



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Our Ref: E19/7567/MD/06

Date: 3 November 2023

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FAO Steve Mitchell

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Dear Sir,

Re: Contamination Remediation Method Statement for Proposed development off Lingards Road, Slaithwaite

1. INTRODUCTION

- 1.1 Haigh Huddleston & Associates have been requested by SB Homes West Yorkshire Homes to provide a remediation statement for the proposed development north of Lingards Road, Slaithwaite.
- 1.2 The purpose of the document is to specify the remediation philosophy for the site and to specify the fill materials that are required for the controlled backfilling and capping of the site.
- 1.3 Site investigation works have been undertaken based on the Phase 1 Environmental Assessment by Coda Structures (Report 7364 dated December 2014) and are detailed in HHA Report E19/7567/R001 dated October 2023. These reports have been utilised to compile this Remediation Statement.

2. RESULTS OF THE INVESTIGATION

- 2.1 Generally, the site investigations proved up to 2.8m of clays overlying 1.3-12.3m of weathered mudstone, except in the north west of the site where no mudstone was encountered and the clays directly overlaid sandstone. Beneath this, there was a sandstone bedrock encountered at 0.5-14.6m beneath existing ground levels. The depth to the sandstone reduced the further north and west within the site.
- 2.2 Of the thirteen samples submitted for chemical analysis, only the topsoil sample from TP10 in the north of the site recorded elevated levels of Lead (320 mg/kg) and PAH Total and individual PAH compounds including Napthalene (4.4 mg/kg), Benzo(a,h)anthracene (61 mg/kg), Benzo(b)Flouranthene (42 mg/kg), Benzo(a)pyrene (59 mg/kg) and Dibenzo(a,h)anthracene (6.7 mg/kg). A plan is attached the rear of this letter identifying the location of the hotspot at TP10.
- 2.3 No other elevated levels of heavy metals, phytotoxic metals, PAH (Total) or individual PAH compounds were recorded in the samples taken from site.
- 2.4 No asbestos was recorded in the samples taken from site.

- 2.5 During five monitoring visits to date, a maximum steady carbon dioxide concentration of 4.2% has been recorded in BH06. No methane has been recorded on site. No flow rates have been detected within the monitoring stations. Due to the low levels of carbon dioxide levels and flow rates on site, we would recommend the gas regime on this site be currently classified CS1 by BS 8485:2015 Table 2.
- 2.6 The gas monitoring is ongoing and a final report confirming any gas protection measures required will be prepared when the monitoring is completed.

2.7 REMEDIATION OBJECTIVES

- 2.7.1 From the above, the remediation works required can be stated as follows:
- Removal, and validation of removal, of the contaminated topsoil from the hotspot at TP10.
 - Stockpiling and further testing of the remaining topsoil to provide a robust sample set confirming its suitability for use on site.
 - Validation of any gas protection measures required following completion of gas monitoring.

3. REMEDIAL PROPOSALS

3.1 REMOVAL OF CONTAMINATION HOTSPOT AND FURTHER TESTING

- 3.1.1 The topsoil from the contamination hotspot identified at TP10, should be excavated to the underlying natural clay strata and the topsoil removed from site to a suitable licensed waste facility.
- 3.1.2 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 chemical analysis to determine if any elevated levels of contaminants are present. Dependent on the size of the excavation, additional samples should be taken on a 10m grid spacing. Should no elevated levels of contaminants be proved in the new samples, the contaminated hotspot has been successfully removed.
- 3.1.3 Should any of the samples prove positive for elevated levels of 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 elevated contaminants when compared to the tier 1 trigger levels attached to the rear of this report.
- 3.1.4 Waste transfer tickets for any material removed from site should be retained for inclusion in a final validation report.

3.2 FURTHER TOPSOIL TESTING

- 3.2.1 Following the removal of the contamination hotspot, 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.

- 3.2.2 Based on the proposed soft landscaping areas on site, and a topsoil depth of 0.2m, approximately 1900m³ of topsoil will be required on site. As this is a greenfield site, based on a test rate of 1 sample per 250m³ of topsoil, eight samples are required to confirm it is suitable for re-use on site prior to being re-laid.
- 3.2.3 Excluding the topsoil sample from the contamination hotspot at TP10, seven samples of topsoil have proven clean from contamination at the site. A minimum of four further samples of topsoil will be taken as part of the validation of the removal of the contamination hotspot, making for eleven samples.
- 3.2.4 We would therefore consider this sufficient to categorise the remaining topsoil as suitable for re-use on site within soft landscaped areas including domestic gardens.

3.4 GAS PROTECTION MEASURES

- 3.4.1 During the gas monitoring to date, a maximum steady carbon dioxide concentration of 4.2% was recorded in BH06. No methane has been recorded. No flow rates have been detected on site.
- 3.4.2 The proposed development consists of low rise residential housing and therefore the gas regime has been characterised in accordance with the traffic light methodology as outlined in CIRIA Report C665. Due to the low carbon dioxide levels on site, we would recommend the gas regime on this site be currently classified as **CS1** by BS 8485:2015 Table 2.
- 3.4.3 No Radon Protection measures are required for the site.
- 3.4.4 The gas monitoring is ongoing and a detailed analysis of the results and any gas protection measures required will be confirmed on completion of the on-site gas testing in a separate report.

4. REMEDIATION VALIDATION

- 4.1 Final gas protection measures strategy to be confirmed and validated accordingly.
- 4.2 Photographic evidence to be recorded of the excavation of all contaminated topsoil and waste transfer tickets provided and submitted to the local authority and warranty provider confirming the completion of the works.
- 4.3 Should the topsoil prove suitable to re-use on site, a copy of the chemical analysis results along with covering letter confirming the same should be submitted to the local authority and the warranty provider to discharge the outstanding contaminated land conditions.

- 4.4 If suspected contaminated material is found during remediation works, the independent consultant must be contacted and 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.
- 4.5 Should the existing topsoil prove unsuitable for use, clean material will need to be imported to site to provide a growing medium to soft landscaped areas. All imported material to be used for the growing medium should be uncontaminated and comply with the specification for Engineering Fill. All imported material should be tested for the full range of contaminants listed to the rear of this report. Only material found to be below published trigger levels should be deemed uncontaminated and accepted for use on site.
- 4.6 If the imported material is from a Greenfield site, a minimum of 3 samples or 1 per 250m³ 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 100m³ 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.
- 4.7 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.
- 4.8 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 Lincolnshire Pollution Advisory Group: Verification Requirements For Cover Systems'.
- 4.9 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.
- 4.10 Clean material imported should be visually inspected to confirm it doesn't contain unsuitable materials (i.e. glass, brick, etc)

We trust that the above is sufficient for your current requirements, however should you need any further information please do not hesitate to contact me direct.

Yours faithfully,



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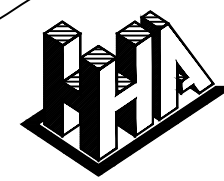
KEY:

- TRIAL TRENCH LOCATION
- TRIAL PIT LOCATION
- BOREHOLE LOCATION

165.2m

413400m

413300m



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Client	SB Homes
Project	Lingards Road, Slaithwaite
Detail	Contamination Hotspot Location
Scale	1:1000@A3MD
Dwn	Chkd
Date	Oct'23
Dwg No.	E19/7567/047

TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS
(WITH PLANT UPTAKE)

<u>CONTAMINANT</u>	<u>ICRCL – TTV / DEFRA – SGV</u> <u>MG/KG</u>
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

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- (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.

**TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS WITH
PLANT UPTAKE (SPECIATED PAH)**

<u>CONTAMINANT</u>	<u>SCREENING CRITERIA FOR PAH</u> <u>(mg/kg)</u>		
	1% SOM	2.5% SOM	6% SOM
Acenaphthlene	210 (1)	510 (1)	1100 (1)
Acenaphthylene	170 (1)	420 (1)	920 (1)
Anthracene	2400 (1)	5400 (1)	11000 (1)
Benzo[a]anthracene	7.2 (1)	11 (1)	13 (1)
Benzo(a)pyrene	5 (2)	5 (2)	5 (2)
Benzo[b]fluoranthene	2.6 (1)	3.3 (1)	3.7 (1)
Benzo[ghi]perylene	320 (1)	340 (1)	350 (1)
Benzo[k]fluoranthene	77 (1)	93 (1)	100 (1)
Chrysene	15 (1)	22 (1)	27 (1)
Dibenzo[ah]anthracene	0.24 (1)	0.28 (1)	0.3 (1)
Fluoranthene	280 (1)	560(1)	890 (1)
Fluorene	170 (1)	400 (1)	860 (1)
Indeno[123-cd]pyrene	27 (1)	36 (1)	41 (1)
Naphthalene	2.3 (1)	5.6 (1)	13 (1)
Phenanthrene	95 (1)	220 (1)	440 (1)
Pyrene	620 (1)	1200 (1)	2000 (1)

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- (2) Category 4 Screening Level