to the former watercourse on site, as identified in paragraphs 3.3-3.7.

4.2 The arsenic/chromium contaminated hotspots identified, along with the infill material to the former watercourse should be excavated to the natural clay strata and the made ground and topsoil removed from site to a suitable licensed waste facility.

4.3 A minimum of five samples (one from each side and one from the base) should be taken from the perimeter and base of the excavation and submitted for analysis to determine if any further arsenic or other contaminants are present. Dependent on the size of the excavation, additional samples should be taken on a 10m grid spacing. Should no contaminants be proved in the new samples, the contaminated hotspot has been successfully removed.

4.4 Should any of the samples prove positive for contaminants, additional material should be removed from site, and further samples should be taken and submitted for analysis. This process should be repeated until all samples prove clean for contaminants when compared to the tier 1 trigger levels attached to the rear of this report.

4.5 The remainder of the existing topsoil on site should be scraped and stockpiled on site behind protective fencing to prevent cross contamination. The topsoil should be screened to remove organic and inorganic waste materials. Testing should be undertaken at a rate of 1 sample per 250m^3 of stockpiled material to confirm it is suitable for re-use on site prior to being relaid.

4.6 Should the stockpiled material prove unsuitable for re-use on site, this will need to be removed from site to a suitably licensed waste transfer facility. Clean material for use as a growing medium to soft landscaped areas will need to be imported to site.

4.7 If during the remediation work or ground works any other suspected contaminated soil/material is found, that has not been identified in the original ground investigation, then remediation works on site should cease and the Local Planning Authority notified in writing within two days. The material should be chemically analysed and its location

and extent on site should be accurately surveyed and documented. Any specific remediation proposals should then be agreed with the relevant overseeing bodies, i.e. NHBC, Environment Agency and Local Environmental Health Department, and a revised Remediation Strategy submitted and approved in writing by the Local Planning Authority. The remediation works on site should then proceed in accordance with the approved revised strategy.

4.8 All imported material to be used for the capping/topsoil layer should be uncontaminated and comply with the specification for Engineering Fill. All imported material should be tested for the range of contaminants listed in Section 10. Only material found to be below published trigger levels should be deemed uncontaminated and accepted for use on site.

4.9 If the imported material is from a Greenfield site, a minimum of 3 samples or 1 per 250m^3 of imported material should be taken for testing, whichever is greater. If it is from a brownfield site, a minimum of 6 samples, or 1 per 100m^3 of imported material should be taken for testing, whichever is greater. Material provided by a commercial supplier should be certified to the same level of testing.

4.10 All imported certified material should be placed immediately. If this is not possible, or the material is not certified and sampling is to be carried out prior to being laid, it should be securely stored on site prior to use to prevent possible contamination from any materials on site.

4.11 If any areas of contaminated or made ground are removed off site, they should be taken to a suitably licensed waste site and full documentation should be obtained. Any material to be taken off-site should be suitably quarantined prior to removal to prevent cross contamination. Any relevant chemical test results should be given to the landfill operator, so that they can determine if this material is suitable to be disposed of in their licensed landfill.

4.12 Following completion of the remediation, shallow trial pits should be excavated to the top of the capping layer by an independent consultant to confirm the capping layer thickness. Due to the overall depth of clean capping required, this may need to be undertaken in two phases. Samples should be taken and chemically tested to validate that the capping layer has been constructed correctly. All site records and results of the

shallow trial pits should be consolidated into a validation report. The report shall be completed in accordance with 'Yorkshire and Humberside Pollution Advisory Council: Verification Requirements For Cover Systems'.

5.0 REMEDIATION PHILOSOPHY & SEQUENCE OF WORKS

5.1 All existing services and drainage systems should be identified on site and protected throughout the remediation works. In particular, the existing watercourse should be protected from surface water run-off from site that may contain contaminants. Temporary works should be agreed with the LLFA. Service providers should be contacted regarding the closing down and removal of any services that are not to be retained on site.

5.2 Prior to construction commencing, staff and construction workers should be made aware of contaminated materials on site and should follow the Health & Safety Procedures identified in the rear of this report.

5.3 All contaminated materials to be removed from site to a suitably licensed waste facility. Remaining topsoil to be stockpiled on site behind protective fencing for further chemical analysis to be undertaken.

5.4 Extent of re-engineered clays in the eastern half of the site to be determined and surveyed to confirm the affect on the foundations to the proposed properties.

5.5 Site levels to be re-graded to accommodate final road construction, proposed slab levels and clean capping material.

5.6 Importation of clean material suitable for cover to soft landscaped areas should the site won material prove unsuitable for re-use on site.

5.7 To ensure a 300mm thick growing medium is placed to all soft landscaped areas.

6.0 CAPPING LAYER CONSTRUCTION

6.1 Existing contaminated topsoil from identified hotspots, and the infill material to the former watercourse, are to be scraped and removed from site. Sub-soils to be remediated to 300mm below final ground levels in soft landscaped areas.

6.2 Waste transfer tickets confirming the removal of the contaminated material from site should be retained for inclusion in the validation report.

6.3 Any final soft landscaped areas should have a minimum 150mm thickness of clean sub soils and 150 thickness clean top soils to make a total clean growing medium thickness of 300mm.

6.4 Should further testing prove the existing remaining topsoil unsuitable for re-use on site, clean material will be required to be imported to site and should therefore comply with Section 10.0 of this documentation.

7.0 PROPOSED PROGRAMME OF DEVELOPMENT WORKS

7.1 At present it is proposed to remediate the site prior to development works commencing. This would ensure that where it can be accommodated, contaminated material is removed from site prior to foundation excavation, thus reducing risk to construction workers.

7.2 All existing services and drainage systems should be identified on site and protected throughout the remediation works. In particular, temporary works should be provided to ensure surface water run-off from site does not enter the existing watercourse. Service providers should be contacted regarding the closing down and removal of any services that are not to be retained on site.

7.3 All contaminated materials to be removed from site to a suitably licensed waste facility. Remaining topsoils to be stockpiled on site behind protective fencing for further chemical analysis to be undertaken.

7.4 Extent of re-engineered clays in the eastern half of the site to be determined and surveyed to confirm the affect on the foundations to the proposed properties.

7.5 Site levels to be regraded to 0.3m below ground level in soft landscaped areas and to accommodated proposed highway construction.

7.6 Suitable clean material in accordance with Section 10.0 should be imported to site to provide a clean capping layer and suitable growing medium if there is insufficient material on site.

7.7 In soft landscaped areas, there should be 150mm of topsoil and the remainder in subsoils to provide a minimum total thickness of 300mm of suitable growing medium.

7.8 Hand dug trial pits should be undertaken in the landscaped areas prior to any turfing/seeding to confirm the depth of clean capping material.

8.0 GAS AND VAPOUR PROTECTION WORKS

8.1 During the gas monitoring, no methane was detected. Carbon dioxide values were found between 0.1 and 3.6% with oxygen levels between 13.6 and 19.2%. A maximum steady flow rate of 6.9 l/hr has been recorded. A more detailed analysis of the gas monitoring is provided in HHA Letter E19/7465/JF/012 dated 14 May 2021 referred to previously.

8.2 Based on a high sensitivity end use under the NHBC traffic light system in conjunction with CIRIA C665, the GSV value corresponds to the site being characterised as **Green**, or **CS1** by BS 8485:2015.

8.3 No Radon protection measures are required for the site.

8.4 Due to the presence of trees immediately adjacent and on the site, a suspended beam & block floor will be required for the properties in accordance with NHBC Chapter 4.2, this will allow a ventilated void to be constructed beneath the floor construction.

8.5 No additional gas protection measures are considered necessary for the development of the site.

9.0 WASTE CLASSIFICATION

9.1 The soils that are to be removed from the site may contain elevated levels of contamination, above the current accepted guidance levels. Therefore these materials should be tipped in an appropriate licensed waste site.

9.2 Any relevant chemical testing should be made available to the landfill operators so they can determine if this material is suitable to be disposed of in their waste site.

9.3 Full documentation including duty of care certificates should be obtained. These should be included within any final validation report.

9.4 Approval from the Environment Agency is required before moving contaminated material around the site. This includes excavating contaminated material and depositing in the same area. It is likely that the Environment Agency will allow the contaminated material to be moved around the site provided that elevated contamination is not placed in an area where less contamination is present. This would require the more heavily contaminated fill materials to remain within a particular area and not moved to any other parts of the site.

10.0 ENVIRONMENTAL SPECIFICATION FOR IMPORTED FILL

10.1 Suitable topsoil, subsoil and uncontaminated fill should be imported to the site where there are insufficient existing materials available on site. This material should be imported from a source that is not suspected of being contaminated.

10.2 All imported material to be used for the capping/topsoil layer should be uncontaminated and comply with the specification for Engineering Fill. All imported material should be tested for the range of contaminants listed in paragraphs 10.5-10.7. Only material found to be below published trigger levels should be deemed uncontaminated and accepted for use on site.

10.3 If the imported material is from a Greenfield site, a minimum of 3 samples or 1 per 250m^3 of imported material should be taken for testing, whichever is greater. If it is from a brownfield site, a minimum of 6 samples, or 1 per 100m^3 of imported material should be taken for testing, whichever is greater. Material provided by a commercial supplier should be certified to the same level of testing, with the certificate less than two months old.

10.4 All imported certified material should be placed immediately. If this is not possible, or the material is not certified and sampling is to be carried out prior to being laid, it should be securely stored on site prior to use to prevent possible contamination from any materials on site.

10.5 Where the level of any determinant exceeds the Tier 1 concentrations, as listed below, this material is unsuitable for use on site.

CONTAMINANT	ICRCL – TTV / DEFRA – SGV MG/KG
Arsenic	37 (4)
Cadmium	22 (4)
Chromium	130 (2)
Lead	200 (4)
Mercury	40 (1,5)
Selenium	250 (1)
Copper	2400 (1)
Nickel	180 (1)
Zinc	3700 (1)
Cyanide (total)	25
Sulphate	0.24% (3)
Sulphide	250
Thiocyanate	50
PAH (Total)	40
TPH (Total)	250
Phenols	280 (1)
PH	6-8
Asbestos	No fibres present

(1) Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3499. All rights reserved.

(2) DEFRA CLR SGV's withdrawn used for initial comparison

(3) BS 8110 1985 Table 6.1

(4) Category 4 Screening Level

(5) Unless there is considered to be historical site usage that would result in elemental and methylmercury compounds to be present, the inorganic mercury SGV is used as this is the most prevalent for of mercury present in the natural environment.

10.6 Screening values for speciated PAH (Domestic gardens with plant uptake) are indicated below:

CONTAMINANT	SCREENING CRITERIA FOR PAH
Acenaphthlene	210 (1)
Acenaphthylene	170 (1)
Anthracene	2400 (1)
Benz[a]anthracene	7.2 (1)
Benzo(a)pyrene	5 (2)
Benzo[b]fluoroanthene	2.6 (1)
Benzo[ghi]perylene	320 (1)
Benzo[k]fluoranthene	77 (1)
Chrysene	15 (1)
Dibenzo[ah]anthracene	0.24 (1)
Fluoranthene	280 (1)
Fluorene	170 (1)
Indeno[123-cd]pyrene	27 (1)
Naphthalene	2.3 (1)
Phenanthrene	95 (1)
Pyrene	620 (1)

(1) Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3499. All rights reserved.

(2) Category 4 Screening Level

10.7 LQM S4UL Screening values for speciated TPH (Domestic gardens with plant uptake) are indicated below

Petroleum Hydrocarbons	**LQM S4UL Screening Values**
Aliphatics	
C5-C6	42
C6-C8	100
C8-C10	27
C10-C12	130 (38)
C12-C16	1100 (24)
C16-C35	65000 (8.48)
Aromatics	
C5-C7	70
C7-C8	130
C8-C10	34
C10-C12	74
C12-C16	140
C16-C21	260
C21-C35	1100

10.8 The supervising engineer on site will also inspect the proposed materials visually prior to being brought onto site. Where soils are imported which contain materials, which are visually unsuitable, then the onsite supervising engineer reserves the right to refuse such materials.

10.9 Unacceptable materials include significant (greater than 5% by volume) quantities of whole brick, rebar, concrete, cobbles, tarmac, paper, plastic, glass, timber and organic materials.

11.0 VALIDATION

11.1 Photographic evidence to be recorded of the excavation of all contaminated material and waste transfer tickets provided. Samples should be taken from beneath the topsoil to confirm that all contaminated material has been removed.

11.2 Following completion of the work, shallow trial pits should be excavated to the soft landscape areas onsite, to confirm the capping layer thickness. An independent consultant should undertake the investigation works.

11.3 Any imported clean material should have been certified with testing having taken place within two months of the material being imported to site. In the absence of this, soil samples should be taken from the capping layer and chemically analysed to demonstrate that there are no elevated levels of contamination present.

11.4 If contaminated material is found in the capping layer the extent of it must be established by further testing. All contaminated material must be removed from the site and replaced by equivalent uncontaminated material.

11.5 All site records and results of the shallow trial pits should be consolidated into a validation report. The report shall be completed in accordance with 'Yorkshire and Humberside Pollution Advisory Council: Verification Requirements For Cover Systems'.

11.6 All topsoil must be in place and notification given to the validation engineers at least 2 weeks prior to the expected completion date. This will allow time for onsite investigation and chemical analysis to be undertaken and report compiled in line with the CML initiative.

11.7 Clean material imported should be visually inspected to confirm it doesn't contain unsuitable materials (i.e. glass, brick, etc)

12.0 HEALTH AND SAFETY

12.1 The following is intended as supplemental to normal good practice health and safety requirements. These are listed as routine requirements and should be adopted as a minimum when working on the above site.

12.2 Construction workers should be made aware that the site is contaminated. They should avoid coming into contact with these materials where possible and always wear PPE including overalls, boots and gloves when handling the contaminated materials onsite.

12.3 The following legislation and guidance should be complied with: -

12.3.1 Health and Safety Executive Document "Protection of Workers And General Public During The Redevelopment of Contaminated Land"
12.3.2 The Construction Design and Management Regulation 1994.
12.3.3 The Control of Substances Hazardous to Health Regulation 1994.
12.3.4 Special Waste Regulation 1996.
12.3.5 Environmental Protection Act 1990.

12.4 Washing and other welfare facilities in accordance with current Health and Safety Legislation should be made available on site. Eating and smoking should be restricted to designated areas where the above hygiene facilities are available.

12.5 To ensure safety of personnel all sides of excavations should be suitably supported or battered back where excavations are over 1.2m deep. Where there is a risk of harm from collapse of the sides of the excavations at depths less than 1.2m the same rules should apply.

12.6 The general public and any unauthorised personnel should be prevented from gaining access to the site. Any visitors likely to come into contact with the contaminated soils/fills should be made aware of the hygiene requirements.

12.7 Where excavations have not been backfilled they should be adequately fenced off with warning signs erected.

12.8 There should be no fires lit onsite during any of the construction phases of the redevelopment.

13.0 APPROVALS

13.1 Proposals for the remediation of contaminated land may require the approval of numerous bodies.

These include:

a) Kirklees CC Environmental Health Department as required by the building and planning regulations.

b) The NHBC or similar as they will provide the insurance costs to cover the property.

c) The Environment Agency if there are risks of contamination to ground or surface water systems. They will also require notification if material is removed from site and taken to an appropriate tip.

d) Relevant highways and drainage authorities and other service companies may also wish to know about the level of contaminants.

Prepared by

M.Dean. BSc., HND

Checked by

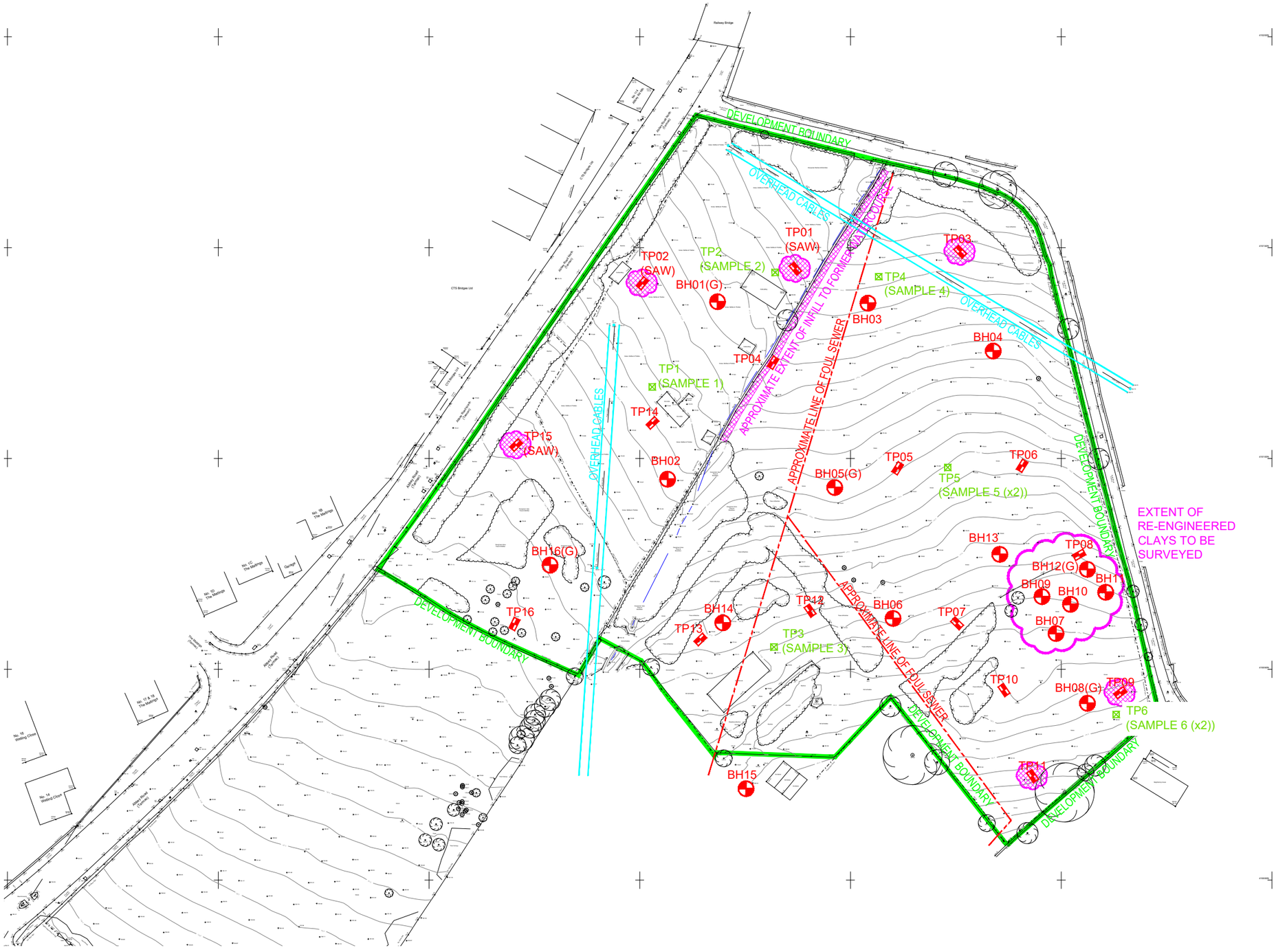
M. Huddleston. MEng

November 2022

APPENDIX

REMEDIATION PROPOSALS PLAN

CHEMICAL ANALYSIS RESULTS



KEY:

- TRIAL PIT (26-27/11/2020)
- BOREHOLE (26-27/11/2020)
- SAMPLE LOCATION (25/01/2022)
- CONTAMINATION HOTSPOT

REMEDIATION PROPOSALS

1. AGREED TEMPORARY WORKS TO BE ESTABLISHED TO PREVENT RUN-OFF CONTAMINATING EXISTING WATERCOURSE.
2. CONTAMINATED MATERIAL TO BE EXCAVATED AND REMOVED FROM SITE TO A SUITABLY LICENSED WASTE FACILITY. REMOVAL OF MATERIAL TO BE VALIDATED TO ENSURE FULL EXTENT OF CONTAMINATION HAS BEEN REMOVED.
3. CONTAMINATED INFILL MATERIAL TO FORMER WATERCOURSE TO BE REMOVED FROM SITE TO A SUITABLY LICENSED WASTE FACILITY.
4. REMAINING TOPSOIL TO BE STOCKPILED BEHIND PROTECTIVE FENCING AND FURTHER SAMPLING TO BE UNDERTAKEN TO CONFIRM SUITABILITY FOR RE-USE ON SITE.
5. EXTENT OF RE-ENGINEERED CLAYS TO BE SURVEYED TO DETERMINE AFFECT ON PROPOSED FOUNDATIONS.
6. SITE LEVELS TO BE REGRADED TO ACCOMODATE DEPTH OF HIGHWAY CONSTRUCTION, FOUNDATIONS AND 300mm CAPPING TO SOFT LANDSCAPED AREAS.
7. 150mm THICK LAYER OF CLEAN TOPSOIL AND 150mm THICK LAYER OF CLEAN SUBSOIL TO PLACED TO SOFT LANDSCAPED AREAS TO PROVIDE A GROWING MEDIUM.

Haigh Huddleston & Associates

Civil Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Rd, Dewsbury, WF12 7BU t 01924 464342 f 01924 450662

e trevor.haigh@haighhuddleston.co.uk

Client: YORKSHIRE COUNTRY PROPERTIES

Project: NORTH ABBEY ROAD, SHEPLEY PHASE 2

Detail: REMEDIATION PROPOSALS PLAN

Scale	Dwn	Chkd	Date	Dwg No.
1:1000 @A3	MD		May'22	E19/7465/003A

Rev A Updated to suit revised remediation proposals 10.11.22 MD

Certificate of Analysis

Certificate Number	20-24820	*Issued:*	11-Dec-20

Client Haigh Huddleston & Associates Ltd
Firth Buildings
99-101 Leeds Road
Dewsbury
WF12 7BU

Our Reference	20-24820
Client Reference	7465
Order No	(not supplied)
Contract Title	Shepley Phase 2
Description	12 Soil samples.
Date Received	03-Dec-20
Date Started	03-Dec-20
Date Completed	11-Dec-20
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By

Adam Fenwick
Contracts Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 20-24820
Client Ref 7465
Contract Title Shepley Phase 2

Sample ID	Depth	Lab No	Completed	Matrix Description
TP01	0.2	1771607	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP03	0.3	1771608	11/12/2020	Dark brown slightly gravelly, sandy CLAY including numerous rootlets
TP05	0.2	1771609	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP08	0.3	1771610	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP09	0.2	1771611	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP11	0.2	1771612	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP15	0.2	1771613	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP04	0.8	1771614	11/12/2020	Brown gravelly, sandy CLAY
TP08	0.6	1771615	11/12/2020	Dark brown gravelly, sandy CLAY
TP12	0.7	1771616	11/12/2020	Brown sandy CLAY including odd rootlets
TP02	0.6	1771617	11/12/2020	Dark brown gravelly, sandy CLAY
TP16	0.6	1771618	11/12/2020	Brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 20-24820
Client Ref 7465
Contract Title Shepley Phase 2

			Lab No	1771607	1771608	1771609	1771610
			.Sample ID	TP01	TP03	TP05	TP08
			Depth	0.20	0.30	0.20	0.30
			Other ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sampling Date	26/11/2020	26/11/2020	26/11/2020	26/11/2020
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	210	70	24	25
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.3	0.2
Chromium	DETSC 2301#	0.15	mg/kg	58	28	38	31
Copper	DETSC 2301#	0.2	mg/kg	34	33	35	50
Lead	DETSC 2301#	0.3	mg/kg	59	53	68	48
Mercury	DETSC 2325#	0.05	mg/kg	2.3	0.10	0.33	0.16
Nickel	DETSC 2301#	1	mg/kg	20	18	24	30
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.7	0.9	< 0.5
Zinc	DETSC 2301#	1	mg/kg	99	71	110	94
Inorganics							
pH	DETSC 2008#		pH	6.2	5.9	6.2	5.7
Thiocyanate	DETSC 2130#	0.6	mg/kg	1.0	1.7	< 0.6	< 0.6
Sulphide	DETSC 2024*	10	mg/kg	12	12	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.06	0.08	0.09	0.06
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.4	0.2	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.3	0.2	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.2	0.2	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.1	0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.3	0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.1	0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	2.5	1.7	< 1.6	< 1.6
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3	0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis

Soil Samples

Our Ref 20-24820
Client Ref 7465
Contract Title Shepley Phase 2

			Lab No	1771611	1771612	1771613	1771614	1771615
			.Sample ID	TP09	TP11	TP15	TP04	TP08
			Depth	0.20	0.20	0.20	0.80	0.60
			Other ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	26/11/2020	27/11/2020	27/11/2020	26/11/2020	26/11/2020
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	270	87	28	100	18
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3	0.3	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	38	38	230	33	29
Copper	DETSC 2301#	0.2	mg/kg	54	41	84	17	43
Lead	DETSC 2301#	0.3	mg/kg	100	89	170	24	27
Mercury	DETSC 2325#	0.05	mg/kg	0.25	0.20	5.1	0.13	0.14
Nickel	DETSC 2301#	1	mg/kg	20	19	18	19	35
Selenium	DETSC 2301#	0.5	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	110	94	140	61	85
Inorganics								
pH	DETSC 2008#		pH	6.2	5.5	6.3	7.1	6.5
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	2.2	2.0	< 0.6	< 0.6
Sulphide	DETSC 2024*	10	mg/kg	< 10	36	< 10	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.09	0.10	0.10	0.02	0.03
PAHs								
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.1	0.2	1.6	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.2	0.2	1.3	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.8	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.9	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.5	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.8	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.4	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	7.8	< 1.6	< 1.6
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	< 0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis

Soil Samples

Our Ref 20-24820
Client Ref 7465
Contract Title Shepley Phase 2

			Lab No	1771616	1771617	1771618
			.Sample ID	TP12	TP02	TP16
			Depth	0.70	0.60	0.60
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	27/11/2020	26/11/2020	27/11/2020
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	9.5	41	28
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	27	36	33
Copper	DETSC 2301#	0.2	mg/kg	26	22	23
Lead	DETSC 2301#	0.3	mg/kg	15	30	16
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.34	0.10
Nickel	DETSC 2301#	1	mg/kg	23	18	26
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	61	54	72
Inorganics						
pH	DETSC 2008#		pH	6.3	6.8	6.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	0.7	< 0.6
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.03	0.04
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis

Soil Samples

Our Ref 20-24820
Client Ref 7465
Contract Title Shepley Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1771607	TP01 0.20	SOIL	NAD	none	Deborah Milburn
1771608	TP03 0.30	SOIL	NAD	none	Deborah Milburn
1771609	TP05 0.20	SOIL	NAD	none	Deborah Milburn
1771610	TP08 0.30	SOIL	NAD	none	Deborah Milburn
1771611	TP09 0.20	SOIL	NAD	none	Deborah Milburn
1771612	TP11 0.20	SOIL	NAD	none	Deborah Milburn
1771613	TP15 0.20	SOIL	NAD	none	Deborah Milburn
1771614	TP04 0.80	SOIL	NAD	none	Deborah Milburn
1771615	TP08 0.60	SOIL	NAD	none	Deborah Milburn
1771616	TP12 0.70	SOIL	NAD	none	Deborah Milburn

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 20-24820
Client Ref 7465
Contract Shepley Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1771607	TP01 0.20 SOIL	26/11/20	GJ 250ml, PT 1L		
1771608	TP03 0.30 SOIL	26/11/20	GJ 250ml, PT 1L		
1771609	TP05 0.20 SOIL	26/11/20	GJ 250ml, PT 1L		
1771610	TP08 0.30 SOIL	26/11/20	GJ 250ml, PT 1L		
1771611	TP09 0.20 SOIL	26/11/20	GJ 250ml, PT 1L		
1771612	TP11 0.20 SOIL	27/11/20	GJ 250ml, PT 1L		
1771613	TP15 0.20 SOIL	27/11/20	GJ 250ml, PT 1L		
1771614	TP04 0.80 SOIL	26/11/20	GJ 250ml, PT 1L		
1771615	TP08 0.60 SOIL	26/11/20	GJ 250ml, PT 1L		
1771616	TP12 0.70 SOIL	27/11/20	GJ 250ml, PT 1L		
1771617	TP02 0.60 SOIL	26/11/20	GJ 250ml, PT 1L		
1771618	TP16 0.60 SOIL	27/11/20	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number	22-01651	*Issued:*	02-Feb-22

Client Haigh Huddleston & Associates Ltd
Firth Buildings
99-101 Leeds Road
Dewsbury
WF12 7BU

Our Reference	22-01651
Client Reference	7465
Order No	(not supplied)
Contract Title	Shepley Phase 2
Description	8 Soil samples.
Date Received	28-Jan-22
Date Started	28-Jan-22
Date Completed	02-Feb-22
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

mCERTS THE ENVIRONMENT AGENCY'S

UKAS TESTING 2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 22-01651
Client Ref 7465
Contract Title Shepley Phase 2

Sample ID	Depth	Lab No	Completed	Matrix Description
TP1	0.2	1963118	02/02/2022	Brown sandy CLAY including some rootlets
TP2	0.2	1963119	02/02/2022	Brown gravelly, sandy CLAY including some rootlets
TP3	0.2	1963120	02/02/2022	Brown gravelly, sandy CLAY including some rootlets
TP4	0.2	1963121	02/02/2022	Brown gravelly, sandy CLAY including some rootlets
TP5	0.2	1963122	02/02/2022	Brown sandy CLAY including some rootlets
TP5	0.45	1963123	02/02/2022	Brown sandy CLAY
TP6	0.2	1963124	02/02/2022	Brown sandy CLAY
TP6	0.4	1963125	02/02/2022	Brown sandy CLAY

Summary of Chemical Analysis
Soil Samples

Our Ref 22-01651
Client Ref 7465
Contract Title Shepley Phase 2

			Lab No	1963118	1963119	1963120	1963121	1963122	1963123	1963124	1963125
			.Sample ID	TP1	TP2	TP3	TP4	TP5	TP5	TP6	TP6
			Depth	0.20	0.20	0.20	0.20	0.20	0.45	0.20	0.40
			Other ID								
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	25/01/2022	25/01/2022	25/01/2022	25/01/2022	25/01/2022	25/01/2022	25/01/2022	25/01/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**								
Metals											
Arsenic	DETSC 2301#	0.2	mg/kg	24	19	21	26	15	6.4	26	6.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.5	0.4	0.5	0.7	0.6	< 0.2	0.5	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3	0.4	0.4	0.3	< 0.1	0.3	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	120	97	55	47	43	23	37	19
Copper	DETSC 2301#	0.2	mg/kg	57	45	45	46	32	16	38	14
Lead	DETSC 2301#	0.3	mg/kg	130	99	82	83	66	16	89	26
Mercury	DETSC 2325#	0.05	mg/kg	16	4.2	0.23	0.15	0.09	< 0.05	0.26	< 0.05
Nickel	DETSC 2301#	1	mg/kg	19	20	19	23	16	16	20	13
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	160	120	85	100	67	48	110	57

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 22-01651
Client Ref 7465
Contract Shepley Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1963118	TP1 0.20 SOIL	25/01/22	GJ 250ml, PT 1L		
1963119	TP2 0.20 SOIL	25/01/22	GJ 250ml, PT 1L		
1963120	TP3 0.20 SOIL	25/01/22	GJ 250ml, PT 1L		
1963121	TP4 0.20 SOIL	25/01/22	GJ 250ml, PT 1L		
1963122	TP5 0.20 SOIL	25/01/22	GJ 250ml, PT 1L		
1963123	TP5 0.45 SOIL	25/01/22	GJ 250ml, PT 1L		
1963124	TP6 0.20 SOIL	25/01/22	GJ 250ml, PT 1L		
1963125	TP6 0.40 SOIL	25/01/22	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report