

RDM
Environmental and Geotechnical Engineering Ltd

REMEDIATION SCHEME
for a
PROPOSED RESIDENTIAL DEVELOPMENT
at
LAND-OFF SPERBERRY HILL,
STEVENAGE ROAD,
ST IPPOLYTS,
HERTFORDSHIRE.
SG4 7NZ

for
Mr Duncan Vercoe
Talbot Construction Ltd,
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1. INTRODUCTION

1.1. General

RDM Environmental and Geotechnical Engineering Ltd (RDM) was commissioned by Mr Duncan Vercoe of Talbot Homes Ltd to provide a remediation scheme for the construction of a proposed residential development on land off Sperberry Hill, Stevenage Road, St Ippolyts, Hertfordshire SG4 7NZ, hereafter known as “the site”.

This remediation scheme is intended to identify measures to reduce the risk of significant harm to site receptors from elevated levels of arsenic (As) determined to be present on the site, probably from natural sources. There are no likely anthropogenic sources identified in historical mapping for the site.

This report makes reference to a site investigation, desktop study and phase two combined investigation report issued by Paddock Geo Engineering (PGE) in February 2019. Extracts from the PGE report have been included or are referenced as appropriate.

1.2. Objectives of the Remediation Scheme

The objectives of this Remediation Scheme are as follows:

- To summarise the site investigation work and risk assessment (DQRA) undertaken to date.
- To present a site remediation option appraisal
- To describe the requirements of the remediation scheme required to sever the contaminant linkages that have been identified.
- To act as a part of the contract documentation between the Client and the remediation contractor.
- To designate roles and responsibilities of the various parties that will be involved in the remediation.
- To state how the remediation should be recorded and verified.

1.3. Site Description

With reference to the PGE report, site observations/notes made in February 2019 included a small shed or store on the site, otherwise there were no structures. There was evidence of the site being cleared some time ago. Access for the February 2019 investigation was via a gap in the hedgerow/vegetation from Stevenage Road.

Elevated levels of arsenic (As) were found in samples taken from the site, and these were shown to be in excess of criteria given in LQM/CIEH (2015) S4ULs Human Health Risk Assessment, following statistical assessment.

1.4. Proposed Site Use

Under current proposals, any former structures on the site will be demolished, the site will then be cleared and developed for fourteen residential dwellings, concurrent with planning reference (North Hertfordshire) 19/01669/FP.

1.5. Previous Site Investigation and Related Works

A combined report by Paddock Geo Engineering comprising phase one and phase two investigations with a geotechnical assessment of the site-specific geology was issued in February 2019. These works form the basis of site information for the purposes of this remediation scheme, although some further details have been included from public on-line sources.

1.6. Identified Significant Potential Contaminant Linkages

The following is based on the land use of the proposed development being “residential”, and the most vulnerable site receptor being a female child of 0 to 6 years of age. The site-receptor linkages are through ingestion or inhalation of determinants, and safe levels are provided by LQM/CIEH S4UL Human Health Risk Assessment (2015). A summary of determinants are included in Table 1 below:

Determinant	Level detected (mg/kg) (95% confidence)	S4UL Limit (mg/kg)	Origin
Arsenic	52.5	37	Naturally occurring (DQRA sampling in Feb 2019)

Table 1: Summary of determinants exceeding LQM/CIEH S4UL criteria.

1.7. Objectives of Remediation Works

The main objectives of the remediation scheme are to break the potential contamination linkages identified above and to ensure that contaminated soils can no longer be considered likely to represent a significant risk of harm to human health.

To this end, it is desirable that remediation results in a high degree of certainty that the potential for contamination linkages have been removed permanently.

Remediation must be undertaken in a manner that is sustainable and proportionate to environmental and economic costs.

1.8. Principal Stakeholders in the Remediation

The principal stakeholders in the remediation will be as follows:-

- a.) The prospective or current site owners and future site users.
- b.) A remediation supervisor who may be an independent advisor employed to supervise and verify the remediation program.
- c.) A remediation contractor employed to achieve the remediation objectives.

2. REMEDIATION OPTIONS

2.1. Breaking the Contaminant Linkages

In order to break the contamination linkages identified on the site, remediation will be based on:

- i.) the encapsulation of near surface soils beneath hard surfaces (building footprint, footpaths, car parks etc) and
- ii.) removal of current surface soils to be substituted by certified clean top-soils. Depths to which soils are removed is included in the next section.

Removal of current top-soils and other waste soils will require WAC testing to identify the appropriate landfill site.

Alternatively, further testing could be carried out to determine the bio-accessibility of the toxins present in the soils. A physiologically based extraction test (PBET) mimics mammalian digestive processes, giving a percentage of the determinant which is toxic to mammals. If the result exceeds criteria then remedial works to remove soils will still be necessary.

3. SUMMARY OF CHOSEN REMEDIATION STRATEGIES

3.1. Management of Soil & Groundwater Contamination Pathways

The following should be considered under the option or preference to follow a program of additional PBET testing. If excess levels of toxicity are present then, in order to break contamination pathways, the following methodology should be adopted:

- i.) Where hard-surfacing is proposed, existing soils can remain but should be fully encapsulated. This applies to soils within the footprint of the building, below car parks/accessways/footpaths etc. This method is economical and environmentally preferable as soils do not leave the site. Once covered by hard surfacing, access to the soils is prevented and the source-receptor linkage is broken
- ii.) Where soft landscaping is proposed, flowers-beds or lawns etc, existing soils can be removed and replaced with certified clean soils to form a capping layer. The capping layer should be 0.6m in depth and can comprise a lower layer (0.3m in thickness) of granular materials, provided these too are certified clean.
- iii.) Where soils will need to be removed or displaced by excavations necessary for founding or for soft landscaped areas, then they can be disposed of in landfill. A WAC test will be required.

3.2. Management of Ground Gas Risk

- i.) The risk posed by excessive accumulations of ground gas (methane and/or carbon dioxide) has not been quantified under BS8485:2015. However, following the observations made in the PGE investigations, no organic or putrescent materials were present during investigations, so ground gas risk is determined to be low.
- ii.) Reference to maps produced by UK Radon indicates that between 1% and 3% of homes in the area are affected by Radon. Consequently, basic radon protection measures are required and this will comprise a radon membrane. Full details are found in the Building Research Establishment's radon guide BR211.

4. ENABLING WORKS

4.1. Access

Access to the site from the surrounding road network is hindered by narrow roads, a nearby school and associated traffic, so it should be kept in mind that the area is vulnerable to congestion. Noise and dust nuisance should be kept to a minimum and local traffic flows should be allowed to continue to move freely.

Vehicles, such as grab lorries, that may need to access the site, in order to remove soils, are advised to do so on a low-key basis so that limited access is not over-subscribed, and vehicles are not forced to use the roadway whilst waiting for space. This approach would also be in keeping with maintaining a tolerable nuisance level for nearby properties or infrastructure which may be affected by works on the site.

4.2. Underground and Overhead Utilities

It was generally clear that the site was free from overhead and underground, but the contractor should identify all services that cross the site, and either divert them or put in place adequate signage/fencing to prevent damage during the remediation.

4.3. Removal of Existing Structures and Vegetation

Removal of existing structures should be undertaken with consideration for potential use of asbestos containing materials which will need to be removed by specialist contractors.

Guidance for the lawful demolition of structures and the measures necessary for safeguarding contractors and surrounding communities is published by the HSE and an appropriate site-specific construction management plan (CMP) should be based on this guidance.

5. HEALTH & SAFETY AND ENVIRONMENT

5.1. CDM Regulations

It is understood that the time required to complete the remediation works will be below the threshold whereby such works would become a notifiable project under the Construction (Design and Management) Regulations (2015).

5.2. Contractor's Qualifications and Experience

The remediation should only be undertaken by contractor(s) with appropriate qualifications and experience to undertake the work. As a minimum, the contractor should have been previously employed to undertake similar remediation, and be able to demonstrate satisfactory completion.

Only members of staff who are suitably qualified and experienced in their duties should be employed on the site.

The contractor should provide a suitably qualified and experienced site supervisor to oversee the works on a full-time basis. The supervisor will be the contractor's point of contact on-site and between other principal stake-holders.

5.3. Welfare Facilities

The contractor is to ensure that all necessary welfare facilities are available for their staff, bearing in mind access and spacing constraints of the site.

5.4. Hygiene Facilities and Personal Protective Equipment (PPE)

Shallow or near surface soils are known to be contaminated by metalloids, specifically arsenic (As), exceeding safe criteria.

Metalloids all enter the body chiefly via oral pathways. Dermal contact is not considered to be the critical pathway as only limited absorption occurs in this way.

Though dermal contact is likely to be limited for site contractors, appropriate PPE should be provided for all staff employed on the site, i.e. overalls and gloves, and these should also be made available to site visitors. There should be provision of hand washing facilities which should be easily accessible. The wearing of masks should also be considered during dry conditions where excavations for founding are undertaken.

5.5. Control of Dust

It is noted that the site is proximal to private residences where a number of receptors may be affected by the release of dusts from the site. To mitigate this, activities where dust is generated should be kept to a minimum, and the site should be kept damp when drier conditions persist that allow dust to be generated.

5.6. Noise and Vibration

Some noise and vibration may be generated during remediation, and this is unavoidable. Reasonable steps should be taken to minimise any activities where excessive levels are generated.

5.7. Traffic Management

The remediation contractor will ensure that an appropriate traffic management system is in place to control the flow of traffic removing and importing soils. All vehicles will be required to comply with the system and all documentation relating to soil movement retained for inclusion in a verification report.

Speed limits should be adhered to, and parking should not be allowed in locations that pose an inconvenience to local residents.

5.8. Security

The contractor will ensure that the site remains secure at all times, and that all plant equipment is secured when not in use.

5.9. Protection of the Public Highway

The remediation contractor must ensure that dust, mud and silt etc are not deposited on the public highway as a result of the remediation works. Should this occur, then the highway should be cleaned immediately.

5.10. Protection of Surface Water Drains

Where appropriate, soil and water run-off from the remediation works should not be allowed to enter the surface water drainage system local to the site. The contractor should take measures to prevent this.

5.11. Fuelling of Plant and Machinery

Fuel to be used in machinery and plant involved with the remediation should not be stored on site. When fuelling is required during remediation, spillages should be avoided. However, if they do occur, affected soils should be excavated and removed from the site.

6. UNFORESEEN CONTAMINATION

6.1. Unforeseen Contamination

Although the site has been subject to investigation and sample coverage, unforeseen contamination being encountered during the remediation works is considered unlikely but not beyond possibility.

In this event, the remediation supervisor will log the nature of the contamination and agree any further works, over and above that described in this remediation scheme, with the remediation contractor and the Local Authority.

7. EXCAVATED SOIL AND MATERIALS MANAGEMENT

7.1. General

The remediation contractor shall at all times comply with the relevant legislation and best practice guidelines in relation to waste management.

7.2. Burning of Wastes

Unlicensed burning of wastes including green waste arising from the remediation works is prohibited.

7.3. Re-Use of Excavated Soils

During the remediation works, it is envisaged some soils will be removed from the site whilst others will be encapsulated. Any stock-piling of soils should be managed accordingly with consideration to items listed in Section 5 of this remediation scheme. If necessary, contaminated stock-piles should be covered with a tarpaulin to prevent rain-water ingress.

The period between re-use or disposal of soils should be minimised as far as is practical.

7.4. Transportation of Wastes

Waste soils should be disposed of in landfill or re-used as deemed appropriate and the remediation contractor should ensure that the risk of materials being spilled or lost during transportation is minimised. Only licensed waste carriers should be employed to transport waste from the site.

The remediation supervisor will keep a log of approximate volumes and types of soil waste that leave the site during the remediation.

Accurate and comprehensive documentation showing the volume/tonnage of waste soils, the disposal location, date of disposal and details of any treatment applied should be maintained by the remediation contractor. These records should be legible and submitted to the remediation supervisor upon request.

The remediation supervisor will not advise the Local Authority that the remediation contractor has completed the remediation scheme satisfactorily until it can be demonstrated, through maintained records, that all waste soils have been transported and disposed of or re-used correctly.

8. SUPERVISION OF WORKS

8.1. General

In order to record the works undertaken during remediation, it is recommended that the remediation works are supervised and recorded by an independent environmental consultant.

Further, it is recommended that supervision of the remediation work is provided by a combination of the remediation supervisor and the Local Authority. This will enable a satisfactory remediation verification report to be produced and minimise potential delays due to uncertainty over how to carry out the remediation in accordance with this remediation scheme.

9. DUTIES OF THE REMEDIATION SUPERVISOR

9.1. Duties of the remediation supervisor should include the following:

- Ensure that the remediation contractor undertakes the remediation in accordance with this remediation scheme and any other applicable guidelines.
- Act as liaison between the other principal stakeholders of the remediation
- Represent the interests of the Local Authority and, where appropriate, future residents
- Keep records that are sufficient to provide an accurate account of how the remediation works were undertaken and to produce a remediation verification report.
- Production of a remedial verification report.

10. VERIFICATION REPORT

10.1. Remedial Verification Report

Following satisfactory completion of the remediation, the remediation supervisor will provide a remediation verification report addressed to the Local Authority.

The report will contain all relevant information that is necessary to demonstrate that the remediation has been completed satisfactorily and that the objectives of the remediation have been met.

The report will include a revised site conceptual model showing that there are no longer any significant contaminant linkages, and a statement that the site is suitable for its intended use.

10.2. Contents of Remediation Verification Report

The contents of the remediation verification will include the following information:

- References to this remediation scheme, previous site inspection reports and any other relevant documents
- Any agreed changes to this remediation scheme following issue
- Topographical survey drawing of the site prior to remediation
- Details of any additional laboratory analysis undertaken on soils prior to or during the remediation
- Details of the remediation contractor and supervisor and their roles during the remediation
- Description of enabling works undertaken, e.g. removal of existing structures and soils.
- Description of how contaminated soils were excavated and removed from the site.
- Waste transfer notes detailing where waste soils were removed to and the details of the waste carriers
- Details of any treatment undertaken on the waste soils prior to disposal
- Details of any unexpected contamination encountered, and the steps taken to remove it.
- If applicable where soils were re-used and details of suitability
- Verification that works were undertaken in accordance with the MMP

- Confirmation that re-instatement was completed satisfactorily
- Photographic evidence with identifiable reference points to show stages of reinstatement works
- Confirmation that the remedial works were undertaken successfully
- Confirmation of achieved objectives
- Any necessary pre-cautions for contaminated soils remaining on-site
- A revised conceptual model

The verification report will remain in draft form until a signed declaration by a qualified person for the purposes of the Definition of Waste; Development Industry Code of Practice (CoP).



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Enc:

Site Location
Reporting limitations



Site location for land-off Sperberry Hill, Stevenage Road, St Ippolyts

Limitations to the Investigation

1. This report has been prepared and written specifically for the Client named in the introduction and is exclusively for his/her/their benefit. No reliance may be placed in the contents of this report by any third party except with the express agreement of the original Client and the written agreement of RDM. Such written agreement may require the payment of an additional fee.
2. Where applicable, the Executive Summary and Recommendations sections of this report only provide an overview of the guidance and should not be specifically relied upon in their own right but should be considered in relation to the whole report and the development described in this report.
3. This report has been prepared and written in the context of the proposals for the development of the Site as stated by the Client and will not be valid in a differing context. Furthermore, new information, improved practices, or legislation may necessitate alterations to the report in whole or in part after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of this report, it should be referred to us for re-assessment.
4. The assessment and interpretation of contamination and associated risks are based upon the scope of the work described in the fee proposal and agreed with the client, the report may not be sufficient to fully address the contamination or allow a detailed remediation scheme to proceed without further investigation or analysis.
5. Any assessments made in this report are based on the ground conditions and as revealed by the test pits and boreholes together with the results of any field or laboratory testing undertaken and where appropriate other relevant data which may have been obtained for the Site. The sources of such information are detailed in this report and while RDM use only such sources as are believed to be reliable, RDM will not be liable for the authenticity or reliability of information obtained from others.
6. Notwithstanding that factual reports from third parties concerning asbestos or mould of any kind may have been included for information purposes in this report, RDM will have no liability whatsoever for any claim or claims arising related to asbestos or mould of any kind.
7. There may also be special conditions appertaining to the Site which were not revealed by the investigation and which will not, therefore, have been taken into account in this report. Any assessments may be subject to amendment in the light of additional information becoming available.
8. Whilst an opinion may be expressed or implied in this report on possible configurations of strata between or beyond test pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence, this is for guidance only and no liability can be accepted for the accuracy of such opinions.
9. Comments on groundwater conditions will have been based on observations made only at the time of the investigation unless otherwise stated. It should be noted, however, that groundwater levels vary due to seasonal and other effects.
10. This report is not a site categorisation, and hazards could occur which have not been detected.
11. Where data has been provided or is made available to RDM and this has been used in the report, it has been assumed that the information is correct. No responsibility can be accepted by RDM for inaccuracies within the data supplied.
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13. This report has been prepared solely for the client's purposes in obtaining planning permission and discharge of the planning conditions related to the proposed development indicated in the report. The discharge of these conditions does not constitute that the Site could be determined under Part IIA of the Environmental Protection Act 1990.