# MOTUS COMMERCIALS, KETTERING ROAD, SCUNTHORPE

# REMEDIATION METHOD STATEMENT
# FOR
# AJS-REES DEVELOPMENTS LIMITED

**Project Ref:**
EAL.93.23
**Date:**
December 2023

**Prepared for:**
AJS-Rees Developments Limited
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| | | |
|---|---|---|
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| Date: | December 2023 | |
| Version: | 1.0 | |

| GENERAL REFERENCE DETAILS | |
|---|---|
| **SITE:** | Motus Commercials, Kettering Road, Scunthorpe |
| **CLIENT:** | AJS-Rees Developments Limited |
| **DATE:** | December 2023 |
| **REFERENCE:** | EAL.93.23 |
| | |
| **DEVELOPMENT PROPOSAL:** | Refurbishment and extension of existing commercial vehicle workshop and demolition of detached office building. |

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## 1.0 INTRODUCTION

### 1.1 PREAMBLE

Erda Associates Ltd have been instructed by AJS-Rees Developments Limited. (hereafter referred to as 'the client') to prepare a Remediation Method Statement (RMS) for a proposed residential redevelopment at their site at *Motus Commercials, Kettering Road, Scunthorpe*. Site location and proposed development plans are included in **Appendix A**.

The Client proposes to develop the site through the refurbishment and extension of existing commercial vehicle workshop and demolition of detached office building.

### 1.2 PREVIOUS REPORTS

This RMS is based on the findings of the following previous reports undertaken for the site;

- Erda Associates Ltd., Motus Commercials, Kettering Road, Scunthorpe – Phase I & II Geo-environmental Assessment (dated August 2023, Ref: EAL.93.23).
- Erda Associates Ltd., Motus Commercials, Kettering Road, Scunthorpe – Additional Ground Investigation (dated November 2023, Ref: EAL.93.23).

Copies of the above report have not been included, but are available upon request. The following RMS should not be referred to in isolation and should be read in conjunction with the above referenced reports.

### 1.3 LIMITATIONS

This report has been produced in accordance with industry best practice at the time of writing.

In the production of this report, Erda Associates Ltd., have relied upon information provided by third parties. Erda Associates Ltd cannot accept responsibility for the reliability and authenticity of this information. Erda Associates Ltd. will not be responsible for any opinions which it has expressed, or conclusions which it has drawn, in reliance upon information which is subsequently proven to be inaccurate.

This report has been prepared for the sole use of the client and shall not be relied upon or transferred to third parties without the express written consent of Erda Associates Ltd. Unauthorised third parties rely upon the information contained within this report at their own risk.

## 2.0 SUMMARY CONCEPTUAL SITE MODEL

Full details relating to the site setting and ground conditions encountered at the subject site are presented within the previous reports (as referenced in Section 1.2). The following section presents a summary conceptual site model as background information to put the proposals presented in the RMS into perspective.

### 2.1 SOURCE

Previous ground investigations have identified evidence of visual and olfactory hydrocarbon contamination within shallow soils, however laboratory analysis has not revealed concentrations above relevant GACs.

Loose chrysotile fibres were identified within two boreholes (WS04 and WS05) which are deemed to pose a risk.

Elevated Arsenic was identified within natural strata in BH05.

A ground gas risk assessment has been undertaken, which has classified the site as 'Characteristic Situation 2' (CS2) and therefore ground gas protection measures are required. Furthermore, low concentrations of oxygen were also recorded.

### 2.2 PATHWAY

The identified pathways for the contamination include the ingestion and inhalation of contaminated soil, dust and fibres; dermal contact with contaminated soil and dust; inhalation of ground gases (carbon dioxide and methane) and oxygen deficient air; and water pipes.

### 2.3 RECEPTORS

The previously identified receptors include workers of the completed development and construction workers.

### 2.4 CONCLUSION

Remediation is required, in the form of a permanent cap, CS2 ground gas protection measures and installation of barrier pipe.

## 3.0 REMEDIAL SCHEME

### 3.1 END USERS

**Shallow Soils**

Due to the presence of Arsenic and Asbestos fibres within shallow soils, remediation is required to protect the end user.

The development proposal incorporates a site wide cap through either the building footprint or placement of a permanent cap in all outdoors areas (tarmac or concrete).
This is considered sufficient to break the source-pathway-receptor linkage.

If any landscaped areas or areas of hardstanding (i.e. hardcore) are constructed, then additional work will be required to protect the end user.

In these locations, Made Ground will need to be entirely stripped out and removed from site. It will also be necessary to test the natural soils in these locations to prove their suitability and to confirm all contaminants have been removed.

**Characteristic Situation 2 (CS2) Protection Measures**

The ground gas risk assessment has determined that all structures will require Characteristic Situation 2 (CS2) ground gas protection. Based on the proposed development, CS2 protection measures should comprise the following;

- Reinforced cast in situ suspended floor slab with minimal penetrations.
- Minimum 2000g gas protection membrane installed (incorporating Carbon Dioxide, Methane and Radon protection)
- Laps and joints bonded as per manufacturers details.
- All service entries sealed.

Or if precast beam and block is to be used;

- A passive sub floor dispersal layer conforming to at least ‘good performance’ (in the form of a ‘clear void’, or a ‘no-fines gravel layer’, or a ‘polystyrene void former blanket’ or a ‘geocomposite void former blanket’.
- Gas membrane as above.

Due to the low risk setting of the site (CS2), ground gas protection measures may be installed by the general builder/groundworker or by a qualified installer. Independent inspection and verification will be required of the installation measures in each plot.

The above measures with regard to shallow soils and ground gas are considered sufficient to reduce the contamination risks to acceptable levels for the proposed development.

### 3.2 CONSTRUCTION WORKERS

It is considered that the elevated concentrations of Arsenic and Asbestos fibres do not present a significant risk to construction workers. However, basic PPE for all workers (including overalls, gloves and dust masks) and wash facilities should be provided as a precautionary measure.

Depleted oxygen concentrations were recorded during ground gas monitoring and therefore, appropriate protection measures will need to be adhered to for all personnel working in confined or poorly ventilated areas during the development.

Care and vigilance should be maintained throughout the removal of all Made Ground for any further evidence of potential contamination. Should any further suspected contaminated material be encountered then appropriate safety precautions to protect site personnel will be required. Further assessment by a suitably qualified person may also be required.

## 4.0 VERIFICATION PLAN AND REPORTING

**Capping**

An inspection of the proposed permanent cap (concrete or tarmac) is not considered necessary.

**Landscaped or Hardstanding Areas**

Should any landscaped or hardstanding areas be constructed, the removal of Made Ground in these areas will be necessary.

Made Ground should be excavated and removed from site with natural strata exposed.

Validation sampling following removal of this material will be required in order to demonstrate that all impacted material has been removed.

The above measures with regard to shallow soils are considered sufficient to reduce the contamination risks to acceptable levels for the proposed development.

**Ground Gas Protection Measures (CS2 with Radon protection)**

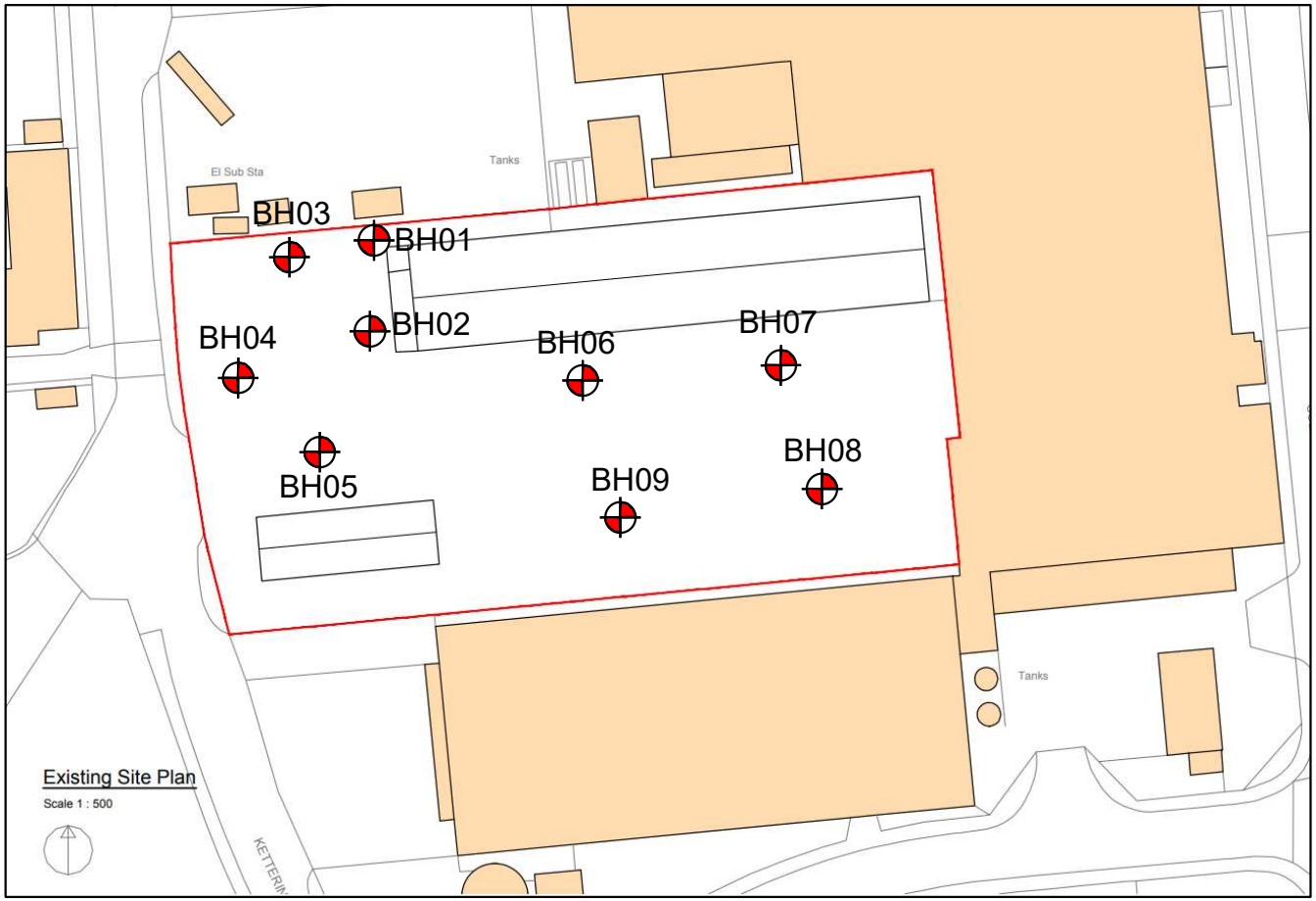
All plots will require a gas membrane inspection prior to being covered. The gas membrane installation quality will be inspectedby a suitably qualified person from Erda Associates Ltd and marked against the enclosed checklist in **Appendix C**. Any necessary alterations will be made and re-inspected until approved by Erda Associates Ltd.

A gas protection measures verification report detailing the inspection records (including inspection photographs) will be provided for each plot.

## 4.1 ADDITIONAL INVESTIGATION

Should further suspected contamination (e.g., significant volumes of ash) be identified during the site developments works, a qualified environmental specialist should be consulted to assess the risk posed to end users and the environment. This may include scheduling of additional samples for chemical screening and modification of this Remediation Method Statement accordingly.

# Appendix A




KEY:

Rotary Borehole Location

DO NOT SCALE

Erda Associates ltd

TITLE:

Proposed Borehole Plan

PROJECT:

Motus, Scunthorpe

| PROJECT No: | DATE: |
|---|---|
| EAL.93.23 | 09/2023 |

| SCALE : | DRAWN : | DWG No: |
|---|---|---|
| NTS | PD | Figure 1 |

# Appendix B

# Tier 1 Assessment Criteria

| Determinand | Commercial/Industrial (mg/kg) - 1% SOM | | | Source |
|---|---|---|---|---|
| Arsenic | 640.00 | | | LQM S4UL |
| Boron | 240000.00 | | | LQM S4UL |
| Cadmium | 410.00 | | | C4SL |
| Chromium III | 8600.00 | | | LQM S4UL |
| Chromium VI | 33.00 | | | LQM S4UL |
| Lead | 2300.00 | | | C4SL |
| Mercury, elemental | 58.00[vap] (25.80) | | | LQM S4UL |
| Mercury, inorganic | 1100.00 | | | LQM S4UL |
| Mercury, methyl | 320.00 | | | LQM S4UL |
| Selenium | 12000.00 | | | LQM S4UL |
| Nickel | 980.00 | | | LQM S4UL |
| Copper | 68000.00 | | | LQM S4UL |
| Vanadium | 9000.00 | | | LQM S4UL |
| Zinc | 730000.00 | | | LQM S4UL |
| | **Polycyclic Aromatic Hydrocarbons** | | | |
| | **SOM 1%** | **SOM 2.5%** | **SOM 6%** | |
| Benzo(a)pyrene | 35.00 | 35.00 | 36.00 | LQM S4UL |
| Dibenz(ah)anthracene | 3.50 | 3.60 | 3.60 | LQM S4UL |
| Acenaphthene | 84000 (57)[sol] | 97000 (141)[sol] | 100000.00 | LQM S4UL |
| Acenaphthylene | 83000 (86)[sol] | 97000 (212)[sol] | 100000.00 | LQM S4UL |
| Anthracene | 520000.00 | 540000.00 | 540000.00 | LQM S4UL |
| Benzo(a)anthracene | 170.00 | 170.00 | 180.00 | LQM S4UL |
| Benzo(b)fluoranthene | 44.00 | 44.00 | 45.00 | LQM S4UL |
| Benzo(ghi)perylene | 3900.00 | 4000.00 | 4000.00 | LQM S4UL |
| Benzo(k)fluoranthene | 1200.00 | 1200.00 | 1200.00 | LQM S4UL |
| Chrysene | 350.00 | 350.00 | 350.00 | LQM S4UL |
| Fluoranthene | 23000.00 | 23000.00 | 23000.00 | LQM S4UL |
| Fluorene | 63000 (30)[sol] | 68000.00 | 71000.00 | LQM S4UL |
| Indeno(123cd)pyrene | 500.00 | 510.00 | 510.00 | LQM S4UL |
| Phenanthrene | 22000.00 | 22000.00 | 23000.00 | LQM S4UL |
| Pyrene | 54000.00 | 54000.00 | 54000.00 | LQM S4UL |
| Naphthalene | 190 (76)[sol] | 460 (183)[sol] | 1100 (432)[sol] | LQM S4UL |

**Note:**



* Values calculated using CLEA v1.071

[VAP] - S4UL presented exceed the vapour saturation limit, which is presented in brackets.

[sol] - S4UL presented exceeds the solubility saturation limit, which is presented in brackets.

# Tier 1 Assessment Criteria

| Determinand | Commercial/Industrial (mg/kg) | | | Source |
|---|---|---|---|---|
| | 1% SOM | 2.5% SOM | 6% SOM | |
| Benzene | 27.00 | 47.00 | 90.00 | LQM S4UL |
| Ethylbenzene | 5700[vap] (518) | 13000[vap] (1220) | 27000[vap] (2840) | LQM S4UL |
| Phenol | 760.00 | 1500.00 | 3200.00 | LQM S4UL |
| Toulene | 56000[vap] (869) | 110000[vap] (1920) | 180000[vap] (4360) | LQM S4UL |
| Xylene, o- | 6600[sol] (478) | 15000[sol] (1120) | 33000[sol] (2620) | LQM S4UL |
| Xylene, m- | 6200[vap] (625) | 14000[vap] (1470) | 31000[vap] (3460) | LQM S4UL |
| Xylene, p- | 5900[sol] (576) | 14000[sol] (1350) | 30000[sol] (3170) | LQM S4UL |
| | | | | |
| Aliphatic C5-C6 | 3200 (304)[sol] | 5900 (558)[sol] | 12000 (1150)[sol] | LQM S4UL |
| Aliphatic C6-C8 | 7800 (144)[sol] | 17000 (322)[sol] | 40000 (736)[sol] | LQM S4UL |
| Aliphatic C8-C10 | 2000 (78)[sol] | 4800 (190)[vap] | 11000 (451)[vap] | LQM S4UL |
| Aliphatic C10-C12 | 9700 (48)[sol] | 23000 (118)[vap] | 47000 (283)[vap] | LQM S4UL |
| Aliphatic C12-C16 | 59000 (24)[sol] | 82000 (59)[sol] | 90000 (142)[sol] | LQM S4UL |
| Aliphatic C16-C35 | 1600000 | 1700000 | 1800000 | LQM S4UL |
| Aliphatic C35-C44 | 1600000 | 1700000 | 1800000 | LQM S4UL |
| | | | | |
| Aromatic C5-C7 | 26000 (1200)[sol] | 46000 (2260)[sol] | 86000 (4710)[sol] | LQM S4UL |
| Aromatic C7-C8 | 56000 (869)[vap] | 110000 (1920)[sol] | 180000 (4360)[vap] | LQM S4UL |
| Aromatic C8-C10 | 3500 (613)[vap] | 8100 (1500)[vap] | 17000 (3580)[vap] | LQM S4UL |
| Aromatic C10-C12 | 16000 (364)[sol] | 28000 (899)[sol] | 34000 (2150)[sol] | LQM S4UL |
| Aromatic C12-C16 | 36000 (169)[sol] | 37000 | 38000 | LQM S4UL |
| Aromatic C16-C21 | 28000 | 28000 | 28000 | LQM S4UL |
| Aromatic C21-C35 | 28000 | 28000 | 28000 | LQM S4UL |
| Aromatic C35-C44 | 28000 | 28000 | 28000 | LQM S4UL |
| | | | | |
| Combined Aliphatic and Aromatic C44-C70 | 28000 | 28000 | 28000 | LQM S4UL |

**Note:**



[VAP] - S4UL presented exceed the vapour saturation limit, which is presented in brackets.

[sol] - S4UL presented exceeds the solubility saturation limit, which is presented in brackets.

# Appendix C