

VERIFICATION REPORT
of a site at
1 Belmont Street, London NW1 8HJ
for
RISNER DESIGN



**Contaminated
Land
Solutions**

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Project No 1557
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1 EXECUTIVE SUMMARY

A phase 1 environmental report, phase 2 and 3 environmental investigation and remediation strategy have been undertaken by GO Contaminated Land Solutions Ltd. This report provides verification in order to demonstrate that remediation measures have been completed.

In accordance with the Remediation Strategy the following remedial actions were required:

- Demonstrate that made ground from the basement has been removed to at least 500mm and until all visual evidence of contamination is removed.
- Provide a barrier in the form of vapour membrane in order to remove the pathway between any residual contamination and residents.

The made ground on the basement area has been removed to 500mm. A geotextile membrane was laid down, and a 150mm layer of hardcore was placed on top. Subsequently a total of four samples were tested for vapours from the old made ground below the membrane.

The results showed that in three of the samples there were no vapours present and in one the reading value was 1.5ppm.

The site conceptual model and risk assessment were re-evaluated and as a result the risk of potential hydrocarbon vapours entering the dwelling was considered low and therefore, the vapour membrane is not required.

1.1 Risk Summary

| | | | | |
|----------|-----|----------------|----------|------|
| Very Low | Low | Moderate / Low | Moderate | High |
|----------|-----|----------------|----------|------|

| | | Receptors | | | | | |
|---------|------------------------|------------|----------------|------------|-------------------|---------|-------------|
| | | Site Users | Ground Workers | Neighbours | Proposed Building | Aquifer | Watercourse |
| Sources | Made Ground (On-Site) | | | | | | |
| | Made Ground (Off-Site) | | | | | | |

2 BRIEF

Mr Mark Risner of Risner Design requested GO Contaminated Land Solutions complete a verification report for the site.

This report should be read in conjunction with the following GO Contaminated Land Solutions Reports:

- Phase 1 environmental report, ref: 1557-P1E-1, issued 05 March 2019,
- Phase 2 and 3 environmental investigation and remediation strategy, ref: 1557-P2/3E-1-A, issued 11 April 2019

3 PREVIOUS CONTAMINATION TESTING

A phase 1 desktop study and site investigation have been undertaken by GO Contaminated Land Solutions Ltd. The study identified possible sources of contamination, on site from its former use as radio valve and cabinet factory and a motorbike repair shop. During the site visit, three soil samples were tested for vapours. In two of them the levels of vapours were elevated with values 28 and 58 ppm. In the third one the value of vapours was 3.4 ppm.

During the site works, three samples were collected and tested for metals, hydrocarbons, PAHs, asbestos, water soluble sulphate and Waste Acceptance Criteria. No asbestos was identified in any of the samples. The results can be found in appendix C.

4 REMEDIAL SITE WORKS

4.1 Excavation

The area of the basement was excavated to a depth of 500mm below the existing level. At that depth there was no visual contamination present. Photographs are contained in appendix D.

The variation in colour, shown on the photographs, on the excavated surface, is considered to be a natural phenomenon, as it was also noted during the phase 2 and 3 site works. This can be confirmed from borehole logs obtained from the near vicinity as they describe the clay variously as black/grey, brown/blue and grey/brown clay. The borehole logs from the surrounding area can be found in appendix G.

The client advised that: *“All clay with any odour was removed so only clean clay was*

**1557-P4E-1-A: Belmont Street, Chalk Farm
Risner Design**

left. The photos show clean clay and clean water sitting on top”.

Information received from the client confirm the absence of contamination after the excavation as the structural engineer advised: *“Following the removal of approximately a 500mm depth of the sub base for the purposes of accommodating the floor build-up of concrete slab, sub base hardcore, thermal insulation, waterproofing structure and floor finishes I confirm that there was no visual indication of significant contamination to the finally reduced level of the sub base.”*

4.2 Basement Slab Construction

A geotextile membrane was laid down and a 150mm layer of hardcore was placed on top. Following the hardcore, a 50mm layer of concrete blinding was poured and on top of that, a Memtech Pro M1 membrane was placed. Then a 150mm reinforced concrete slab, insulation and screed.

5 VERIFICATION TESTING

In order to demonstrate that the made ground in the basement has been removed to a depth of 500mm, photographs were taken of the area following removal of made ground (Refer to appendix D).

Verification works were undertaken on 03 May 2019. The membrane was pulled back to enable samples to be taken from the underlying made ground. A total of four samples were tested for vapours with a hand held PID monitor. In samples S1, S2 and S4 there were no vapours measured and in S3 the reading value was 1.5ppm.

Three of the samples were located on areas where previously vapours or visual evidence of oil were identified.

A plan of the verification sample locations is contained in appendix B

| Location Reference | Rationale for Location | Depth (mbgl) | Sampling, Testing & Monitoring |
|--------------------|--|--------------|---|
| S1-S4 | Samples were located where previously vapours or visual evidence of oil were identified. | 0.2-0.3 | Samples taken from old made ground, below geotextile membrane. Tested for vapours |

No olfactory evidence of contamination (such as vapours) was identified during the verification sampling. No visual evidence of contaminants, such as oils, were noted.

6 DISCUSSION

In the phase 1 site visit and phase 2 site investigation samples were tested for vapours. The levels of vapours found in two samples, were elevated with values 28 and 58 ppm. There was also visual evidence of oil.

From conversations with the client it was understood that the following remedial actions would take place prior to commencement of the proposed development:

- Lay a minimum new 150mm reinforced concrete slab
- Lay a new delta membrane tanking system which will prevent any vapour ingress*
- Lay a new methane tanking system which will prevent any gas ingress*
- Lay a new 60mm layer of foil back rigid insulation
- Lay a new 60mm concrete screed

During the verification works four samples were tested for vapours. Three of the samples were located on areas where previously vapours or visual evidence of oil were identified. The samples were collected from the old made ground, immediately below the geotextile membrane. The results showed that in three of the samples there are no vapours present and in one the reading value is 1.5ppm.

The risk of potential hydrocarbon vapours entering the dwelling is considered low and therefore, the vapour membrane is not required.

7 REVISED RISK ASSESSMENT

The potentially significant risks identified in previous reports have been reviewed in the following table.

| Sources | Potential pollutant | Receptor | Pathway | Hazard severity | Likelihood of occurrence | Risk / Significance | Comment & control measures |
|--|---------------------|----------------|---|-----------------|--------------------------|---------------------|--|
| Former site use as radio valve and cabinet factory and motorbike repair shop | Hydrocarbon vapours | Site Users | Inhalation of vapours, indoors and outdoors | Medium | Unlikely | Low risk | No significant vapours detected during verification sampling. No further action required. |
| | | Ground Workers | Dermal contact | Mild | Low likelihood | Low risk | Information to be contained in site Health & Safety Plan and File. Use of appropriate PPE and normal good hygiene measures. Appropriate dust control measures during construction. |
| | | | Inhalation of vapours, indoors and outdoors | Medium | Low likelihood | Moderate/Low risk | |
| | | | Soil Ingestion | Mild | Low likelihood | Low risk | |
| | | | Inhalation of contaminated dust | Mild | Low likelihood | Low risk | |

| Sources | Potential pollutant | Receptor | Pathway | Hazard severity | Likelihood of occurrence | Risk / Significance | Comment & control measures |
|--|---------------------|------------|---|-----------------|--------------------------|---------------------|-----------------------------|
| Former site use as radio valve and cabinet factory and motorbike repair shop | Hydrocarbon vapours | Neighbours | Inhalation of vapours, indoors and outdoors | Mild | Unlikely | Very low risk | No further action required. |
| | | | Inhalation of contaminated dust (during construction) | Mild | Unlikely | Very low risk | |
| Commercial activity (off site) | | Site Users | Inhalation of vapours | Minor | Unlikely | Very low risk | No further action required. |

| Sources | Potential pollutant | Receptor | Pathway | Hazard severity | Likelihood of occurrence | Risk / Significance | Comment & control measures |
|---|---------------------|-------------------|--|-----------------|--------------------------|---------------------|--|
| Commercial activity (off site) | Hydrocarbon vapours | Ground Workers | Dermal contact | Mild | Low likelihood | Low risk | Information to be contained in site Health & Safety Plan and File. Use of appropriate PPE and normal good hygiene measures. Appropriate dust control measures during construction. |
| | | | Inhalation of vapours, indoors and outdoors | Mild | Low likelihood | Low risk | |
| | | | Soil Ingestion | Mild | Low likelihood | Low risk | |
| | | | Inhalation of contaminated dust | Mild | Low likelihood | Low risk | |
| Naturally occurring contaminants, Made Ground (on and off site) | Sulphates, pH | Proposed Building | Direct contact of soil with building materials | Medium | Likely | Moderate risk | Testing undertaken to determine the sulphate class for buried concrete in aggressive ground. |

Any visual or olfactory evidence of contamination noted during works should be investigated by a suitably qualified person and their recommendations implemented.

8 DUTY OF CARE DOCUMENTATION

The material removed was taken to an appropriate landfill facility, following Waste Acceptance Criteria (WAC) testing.

A full record of “Duty of Care” documentation, waste transfer notes and tickets confirming receipt at the landfill is contained in appendix E.

An approximate volume of excavation has been calculated at 23.83m³, see appendix E for calculation. The bulking (swelling) factor for soil is 20-40%. For this calculation 30% was used. Taking under consideration this factor, the volume of the waste in the skip is calculated to be 30.979m³. The waste transfer tickets show that the 7/8 yard skip was used. Information obtained from the company’s website suggests that the volume of this skip is 5.806m³. Assuming each vehicle is full to capacity the number grab lorries required is $30.979/5.806 = 5.33$. A total of 6 tickets have been presented from the receiving landfill, as the minimum number of skips required to transfer the waste is 6 this appears to provide a reasonable correlation and therefore demonstrates that the excavated spoil was deposited at an appropriate facility.

If the density of the soil is assumed to be 1.8tonne/m³ the weight of the transferred waste is $30.979 \times 1.8 = 42.894$ tonne.

9 CONCLUSIONS

A phase 1 desktop study and site investigation have been undertaken by GO Contaminated Land Solutions Ltd. The study identified possible sources of contamination, on site from its former use as radio valve and cabinet factory and a motorbike repair shop. During the site visit, three soil samples were tested for vapours. In two of them the levels of vapours were elevated with values 28 and 58 ppm respectively. In the third one the value of vapours was 3.4 ppm. Appropriate remediation measures have been described in the Remediation Strategy.

The made ground within the area of basement that required remediation has been removed to the depth of 500mm. A geotextile membrane, 150mm of hardcore, 50mm of concrete and a Memtech Pro M1 membrane have been placed. Over this a reinforced concrete slab, insulation and screed will be placed.

Verification works were undertaken on 03 May 2019. A total of four soil samples were collected from the old made ground, immediately below the geotextile membrane and tested for vapours with a hand-held PID monitor. In samples S1, S2 and S4 there were no vapours measured and in S3 the reading value was 1.5ppm.

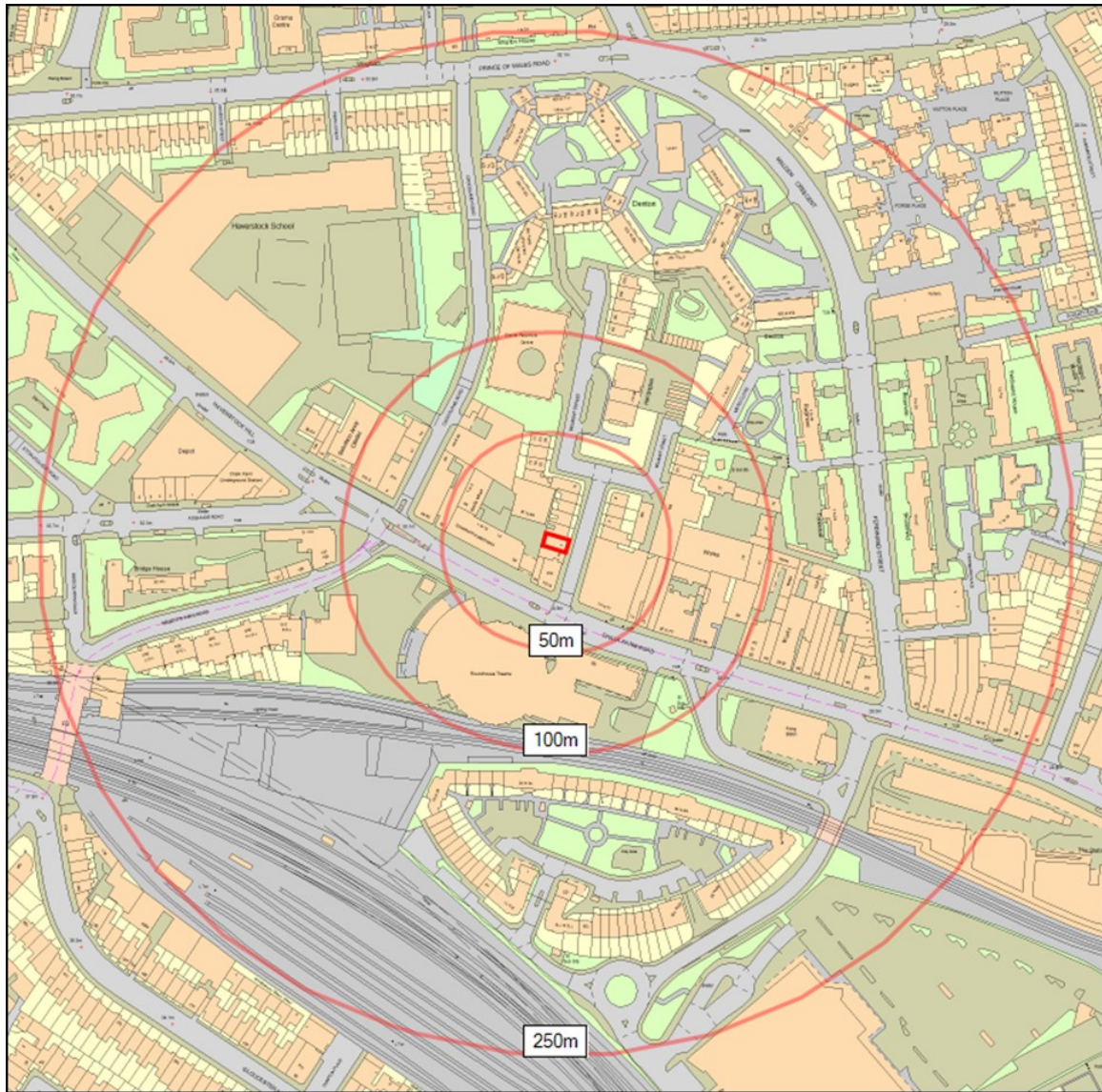
The risk of potential hydrocarbon vapours being present is considered low and therefore, the vapour membrane is not required.

It has been concluded that the remedial site works have been successful in ensuring that the development does not pose an increased risk to human health.

*This document has been prepared for the titled project and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and the prior written authority of GO Contaminated Land Solutions Ltd being obtained. No responsibility or liability is accepted for the consequences of this document being used for a purpose other than that for which it was commissioned. Any person using or relying on this document for such other purpose will by such use or reliance be taken to confirm his agreement to indemnify GO Contaminated Land Solutions Ltd for all loss or damage resulting therefrom. GO Contaminated Land Solutions Ltd accepts no responsibility or liability for this document to any party other than **Risner Design** by whom it was commissioned.*



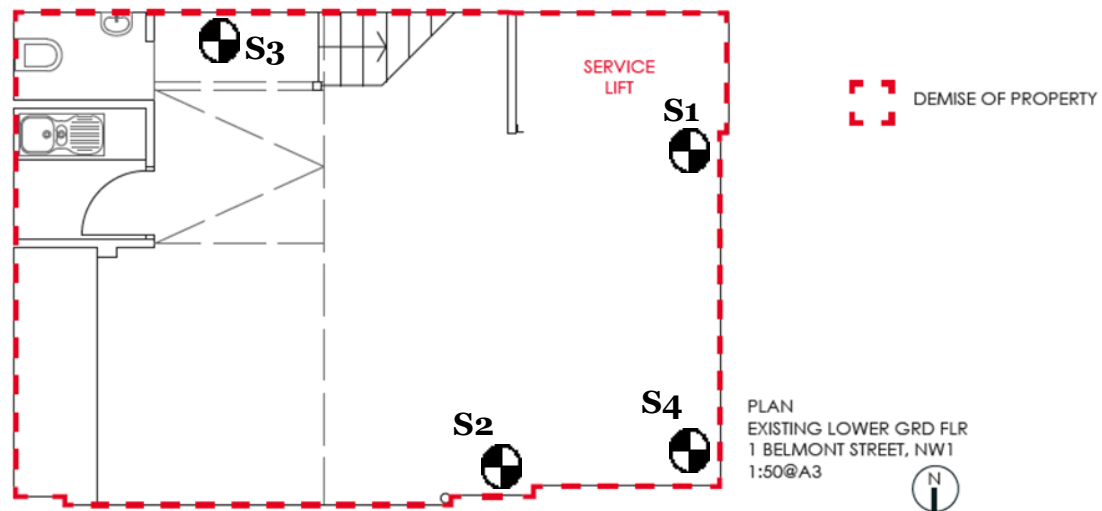
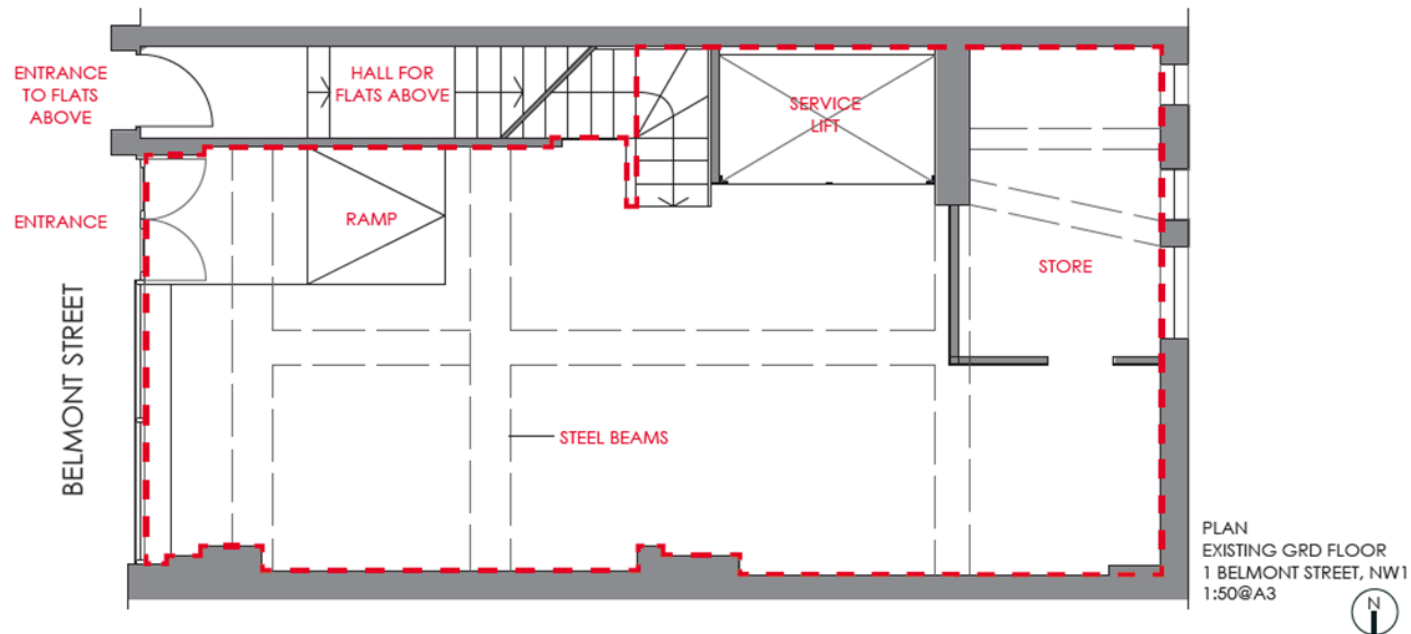
Appendix A – Site Location Plan



1557-P4E-1-A: Belmont Street, Chalk Farm
Risner Design



Appendix B – Sample Location Plan



| | |
|---|--------------------|
| NOTES | |
| | |
| | |
|  | |
| Description | Rev. |
| FOR INFORMATION | |
| Risner Design The Tower, St Matthews Great Peter Street Westminster SW1P 2BU info@risnerdesign.com | |
| 1 BELMONT STREET, CAMDEN | |
| DRAWING TITLE EXISTING INTERNAL LAYOUT PLAN: GROUND FLR AND BASEMENT | |
| Drawing No. A-E-201 | Date 31/05/2018 |
| Scale @ A3 1:50 @A3 | |

1 BELMONT STREET, Chalk Farm
Risner Design



Appendix C – Previous Contamination Testing



Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 19-21820

Issue: 2. Replaces Analytical Report number 19-21820; issue no.1

Date of Issue: 08/04/2019

Contact: Peter George

Customer Details: GO Contaminated Land Solutions Ltd
4 De Frene Road
Sydenham
London
SE26 4AB

Quotation No: Q14-00029

Order No: 1557

Customer Reference: 1557

Date Received: 15/02/2019

Date Approved: 08/04/2019

Details: Belmont Street, Chalk Farm

Approved by:

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)



Sample Summary

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| Elab No. | Client's Ref. | Date Sampled | Date Scheduled | Description | Deviations |
|----------|----------------|--------------|----------------|---------------------|------------|
| 165688 | S1 0.15 - 0.30 | 14/02/2019 | 15/02/2019 | Loamy sand + stones | g |
| 165689 | S2 0.20 - 0.45 | 14/02/2019 | 15/02/2019 | Sandy clayey loam | g |
| 165690 | S3 0.15 - 0.40 | 14/02/2019 | 15/02/2019 | Loamy sand + stones | g |



Results Summary

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Report No.: 15-1020, Issue Number 2

| | | | | | | |
|------------------------------------|-------------|-------------|-------------|---------|--------|---------|
| ELAB Reference | 165688 | 165689 | 165690 | | | |
| Customer Reference | | | | | | |
| Sample ID | | | | | | |
| Sample Type | SOIL | SOIL | SOIL | | | |
| Sample Location | S1 | S2 | S3 | | | |
| Sample Depth (m) | 0.15 - 0.30 | 0.20 - 0.45 | 0.15 - 0.40 | | | |
| Sampling Date | 14/02/2019 | 14/02/2019 | 14/02/2019 | | | |
| Determinand | Codes | Units | LOD | | | |
| Soil sample preparation parameters | | | | | | |
| Moisture Content | N | % | 0.1 | 21.0 | 35.9 | 24.0 |
| Stones Content | N | % | 0.1 | 14.0 | < 0.1 | 29.9 |
| Material removed | N | % | 0.1 | 14.0 | < 0.1 | 29.9 |
| Metals | | | | | | |
| Arsenic | M | mg/kg | 1 | ^ 24.2 | 27.0 | ^ 21.5 |
| Cadmium | M | mg/kg | 0.5 | ^ < 0.5 | < 0.5 | ^ < 0.5 |
| Chromium | M | mg/kg | 5 | ^ 41.0 | 48.2 | ^ 14.9 |
| Copper | M | mg/kg | 5 | ^ 145 | 80.5 | ^ 101 |
| Lead | M | mg/kg | 5 | ^ 194 | 171 | ^ 195 |
| Mercury | M | mg/kg | 0.5 | ^ 3.4 | 5.0 | ^ 1.7 |
| Nickel | M | mg/kg | 5 | ^ 31.7 | 51.7 | ^ 14.7 |
| Selenium | M | mg/kg | 1 | ^ < 1.0 | < 1.0 | ^ < 1.0 |
| Zinc | M | mg/kg | 5 | ^ 208 | 147 | ^ 143 |
| Anions | | | | | | |
| Water Soluble Sulphate | M | mg/kg | 40 | g^ 311 | g 1170 | g^ 912 |
| Inorganics | | | | | | |
| Free Cyanide | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 |
| Hexavalent Chromium | N | mg/kg | 0.8 | < 0.8 | < 0.8 | < 0.8 |
| Miscellaneous | | | | | | |
| Acid Neutralisation Capacity | N | mol/kg | 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Loss On Ignition (450°C) | M | % | 0.01 | ^ 1.94 | 4.47 | ^ 1.77 |
| pH | M | pH units | 0.1 | ^ 8.2 | 8.3 | ^ 8.7 |
| Soil Organic Matter | U | % | 0.1 | 0.6 | 0.7 | 1.1 |
| Total Organic Carbon | N | % | 0.01 | 0.53 | 0.80 | 0.72 |
| Phenols | | | | | | |
| Total Monohydric Phenols | N | mg/kg | 5 | < 5 | < 5 | < 5 |



Results Summary

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| ELAB Reference | | | | 165688 | 165689 | 165690 |
|-------------------------------------|-------|-------|------|-------------|-------------|-------------|
| Customer Reference | | | | | | |
| Sample ID | | | | | | |
| Sample Type | | | | SOIL | SOIL | SOIL |
| Sample Location | | | | S1 | S2 | S3 |
| Sample Depth (m) | | | | 0.15 - 0.30 | 0.20 - 0.45 | 0.15 - 0.40 |
| Sampling Date | | | | 14/02/2019 | 14/02/2019 | 14/02/2019 |
| Determinand | Codes | Units | LOD | | | |
| Polyaromatic hydrocarbons | | | | | | |
| Naphthalene | M | mg/kg | 0.1 | ^ < 0.1 | < 0.1 | ^ 0.5 |
| Acenaphthylene | M | mg/kg | 0.1 | ^ < 0.1 | < 0.1 | ^ < 0.1 |
| Acenaphthene | M | mg/kg | 0.1 | ^ < 0.1 | 0.2 | ^ 0.2 |
| Fluorene | M | mg/kg | 0.1 | ^ < 0.1 | 0.2 | ^ 0.1 |
| Phenanthrene | M | mg/kg | 0.1 | ^ < 0.1 | 3.4 | ^ 0.4 |
| Anthracene | M | mg/kg | 0.1 | ^ < 0.1 | 0.8 | ^ 0.2 |
| Fluoranthene | M | mg/kg | 0.1 | ^ 0.1 | 4.5 | ^ 0.6 |
| Pyrene | M | mg/kg | 0.1 | ^ 0.1 | 3.3 | ^ 0.5 |
| Benzo(a)anthracene | M | mg/kg | 0.1 | ^ < 0.1 | 1.8 | ^ 0.2 |
| Chrysene | M | mg/kg | 0.1 | ^ < 0.1 | 2.4 | ^ 0.2 |
| Benzo(b)fluoranthene | M | mg/kg | 0.1 | ^ < 0.1 | 1.5 | ^ 0.2 |
| Benzo(k)fluoranthene | M | mg/kg | 0.1 | ^ < 0.1 | 1.3 | ^ 0.2 |
| Benzo(a)pyrene | M | mg/kg | 0.1 | ^ < 0.1 | 1.2 | ^ 0.2 |
| Indeno(1,2,3-cd)pyrene | M | mg/kg | 0.1 | ^ < 0.1 | 0.8 | ^ 0.1 |
| Dibenzo(a,h)anthracene | M | mg/kg | 0.1 | ^ < 0.1 | 0.3 | ^ < 0.1 |
| Benzo(g,h,i)perylene | M | mg/kg | 0.1 | ^ < 0.1 | 0.7 | ^ 0.1 |
| Total PAH(16) | M | mg/kg | 0.4 | ^ 0.9 | 22.4 | ^ 3.8 |
| Total PAH (Including Coronene) | N | mg/kg | 2 | < 2 | 23 | 4 |
| BTEX | | | | | | |
| Total BTEX | M | mg/kg | 0.01 | ^ < 0.01 | < 0.01 | ^ < 0.01 |
| TPH CWG | | | | | | |
| >C5-C6 Aliphatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| >C6-C8 Aliphatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| >C8-C10 Aliphatic | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 |
| >C10-C12 Aliphatic | N | mg/kg | 1 | < 1.0 | < 1.0 | 12.3 |
| >C12-C16 Aliphatic | N | mg/kg | 1 | < 1.0 | < 1.0 | 73.6 |
| >C16-C21 Aliphatic | N | mg/kg | 1 | < 1.0 | < 1.0 | 75.8 |
| >C21-C35 Aliphatic | N | mg/kg | 1 | < 1.0 | < 1.0 | 24.2 |
| >C35-C40 Aliphatic | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 |
| >C5-C7 Aromatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| >C7-C8 Aromatic | N | mg/kg | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| >C8-C10 Aromatic | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 |
| >C10-C12 Aromatic | N | mg/kg | 1 | < 1.0 | < 1.0 | 12.1 |
| >C12-C16 Aromatic | N | mg/kg | 1 | < 1.0 | < 1.0 | 90.3 |
| >C16-C21 Aromatic | N | mg/kg | 1 | < 1.0 | < 1.0 | 120 |
| >C21-C35 Aromatic | N | mg/kg | 1 | 1.6 | < 1.0 | 47.8 |
| >C35-C40 Aromatic | N | mg/kg | 1 | < 1.0 | < 1.0 | < 1.0 |
| Total (>C5-C40) Ali/Aro | N | mg/kg | 1 | 1.6 | < 1.0 | 456 |
| Total Petroleum Hydrocarbons | | | | | | |
| Mineral Oil | U | mg/kg | 5 | < 5 | < 5 | 221 |
| PCB (ICES 7 congeners) | | | | | | |
| PCB (Total of 7 Congeners) | M | mg/kg | 0.03 | ^ < 0.03 | < 0.03 | ^ < 0.03 |

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1557-P4E-1-A: Belmont Street, Chalk Farm
Risner Design



Results Summary

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| WAC Analysis | | | | | | | |
|------------------------------|----------------------------|------|---------|---------|--|---|--------------------------|
| Elab Ref: | 165690 | | | | Landfill Waste Acceptance Criteria Limits* | | |
| Sample Date: | 14/02/2019 | | | | Inert Waste Landfill | Stable Non-reactive Hazardous waste in non-hazardous Landfill | Hazardous Waste Landfill |
| Sample ID: | S3 | | | | | | |
| Depth (m) | 0.15 - 0.40 | | | | | | |
| Site: | Belmont Street, Chalk Farm | | | | | | |
| Determinand | | Code | Units | | | | |
| Total Organic Carbon | | N | % | 0.72 | 3 | 5 | 6 |
| Loss on Ignition | | M | % | 1.8 | -- | -- | 10 |
| Total BTEX | | M | mg/kg | < 0.01 | 6 | -- | -- |
| Total PCBs (7 congeners) | | M | mg/kg | < 0.03 | 1 | -- | -- |
| TPH Total WAC | | M | mg/kg | 221 | 500 | -- | -- |
| Total (of 17) PAHs | | N | mg/kg | 4.0 | 100 | -- | -- |
| pH | | M | | 8.7 | -- | >6 | -- |
| Acid Neutralisation Capacity | | N | mol/kg | < 0.1 | -- | To evaluate | To evaluate |
| Eluate Analysis | | | | 10:1 | Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg | | |
| | | | mg/l | mg/kg | | | |
| Arsenic | | N | 0.020 | 0.20 | 0.5 | 2 | 25 |
| Barium | | N | 0.013 | 0.13 | 20 | 100 | 300 |
| Cadmium | | N | < 0.001 | < 0.01 | 0.04 | 1 | 5 |
| Chromium | | N | < 0.005 | < 0.05 | 0.5 | 10 | 70 |
| Copper | | N | 0.008 | 0.08 | 2 | 50 | 100 |
| Mercury | | N | < 0.005 | < 0.01 | 0.01 | 0.2 | 2 |
| Molybdenum | | N | 0.020 | 0.20 | 0.5 | 10 | 30 |
| Nickel | | N | 0.002 | < 0.05 | 0.4 | 10 | 40 |
| Lead | | N | 0.014 | 0.14 | 0.5 | 10 | 50 |
| Antimony | | N | 0.011 | 0.11 | 0.06 | 0.7 | 5 |
| Selenium | | N | < 0.005 | < 0.05 | 0.1 | 0.5 | 7 |
| Zinc | | N | 0.009 | 0.09 | 4 | 50 | 200 |
| Chloride | | N | < 5 | < 50 | 800 | 15000 | 25000 |
| Fluoride | | N | < 5 | < 10 | 10 | 150 | 500 |
| Sulphate | | N | 31 | 315.00 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | | N | 118 | 1180.00 | 4000 | 60000 | 100000 |
| Phenol Index | | N | < 0.01 | < 0.10 | 1 | - | - |
| Dissolved Organic Carbon | | N | 11.600 | 116.00 | 500 | 800 | 1000 |
| Leach Test Information | | | | | | | |
| pH | | N | 7.9 | | | | |
| Conductivity (uS/cm) | | N | 176 | | | | |
| Dry mass of test portion (g) | | | 101.000 | | | | |
| Dry Matter (%) | | | 73 | | | | |
| Moisture (%) | | | 37 | | | | |
| Eluent Volume (ml) | | | 952 | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.



Results Summary

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| WAC Analysis | | | | | | | | |
|------------------------------|----------------------------|------|---------|--|---------|--|---|--------------------------|
| Elab Ref: | 165689 | | | | | Landfill Waste Acceptance Criteria Limits* | | |
| Sample Date: | 14/02/2019 | | | | | Inert Waste Landfill | Stable Non-reactive Hazardous waste in non-hazardous Landfill | Hazardous Waste Landfill |
| Sample ID: | S2 | | | | | | | |
| Depth (m) | 0.20 - 0.45 | | | | | | | |
| Site: | Belmont Street, Chalk Farm | | | | | | | |
| | | | | | | | | |
| Determinand | | Code | Units | | | | | |
| Total Organic Carbon | | N | % | | 0.80 | 3 | 5 | 6 |
| Loss on Ignition | | M | % | | 4.5 | -- | -- | 10 |
| Total BTEX | | M | mg/kg | | < 0.01 | 6 | -- | -- |
| Total PCBs (7 congeners) | | M | mg/kg | | < 0.03 | 1 | -- | -- |
| TPH Total WAC | | M | mg/kg | | < 5 | 500 | -- | -- |
| Total (of 17) PAHs | | N | mg/kg | | 23.0 | 100 | -- | -- |
| pH | | M | | | 8.3 | -- | >6 | -- |
| Acid Neutralisation Capacity | | N | mol/kg | | < 0.1 | -- | To evaluate | To evaluate |
| Eluate Analysis | | | 10:1 | | 10:1 | Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg | | |
| | | | mg/l | | mg/kg | | | |
| Arsenic | | N | < 0.005 | | < 0.05 | 0.5 | 2 | 25 |
| Barium | | N | 0.013 | | 0.13 | 20 | 100 | 300 |
| Cadmium | | N | < 0.001 | | < 0.01 | 0.04 | 1 | 5 |
| Chromium | | N | < 0.005 | | < 0.05 | 0.5 | 10 | 70 |
| Copper | | N | < 0.005 | | < 0.05 | 2 | 50 | 100 |
| Mercury | | N | < 0.005 | | < 0.01 | 0.01 | 0.2 | 2 |
| Molybdenum | | N | 0.013 | | 0.13 | 0.5 | 10 | 30 |
| Nickel | | N | 0.002 | | < 0.05 | 0.4 | 10 | 40 |
| Lead | | N | < 0.001 | | < 0.05 | 0.5 | 10 | 50 |
| Antimony | | N | < 0.005 | | < 0.05 | 0.06 | 0.7 | 5 |
| Selenium | | N | < 0.005 | | < 0.05 | 0.1 | 0.5 | 7 |
| Zinc | | N | < 0.005 | | < 0.05 | 4 | 50 | 200 |
| Chloride | | N | < 5 | | < 50 | 800 | 15000 | 25000 |
| Fluoride | | N | < 5 | | < 10 | 10 | 150 | 500 |
| Sulphate | | N | 101 | | 1010.00 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | | N | 216 | | 2160.00 | 4000 | 60000 | 100000 |
| Phenol Index | | N | < 0.01 | | < 0.10 | 1 | - | - |
| Dissolved Organic Carbon | | N | 9.380 | | 94.00 | 500 | 800 | 1000 |
| Leach Test Information | | | | | | | | |
| pH | | N | 7.6 | | | | | |
| Conductivity (uS/cm) | | N | 323 | | | | | |
| Dry mass of test portion (g) | | | 101.000 | | | | | |
| Dry Matter (%) | | | 70 | | | | | |
| Moisture (%) | | | 44 | | | | | |
| Eluent Volume (ml) | | | 946 | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.



Results Summary

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WAC Analysis

| Elab Ref: | | | | | Landfill Waste Acceptance Criteria Limits* | | | |
|------------------------------|----------------------------|------|--------|--------|--|---|--------------------------|--|
| Sample Date: | 14/02/2019 | | | | Inert Waste Landfill | Stable Non-reactive Hazardous waste in non-hazardous Landfill | Hazardous Waste Landfill | |
| Sample ID: | S1 | | | | | | | |
| Depth (m) | 0.15 - 0.30 | | | | | | | |
| Site: | Belmont Street, Chalk Farm | | | | | | | |
| | | | | | | | | |
| Determinand | | Code | Units | | | | | |
| Total Organic Carbon | | N | % | 0.53 | 3 | 5 | 6 | |
| Loss on Ignition | | M | % | 1.9 | -- | -- | 10 | |
| Total BTEX | | M | mg/kg | < 0.01 | 6 | -- | -- | |
| Total PCBs (7 congeners) | | M | mg/kg | < 0.03 | 1 | -- | -- | |
| TPH Total WAC | | M | mg/kg | < 5 | 500 | -- | -- | |
| Total (of 17) PAHs | | N | mg/kg | < 2 | 100 | -- | -- | |
| pH | | M | | 8.2 | -- | >6 | -- | |
| Acid Neutralisation Capacity | | N | mol/kg | < 0.1 | -- | To evaluate | To evaluate | |

| Eluate Analysis | | | 10:1 | 10:1 | Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg | | |
|--------------------------|--|---|---------|---------|--|-------|--------|
| | | | mg/l | mg/kg | | | |
| Arsenic | | N | < 0.005 | < 0.05 | 0.5 | 2 | 25 |
| Barium | | N | 0.031 | 0.31 | 20 | 100 | 300 |
| Cadmium | | N | < 0.001 | < 0.01 | 0.04 | 1 | 5 |
| Chromium | | N | < 0.005 | < 0.05 | 0.5 | 10 | 70 |
| Copper | | N | < 0.005 | < 0.05 | 2 | 50 | 100 |
| Mercury | | N | < 0.005 | < 0.01 | 0.01 | 0.2 | 2 |
| Molybdenum | | N | 0.009 | 0.09 | 0.5 | 10 | 30 |
| Nickel | | N | 0.001 | < 0.05 | 0.4 | 10 | 40 |
| Lead | | N | 0.001 | < 0.05 | 0.5 | 10 | 50 |
| Antimony | | N | < 0.005 | < 0.05 | 0.06 | 0.7 | 5 |
| Selenium | | N | < 0.005 | < 0.05 | 0.1 | 0.5 | 7 |
| Zinc | | N | < 0.005 | < 0.05 | 4 | 50 | 200 |
| Chloride | | N | < 5 | < 50 | 800 | 15000 | 25000 |
| Fluoride | | N | < 5 | < 10 | 10 | 150 | 500 |
| Sulphate | | N | 53 | 533.00 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | | N | 172 | 1720.00 | 4000 | 60000 | 100000 |
| Phenol Index | | N | < 0.01 | < 0.10 | 1 | - | - |
| Dissolved Organic Carbon | | N | 15.200 | 152.00 | 500 | 800 | 1000 |

Leach Test Information

| | | | | | | | | |
|------------------------------|--|---|---------|--|--|--|--|--|
| pH | | N | 7.8 | | | | | |
| Conductivity (uS/cm) | | N | 256 | | | | | |
| Dry mass of test portion (g) | | | 103.000 | | | | | |
| Dry Matter (%) | | | 73 | | | | | |
| Moisture (%) | | | 37 | | | | | |
| Eluent Volume (ml) | | | 966 | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.



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Results Summary

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Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

| Elab No | Depth (m) | Clients Reference | Description of Sample Matrix # | Asbestos Identification | Gravimetric Analysis Total (%) | Gravimetric Analysis by ACM Type (%) | Free Fibre Analysis (%) | Total Asbestos (%) |
|---------|-------------|-------------------|---|-------------------------|--------------------------------|--------------------------------------|-------------------------|--------------------|
| 165688 | 0.15 - 0.30 | S1 | Brown sandy soil, stones, concrete, brick, clinker, chalk | No asbestos detected | n/t | n/t | n/t | n/t |
| 165689 | 0.20 - 0.45 | S2 | Brown sandy soil, stones, concrete, brick, clinker, chalk | No asbestos detected | n/t | n/t | n/t | n/t |
| 165690 | 0.15 - 0.40 | S3 | Grey sandy soil, stones, concrete, brick, clinker, chalk | No asbestos detected | n/t | n/t | n/t | n/t |



Method Summary

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| Parameter | Codes | Analysis Undertaken On | Date Tested | Method Number | Technique |
|---|-------|------------------------|-------------|---------------|--------------------|
| Soil | | | | | |
| Free cyanide | N | As submitted sample | 19/02/2019 | 107 | Colorimetry |
| Hexavalent chromium | N | As submitted sample | 19/02/2019 | 110 | Colorimetry |
| Aqua regia extractable metals | M | Air dried sample | 19/02/2019 | 118 | ICPMS |
| Phenols in solids | N | As submitted sample | 19/02/2019 | 121 | HPLC |
| PAH (GC-FID) | M | As submitted sample | 19/02/2019 | 133 | GC-FID |
| Water soluble anions | M | Air dried sample | 05/04/2019 | 172 | Ion Chromatography |
| Low range Aliphatic hydrocarbons soil | N | As submitted sample | 19/02/2019 | 181 | GC-MS |
| Low range Aromatic hydrocarbons soil | N | As submitted sample | 19/02/2019 | 181 | GC-MS |
| Aliphatic hydrocarbons in soil | N | As submitted sample | 19/02/2019 | 214 | GC-FID |
| Aliphatic/Aromatic hydrocarbons in soil | N | As submitted sample | 21/02/2019 | 214 | GC-FID |
| Aromatic hydrocarbons in soil | N | As submitted sample | 20/02/2019 | 214 | GC-FID |
| Soil organic matter | U | Air dried sample | 20/02/2019 | BS1377:P3 | Titrimetry |
| Asbestos identification | U | Air dried sample | 19/02/2019 | PMAN | Microscopy |
| Leachate | | | | | |
| Arsenic* | N | | 21/02/2019 | 101 | ICPMS |
| Cadmium* | N | | 21/02/2019 | 101 | ICPMS |
| Chromium* | N | | 21/02/2019 | 101 | ICPMS |
| Lead* | N | | 21/02/2019 | 101 | ICPMS |
| Nickel* | N | | 21/02/2019 | 101 | ICPMS |
| Copper* | N | | 21/02/2019 | 101 | ICPMS |
| Zinc* | N | | 21/02/2019 | 101 | ICPMS |
| Mercury* | N | | 21/02/2019 | 101 | ICPMS |
| Selenium* | N | | 21/02/2019 | 101 | ICPMS |
| Antimony | N | | 21/02/2019 | 101 | ICPMS |
| Barium* | N | | 21/02/2019 | 101 | ICPMS |
| Molybdenum* | N | | 21/02/2019 | 101 | ICPMS |
| pH Value* | N | | 21/02/2019 | 113 | Electrometric |
| Electrical Conductivity* | N | | 21/02/2019 | 136 | Probe |
| Dissolved Organic Carbon | N | | 21/02/2019 | 102 | TOC analyser |
| Chloride* | N | | 21/02/2019 | 131 | Ion Chromatography |
| Fluoride* | N | | 21/02/2019 | 131 | Ion Chromatography |
| Sulphate* | N | | 21/02/2019 | 131 | Ion Chromatography |
| Total Dissolved Solids | N | | 21/02/2019 | 144 | Gravimetric |
| Phenol index | N | | 21/02/2019 | 121 | HPLC |
| WAC Solids analysis | | | | | |
| pH Value** | M | Air dried sample | 21/02/2019 | 113 | Electrometric |
| Total Organic Carbon | N | Air dried sample | 20/02/2019 | 210 | IR |
| Loss on Ignition** | M | Air dried sample | 21/02/2019 | 129 | Gravimetric |
| Acid Neutralization Capacity to pH 7 | N | Air dried sample | 21/02/2019 | NEN 737 | Electrometric |
| Total BTEX** | M | As submitted sample | 19/02/2019 | 181 | GCMS |
| Mineral Oil** | U | As submitted sample | 19/02/2019 | 117 | GCFID |
| Total PCBs (7 congeners) | M | Air dried sample | 19/02/2019 | 120 | GCMS |
| Total PAH (17)** | N | As submitted sample | 20/02/2019 | 133 | GCFID |

Tests marked N are not UKAS accredited



Report Information

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Key

| | |
|-----|---|
| U | hold UKAS accreditation |
| M | hold MCERTS and UKAS accreditation |
| N | do not currently hold UKAS accreditation |
| ^ | MCERTS accreditation not applicable for sample matrix |
| * | UKAS accreditation not applicable for sample matrix |
| S | Subcontracted to approved laboratory UKAS Accredited for the test |
| SM | Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test |
| NS | Subcontracted to approved laboratory. UKAS accreditation is not applicable. |
| I/S | Insufficient Sample |
| U/S | Unsuitable sample |
| n/t | Not tested |
| < | means "less than" |
| > | means "greater than" |

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client

Deviation Codes

| | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

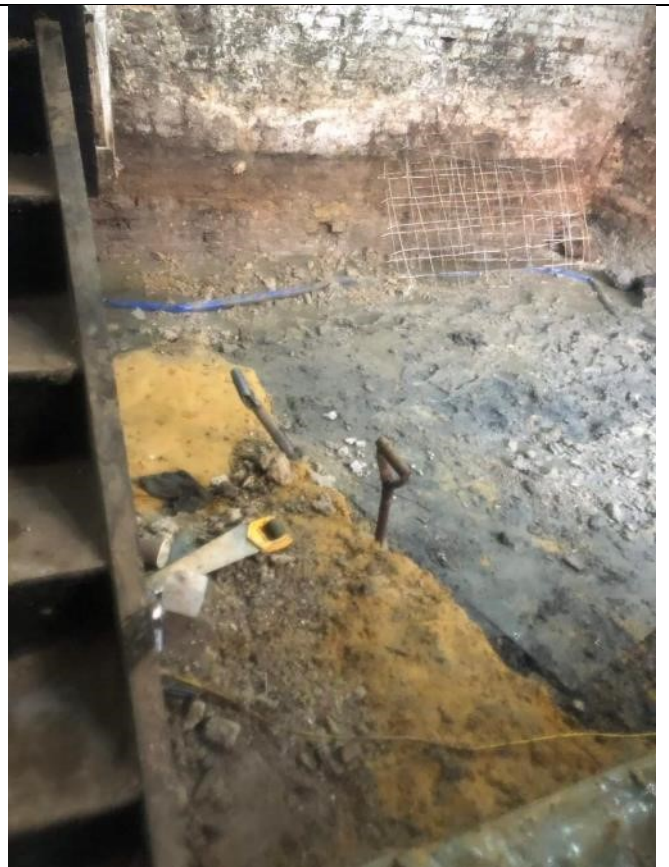
Charges may apply to extended sample storage



Appendix D – Photographs of Remediation



Area before excavation



Area during excavation



Area after excavation



Geotextile membrane and new hardcore



Appendix E – Duty of Care Documentation