



**BROWNFIELD
SOLUTIONS LTD**

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

EDGEFOLD HOMES

Springside Road, Bury

Remediation Strategy

MP/C6123/14552

August 2025

EXECUTIVE SUMMARY OF REMEDIATION PROPOSALS

Remediation Requirements	Verification Requirements
Excavation, screening and engineering / re-use of soils to an appropriate specification.	Materials destined for re-use to meet chemical criteria as per residential with private garden (C4SL/S4UL) SOM 1% General Acceptance Criteria outlined in Appendix A and geotechnical requirements (outside the scope of this document).
Removal of Contaminated Made Ground (Heavy Metals)	Removal of historic pond which the elevated levels of heavy metals are likely linked to. Followed by testing of the sides surrounding the excavation.
Removal of Contaminated Made Ground (Asbestos)	Delineation of the asbestos impacted area followed by the removal of the impacted soils. Grid sampling should then be undertaken of the impacted area to determine the impacted soils have been removed.
Japanese Knotweed Removal	Contact a specialist contractor.
Installation of clean cover system in private gardens and soft landscaping areas which should comprise (top down): <i>Private Gardens</i> • 100mm chemically and physically suitable validated topsoil; over • 500mm chemically and physically suitable subsoil; over • 100mm hard dig layer (ideally “clean” quarried MOT Type 1 or similar, reducing subsoil to 400mm) or Warning barrier membrane/geotextile. <i>Public Open Space Soft Landscaping</i> • 100mm chemically and physically suitable validated topsoil; over • 350mm chemically and physically suitable • 100mm hard dig layer (ideally “clean” quarried MOT Type 1 or similar, reducing subsoil to 250mm) or Warning barrier membrane/geotextile. Elsewhere hardstanding (highways, pavements, driveways, structures) will break the pathway to site end users/ human health. For areas of proposed trees, a tree pit will need to be excavated, and additional subsoil provided above the hard dig layer / membrane. The above is subject to agreement with the local authority, and requirements should be confirmed at the earliest opportunity.	Imported topsoil and subsoil, and any materials re-used requiring chemical testing as per Appendix A. Thickness of clean cover system requires validation.
On completion of the above follow final verification reporting requirements.	Final verification and reporting to include (but not limited to): • The size and extent of the Remediation excavations (lateral extent and depth plotted on suitable plans). • Any treatment undertaken. • All sampling locations and test results, including any monitoring during works. • All the material imported to the site (including volume, source and chemical composition). • All the material exported from the site (including volume, destination and chemical composition). • Clean cover thickness validation records. • Discharge of any groundwater.

This executive summary should be read in conjunction with the full report, reference MP/C6123/14552, and not as a standalone document.

PROJECT QUALITY CONTROL DATA SHEET

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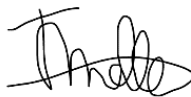
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DRAWINGS

Drawing Number	Rev	Title
J1192-SK103	-	Proposed Development Layout Plan
C6123/01	-	Site Location Plan
C6123/02	-	Exploratory Hole Location Plan
C6123/03	-	Site Remediation Plan

APPENDICES

Appendix	Title
Appendix A	Chemical Specification for Soils
Appendix B	BSL Guidance - Re-use of Waste and Disposal

1.0 INTRODUCTION

1.1 Context

This Remediation Strategy has been produced by Brownfield Solutions Limited (BSL) for Edgefold Homes on a site off Springside Road, Walmersley, Bury and has been completed in general accordance with the following guidance:

- Environment Agency guidance - Land Contamination: Risk Management (LCRM).
- BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites.
- NHBC Standards. Chapter 4.1: Land Quality - Managing Ground Conditions.

1.2 Background and Scope

This Remediation Strategy is to set out how the remediation of the site will be undertaken and how the works will be validated. The document explains how the works will be permitted under current regulatory regimes.

The scope of work for this document comprises a summary of the ground model, summaries of the of risk assessments carried out, a Remediation options appraisal (LCRM Stage 2), Remediation Strategy (LCRM stage 3) implementation details and any validation requirements.

Note that geotechnical aspects are not specifically addressed within this document, as it seeks to meet the requirements set out within LCRM. Geotechnical aspects should be considered within a Geotechnical Design Report in accordance with Eurocode 7 or a suitable site specific Earthworks Strategy.

1.3 Proposed Development

The proposed development is for a residential end use, comprising the construction of 12 traditional two-storey houses with associated private gardens, highways, and infrastructure, as shown on the proposed development schematic, drawing No. J1192-SK103 was provided to BSL by the client.

1.4 Available Information

This report should be read in conjunction with the following Reports (in date order)

- GEO Environmental Engineering, Phase I, Ref: GEO2022-5262, dated May 2022
- Brownfield Solutions, Phase II, Ref: MAS/C6123/14192 (REV B), dated August 2025

It is assumed that the Local Planning Authority will have provided the above reports to the appropriate statutory consultees, and the recommendations therein have been accepted.

1.5 Limitations

This report has been prepared for the sole use and reliance of the Client, Edgefold Homes. This report shall not be relied upon or transferred to any other parties without the express written authorisation of BSL. If an unauthorised third party comes into possession of this report, they rely on it at their risk, and the authors owe them no duty of care or skill.

Current UK guidance and legislation has been used in the environmental assessment of the site, BSL is not liable for any subsequent changes in the guidance and legislation.

BSL have used reasonable skill, care and diligence in the production of this report. The findings and opinions conveyed via this report are based on information obtained from a number of sources as detailed within this report, BSL have assumed this information is correct and reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon. This report may not be relied upon by the client or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance and regulatory approval, until all invoices have been settled in full.

The recommendations within this report are based upon the proposed site end use provided to BSL at the time of writing. If the end use or development layout changes from the proposal, then the recommendations may change or become invalid.

The site plans enclosed in this report should not be scaled off. Any site boundary line depicted on plans does not imply legal ownership of land.

Any recommendations made in this report should be confirmed with the Regulatory Authorities prior to implementation to ensure compliance.

2.0 THE SITE

2.1 Location

The site is located off Springside Road, Walmersley, Bury, BL9 5JQ, centred on National Grid Reference 380183, 413608, as shown on the Site Location Plan, Drawing No. C6123/01, presented at the rear of this report.

2.2 Description of Site

A site reconnaissance survey was carried out at the site on 28th April 2025, by a suitably qualified and competent Brownfield Solutions geo-environmental consultant as part of the Phase II Report. The main site features and potential issues identified are summarised below.

Feature	Description
Site Area	Approximately 0.50 hectares.
Site Access	Access to the site is gained off Springside Road to the southeast, via an electric gate.
Current Land Use and Site Features	The site comprises open fields covered with overgrown grasses and shrubs in the north, and grasses in the south. The site forms part of a farm, the access road for which bisects the middle of the site from southeast to northwest. The road is enclosed by barbed wire fencing and comprises a tarmac surface. Access to the northern half of the site is via an unlocked gate found in the central-eastern site area, and access to the southern half of the site is via an unlocked gate found off-site to the northwest, further along the access road towards the farm. There is a sectioned-off area of overgrown vegetation in the northern area. This was marked out with rope and was noted to contain Japanese Knotweed. Overhead cables run parallel to the southern site boundary, circa 3m from the site boundary.
Potential Sources of Gross Contamination	No potential sources of gross contamination were identified.
Vegetation / Ecology	There is a hedge running along the southern edge of site, and sporadic mature trees along the site boundaries. The northern area of the site was overgrown with grasses and shrubs and had a sectioned off area which was noted to contain Japanese Knotweed (this is beyond the scope of this strategy and specialist advice should be sought). The southern area of site was covered in grasses. Deer were noted during site works, crossing the northwestern area of site.
Topography	The site is circa 125m OD. There is a trench along the northern site boundary, circa 1m deep and 1m wide. There is a slight incline towards the southern boundary from the access road. There is also a slight depression in the southeastern site area, which is thought to be an infilled pond.
Site Boundaries	Wooden fencing encloses the site to the north, barbed wire fencing to the east, hedges and mature trees along the south, and the fields are open to the west.
Surrounding Area	The site is set within a largely residential and agricultural area, bordered by houses to the north and east, and fields to the south and west.

3.0 GROUND MODEL SUMMARY

Please see the Brownfield Solutions Phase II report, dated August 2025 (Ref: MAS/C6123/14192 Rev B) and the GEO Environmental Engineering Phase I report, dated May 2022 (Ref: GEO2022-5262), for full details.

3.1 Environmental Setting

Section	Aquifer Designation
Brief Site History	Previous uses: - Historically undeveloped land which is mainly used as agricultural land apart from a Lodge present between the 1850s and 1910. - Historic pond recorded on site in the south-east was likely infilled with made ground. - No significant industrial activity recorded.
Published Geology	Anticipated ground conditions (top-down): - Superficial – Glacial Till (sandy gravelly clay). - Bedrock – Pennine Lower Coal Measures (mudstone, siltstone and sandstone with thick coal seams) underlain by Old Lawrence Rock (sandstone). - There was not any made ground recorded on the site. - One fault recorded 67m northeast.
Hydrogeology	Glacial Till – Secondary Undifferentiated aquifer (Assigned where it is not possible to attribute either category A or B to a rock type. In general, these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.) Old Lawrence Rock (Sandstone) – Secondary A aquifer (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. These are generally aquifers formerly classified as minor aquifers.)
Source Protection Zone	The site is not recorded within a Source Protection Zone (SPZ).
Groundwater Abstractions	There are no recorded active groundwater abstractions within 1km.
Hydrology	Nearest named watercourse: Walmersley Brook (Located 162m North of the site).
Potential Environmental Constraints	There are no recorded landfills on or near the site.
Radon	Site is not in a radon-affected area - No radon protective measures necessary (per BRE Report: 211)
UXO Risk	There is no indication of any former military use - Zetica mapping indicates site is in an area with low bomb risk - No further consideration of UXO required.
Coal Mining Risk	There are no recorded past underground mining or probable shallow workings. There are no recorded mine entries within 100m. There are no recorded or unrecorded coal workings, opencast mining, or mine gas risk. Site is not in a Mining Remediation Authority High Risk Area.

3.2 Ground Conditions – Summary

A detailed description of the ground conditions and ground model is presented in BSL Phase II Geo-environmental Assessment Report, reference MAS/C6123/14192 Rev B. A brief summary of the ground conditions encountered is presented in the table and paragraphs below:

Stratum	Range Depths - Top (m bgl)	Range Depths - Base (m bgl)	Range Thickness' (m)	Brief Description
Natural Topsoil	GL	0.30 – 0.50	0.30 – 0.50	Clay with minor constituents of sand and gravel
Made Ground Topsoil	GL	0.30 – 0.50	0.30 – 0.50	Clay with minor constituents of sand and gravel

Stratum	Range Depths - Top (m bgl)	Range Depths - Base (m bgl)	Range Thickness' (m)	Brief Description
Made Ground	GL– 1.50	0.90 – 4.00	0.30 – 3.50	Clay
	0.30 – 0.50	1.50 – 2.20	1.00 – 1.90	Sand and gravel
Natural Superficial Strata	0.30 – 2.20	2.60 – 5.45	1.70 – 4.95	Clay
	2.60 – 3.10	5.45	2.35 – 2.85	Gravelly sand

3.3 Made Ground

Made Ground Topsoil was identified in nine locations, all situated in the northern section of the site, with exception to the historic pond feature. It was found from ground level to depths between 0.30m and 0.50m below ground level (bgl), typically consisting of brown clay mixed with varying amounts of sand, gravel, and rootlets. This layer also contained numerous anthropogenic materials such as gravel- and cobble-sized fragments of brick, clinker, ceramic, concrete, coal, plastic, textile, metal, and timber.

Generally, made ground was encountered beneath the made ground topsoil within eight exploratory holes in the northern part of the site. Cohesive made ground (clay) was found in six locations, extending from ground level or up to 1.50m bgl, and continuing to depths between 0.90m and 4.00m bgl, with thicknesses ranging from 0.30m to 3.50m. This clay included similar anthropogenic inclusions as the topsoil. Granular made ground was found in three locations and consisted of gravelly sand or sandy gravel with inclusions such as brick, concrete, coal, glass, ceramic, plastic, and metal. Cobbles of brick, sandstone, concrete, ceramic, and metal were moderately present in deeper sections, and ash was observed in both trial trenches. This granular material was found between 0.30m and 0.50m bgl, with a thickness of 1.00m to 1.90m.

3.4 Natural Topsoil

Topsoil was encountered in 5 locations across the site, all in the south, from ground level to depths ranging between 0.30m and 0.50m bgl, generally comprising brown clay with rootlets and clay with varying amounts of sand and gravel. For the purpose of this assessment, topsoil is defined as the upper darker and more fertile layer of the soil profile, which is a product of natural chemical, physical, biological and environmental processes. This does not imply compliance with BS 3882:2015.

3.5 Natural Superficial

The natural strata underlying the site was generally soft to stiff clay with varying amounts of sand and gravel as minor constituents. This is interpreted to represent Glacial Till. This was encountered from depths ranging between 0.30m and 1.60m bgl, down to depths ranging between 2.60m and 5.45m bgl. It ranged in thickness from 1.70m to 4.95m bgl.

Gravelly sand was encountered in 2 locations across the site (WS01 and WS03) encountered from 2.60m and 3.10m bgl respectively, with both present down to the borehole base at 5.45m bgl. It ranged in thickness from 2.35m to 2.85m.

Shear vane readings in the cohesive soils indicate the clays ranged from low (soft) to high (very stiff) strength. The cohesive soils generally ranged from firm to stiff.

3.6 Solid Geology

The solid geology of the Pennine Lower Coal Measures was not encountered in this investigation.

3.7 Groundwater

Groundwater was not encountered during site works, and post-site works monitoring has revealed no groundwater to be present.

3.8 Visual and Olfactory Observations

During the works undertaken by BSL, observations for both visual and olfactory evidence of contamination were undertaken.

A slight hydrocarbon odour was noted in TP02 at 1.70m bgl. No further olfactory evidence was noted during site works.

With the exception of ash, clinker, and other anthropogenic inclusions observed as a minor constituents in the made ground soils, no other evidence of contamination was observed at the site.

4.0 SUMMARY OF RISK ASSESSMENTS

4.1 General

The previous site investigation has confirmed the following:

- Localised heavy metal contamination within the made ground.
- Asbestos (loose fibres) within the made ground soils at one location.
- Deep made ground within a historic pond area.

A pre-development CSM is presented in section 8.8 in the BSL Phase II Geo-Environmental Assessment report MAS/C6123/14192 Rev B (dated August 2025).

4.2 Human Health Risks

Asbestos

Chrysotile loose fibres have been detected in one sample from WS04 at 0.10 – 0.40m bgl within the made ground. On quantification analysis the asbestos level was <0.001% mass and classified as being trace levels.

No visual evidence of asbestos contamination was noted during the investigation, which was undertaken by an engineer with asbestos awareness and NNLW qualifications.

Heavy Metals

Elevated levels of heavy metals including arsenic, lead and mercury were recorded in one sample from TT01 at 0.50 – 1.50m bgl which is from the made ground.

4.3 Permanent Ground Gases and Vapours

A summary of the ground gas monitoring carried out by BSL is presented below:

- BSL conducted 6 monitoring visits over 3 months, in line with CIRIA C665 guidance.
- Methane was not recorded above the detection limit of the monitoring equipment (i.e. <0.1% v/v).
- Carbon dioxide concentrations ranged between <0.1% v/v and 9.5% v/v.
- Oxygen concentrations ranged between 7.8% v/v and 21.2% v/v.
- The maximum steady state gas flow rate was 0.3 l/hr.

The main sources of ground gas identified were made ground.

On the basis of the above and the assessment carried out, the site is classified to fall within Characteristic Situation 1 in accordance with CIRIA 665 and therefore no mitigation measures are required.

The site has been assessed as Characteristic Situation 1 (CS1) in respect to permanent ground gases (carbon dioxide and methane). For CS1 no specific gas protections measures are required.

4.4 Risk to Controlled Waters

Groundwater water testing has not been carried out based on the preliminary CSM risk assessment and the site is not considered to pose a significant risk to controlled water for the following reasons:

- There is no indication under present conditions of significant pollution of controlled waters and conditions following development of the site will not be any worse, indeed they may improve with increased hard cover and water retaining imported soft landscaping soils.
- The nearest watercourse is 162m away, which provides considerable distance for attenuation and contaminant degradation.
- The site is underlain by low permeability clays which will inhibit lateral and vertical contaminant migration.
- The site does not lie within an SPZ.
- There are no active groundwater abstractions within 1000m.
- The closest active surface water abstraction is recorded 684m southwest of site and is not considered to be at risk from the proposed development.

Based on the above, the site is not considered to pose an unacceptable risk to controlled waters. Therefore, no specific Remediation requirements for controlled waters are necessary.

4.5 Summary

A summary of the findings of the previous investigations and assessments where a risk is present (i.e. an unacceptable source-pathway-receptor linkage identified as a Contaminant Linkage (CL)) which requires mitigation is presented in the table below.

Source	CL*	Receptor
← Poses an unacceptable risk to →		
Made ground with elevated levels of heavy metals (Arsenic, Lead & Mercury).	CL1	Human health / construction workers Residential with homegrown produce
Made ground with elevated asbestos fibres.	CL2	Human health / construction workers Residential with homegrown produce
Japanese Knotweed	CL3	Property
Contingency Items	CL4	Human health / construction workers Residential with homegrown produce

* Contaminative Linkage (CL) number

Based on the above, it was recommended that a Remediation Strategy be prepared that identifies the specific remediation requirements for the site. As mentioned previously a specialist Japanese Knotweed contractor should be contacted as this is beyond the scope of this report, therefore this will not be taken any further.

5.0 REMEDIATION OPTIONS APPRAISAL

5.1 Remediation Options

This section has been produced in general accordance with the requirements of LCRM: Stage 2 Options Appraisal.

The Investigations and risk assessment have concluded that the site will require remediation is the action required to prevent, minimise, remedy or mitigate the effects of the identified unacceptable risks listed in the section above.

The remediation of the site will need to ensure that upon completion of the development, the ground conditions at the site can be shown to be appropriate for the intended use and that they will not pose unacceptable contamination risks to the identified receptors.

For the options appraisal, there are 3 steps to follow:

- 1) Identify feasible remediation options.
- 2) Do a detailed evaluation of options.
- 3) Select the final remediation option.

The objectives of the remediation will be to sever one or more of the linkages within the source-pathway-receptor (S-P-R) model. There are three broad approaches which can be adopted:

- Remove or treat the source of pollutants.
- Remove or modify the migration pathway.
- Remove or modify the behaviour of the receptor.

The options appraisal process considers the available Remediation techniques to achieve the above based on following key criteria:

- Effectiveness.
- Practicality.
- Durability.
- Relative Cost.
- Relative Operational Time (in terms of installation or the activity).
- Sustainability.

The feasibility of each of the listed Remediation option is assessed in terms of effectiveness at treating the contamination, which is broken down into; effective (Yes), partially effective (Partially) or not effective (No).

The listed techniques are also assessed in terms of relative cost ranging from negligible cost (£) through moderately expensive (££) to prohibitively expensive (£££).

Timescales over which the remediation technique is operational has been relatively assessed as weeks, months, years and decades. If a given technique is only effective over a period in the order of years to decades, then its overall feasibility is diminished.

A sustainable approach can help to ensure that the benefit of doing the remediation is greater than its impact.

The table below summarises the possible Remediation options and assesses each against the six key criteria listed above:

Remediation Activity	Effective	Relative Cost	Operational Time	Comments (Practicality / Sustainability / Durability)	Feasible
Civil Engineering Methods					
Cover System CL1, CL2	Yes	£	Weeks	Will prevent contact between site end users and shallow contaminated soils, breaking the S-P-R linkage.	Yes - considered a suitable remediation option to mitigate the risk to human health.
Excavation and Disposal (may also require pre-treatment by screening & sorting). CL1, CL2	Yes	£££	Weeks	This will effectively remove the source of the contamination, but is much less sustainable compared to other feasible options (excessive cost, take up of landfill space, transport issues, need to replace with clean material)	Yes – in conjunction with other options.
Materials Management (Excavation and Re-Use of Suitable Materials) CL1, CL2	Yes	££	Weeks	Excavation and re-use of any suitable materials and potential re-use of treated materials at a suitable depth. Would need to be undertaken in association with a Materials Management Plan (MMP) prepared in accordance with the CLAIRE Definition of Waste Code of Practice and signed off by a Qualified Person.	Yes – in conjunction with other options.
Biological Methods					
Not considered to be relevant to the subject site.					
Chemical Methods					
Not considered to be relevant to the subject site.					
Physical Methods					
Not considered to be relevant to the subject site.					
Passive Methods					
Not considered to be relevant to the subject site.					

5.2 Selected Remediation Options

Based on the above Remediation options appraisal, the most appropriate approaches to the residual risks are listed below:

- Remove point sources of potential contamination
- Utilise a clean cover system.

The options selected have been chosen because they are considered to be effective, can be carried out practically within the available time periods and are commercially viable.

5.3 Site Remediation Requirements

The key requirements are summarised in the table below:

Source	Contaminants of Concern	Remediation Method	Further Details / Remediation Requirements
CL1 & CL2 Made Ground	Heavy Metals (Arsenic, Lead, Mercury), Asbestos	Removal and disposal of the contaminated the areas and the Installation of Clean Cover System.	In private gardens and soft landscaping areas, a cover system comprising "clean" validated topsoil/subsoil should be installed. A warning geo-membrane should also be installed at the base of the clean cover system.
CL4 Contingency Planning	-	-	Known contamination and any grossly contaminated areas identified during the works should be removed and disposed of accordingly.

In addition to the specific Remediation requirements listed in the tables above which are intended to mitigate the risks from known sources, it was recommended that a watching brief be maintained during the groundworks and construction for any evidence of contamination and BSL consulted for advice.

Detailed requirements are discussed in section 5.0 below. Note where the word "clean" is used from here on, the definition of this shall mean chemically suitable for the intended use.

6.0 DETAILED REMEDIATION REQUIREMENTS AND OTHER CONSTRAINTS

6.1 General

This section is intended to fulfil the requirements of LCRM Stage 3: Remediation and Verification.

All Remediation works are to be overseen by suitably experienced and qualified site staff and a site watching brief will be in place alongside regular visits by a suitably qualified person to undertake the necessary verification works described.

The table below provides a summary of requirements in terms of the approximate order of works. It should be noted that the precise sequencing has not yet been confirmed by an appointed Contractor. This Remediation Strategy may also be subject to revision, dependant on the requirements of the regulators.

Task	Description
	Pre-Commencement
1.	Approval of this Remediation Strategy with the Local Authority, Warranty Provider (e.g. NHBC) and Environment Agency (EA) prior to site works commencing. Appointment of contractor for the works, who is to obtain appropriate permits, licences and approvals. Other appointments as per CDM requirements. Production and declaration of a Materials Management Plan (MMP) under the DoWCoP prior to any works commencing or confirmation of waste exceptions (U1) to be in place.
2.	Site Clearance and Removal of Identified Contaminated Areas Subject to all necessary ecological and arboricultural surveys being undertaken and appropriate mitigation measures in place, the site should be cleared and any vegetation below areas of proposed development should be stripped in accordance with Series 200 of the Specification for Highway Works. Treatment of Japanese Knotweed by a specialist. A watching brief should be maintained during clearance/soils strip for any previously unidentified contamination.
3.	Excavation and Re-use of Site Won Material and Importation of Soils, if required (Earthworks) Excavation, screening, treatment (if required) and engineering / re-use of soils where suitable, to an appropriate Earthworks Specification in accordance with SHW Series 600. To achieve the proposed ground levels, it will be necessary to import naturally occurring soils.
4.	Installation of a Clean Cover System / Placement of Soft Landscaping Area Soils Installation of “clean” validated cover system in soft landscaping areas where required to provide growing medium. Imported soils to be used as part of the cover layer should meet the chemical criteria outlined in Appendix A.
5.	Verification and Reporting of Remediation Work Validation of any Remediation excavations and reporting. The gardens and landscaped areas where made ground is present will require depth validation. The ground gas protection measures will require verification in accordance with CIRIA C735. Collation of information relating to site clearance, chemical testing, any Remediation works, Remediation verification, material movements and waste transfer documentation where appropriate. A closure Verification Report will be required to close out the declared Materials Management Plan and submitted to CL:AIRE. Complete Remediation validation report(s) in line with regulatory guidance and warranty provider requirements. The report(s) should be submitted to the Local Authority and warranty provider for approval following completion.

6.2 CL1 – Removal of Heavy Metal Contaminated Made Ground

Localised heavy metal exceedances within the made ground have been found in TT01 (Arsenic, Lead, and Mercury). The made ground within TT01 is localised to the vicinity of the historic pond within the south-eastern corner of the site. The made ground here has been proven to be 21m in length and 6m in width, and of oval shape, reflecting the shape of the historic pond. The base of the made ground was proven to be 2.20m bgl. Therefore, the approximate volume of made ground is 550m³ (based on the likelihood of made ground thinning out).

This feature should be treated as a hotspot and should be removed from site and reinstated with a suitable, clean imported material (to criteria which is outlined in appendix A). This is shown within the Site Remediation Plan, Drawing No. C6123/03.

All excavations of contaminated soil should be carried out under the guidance and direction of a qualified and experienced geo-environmental engineer.

Potentially impacted soils will be removed and stored in a sealed bunded area for testing and disposal (or re-use if feasible and suitable for use). Impacted soils surplus to requirements will be disposed off-site to a suitably licensed facility.

The impacted area will be excavated and removed until the historic pond is removed. The sides and bases of excavations should be tested by a suitably qualified geo-environmental consultancy, such as BSL, with a minimum of 1 sample per 25m² (minimum one per face) as per GPP27 / UK Government guidance. It is recommended that soil samples are retrieved from the excavator bucket, to avoid cross-contamination and soil mixing.

Soil samples shall be submitted for laboratory analysis under chain of custody at a suitable MCERTS/UKAS accredited laboratory to verify the heavy metal concentrations and in order to determine suitability for re-use or offsite disposal, if required. Testing of samples should comprise aqua regia extractible arsenic, lead and mercury testing.

All testing required by the receiving landfill will be scheduled and paid for by the Remediation Contractor. Results will be submitted to a suitably qualified geo-environmental engineer, such as BSL, for approval and validation.

Soils unsuitable for re-use should be removed from site and shall either be excavated and immediately loaded onto a lorry for disposal to a suitable landfill facility or temporarily stockpiled on site for later removal. In the case of the latter, the stockpile should be located on an impermeable membrane in a bunded area and covered with an impermeable membrane at the end of each working day. Where soils are wet when excavated, adequate measures should be taken to ensure there is no surface run-off onto surrounding soils.

6.3 CL2 – Asbestos Impacted Soils

The asbestos found localised in WS04 should also be treated as a hotspot. Further delineation is recommended as a series of hand pits around the location of WS04. Following suitable delineation, the asbestos impacted made ground should be removed for offsite disposal.

During the excavation, sorting and screening of soils, any easily identifiable asbestos containing material (e.g. asbestos cement sheeting tile etc) shall be removed by hand picking and disposed off-site to a suitably licensed waste facility by a suitably qualified and licensed contractor.

The reuse of excavated soils contaminated by asbestos should also be carried out in accordance with “Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance (shortened name CAR-SOILS™)” with work requirements assessed by a competent person in line with the Joint Industry Working Group (JIWG) Decision Support Tool for CAR 2012 Work Categories (i.e. are the works notifiable or not and are they non-licensed or licensed).

The presence of asbestos within the ground will require a safe system of work to be set up on site to deal with the asbestos risk from the made ground. This may include, but be not limited to:

- Personal working in the vicinity of the ACM/loose fibres should be suitably trained and competent in line with CAR 2012.
- Careful segregation of stockpiles on site.
- Defining transport routes.
- Cleaning down of machinery in designated areas.
- Suitable PPE, RPE and decontamination unit for ground workers.
- Damping down of soils to prevent dust migration.
- Air quality reassurance monitoring (before/during/after works).

Note that a reduction in control methods is possible if natural factors are present (e.g. wet ground or raining).

Air Monitoring and Dust

Risks associated with the transport of soils that potentially contain asbestos fibres, such as dust emission, should be appropriately managed.

If the areas where asbestos have been identified are to be disturbed, then it is recommended that boundary asbestos and dust monitoring should be undertaken before site works commence to establish baseline conditions. This monitoring will continue at points during earthworks to determine if during the works there is evidence of an increased risk of release of fibres to the air / surface soils.

Boundary air monitoring results during works shall be compared with acceptable maximum standards set by the HSE. For asbestos, these air monitoring procedures and limits are given in HSG 248 entitled “Asbestos: The analysts’ guide for sampling, analysis and clearance procedures” and CAR 2012. The monitoring should be undertaken by a UKAS accredited laboratory/contractor. The limit used is governed by the levels stated in the above guidance documents and the accuracy of the testing used.

The proposed method uses the WHO fibre counting method with a limit of detection of 0.001 f/ml and a reporting limit of 0.01 f/ml. Should there be breaches of the 0.1 f/ml four hour control limit, then work will be stopped and a course of action agreed between the project team and the regulators (if deemed necessary).

Groundworkers should have appropriate personal UKAS accredited air monitoring to monitor for the presence of airborne asbestos fibres, along with access to a combination of suitable personal protective equipment (PPE) and respiratory protective equipment (RPE) for immediate use, if required.

Should elevated levels of airborne asbestos fibres be recorded during personal monitoring, the work item or area shall be suspended, and the Principal Contractor Site Manager shall be immediately informed, who will consider if further mitigation measures are necessary. The Contractor will inform BSL, the client and the Local Authority within 24 hours of the incident, if deemed a requirement and agree measures, if necessary.

Re-use of Asbestos Impacted Soils

In terms of materials placement (i.e. re-use), if implemented, the following criteria will deliver a site that is suitable for use in terms of asbestos risk (applicable to the built environment only):

- Soils between finished ground level to 0.60m depth must be characterised by nil asbestos.
- Soils below 0.60m depth or directly beneath building plots (i.e. below hardstanding, floor slabs, driveways etc) and adopted highways/pavements must be characterised by asbestos at or <0.001% w/w asbestos.
- For soils >1.00m below finished ground levels, asbestos in soils should be <0.1% w/w and providing that asbestos contaminated soils are placed below this depth, then it is considered that there is no risk to human health. Efforts should be made to remove any visible ACM, providing it is practical to do so and does not generate any increased level of risk.

Provision will need to be made for hand picking of identifiable asbestos containing materials where observed and these materials will need to be placed in a locked skip prior to disposal to an appropriate waste facility.

These criteria have been used on similar sites to the satisfaction of the local regulatory authority.

Records of all activities undertaken, especially where soils containing 0.1% w/w to 0.001% w/w are placed below 1.00m, should be kept in a Health & Safety file for future reference, noting that this primarily applies to persons engaged in excavation works below 1.00m depth. CAT B training is likely to be required for operatives excavating below these depths, although the contractor should undertake their own risk assessments to confirm requirements.

6.4 Cover Layer

Whilst the soils in the remainder of the site had no elevated determinants above a residential with homegrown produce end use, the soils in the northern section of the site were all encountered as made ground topsoil, containing anthropogenic inclusions of gravel and cobble sized brick, clinker, ceramic, concrete, coal, plastic, textile, metal, and timber. Therefore, these soils are not suitable for use in gardens or soft landscaping as a suitable growing medium.

It would be prudent for a cover system comprising of “clean” validated topsoil/subsoil to be placed in proposed private gardens and soft landscaped areas to mitigate against the risk of the made ground to human health.

Imported soils to be used as part of the cover layer should meet the chemical criteria outlined in Appendix A.

It should be noted that the screening criteria and scenarios adopted within Appendix A are conservative, thus an exceedance of a contaminant will not necessarily deem the material to be unsuitable. Any exceedances detected and overall material suitability will be assessed on a case by case basis, with the results included and discussed in the Validation Report.

The installation of a clean cover system will break the pathway to human health from the heavy metal and asbestos contamination and act as a growing medium.

The cover layer in private garden areas should comprise (top down):

- Min 100mm “clean” validated topsoil; over

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- 500mm “clean” validated subsoil; over
 - Warning barrier membrane/geotextile or 100mm thick hard dig layer (ideally “clean” first generation quarried MOT Type 1 or similar, with the hard dig layer reducing the subsoil thickness by 100mm).
-

The cover layer in public open space (POS) soft landscaping areas should comprise (top down):

-
- Min 100mm “clean” validated topsoil; over
 - 350mm “clean” validated subsoil; over
 - Warning barrier membrane/geotextile.
-

For areas of proposed trees, a tree pit will need to be excavated, and additional subsoil provided above the hard dig layer / membrane, further guidance over suitable thickness’ should be obtained from a landscape architect.

Site drainage should be taken into consideration with the implementation of the clean cover layer. It is also essential to provide a structured, uncompacted and well-aerated soil profile for the successful establishment and subsequent growth of plants and grass. However, where heavy machinery and large volumes of soil are excavated and stored, soil structure can easily be destroyed by over-compaction, leading to poor drainage and failed garden planting. This can often be mitigated by careful site planning or rotavating the soils as required.

The above is subject to agreement with the Local Authority and the warranty provider, and requirements should be confirmed at the earliest opportunity.

6.5 CL4 – Unexpected Contamination

If any unexpected, contaminated materials are encountered by the contractor, then work should cease in that area, and the contractor should consult a suitable geo-environmental consultancy, such as BSL, for advice prior to any irrevocable action at the site.

6.6 Other Geo-Environmental Considerations

Imported Materials and Materials for Re-use

Any soils or materials imported or to be re-used as part of the works should be tested for chemical compliance and suitability in line with the guidance stipulated in Appendix A and the proposed end use.

Any imported material should be approved by BSL and the Local Authority prior to being imported onto site.

Where feasible, imported topsoil should conform to the requirements of BS 3882:2015 (Specification for Topsoil and requirements for use), or as agreed with the client. Imported subsoil should also conform to the requirements of BS 38601:2013 (Specification for subsoil and requirements for use), or as agreed with the client.

In addition, all materials must be free from aggressive / invasive weeds (such as Japanese Knotweed and Giant Hogweed) and bulk vegetative growth.

Records

Accurate records and as-built drawings will need to be kept, updated and provided for all aspects of the Remediation works as they progress.

The construction works should be devised in a way to allow the maximum re-use of site won materials adhering to current waste regulations. To allow this and demonstrate compliance with Waste Management Licensing Regulations the Contractor should maintain an accurate Materials Management Plan (MMP). These shall show the source, description, classification and placement location of all fill used on the site. The plans shall be revised regularly with archive versions maintained for future reporting purposes. The MMP should show the extent of any excavations undertaken on site.

Testing

Prior to commencing any works, the Contractor will submit to the Clients Representative (Suitably qualified Geo-environmental Engineers) details for the testing laboratories to be used together with their UKAS and MCERTS accreditations (as appropriate). The Clients Representative will approve the laboratories subject to them holding the relevant certifications. Alternatively, providing the Client's Representative is a suitably qualified Engineer, then they may attend site to obtain samples for appropriate testing.

Tests carried out by a laboratory without the approval of the Client's Representative will be rejected.

All samples will be taken in accordance with relevant guidance (e.g. BS 10175:2011+A2:2017).

The contractor is responsible for the testing of the physical properties of any imported or processed material to be used in the engineering works. This applies to both site won and any imported materials.

Site won material shall be tested to confirm its chemical suitability. Contaminated material for disposal should be tested to define the most economical disposal route. In addition, any material to be imported to the site shall be tested and its suitability demonstrated prior to it being brought to the site.

The geotechnical suitability of site-won materials will be confirmed before reuse, by appropriate earthworks testing, in accordance with an Earthworks Specification (preparation of which is outside the scope of this Remediation strategy).

Surface Water Runoff

The contractor should provide and maintain means to intercept surface run off in accordance with good site practice. Run-off from the site shall not be allowed to enter adjacent waterways or drainage gullies without the permission of the Drainage and Highway Authorities.

Surface waters from the site shall be discharged to the mains sewer under consent from the local Water Authority.

It should be noted that groundwater impacted by hydrocarbons may require some form of treatment prior to discharge. Alternatively, if only small amounts of water are encountered, this could be stored and removed to a suitable waste disposal facility.

Permits

The appointed contractor will need to hold or obtain relevant waste permits or exemptions (where applicable) in accordance with the Environmental Permitting Regulations 2016 to carry out waste recovery, treatment and re-use activities on site. Alternatively, waste recovery and re-use operations shall be in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP), 2011 and an approved Materials Management Plan (MMP) declared under the DoWCoP by a Qualified Person (QP).

A crusher/screener will also require a waste permit or exemption. Aggregates should be processed in accordance with relevant WRAP Quality Protocol to produce a non-waste product.

It is the contractor's duty of care to ensure that any waste to be treated or disposed off-site is transported by a licenced waste carrier and that the waste facility is licenced, permitted or holds an appropriate exemption.

Evidence of the above should be maintained and provided on request along with any waste transfer or consignment notes for materials removed off-site.

6.7 General Considerations

Dust

Work procedures should be designed to minimise the risk of dust becoming airborne by suitable means, such as keeping the exposed soils damp or covered at all times. It is important that the control measures in place are sufficiently robust to prevent the release of contaminated dust into the surrounding environment.

Stockpile Management

Segregation of materials and stockpiles should be maintained, and accurate records kept to avoid the potential for cross contamination. Good site practice for stockpile management includes, but is not limited to:

- Damping down of the site surface, excavations and stockpiles to prevent the generation of dust (wind blown asbestos fibres can contaminate "clean" topsoil stockpiles potentially resulting in expensive disposal costs).
- Stockpiles sizes should be kept to a minimum to reduce 'wind whip' causing potentially hazardous material to be blown from the pile.
- Once at the intended size, stockpiles should be "sealed" to ensure no excess materials are placed and mixed into the stockpiled to prevent cross contamination.
- Clean, validated material proposed for re-use as part of the cover system should ideally be placed on a suitable polythene membrane or clean concrete hardstanding to prevent any cross contamination.
- Appropriate loading of plant to prevent spillages.
- Appropriate signage should be displayed so that site workers/visitors are aware of the intended use and are alerted to the potential hazards associated with the material to be stored on site.

Examples of good site practice for stockpile management are presented below:



Well Decommissioning

Existing monitoring wells to be decommissioned to remove potential pathways. Covers and pipe shall be removed, and the resultant annulus filled with bentonite grout or concrete in accordance with EA guidance.

6.8 Geotechnical Considerations

Geotechnical Considerations

Whilst geotechnical aspects are not specifically considered within this Remediation Strategy, all earthworks should be undertaken in accordance with an appropriate Earthworks' Specification.

Former pond areas are likely to contain soft or infilled materials that will require excavation and either some form of treatment for possible re-use on site or disposed of off-site to a suitable facility.

If present, unsuitable materials (e.g. timber, metals and plastics) removed during screening should be segregated and stored in a suitable location prior to off-site disposal to a suitable licence facility. Where practicable materials should be re-used or recycled.

The contractor should be responsible for controlling groundwater entry into excavations.

Materials Management

Any works involving the movement of soils within the site boundary shall be done in accordance with a Materials Management Plan (MMP) under the CL:AIRE Definition of Waste Code of Practice (CoP) or shall be done in accordance with an appropriate exception (U1). Further guidance is presented in Appendix B.

To implement the DoWCoP, there is a requirement to notify the Environment Agency and Local Authority of the intention to use the code of practice in principal, after which there is a 21-day notice period for their response.

In order to re-use soils under the DoWCoP, there are four key criteria that need to be met:

-
- The aims and objectives of the project meet the requirements of the Waste Framework Directive.
 - The soils can be demonstrated to be suitable for use (backed up by chemical/geotechnical testing and assessment).
 - There is certainty of use (i.e. materials tacking which should be in place as part of good site practice in any case).
 - Quantity (the quantity of materials used should be known).
-

Information on existing site levels, proposed levels, volumes generated (e.g. foundation / drainage excavation arisings) would need to be known in order to complete the MMP.

If the DoWCoP is the chosen route, it is an absolute that the MMP should be in place and declared by a Qualified Persons (QP) before works commence, otherwise excavated soils could constitute an illegal deposit of waste and enforcement action could be taken by the EA and HMRC.

In regard to "clean" naturally occurring soils only that are to be re-used on their site of origin, these are covered by a Waste Framework Directive (WFD) exclusion. So long as the project can prove the four criteria (listed above) then permits or the DoWCoP are not required. However, many projects still use the DoWCoP to ensure compliance.

Re-use of soils containing asbestos should comply with the CL:AIRE publication 'Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials' (CAR-SOILTM) and CAR 2012.

In terms of the re-use of brick/concrete crush materials, the DoWCoP does cover aggregates, but only on the site of origin and the EA WRAP aggregate Quality Protocol might best apply to ensure quality standards.

7.0 STAKEHOLDERS AND RESPONSIBILITIES

7.1 Key Stakeholders

A summary of the key project stakeholders is presented below (not exhaustive):

Client / Developer	Consultant / Engineer	Contractor	CDM Stakeholders	Regulators
Edgefold Homes	Brownfield Solutions Ltd (BSL)	Demolition, Remediation and Groundworks Contractors (TBC)	Principal Contractor (TBC) Principal Designer (TBC) Health and Safety Executive (HSE)	Bury Metropolitan Borough Council (regulator - Human Health risk and planning consent) Environment Agency (EA) (regulator - controlled waters and waster) Warranty provider (e.g. NHBC/LABC)

7.2 Client

The remediation works will come under the umbrella of CDM 2015 Regulations. The Client is responsible for formally appointing a Principal Designer and Principal Contractor, otherwise the Client assumes the role of Principal Designer. All pre-construction information will need to be made available to the appointed duty holders and sufficient time and resources allowed.

7.3 Consultant/Engineer (Client's Representative)

A suitably qualified Geo-Environmental Engineer/consultant should be appointed as the client's representative to oversee the works, who will have a visiting role throughout and provide advice when required.

They should be responsible for:

- Providing appropriate supervision of the Remediation works (either part time or full time).
- Monitoring the works to ensure compliance with this strategy and specification.
- Audit testing of materials. (However, it is the responsibility of the contractors to demonstrate the suitability/acceptability and the compliance of the material with the specification).
- Approval of test results.
- Validation of the works.

They will maintain records of the works to include the following:

- Record sheets to include a summary of the activities.
- Aspects relating to Environmental Control or non-compliance with this strategy.
- Test Results.

Liaison will be carried out with relevant regulators prior to commencing on site. The design of the Remediation Strategy can be adapted to avoid unnecessary delays at a later date.

Validation information will be supplied to the Local Authority for approval in a Verification Report. The report will include relevant site records and stand as certification that the Remediation works have been carried out in accordance with this strategy.

7.4 Contractor

The contractor appointed to oversee the development construction works should comply with the following regulations, guidance and legislation relating to the works:

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- Environmental Protection Act 1990.
 - Health and Safety Executive “Protection of Workers and the General Public during the Redevelopment of Contaminated Land”, HS(G)66, HMSO 1991.
 - Duty of Care Regulations 1991.
 - Water Resources Act 1991.
 - Water Industry Act 1991.
 - Environment Act 1995.
 - The Control of Substances Hazardous to Health Regulations 2002.
 - Hazardous Waste Regulations.
 - Control of Asbestos Regulations (CAR) 2012.
 - Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance (shortened name CAR-SOIL™).
 - The Construction, Design and Management Regulations 2015.
-

The contractor should provide adequate supervision for all the site works. This shall include a suitably experienced Remediation Engineer or Site Manager who will validate the work and maintain records allowing preparation of a validation report for the works.

The appointed contractors will be responsible for maintaining all records in connection with the works.

Records shall include details of:

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- All the material imported to the site (including volume, source and chemical composition).
 - All the material exported from the site (including volume, destination and chemical composition).
 - The size and extent of the Remediation excavations (lateral extent and depth plotted on suitable plans).
 - Any treatment undertaken.
 - Details of the contractor’s waste exemptions, if applicable.
 - Discharge of any groundwater.
-

7.5 CDM Stakeholders - Health & Safety

The appointed Principal Contractor (PC) will need to produce a Construction Phase Plan for the work, prepare risk assessments and method statements. The PC will be responsible for the coordination of welfare and H&S matters on-site including sub-contractors.

The Principal Designer/Client will review the Construction Phase Plan and notify the local office of the Health and Safety Executive (HSE) of the works prior to commencing (via form F10). Unless otherwise agreed with the client, the table below provides a broad outline of the overall project team.

All works should be carried out in a manner that will safeguard all site employees. This should include but not be limited to; site induction for all staff and visitors, training/safety awareness training, issue of Personal Protective Equipment (PPE) and the provision of suitable welfare facilities. Further advice is provided within HSE publication 'HSG 66 Protection of Workers and the General Public during Redevelopment of Contaminated Land'.

The works should be carried out in a manner to protect against damage to property or nuisance to property or persons on the site or within its immediate vicinity. Noise and dust issues should be considered. Members of the public should be excluded from the works areas, and the contractor should maintain suitable security to ensure unauthorised persons cannot access the works.

Appropriate temporary protection and warning signs should be erected to warn of hazards that may result as a consequence of the works.

7.6 Regulators

Implement the regulations and environmental standards set by government. The contents of this report will need to be agreed in advance of works with the regulators.

8.0 VERIFICATION PLAN

8.1 CL1 – Remediation Excavations

In order to verify the successful removal of the heavy metals, the impacted area of heavy metals will be excavated and removed until the area where the historic pond is removed. The sides and bases of excavations should be tested by BSL, with a minimum of 1 sample per 25m² (minimum one per face) as per GPP27 / UK Government guidance.

Impacted soils surplus to requirements will be disposed of off-site to a suitably licensed facility, with waste consignment notes retained to prove suitable disposal.

Potentially impacted soils will be removed and stored in a sealed bunded area for testing and disposal (or re-use if feasible).

The soil samples taken from the excavations will be screened for residential with private gardens, human health values.

8.2 CL2 – Asbestos Impacted Soils

Grid sampling should be undertaken in the asbestos-impacted area to determine whether the soil impacted by asbestos has been removed. These samples should then be sent for asbestos screening & identification. If asbestos is recorded as present within the samples, quantification testing should be carried out. The soils should contain no asbestos within the top 600mm.

Should gross asbestos contamination be identified, then all works should cease until an Asbestos Management Plan is put into place (if not done so already) and remediation requirements are confirmed by a suitably qualified geo-environmental engineer. Note remediation works under such instances may be classified as either licenced or non-licenced and may be notifiable to the Health and Safety Executive (HSE). Works would need to comply with CAR 2012 and CARSOILSTM.

8.3 Imported Soft Landscaping Soils

Scope of Verification

Soils used within soft landscaping topsoil will comply with the chemical specification and testing rates provided within Appendix A. There are no requirements for depth validation at this site.

Prior to importing any soils, test results for the proposed import will be provided to the clients representative, alongside the confirmation of the source (greenfield/brownfield etc).

8.4 Clean Cover System

Soils used within the top 600mm in private gardens and 450mm in public open space soft landscaping will comply with the chemical specification and testing frequencies provided within Appendix A.

Prior to importing any soils, test results for the proposed import will be provided to the clients representative, alongside the confirmation of the source (greenfield/brownfield/recycled etc).

Once installed by the groundworks contractor, there is a requirement to provide evidence of the chemical suitability and depths of the clean cover system, with inspections to be carried out by a suitably qualified Geo-environmental Consultant in a randomly selected area of the plot. confirmatory photographs will be taken for inclusion in the validation report. An example of good practice for depth validation is provided below:

Containing staff, datum bar and photo board, clearly showing spoil and pit depth



Plot Overview



Evidence of Hard Dig Layer



Evidence of Warning Membrane



The frequency of garden validations shall be specified at one depth validation inspection pit per plot ready at the time of inspection (1 in 1). Photos of all other plots with soils in place during the time of the inspection should also be provided.

In areas of soft landscaping/public open space (POS), validation pits should be excavated at a frequency of circa one pit per 25m x 25m area of POS.

Minor variances in the thickness of individual soils layers cover may be tolerated during validation, provided the overall clean cover system is a minimum depth of 600mm in private gardens and 450mm in soft landscaping elsewhere to minimise soils mixing and includes an engineered element such as a warning membrane or hard dig layer. If the thickness is varied, the topsoil layer should be a minimum thickness of 100mm in accordance with warranty provider standards.

If a warning geotextile is utilised, this should be sufficiently durable and robust for the lifetime of the development. If a hard dig layer is opted for, first generation clean quarried stone is generally preferred.

Where made ground has been completely removed from an entire plot, the cover system as such is not required, however a "clean" topsoil/subsoil layer comprising a minimum of 150mm "clean" topsoil is still required to act as a growing medium. Evidence of the removal of made ground soils down to natural

strata will be required in such areas (visual inspection by an engineer with photos taken or survey data provided with photos from the contractor).

If the cover system is deemed to be insufficient, the groundworks contractor will be informed and advised on how much more material is needed for the cover system to be meet requirements, with additional verification pits re-excavated after rectification to confirm that a sufficient thickness of soil is present.

8.5 CL4 – Contingency Planning

Should significantly contaminated material be encountered during the development (e.g. gross hydrocarbon impaction), then a suitably qualified geo-environmental engineer should be consulted for advice. Measures may include the excavation of the material, which should be stockpiled on 2000-gauge polythene sheeting, sampled and tested for an appropriate range of contaminants.

Once the laboratory analysis of the material is available, an assessment will be undertaken to determine whether it will need to be disposed off-site to a suitable facility or if the materials could be retained on site re-used with or without some form of treatment within regulatory requirements.

Depending on the nature of any such impact it may be necessary to undertake validation testing of the excavation faces in order to demonstrate that no such materials are left in-situ.

Should gross asbestos contamination be identified, then all works should cease until an Asbestos Management Plan is put into place (if not done so already) and Remediation requirements are confirmed by a suitably qualified geo-environmental engineer. Note Remediation works under such instances may be classified as either licenced or non-licenced and may be notifiable to the Health and Safety Executive (HSE). Works would need to comply with CAR 2012 and CARSOILS™.

8.6 Summary of Remediation Action and Verification Actions

Source	Work to be undertaken	
	Remediation Actions	Verification Actions
-	All samples will be collected under chain of custody documentation and tested in a UKAS-accredited and MCERTS- compliant laboratory.	-
CL1 – Made ground with elevated levels of heavy metals (Arsenic, Lead & Mercury).	- Removal of contaminated made ground.	- Minimum of 1 sample per 25m2 (minimum one per face) after the removal of the historic pond. - Samples should be tested for arsenic, lead and mercury.
CL2 – Made ground with elevated asbestos fibres.	- Removal of contaminated made ground.	- Delineation of asbestos impacted made ground via hand pitting and sampling. - Grid sampling in the asbestos impacted area to determine the impacted soil has been removed and the soil has acceptable levels (<0.001% w/w). - Samples to be tested for asbestos screen and ID. If samples are positive

		for asbestos quantification to be completed.
CL3 – Japanese Knotweed	- Contact a specialist contractor.	
CL4 – Contingency Items	- A watching brief will be maintained throughout the construction. Site operatives will look out for visual and olfactory contamination.	- Contact a suitably qualified geo-environmental engineer for advice (BSL). - Remove visual and olfactory contaminated materials. - Suspected contaminated material (soils/concrete) should be stored stockpiled on 2000-gauge polythene sheeting, sampled and tested for an appropriate range of contaminants. - Once the laboratory analysis of the material is available, an assessment will be undertaken to determine the disposal route or reuse of the material. - It may be necessary to carry out in-situ testing depending on the contamination encountered.
Cover System over the made ground	Private Gardens should comprise: • Min 100mm “clean” validated topsoil; over • 500mm “clean” validated subsoil; over • Warning barrier membrane/geotextile or 100mm thick hard dig layer (ideally “clean” first generation quarried MOT Type 1 or similar). Public Open Space (POS) should comprise: • Min 100mm “clean” validated topsoil; over • 350mm “clean” validated subsoil; over • Warning barrier membrane/geotextile.	- A suitably qualified Geo-Environmental Consultant (BSL) will randomly select an area of the plot and then dig to determine whether the correct cover levels have been laid. - Photographs will be taken and included in the validation.

8.7 Verification Reporting

On receipt of all information, the appointed Geo-Environmental Engineer will compile a Verification Report(s). The report will be a concise document that provides records and collected evidence of the remediation carried out at the site. The final report should contain:

-
- Introduction, including description of the project and background to the works.
 - Summary references to site investigation data, risk assessments and the Remediation Strategy.
 - A description of the works undertaken and any treatment records.
 - Details of chemical validation testing.
 - Reference to the MMP (if utilised – see below).
 - Details of how any out of specification materials were dealt with and final destination, including waste transfer notes.
 - Appropriate site plans and photographic record.
 - Conclusions, detailing any additional works that may be required.
 - Details of any long term monitoring requirements, if any.

For Materials Management, the verification report shall include (as per listed within V2 of the DoWCoP):

- Appropriate site plans.
- Experience and qualifications of the person preparing the report in relation to the specific project.
- Description of how the use of materials links with the Remediation Strategy or Design Statement.
- Reference to site investigation data.
- Reference to risk assessments (including qualitative risk assessments).
- Reference to the MMP and associated tracking system, including any deviations and why.
- The suitable for use criteria adopted.
- Any treatment records.
- Reference to waste transfer documentation, including return loads (this may not be applicable to the use of materials within the Site of Origin scenario).
- Signed delivery tickets (possibly as an annex or alternatively there must be a clear reference out to them – this may not be applicable to the use of materials within the Site of Origin scenario).
- Record of contingency arrangement(s) that had to be implemented (if any).
- Record of quantity of materials used.
- Copies of signed Declaration(s) by Qualified Person(s).

This should then be submitted to the regulators and warranty providers for approval, which should close out the requirements of this Remediation Strategy.

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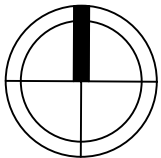
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Land At Springside Rd, Walmersley						
ACCOMMODATION SCHEDULE						
Type	Beds	Storeys	No. Units	GIFA (m²)	Site Total(m²)	
Lawson	3	2	1	96.27	96.27	8%
Lightshaw	3	2	2	109.03	218.06	17%
Newhall Bay	3	2	2	107.04	214.08	17%
Kenyon	4	2	4	127.35	509.4	33%
Audlum	4	2	1	134.64	134.64	8%
Pendleton	4	2	2	108.35	216.7	17%
			12		1389.15	100%
Gross Site Area	0.55 ha				1.35 acres	
Undevelopable Area	0.16 ha				0.39 acres	
Net Site Area	0.39 ha				0.96 acres	
Net Density	30.77 Units/ha				12.50 Units/acre	
Net Coverage	3561.92 m²/ha				1447.03 m²/acre	



MANOR
ARCHITECTURE

Client
Edgefold Homes Ltd

Project Name
Land at Springside Rd, Walmersley

Drawing Name
Sketch Scheme 3

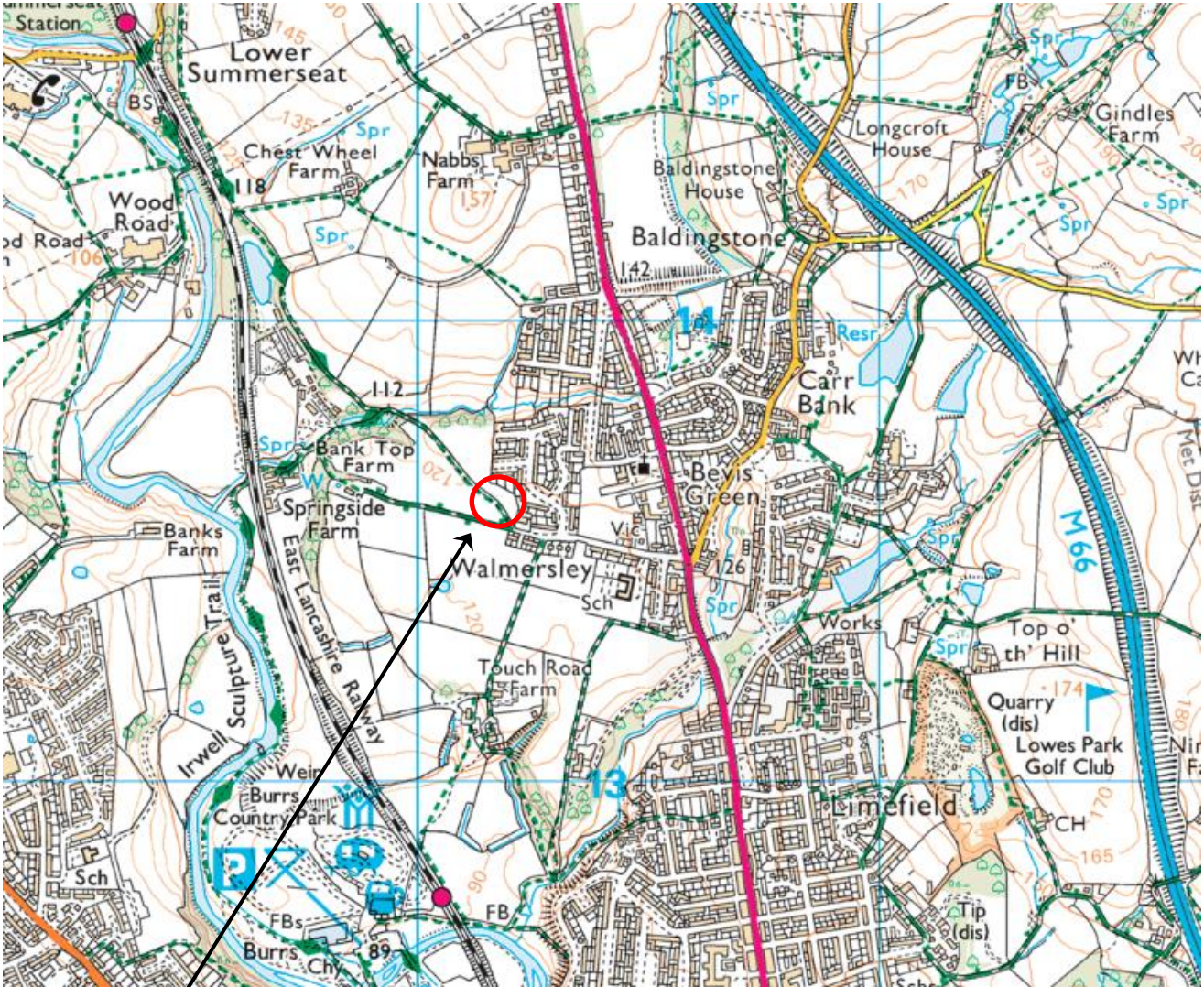
Drawing Number J1192-SK103	Revision -		
Date March 2025	Scale 1:500	Size A3	Status Information

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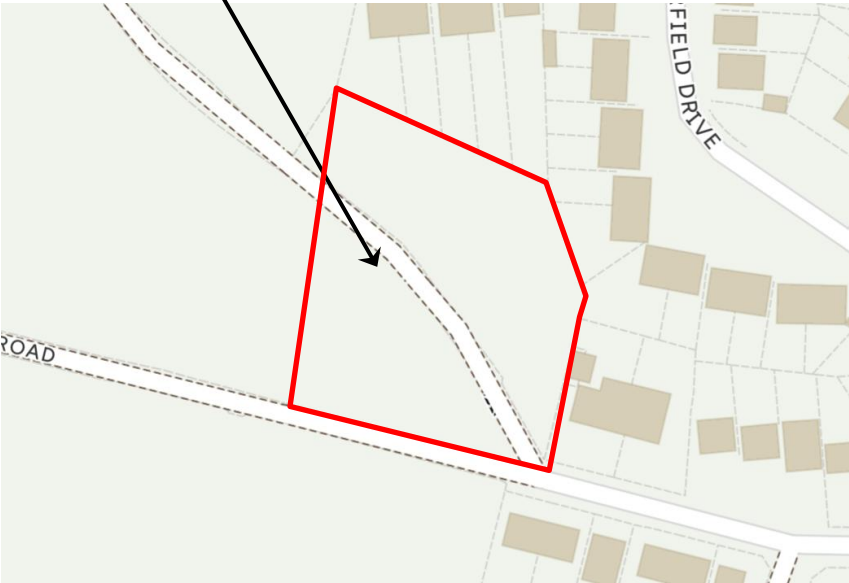
CIAT
CHARTERED PRACTICE



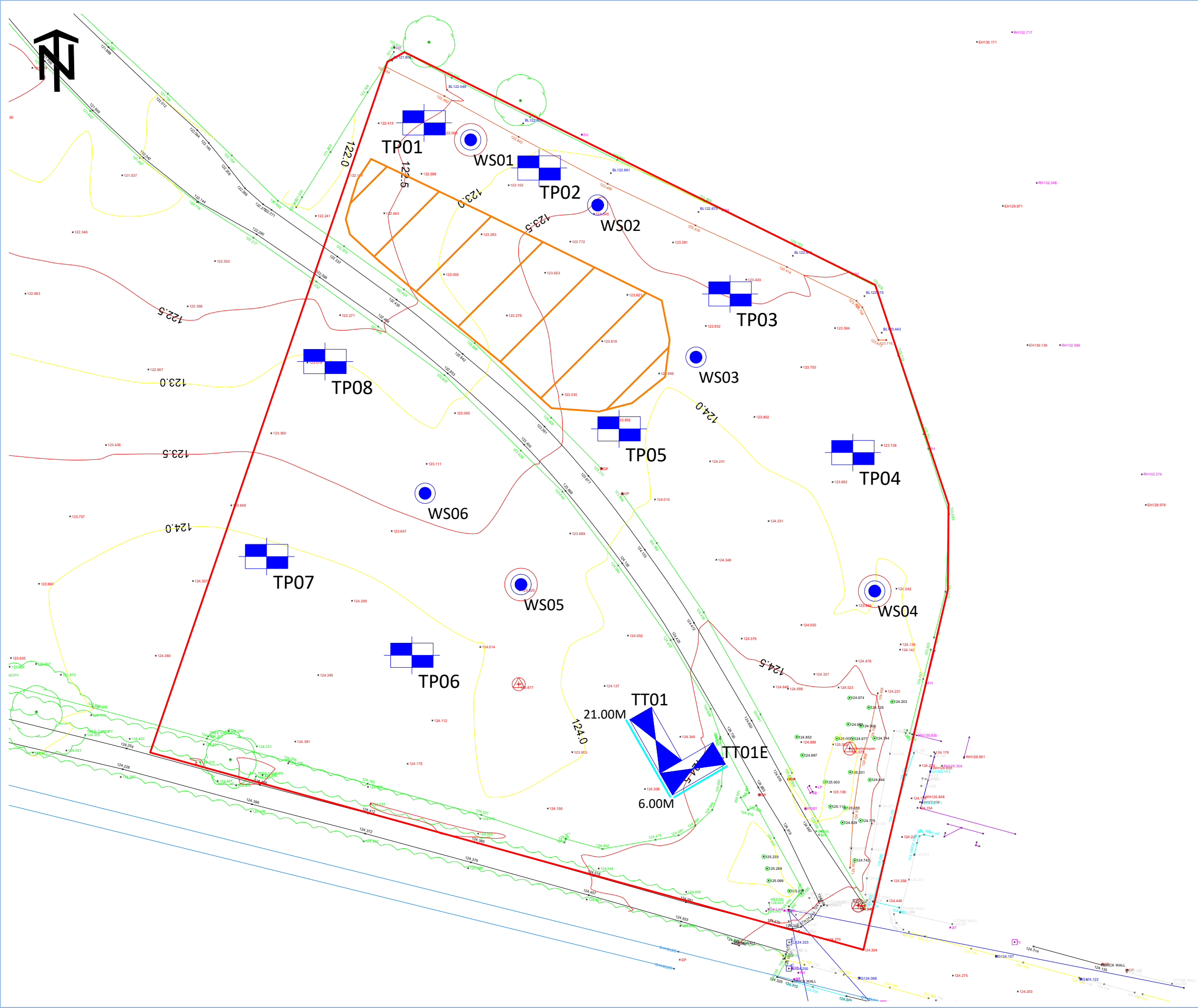
SITE LOCATION

NEAREST POSTCODE: BL9 5JB

SITE ENTRANCE. WHAT THREE WORDS /// SCANS.MISS.TAPS



REV	DATE	DESCRIPTION	BY	CKD
 BROWNFIELD SOLUTIONS LTD CEO ENVIRONMENTAL ENGINEERING EXCELLENCE				
CLIENT				
EDGEFOLD HOMES				
PROJECT TITLE				
SPRINGSIDE ROAD, BURY				
DRAWING TITLE				
SITE LOCATION PLAN				
DRAWING No.	REVISION	SCALE	DATE	
C6123/01	-	NTS	15/04/25	
DRAWN BY		CHECKED BY		
JM		JM		



KEY	
	APPROXIMATE SITE BOUNDARY
	TRIAL PIT
	TRIAL TRENCH
	WINDOW SAMPLE BOREHOLE
	BOREHOLE INSTALLATION
	JAPANESE KNOTWEED

- NOTES
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
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REV	DATE	DESCRIPTION	BY	CKD



CLIENT
EDGEFOLD HOMES

PROJECT TITLE
SPRINGSIDE ROAD, BURY

DRAWING TITLE
EXPLORATORY HOLE PLAN

DRAWING No. C6123/02	REVISION -	SCALE NTS	DATE 14/05/2025
DRAWN BY MAS		CHECKED BY JM	



KEY	
	APPROXIMATE SITE BOUNDARY
	CL2 - AREA REQUIRING ASBESTOS DELINEATION
	CL1 - HISTORIC POND AREA REQUIRING REMOVAL
	CL1 & CL2 - CLEAN COVER SYSTEM REQUIRED IN SOFT LANDSCAPING / GARDENS
	NO REMEDIATION REQUIRED
	CL4 - JAPANESE KNOTWEED

- NOTES
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS REPORTS. THIS DRAWING IS COPYRIGHT OF BSL.
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REV	DATE	DESCRIPTION	BY	CKD
A	11/08/25	Adding CL's to the key	MP	JM



CLIENT
EDGEFOLD HOMES

PROJECT TITLE
SPRINGSIDE ROAD, BURY

DRAWING TITLE
SITE REMEDIATION PLAN

DRAWING No.	REVISION	SCALE	DATE
C6123/03	-	NTS	14/05/2025
DRAWN BY MAS		CHECKED BY JM	

side Rd, Walmersley			
No. Units	GIFA (m²)	Site Total(m²)	
1	96.27	96.27	8%
2	109.03	218.06	17%
2	107.04	214.08	17%
4	127.35	509.4	33%

APPENDIX A

Chemical Specification for Soils

Quality Control Methodology for Imported and Re-used Soils

Prior to Importation and Re-use

In order to prove soils/materials are chemically suitable for the intended use, reliable testing results should be provided, or samples should be obtained at the source and tested prior to either importation or re-use on site of origin as early as possible.

The frequency and scope of testing will vary depending on the source, the required testing of which is provided below.

These rates are based on a combination of guidance from the National Contained Land Officers Groupe (NCLOG) "A Regulator's Guide to Cover Systems and their Verification", YALPAG "Verification Requirements for Cover Systems" alongside other similar local authority guidance documents, the professional judgement of BSL and acceptance of similar criteria used on similar sites to the satisfaction of the local regulatory authority. Results should be compared to the acceptance criteria appended.

Material Use	Testing Frequency*	Suite of Analysis					
		1	2	3	4	5	6
Topsoil							
Greenfield Source including Site Won (Top 600mm)	*1 per 50m³						
Brownfield/Recycled Source including Site Won (Top 600mm)	**1 per 50m³						
Subsoil							
Greenfield Source (Top 600mm)	*1 per 150m³						
Brownfield/Recycled Source (Top 600mm)	**1 per 150m³						
Site Won (Top 600mm)	*1 per 150m³						
First Generation (i.e. quarried sand)	No testing required. Certificate of material provenance is required.						
Physical Stone Break Layer							
First Generation (i.e. quarried stone)	No testing required. Certificate of material provenance is required.						
Site Generated / Imported 6F2	*1 per 500m³						
General Fill***							
Site Generated / Imported 6F2	*1 per 1000m³						
Site Won Made Ground	*1 per 250m³						
	*1 per 1000m³						
Site Won Natural Arisings on Brownfield Site	*1 per 1500m³						
Site Win Natural Arisings on Greenfield Site	*1 per 2000m³						

Notes

1 – BSL Default Suite - *Arsenic, Cadmium, Chromium (total and hex), Copper, Nickel, Mercury, Lead, Zinc, Selenium, speciated polycyclic hydrocarbons (PAH 16), water soluble sulphate (2:1 Extract), soil organic matter, and pH.*

2 – Asbestos ID (and Quantification if detected).

3 – TPH Analysis - *Speciated Total Petroleum Hydrocarbons (TPH CWG) including BTEX and MTBE.*

4 – VOC Analysis - *Volatile Organic compounds (VOCs) by GC-MS (ex TIC).*

5 – SVOC Analysis - *Semi-Volatile Organic compounds (SVOCs) by GC-MS (ex TIC).*

6 – Visual Inspection & on-site screening for VOC using calibrated PID.

* - Minimum of 3 samples per source.

** Minimum of 6 samples per source.

***To be used at depths >600mm bgl or below building/hardstanding.

The testing should be undertaken at a UKAS accredited laboratory, be MCERTS accredited where available, and all results should be below the remedial target values appended.

Waste Legislation

Prior to the excavation, stockpiling, movement and placement of soils/materials, appropriate exemptions should be in place (e.g. an MMP or other suitable exemption/permit).

Topsoil/Subsoil

For topsoil and subsoil suitability as a growing medium, reference should be made to BS3882:2015 Specification for Topsoil and BS 8601:2013 Specification for Subsoil and Requirements for Use. These standards should be adopted where feasible, especially for recycled/manufactured soils, but it should be noted that this standard is often difficult to apply to existing greenfield topsoil/subsoil which has shown no prior issue as a growing medium (i.e. no vegetative stress prior to stripping/stockpiling).

In consideration of promoting soils sustainability, a view should be taken on the suitability of topsoil/subsoil if it does not fully comply with the standards and agreed with the LPA. For example, on a site whereby sensitive peat/acid soils are present, but site won topsoil does not comply with the standard, it would potentially be more sustainable and appropriate to retain and re-use such soils as opposed to removal and replacement.

In addition to the above sampling frequencies and testing, all imported topsoil/subsoil should also confirm to the following criteria:

-
- Have a maximum stone size of 75mm.
 - Be clean and free of foreign debris including building waste materials or contaminants e.g. brick, glass, asbestos and plasterboard, etc.
-

For imported soils, approval should be obtained from the Local Authority prior to importing to site.

Site Won Crushed Hardcore/Concrete (for use below building/hardstanding only)

In addition to the above sampling frequencies and testing; for re-use of hardcore/concrete (Grade 6) on the site of origin, BSL proposes the following inspection criteria:

-
- No visual contamination (oil staining etc).
 - Limited deleterious material (organics, wood, etc).
 - Limited metal.
 - No visible asbestos containing material (ACM).
 - Quantifiable Asbestos at or <0.001 w/w%.
-

Production of Grade 6 materials should be done under WRAP quality protocols or similar. Inspections and sampling would need to be carried out by a qualified geo-environmental engineer. For geotechnical performance, reference should be made to Series 600 Earthworks Guidance.

If the above criteria for asbestos is exceeded, then further consideration and assessment will be required. Works would need to be undertaken in compliance with the Control of Asbestos Regulations (CAR) 2012 and an Asbestos Plan of Works may be required.

Post Importation

The imported soils should be inspected on site to confirm it is the same material inspected at source and it is suitable for use. Once imported to site, tests should also be undertaken to confirm the batch is suitable prior to use and has not been contaminated in transit.

A management plan should be in place on site for storage and transportation. The material should be stockpiled separately and well segregated on site to prevent cross contamination in accordance with good site practice.

Accurate records of movement of soils should be kept in order to be incorporated in the final verification report.

Approval should be obtained from the Local Authority prior to use on site.

Validation and Verification Report

Site

A final verification report should be issued to the Local Authority/Warranty Provider (e.g. NHBC) detailing records of the re-use and importation of soils, alongside their use on the site.

Cover Layer

Once the chemical suitability of soils used for a cover system in soft landscaping and garden areas has been confirmed, the material can be placed in these areas.

The depth of the cover layer should be recorded, and photographs taken as evidence to be issued to the Local Authority/warranty provider in the verification report.

Approval for the placement of the cover layer should be obtained from the Local Authority/Warranty Provider.

Human Health Remediation Targets - Soils			Import and Re-use in Garden Areas <600mm; Criteria based on Human health - residential with homegrown produce (1% SOM)	Import in Garden Areas >600mm (below cover system); Based on human health without homegrown produce (1% SOM)	Import and Re-use in POS areas; Criteria based on Human health - POS resi (1% SOM)
Source	Contaminant	Unit			
LQM S4UL	Arsenic	mg/kg	37	40	79
LQM S4UL	Cadmium	mg/kg	11	85	120
LQM S4UL	Chromium (III)	mg/kg	910	910	1500
LQM S4UL	Chromium (VI)	mg/kg	6	6	7.7
LQM S4UL	Copper	mg/kg	2400	7100	12000
C4SL	Lead	mg/kg	200	330	760
LQM S4UL	Mercury, Elemental	mg/kg	1.2	1.2	16
LQM S4UL	Nickel	mg/kg	130	180	230
LQM S4UL	Selenium	mg/kg	250	430	1100
LQM S4UL	Zinc	mg/kg	3700	40000	81000
Atkins ATRISK	Cyanide (free)	mg/kg	34	34	34
LQM S4UL	Phenol (total)	mg/kg	120	440	440
LQM S4UL	Acenaphthene	mg/kg	210	3000	15000
LQM S4UL	Acenaphthylene	mg/kg	170	2900	15000
LQM S4UL	Anthracene	mg/kg	2400	31000	74000
LQM S4UL	Benz(a)anthracene	mg/kg	7.2	11	29
LQM S4UL / C4SL	Benzo(a)pyrene	mg/kg	2.2	3.2	5.7
LQM S4UL	Benzo(b)fluoranthene	mg/kg	2.6	3.9	7.1
LQM S4UL	Benzo(ghi)perylene	mg/kg	320	360	640
LQM S4UL	Benzo(k)fluoranthene	mg/kg	77	110	190
LQM S4UL	Chrysene	mg/kg	15	30	57
LQM S4UL	Dibenz(a,h)anthracene	mg/kg	0.24	0.31	0.57
LQM S4UL	Fluoranthene	mg/kg	280	1500	3100
LQM S4UL	Fluorene	mg/kg	170	2800	9900
LQM S4UL	Indeno(1,2,3,cd)pyrene	mg/kg	27	45	82
LQM S4UL	Naphthalene	mg/kg	2.3	2.3	4900
LQM S4UL	Phenanthrene	mg/kg	95	1300	3100
LQM S4UL	Pyrene	mg/kg	620	3700	7400
LQM S4UL	TPH Aliphatic EC 5 - 6*	mg/kg	42	42	570000
LQM S4UL	TPH Aliphatic EC 6 - 8*	mg/kg	100	100	600000
LQM S4UL	TPH Aliphatic EC 8 - 10*	mg/kg	27	27	13000
LQM S4UL	TPH Aliphatic EC 10 - 12*	mg/kg	130	130	13000
LQM S4UL	TPH Aliphatic EC 12 - 16*	mg/kg	1100	1100	13000
LQM S4UL	TPH Aliphatic EC 16 - 35*	mg/kg	65000	65000	250000
LQM S4UL	TPH Aliphatic EC 35 - 44*	mg/kg	65000	65000	250000
LQM S4UL	TPH Aromatic EC 5 - 7*	mg/kg	70	370	56000
LQM S4UL	TPH Aromatic EC 7 - 8*	mg/kg	130	860	56000
LQM S4UL	TPH Aromatic EC 8 - 10*	mg/kg	34	47	5000
LQM S4UL	TPH Aromatic EC 10 - 12*	mg/kg	74	250	5000
LQM S4UL	TPH Aromatic EC 12 - 16*	mg/kg	140	1800	5100
LQM S4UL	TPH Aromatic EC 16 - 21*	mg/kg	260	1900	3800
LQM S4UL	TPH Aromatic EC 21 - 35*	mg/kg	1100	1900	3800
LQM S4UL	TPH Aromatic EC 35 - 44*	mg/kg	1100	1900	3800
LQM S4UL	Benzene	mg/kg	0.087	0.38	72
LQM S4UL	Toluene	mg/kg	130	880	56000
LQM S4UL	Ethyl Benzene	mg/kg	47	83	24000
LQM S4UL	Xylene - o	mg/kg	60	88	41000
LQM S4UL	Xylene - m	mg/kg	59	82	41000
LQM S4UL	Xylene - p	mg/kg	56	79	41000
CL:AIRE 2010	MTBE (methyl tert-butyl ether)	mg/kg	49	49	49
Professional Judgement	Asbestos (No visual ACM)	% w/w	None Detected	<0.001%	None Detected
pH	B53882	pH Units	5 - 8.2	NA	5 - 8.2

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Atkins ATRISK Soil SSVs March 2017.

See LQM/CIEH S4ULs for Human Health Risk Assessment and Atkins ATRISK Soil SSVs documents for notes regarding derivation.

Criteria for PAH and TPH assumes a conservative SOM of 1% - adjustments may be made for higher SOM where considered appropriate.

*Soil matrix should contain no free product.

All imported material to have chemical concentrations less than the above levels for the site, with the exception of pH which is a range.

Test results to be provided to the engineer prior to placing soils, where appropriate.

All tests result to be undertaken by a UKAS Laboratory holding accreditation for the relevant tests.

Should be read in conjunction with any asbestos depth re-use CSM where applicable in corresponding Remedial Strategy.

APPENDIX B

BSL Guidance – Re-use and Disposal of Waste

Re-Use Of Waste - Guidance Note

Definition of Waste

The Environment Agency considers waste to be “...any material that is discarded, or intended to be discarded...” This includes any soil from trenches, footing, site strip etc. It is no longer required in its original location, therefore it is considered to be waste.

CL:AIRE: Code of Practice

Where materials are excavated for construction purposes, wherever possible these should be retained on site for engineering purposes if they are suitable for use. This can be implemented under the CL:AIRE “Development Industry Code of Practice for the Definition of Waste” (CL:AIRE DoWCoP), also commonly referred to as a “Materials Management Plan”.

The developer/contractor is advised to complete all works under the DoWCoP.

Potential scenarios where soils may be able to be re-used:

- Material capable of being used in another place on the same site without treatment.
- Material capable of being used in another place on the same site following ex-situ treatment on site.
- Material capable of being used in another development site without treatment (Direct Transfer).
- Material capable of being used in another development site following ex-situ treatment on another site eg Hub site.

The Code of Practice requires 4 No. Factors to be addressed:

1. Protection of human health and protection of the environment.
2. Suitability of use, without further treatment.
3. Certainty of use.
4. Quantity of material.

In order to satisfy these requirements the following are required:

- i) Consultation/approval with Local Authority & Environment Agency to confirm they have no objections to the proposed re-use of waste soils, or the risk assessments for the site.
- ii) Risk Assessments to demonstrate that the site does not present an Environmental Hazard.
- iii) Remediation Strategy for contaminated sites (or Design Statement for non-contaminated sites).
- iv) Materials Management Plan (MMP) which details material generated stockpiles and the end use.
- v) Volume calculations.
- vi) Planning permission for the development.
- vii) Contractual details to be clear, regarding who steps in if a contractor goes into administration/liquidation.

The use of the CoP is effectively industry regulated, there is a requirement to appoint an independent Qualified Person (QP) who checks all the requirements have been met and registers the documentation with the Environment Agency. This person must not have had any involvement with the preparing of the risk assessments or Remediation strategy on the site.

Soils which require treatment on site (eg bioremediation, stabilisation) will require an Environmental Permit for treatment, together with justification and validation to prove, once treated, this material is suitable for use.

Site management procedures need to be in place to ensure that material is tracked through from excavation stockpiling, treatment and remediation processes. Should the process of material tracking be considered non-robust, or not adhered to, this may fail the test whether excavated materials may be considered non-waste.

Alternatives include the EA U1 exemption (soils and stones <1000 tonnes and aggregates <5000 tonnes) and the Waste Framework Directive, which applies to naturally occurring soils used on site of origin only. Aggregates can also fall under the EA WRAP Quality Protocols.

Waste Classification For Soils

Introduction

Waste producers have a duty of care to classify the waste they are producing:

- before it is collected, disposed of or recovered.
- to identify the controls that apply to the movement of the waste.
- to complete waste documents and records.
- to identify suitably authorised waste management options.
- to prevent harm to people and the environment.

The most sustainable and economic method of dealing with waste soil is usually the retention and re-use on site. Where this is not possible there are three main options for the disposal of soils:

1. Disposal to a permitted waste recycling facility.
2. Re-use on another site (subject to the suitability).
3. Disposal to a landfill site.

The disposal to a permitted facility will be subject to the **specific conditions of the permits for each individual facility** and will vary dependent on location and environmental sensitivity of the receiving site. Re-use on another site will also be subject to the acceptability criteria of that site.

The guidance below relates to disposal to **landfill sites only**.

Background for Landfill Disposal

In July 2005 the United Kingdom implemented the European Directive 1999/31/EC (The Landfill Directive), this introduced the current regime for waste and waste disposal to landfill. The Landfill Directive places controls on waste disposal. These controls include requirements to follow the waste acceptance procedures and criteria that have been agreed by the Council of the European Union and are laid out in Council Decision 2003/33/EC.

Before a waste can be accepted at a landfill site, the landfill **operator** must be satisfied that the waste meets his permit conditions, the waste acceptance procedures (WAP) and waste acceptance criteria (WAC).

If disposal to landfill is the best management option for the waste soils, these procedures **must** be followed, or the operator may refuse to accept the waste.

Key Points

- Not all waste can be landfilled
- Landfills are classified according to whether they can accept **hazardous, non-hazardous** or **inert** wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes that must be followed before wastes can be accepted at a landfill site.

Classification

Wastes are listed in the European Waste Catalogue (EWC 2002) and grouped according to generic industry, process or waste types. Wastes within the EWC are either hazardous or non-hazardous. Some of these wastes are hazardous without further assessment (absolute entries) or are 'mirror' entries that require further assessment of their hazardous properties in order to determine whether they are hazardous waste.

Waste soil has mirror entries on the EWC and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not i.e the hazard assessment. The most common EWC waste codes related to soil are:

17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03

Soils may contain certain contaminants (eg asbestos, oil,) which have prescribed concentration thresholds, that if breached will render the material hazardous waste. These are based on specific "hazardous properties" which include hazards such as carcinogenicity, flammability and toxicity.

In the first instance the concentrations of plausible contaminants within the soil should be identified and wastes should be **classified based on their total concentrations**.

Waste Definitions

Inert	- Will not undergo any significant physical, chemical or biological transformations. - Will not dissolve. - Will not burn. - Will not physically or chemically react. - Will not biodegrade. - Will not adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health. - Has insignificant total leachability and pollutant content. - Produces a leachate with an ecotoxicity that is insignificant (if it produces leachate).
Non-Hazardous	Is not inert (see above) Is not hazardous (see below)
Hazardous	Soil has hazardous properties as defined in WM3 (Guidance on the classification and assessment of waste (1st edition 2015)- Technical Guidance)
Stable Non-reactive hazardous waste#	Hazardous waste, the leaching behaviour of which will not change adversely in the long-term, under landfill design conditions or foreseeable accidents either: in the waste alone (for example, by biodegradation), under the impact of long-term ambient conditions (for example, water, air, temperature or mechanical constraints) or by the impact of other wastes (including waste products such as leachate and gas).

This option allows hazardous waste that is stable and thus has a low leaching potential to be deposited in cells with a standard of containment consistent with non-hazardous wastes.

WAC Testing

The purpose of WAC analysis is to confirm that the waste complies with the relevant WAC for the receiving landfill. If the waste has any disposal route other than a landfill site (e.g. recycling facility, incineration etc) the **WAC is not relevant**. Furthermore, the WAC limits **cannot be used to make an assessment of whether a waste is hazardous**. WAC testing does however define if a non-hazardous waste is suitable for an inert landfill.

Classification based on Total Concentrations ¹	Non-Hazardous Waste		Hazardous Waste	
	Below inert WAC limit values:	Above inert WAC limit values:	Below hazardous WAC limit values	Above hazardous WAC limit values
WAC testing				
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill ²	HAZARDOUS landfill	PRE-TREATMENT ³

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).

2 Individual sites may have certain limit values pre-determined in their licence.

3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.

Hydrocarbons in Soils

WM3 uses the term Oil or Waste Oil to cover hydrocarbons products such as fuel oil, petrol or diesel. These are defined by WM3 as hazardous under an absolute entry in the List of Wastes. However, hydrocarbons in soils are a mixture rather than a pure product and are therefore not absolute entries.

Known Oils

The simplest scenario is where the identity of the contaminating oil is known or can be identified. If the oil is known the manufacturer's or supplier's REACH compliant safety data sheet for the specific oil can be obtained and the hazard statement codes on that Safety Data Sheet can be used for the hazardous waste assessment.

Where the identity of the oil can only be identified down to a petroleum group level (i.e. the contaminating oil is known to be diesel, but the specific type/brand is unknown), then the classification of that petroleum group should be used in the assessment. The marker compounds associated with that petroleum group may be used to confirm carcinogenicity.

Oils may contain a range of hydrocarbons, so the presence of for instance Diesel Range Organics (DRO) does not enable the assessor to conclude that diesel is present. These hydrocarbons may have arisen from other oils; the laboratory needs to provide an interpretation of the chromatograph to determine if it is consistent with diesel or weathered diesel as a whole.

The concentration of known oils should be determined using a method that as a minimum spans the range in which the carbon numbers for that known oil fall.

Unknown Oils

Where hydrocarbons are contaminating soils, it is likely that the oil will be unknown or cannot be determined.

WM3 states that:

For contaminated land specific consideration must be given to the following before proceeding;

- The presence of other organic contaminants, for example solvents or coal tar that could be detected as hydrocarbons. Coal Tar is not an oil and is considered separately in WM3 example 2. Where the site history or investigation indicates the presence of hydrocarbons from oil and other sources (e.g. coal tar), and the origin of the hydrocarbons cannot reliably be assigned to either, then a worst case approach of considering the hydrocarbons both as waste oil (in accordance with this example) and from other sources, for example coal tar should be taken.
- The presence of diesel, or weathered diesel, should be specifically considered by the laboratory and where this is confirmed by the hydrocarbon profile the oil should be assessed as a known or identified oil (diesel).

The use of **marker compounds** is optional; however it is recommended that where possible the marker compounds should be used.

WM3 states:

If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic/mutagenic due to the presence of oil if all three of the following criteria are met:

- The waste contains benzo[a]pyrene (BaP) at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.1 of the CLP for BaP)
- This has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D of WM3, and
- The analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel.

For example:

TPH Concentration (mg/kg)	Petrol or Diesel	BaP (mg/kg)	Classification
10,000	No	0.9	Non- Hazardous
1,000	No	Not available	Hazardous
1,000	Yes	Not relevant	Hazardous

References

1. Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EP Regulations), the Landfill Directive (1999/31/EC) and the subsequent Council Decisions.
2. Environment Agency Environmental Permitting Regulations: "Inert Waste Guidance- Standards and Measures for the Deposit of Inert Waste on Land" 2009.
3. Environment Agency "Waste acceptance at landfills - Guidance on waste acceptance procedures and criteria" Nov 2010.
4. Environment Agency "Guidance on the classification and assessment of waste (Technical Guidance WM3)".
5. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).
6. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives
7. 2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament
8. Environmental Permitting Guidance The Landfill Directive For the Environmental Permitting (England and Wales) Regulations 2010 Updated March 2010 Version 3.1
9. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).

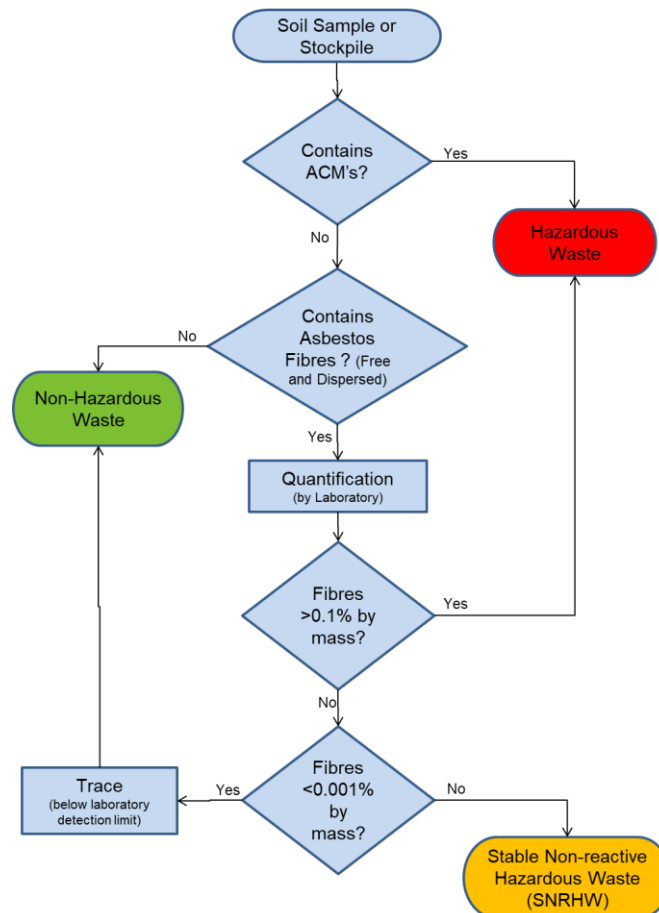
Additional Asbestos Guidance Notes

Disposal

The 1st Edition of WM3 “Guidance on the classification and assessment of waste”, details the way in which Asbestos is assessed within soils.

The assessment of asbestos containing waste is dependent on whether the asbestos is present as:

- Fibres that are free and dispersed, or
- Identifiable pieces of asbestos containing materials (ACM's)



Identifiable pieces of asbestos are any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye. The result is that commonly soils with visible ACM's are sorted and the ACM's removed by hand picking and separate disposal.

Asbestos concentrations below 0.001% by mass are below standard laboratory detection limits and are not currently regarded as containing asbestos for the purposes of disposal and may be disposed of to an inert landfill site¹. These levels are often termed “trace” by laboratories.

Asbestos concentrations between 0.001% and 0.1% are stable non-reactive hazardous waste (SNRHW)¹. Waste transfer stations where soil recycling takes place may be able to take SNRHW, but are unlikely to take soils containing asbestos above trace concentrations.

The following codes should be assigned to the asbestos waste as appropriate:

17 06	Insulation materials and asbestos-containing construction materials
17 06 01	Insulation materials containing asbestos
17 06 03	Other insulation materials consisting of or containing hazardous substances
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05	Construction material containing asbestos

WM3 indicates that 17 06 05 would normally be used in preference to 17 06 01 for the asbestos in asbestos contaminated soil and stones.

Construction materials containing asbestos and “*other suitable materials*” may be landfilled at landfills for non-hazardous waste in accordance with the Landfill Directive without testing.

This means that wastes that are only hazardous because of their asbestos content can be disposed of at landfills for non-hazardous waste in separate landfill cells that only accept asbestos wastes and other suitable materials. The Landfill Directive requires that stable non-reactive hazardous waste shall not be deposited with biodegradable waste (for example organic material, household waste, paper etc..) and must meet the waste acceptance criteria set out in accordance with Annex II.

Construction

Health and Safety Executive (HSE) guidance on asbestos is not directly related to soil and much of the guidance focuses on the removal of asbestos from buildings. The overarching legislation is the Control of Asbestos Regulation (CAR 2012). However, where work involves (or is likely to involve) contact with asbestos then CAR 2012 requires a risk assessment including whether or not the work is licensed or notifiable non-licensed work and may require an Asbestos Management Plan. Work becomes notifiable if it is considered that the control limit could be exceeded.

Brownfield sites frequently have soils that contain asbestos and the presence of asbestos needs to be considered within the context of construction, particularly in relation to groundworks. The exposure of soils and the use of excavators and plant to move soil around increases the possibility of fibres becoming airborne. However, it is good site practice to not generate dusts and to employ dust suppression on all sites regardless of the presence of asbestos.

The legal control limit for asbestos is 0.1f/ml over a continuous four hour period. The control limit is not a ‘safe’ level and exposure from work activities involving asbestos must be reduced to as far below the control limit as possible.

Clearly the higher the concentrations in the soil the greater potential there is for fibres to be released, however IOM publication TM/88/14 “the release of dispersed asbestos fibres from soil” 1988 concludes that:

- Mixtures of asbestos in dry soils with asbestos content as low as 0.001% can produce airborne respirable asbestos concentrations greater than 0.1f/ml in dust clouds where the respirable dust concentrations are less than 5mg/m³.
- An action limit is recommended of no higher than 0.001% asbestos in soils above which steps should be taken to minimise exposure to airborne fibres (eg by wetting).
- The addition of relatively small quantities (10%) of water can reduce the airborne fibre concentrations by an order of magnitude.

Where asbestos has been identified at concentrations above 0.001% as free and dispersed fibres in the soil precautions need to be adopted. Concentrations below this are considered to be normal background, although good site practice dictates that the generation of dusts should be avoided and therefore any fugitive fibre release from minor concentrations should be kept to a practical minimum.

End Use

The use of materials containing asbestos and material containing asbestos is prohibited under EU legislation. There is currently a Joint Industry Working Group (JIWG) tasked with producing a Code of Practice for Asbestos in Soil, Made Ground and Construction & Demolition Material that will clarify in due course the position of the various government agencies.

Asbestos containing materials can remain in situ under a suitable cover system which may be hardsurfacing or soft landscaping (with or without hard dig layers and markers).

There is a risk that future maintenance may compromise such systems and details of the presence of asbestos should be kept in the Health and Safety File.

Preliminary publications from JIWG (April 2015) provide guides for decision making in relation to construction. These are at a “Beta” test stage, and further publications will be provided in due course.

The re-use of waste soils should be undertaken in accordance with the CL:AIRE Code of Practice and is subject to suitable risk assessments demonstrating low risk. There is nothing that specifically excludes the re-use of soils containing asbestos as fill to raise levels. However, the movement of materials increases the risk of fibres becoming airborne and suitable precautions will be required. The re-use of soils containing asbestos at concentrations above hazardous waste levels is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be feasible where there is a long program for implementation.

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