



Goldfinch
ENVIRONMENTAL LTD

**PROPOSED RESIDENTIAL
DEVELOPMENT
LAND R-O 1 CLOUGH ROAD
GOSBERTON RISEGATE
SPALDING
LINCS.**

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**REMEDICATION METHOD
STATEMENT**

Report Ref.: 0656/3

Prepared by

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Date

November 2019

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PROPOSED RESIDENTIAL DEVELOPMENT

LAND R-O 1 CLOUGH ROAD

GOSBERTON RISEGATE

SPALDING

LINCS.

1. INTRODUCTION

Mr Drakard (the Client) proposes to redevelop a plot of land at the above address to a residential end use. Where the named Client is not the Party (or Parties) responsible for installation of the ground gas protection measures in the development this RMS should be made available to the other Party(-ies) prior to commencement of construction to ensure compliance with Planning.

A site location plan (reproduced from the Phase 2 report has been included as Figure 1 towards the back of this RMS to assist the reader together with a proposed layout as shown in Figure 2 towards the back of this report.

A Phase 2¹ Ground Gas Investigation report [at the request of the Regulator] was prepared and issued by this Author, the content of which was subsequently approved by the Local Planning Authority, who also required that the recommendations for ground gas protection measures be provided to their office in the form of [this] Remediation Method Statement (RMS.).

The Phase 2¹ report showed that based upon the interpretation of the collected field data that according to CIRIA Report C665 / BS8485:2015 "*low level gas protection [is] required*". thus identifying a need for mitigating action and hence according to the planning regime, leading to the need for the preparation of this Remediation Method Statement (RMS) which provides details of how the risk posed by the ground gas regime operating at the site is to be managed (i.e. remediated) such that the site can be considered 'suitable for 'use by the LPA.

The Regulator (SHDC Environmental Protection also require a minimum protection level for 'Characteristic Situation 2' (CS2) as described in the above guidance.

It is recommended that this Remediation Method Statement is read in conjunction with the previously issued report(s) referred above.

¹ Proposed Residential Development, Land R-O1 Clough Road, Gosberton Risgate, Spalding, Lincs..
GeoEnvironmental Ground Gas Investigation Report – Phase 2. Goldfinch Environmental Ltd. Report Reference 0610/2. September 2019.

2. SCOPE

This document details the remediation works required to “prevent or control pollution and the protection of public health as a result of the presence of contamination” as outlined above and summarised in the form of the Conceptual Model and Risk Assessment in Section 4 of this RMS, thus bringing the site into a condition where it can be deemed to be ‘suitable for use’ and mitigate the current ‘unacceptable’ environmental risk thus protecting the future end users of the site and wider environment.

This RMS details the ground gas protection measures to be incorporated into the new development for the protection of human health against the ingress of ground gases following outline comments for the same in the Phase 2 Ground Gas Investigation report as referred above.

The Environmental Engineer is Goldfinch Environmental Limited.

3. LIMITATIONS

This report is for the sole reliance and use of the Client. Any Third Party coming into possession of this report relies on it at their risk, unless written permission is expressly sought from, and provided by, Goldfinch Environmental Limited. The author owes them no duty of care and skill. Goldfinch Environmental Ltd accepts no responsibility or liability for the consequences of this document being used for purposes other than that for which it was commissioned and the assessments provided herein should not be relied on as a legal opinion.

The findings and opinions expressed are relevant to the time of the site visit and information review and should not be relied upon to represent conditions at substantially later dates. The assessments and opinions given in this report are based upon information available at the time of the report. Where additional information comes available which may affect or identify a need to review our conclusions or assessments we request the opportunity (and reserve the right), to review the information and where warranted, modify our assessment / opinion in part or wholly, accordingly.

This RMS does not include any geotechnical considerations pertaining to the site as these were outside the agreed brief.

The recommendations given in this report are based on guidance and best practice in place at the time of issue of the report, the information available at the time of the investigation, the nature of the indicated proposed development and associated end user behaviour patterns. Should any of the foregoing change at any time, then this report should be reviewed in the context of proposed changes.

This report has been based upon the construction details, layout drawings and pattern of occupancy/usage provided by the Client and/or their Agent. Where these details are subject to change either by the commissioning Party (Client), (or a subsequent owner where a site is 'sold-on'), then this report will need to be reviewed and amended accordingly in the light of any such proposed design changes. It is the responsibility of the commissioning Party(-ies) to ensure our Office is provided with this information. It is (reasonably) anticipated that this review would be required by the Planning Authority.

This RMS report is for the sole reliance and use of the Client, any Third Party coming into possession of this report relies on it at their own risk, unless written permission is expressly sought from Goldfinch Environmental Limited. The author owes them no duty of care and skill.

The recommendations given in this report are based on the information available at the time of preparation of this RMS (mainly the outcome of the Phase 1 and 2 reports recently approved by the LPA), the nature of the indicated proposed development and associated end user behaviour patterns. Should these proposals change at any time these reports and this RMS should be reviewed accordingly in the context of the proposed change(s).

4. CONCEPTUAL MODEL & RISK ASSESSMENT (Pre-remediation)

The following Conceptual Model has been reproduced from the referred (respective) reports to provide background for the reader. (However they are not intended to replace the referred reports wholly which should be read in conjunction with this RMS.).

4.1 Conceptual Model (Reproduced From Phase 2 Report - September 2019)

Sources (Proven)	Pathway	Target	Risk
Soil: n/a	❖ Dermal contact, and ingestion inhalation	• Present users • End users • Construction workers • General public	• n/a • n/a • n/a • n/a
	❖ Wind erosion and atmospheric dispersion	• Adjacent properties • General public	• n/a • n/a
	❖ Leaching	• Adjacent properties • Shallow groundwater • Services/construction materials • Plant life • Surface water	• n/a • n/a • n/a • n/a • n/a
Shallow groundwater: The site overlies 'Unproductive' Aquifers, which were not considered to be sources of pollution.	❖ Groundwater migration	• Adjacent properties • Deep groundwater • Services/construction materials • Plant life • Surface Water	• n/a • n/a • n/a • n/a • n/a
	❖ Dermal contact, and ingestion inhalation	• Present users • End users • Construction workers • General public	• Neg-Low • Neg-Low • Neg-Low • Neg-Low
Gas: The results of the fieldwork and their interpretation show that the ground gas regime operating at the site is classed as Characteristic Situation 2 (CS2) indicating 'low-level' protection measures are required.	❖ Direct inhalation ❖ Soil migration ❖ Services migration	• End users • Construction workers • Buildings	• Low • Low • Low
Negligible Risk Defined as the site should be considered suitable for present or future use and environmental setting. Contaminants unlikely to be present, which might have unacceptable impact on key targets.			
Low Risk Defined as the site should be considered suitable for present or future use and environmental setting. Contaminants may be present but unlikely to have unacceptable impact on key targets.			
Medium Risk Defined as the site may not be suitable for present or future use and environmental setting. Contaminants are probably present and might have unacceptable impact on key targets.			
High Risk Defined as the site is probably or certainly not suitable for present or future use and environmental setting. Contaminants probably or certainly present and likely to have an unacceptable impact on key targets.			

4.2. Risk Assessment.

4.2.1. Targets.

Potential targets/receptors, in the context of the risk assessment, where a plausible pathway can be proven, are discussed under separate subheadings as follows:-

4.2.2. Human Health (Site Users² & Construction Workers).

The results of the fieldwork and their interpretation show that the ground gas regime operating at the site is classed as Characteristic Situation 2 (CS2) indicating 'low-level' protection measures are required.

In the context of the proposed end use for the site and the localised distribution, depth, measured concentration and contaminant type:-

A Low risk has been identified indicating human health protection measures are required.

4.2.3. Construction Workers.

During the opening up and disturbance of ground at the referred locations, as part of demolition and construction works, construction staff, particularly groundworkers, are likely be exposed to lead and PAH impacted soils and soil dusts and possible ground gas (e.g., when manually handling soil and working in excavations):-

A Low risk has been identified.

² Current & End User

5. REMEDIATION RECOMMENDATIONS.

5.1 Land Contamination – Ground Gas.

Based upon the results of the collected field data and Regulatory (SHDC) requirements ground gas protection measures to the level of CS2 are required for new development at the site.

The Phase 2 report [Section 8] recommended:

- Ventilation of confined spaces in the building and (where these are included), particularly confined spaces to which personnel may have access.
- Should a floor slab is included in the construction methods this should include a low permeability gas control membrane which should comprise as a minimum a 2000 gauge LDPE sheet overlapped and taped at the joints. The overlap should be at least 300mm. This membrane will need to be linked into the DPC layers to ensure a continuous gas barrier is formed covering the whole building footprint. This should include any brick work cavities where these are present.
- It is recommended that consideration be given to increasing the frequency of airbricks above the standard figure by (say) approximately 10-15% to promote improved ventilation of the subfloor void underneath the building(s).
- Where possible, incoming services and ducting and pipes should be vented before entry into the buildings and above the level of the floor where appropriate. This is to minimise penetration of the gas membrane.
- Any entry points penetrating the membrane should be carefully constructed and the membrane sealed completely around the 'service'.
- Details/information designed to support the [independent] validation/verification of the completed remedial works.
- It is recommended that the RMS is submitted to the LPA for approval prior to the remedial works being carried out to ensure compliance with the Planning Regime.

5.2 Concluding Comments To Section 5.

To comply with the planning regime, on completion of the 'remedial measures' a Verification Report (VR) will be required to demonstrate that the RMS has been adhered to and where variation is noted that this is similarly documented. Typical validation information, which is obtained from a combination of site visits and 'desk-based' sources, required for inclusion in the VR has been provided in Section 6 of this RMS.

6. VERIFICATION REQUIREMENTS

6.1 Overview

This section of the RMS provides an outline of the information typically required to support the validation process thus leading to consideration by the Regulator to discharge of the relevant planning condition. The required sources of information for this aspect of the planning regime are both field- and desk-based.

The Verification Report should include a summary of all the works undertaken, relating to gas protection measures including the elements detailed within the Remediation Strategy.

The report should include [but is not restricted to]:~

- Site details (Site location/Proposed Layout).
- Summary of Gas Risk Assessment (including original CSM from RMS).
- Description of protection measures installed with [where available] reference to method statements and drawings and manufacturers specification of the materials used.
- Details of the verification inspection regime e.g. date of inspection visit(s), plot numbers/references etc..
- Supporting information, plans, air vent installation photographs, and possibly as-built drawings.
- Details of non-conformances and how they were rectified (if any).
- Updated CSM & Risk Assessment 'post-remediation.'

6.2 Gas membrane.

- Condition of sub-grade and underside of gas membrane
- Gas membrane type
- Gas membrane condition
- Joining tape product
- Lapping design
- Laps, welds and joints seals
- Service entries seals

6.3 Passive Venting.

- Subfloor Void depth check
- External Wall Airbricks
- External Vents / ducts

7. CONCLUSIONS

Mr A Drakard (the Client) proposes to redevelop a plot of land at the above address to a residential end use by establishment of four new dwellings as shown in Figure 2. Where the Client named in this RMS is not the Party (or Parties) responsible for the installation of ground gas protection measures then this RMS should be made available to the relevant Party prior to commencement of any building works on the site to ensure compliance with this RMNS and hence the planning regime.

A Phase 2 Ground Gas Investigation report was prepared and issued by this Author, the content of which was subsequently approved by the Local Planning Authority, who also required that the referred Phase 2 investigation be carried out.

The Phase 2 report indicated the need for incorporation of ground gas protection measures to provide 'protection' to a minimum of CS2 as defined in BS8485 and CIRIA C665 and hence according to the planning regime, leading to the need for the preparation of this Remediation Method Statement (RMS) which provides details of how the risk posed by the ground gas regime at the site is to be managed (i.e. remediated) for the protection of human health such that the Regulator can discharge the relevant planning condition.

It is recommended that this Remediation Method Statement is read in conjunction with the previously issued report(s) referred above.

This RMS and its content are subject to the approval of the Regulator, which should be sought prior to implementation of any of the works proposed within this document either by the Client or any other Party.

Should unanticipated contamination be suspected, or revealed during any groundworks, then the area should be temporarily isolated and further advice sought by a suitably independent qualified person and a management strategy for these occurrences should be submitted to the Local Authority for their approval prior to proceeding, as required by Regulatory Offices.