Joe Lewis
London Borough of Camden
Town Hall
Judd Street
LONDON
N1C 4AG

16th March 2023

Our ref. EH/23/LP2248

**Re: LP2248 Antrim Grove Allotments Additional Verification**

Dear Joe,

# 1 Introduction

Leap Environmental Ltd (hereafter referred to as LEAP) was appointed by the London Borough of Camden (LB Camden) to provide independent verification of the additional remediation works undertaken at Plot 19b at Antrim Grove Allotments, Antrim Grove, Belsize Park, London, NW3 4XR.

This additional remediation was required following the previous verification works carried out by LEAP, subsequent to remediation carried out across the entirety of the Antrim Grove Allotment site, which identified a level of arsenic in plot 19b that exceeded the specified criteria (44.1mg/kg against an import criteria of 37mg/kg). Additional sampling and testing of soils in plot 19b and adjacent plots 18 and 19a then identified one further exceedance against the import criteria for arsenic. The Verification Report recommended that the topsoil in an area of 7m x 3m in Plot 19b was excavated, removed from site and replaced with fresh, clean material. The location of this recommended additional remediation area is shown in Figure 1.

The objective of this letter is to present the verification data for this additional remediation to demonstrate that the soils containing the elevated arsenic concentrations have been removed from site and replaced with clean Topsoil. This data was obtained onsite on 27th February 2023. The report serves to enable the discharge of Condition 3 of LB Camden planning permission ref: 2021/4075/P.

Previous reports relating to this site are:

- Phase 1 Desk Study, Site Reconnaissance & Phase II Site Investigation Report: LEAP Environmental Ltd. Ref: LP2248, dated 28th July 2020;
- Remediation Options Appraisal. LEAP Environmental Ltd. Ref: LP2248/ROA/Final, dated 3rd November 2020;
- Remediation Method Statement, LEAP Environmental Ltd. Ref: LP2048/RMS dated 11th November 2021;
- Remediation Verification Report. Leap Environmental, Ref LP2048/Verification dated 8th July 2022.

# 2 Verification Works

The additional remediation works for plot 19b, as recommended in the LEAP Verification report, were completed by Ginkgo Landscape Contractors on 19th October 2022. This involved the excavation and removal of the arsenic impacted topsoil within a defined area and replacing this with clean, imported topsoil. A letter from Ginkgo Landscape Contractors, confirming this work was carried out is included in Appendix 2. A photograph provided by the contractor showing the excavated area is included within Appendix B demonstrating that the excavation was taken down to the subsoil and all topsoil was removed.

## 2.1 Site visit – soil sampling

LEAP carried out a site visit on 27th February 2023 to inspect and sample the area where additional remediation had been completed. Photographs were taken, which show the remediated area within the plot with darker coloured soil. Sampling inspection pit locations are shown in Figure 2 (Appendix B). A soil sample TS1 was taken from the centre of the remediated area, indicating >0.25m of new topsoil. Four further soil samples were taken from the soil surrounding the remediated zone. This was to check the concentrations of contaminants in the adjacent material left in the plot to confirm all soils containing elevated arsenic had been removed. A sample was not taken to the west of the zone in plot 19a due to access difficulties on this site (as shown in Plates 3 and 4, Appendix B). Figure 2 shows the location of the sampling points.

Sample descriptions were as follows:

TS1 @0.25m Dark brown, slightly gravely, slightly sandy silty CLAY. Gravel is fine to coarse, sub angular to rounded flint and chalk.

TS2 - TS5 Orange-brown, silty, fine to coarse SAND with occasional to rare fine to medium gravel of flint and wood fragments.

The five soil samples were placed in laboratory supplied containers and couriered in cool boxes to Envirolab and tested for heavy metals.

## 2.2 Geo-chemical test results

The laboratory results for soil testing are shown in Appendix C. All samples tested were found to meet the criteria set out in Table B1 of the original RMS for the site with low measured concentrations for arsenic.

# 3 Conclusions

The verification site visit and subsequent laboratory testing confirms that the area of Plot 19b where slightly elevated levels of arsenic had been identified has been successfully remediated.

The impacted topsoil has been replaced with soil which has a low concentration of arsenic. The soils surrounding the excavated area have been found to have low levels of arsenic in all samples, indicating that the hotspot has been successfully removed.

Please do not hesitate to contact the undersigned if you require any further information.

Yours faithfully,

Dr Emma Hellawell

Enc.

Appendix A - Figures

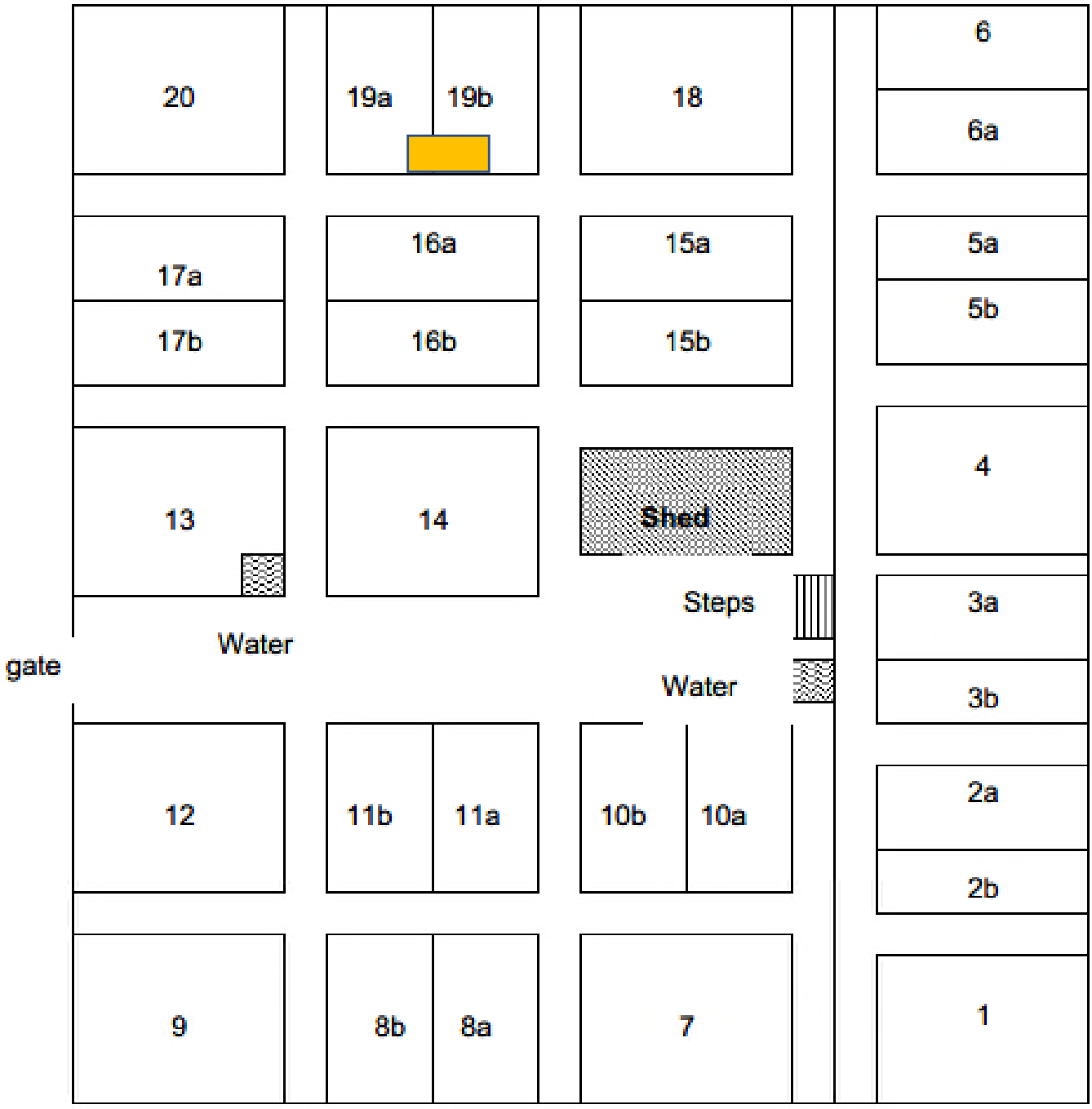
Appendix B – Photos

Appendix C – Geochemical Test Results

# APPENDIX A - FIGURES

Figures

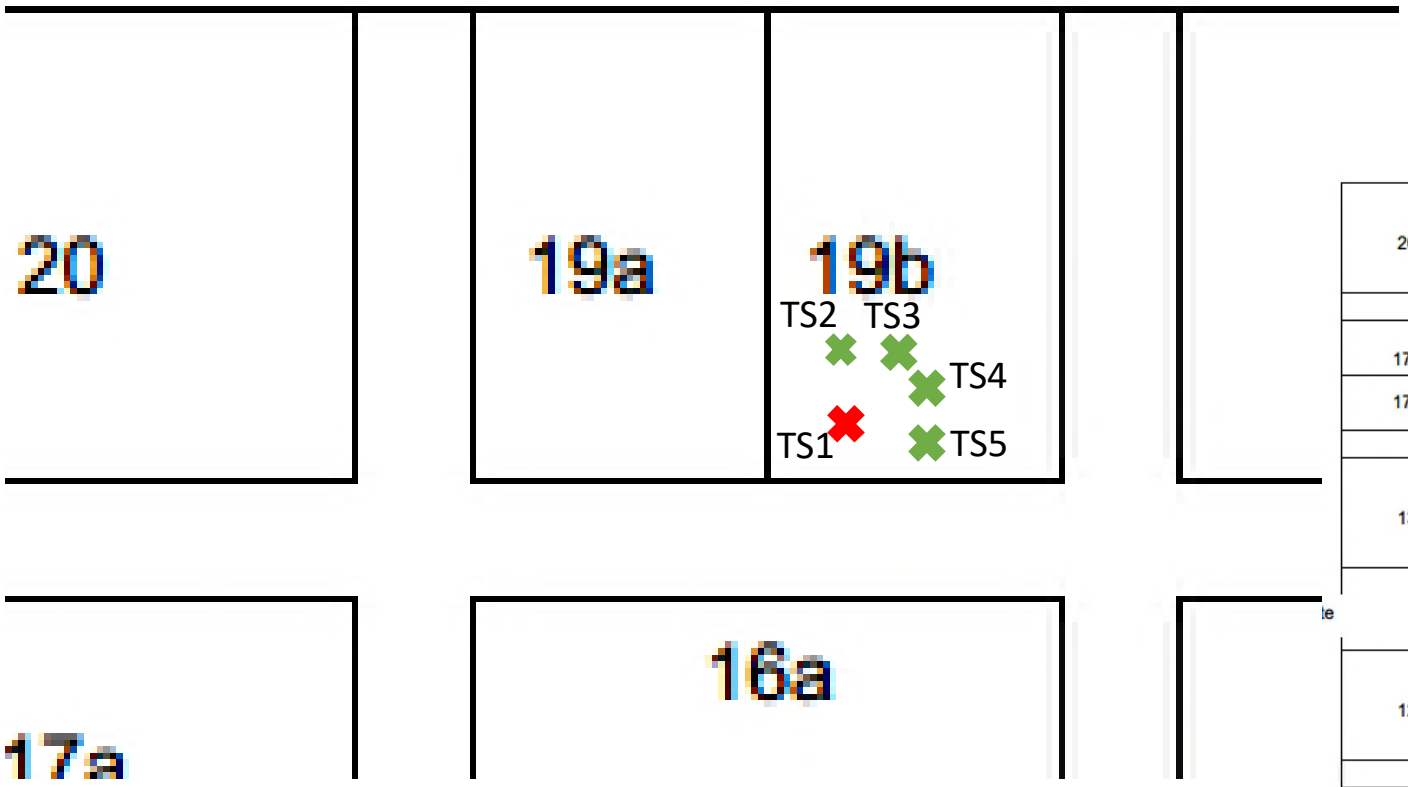
**Excavation and replacement of topsoil recommended**

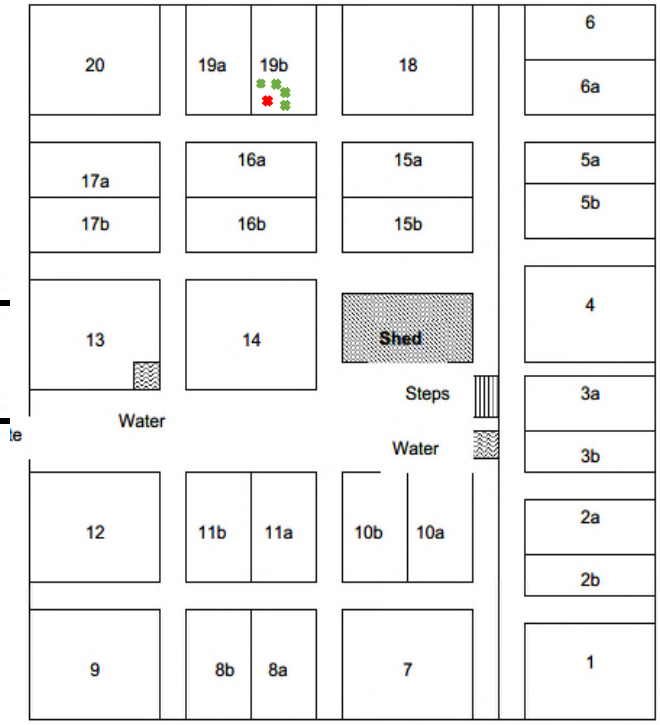



| | | | | | |
|---|---|---|---|---|---|
| leap environmental | Client: | London Borough of Camden | Date: | 20/06/2022 | Project ID: | LP2248 |
| | Project: | Antrim Grove Allotments | Title: | Area recommended for topsoil excavation and replacement | Fig. No. | 1 |

**Sample Location outside remediation zone (0.1 – 0.2m depth)**

**Sample Location in remediation zone (0 – 0.25m depth)**




| | | | | | |
|---|---|---|---|---|---|
| Basemap: Antrim Grove Allotments Plan | leap environmental | Client: | London Borough of Camden | Date: | 27/02/2027 | Project ID: | LP2248 |
| | | Project: | Antrim Grove Allotments | Title: | Sample Location Plan | Fig. No. | 2 |

GINKGO GARDENS
Best Horticultural Practice
Ground Floor Office, D Block, Peabody Estate, Vauxhall Bridge Road, London SW1V 1TE
www.ginkgogardens.co.uk T: 020 7498 2021 F: 020 7976 5801

Joe Lewis
Green Space Project Officer
London Borough of Camden

Works completed at Antrim Grove 19th October 2022.

All works were completed in accordance with the recommendations set out in the verification report for Antrim Grove allotments. All works were completed by Ginkgo Landscape Contractors on 19th October 2022.

Kind regards,

Shane Kenneally

Operations Director

# APPENDIX B – SITE PHOTOGRAPHS

Site Photographs

Plate 1: VISIT 27/02/23 – View of plot 19b looking north. Darker soil indicates area that has been further remediated.

Plate 2: VISIT 27/02/23 View of plot 19b looking south focusing on area that has been further remediated .

Plate 3: VISIT 27/02/2023 Adjacent Plot 19a shown

Plate 4: VISIT 27/02/2023 Further view of adjacent plot 19a

Plate 5: VISIT 27/02/22 Sampling locations shown. .

Plate 6: VISIT 27/02/2023 Sampling locations shown within plot. . (Replaced topsoil shown as dark brown material).

Plate 7: VISIT 27/02/2023 – Replaced topsoil – Dark brown, slightly gravelly, slightly sandy silty CLAY.

Plate 8: VISIT 27/02/2023 – Remaining soil surrounding remediation zone at TS3 - Orange-brown, silty, fine to coarse SAND with occasional to rare fine to medium gravel of flint and wood fragments and a single metal screw

Plate 9: VISIT 27/02/2023 Sample locations infilled.

Plate 10: Photograph provided by Contractor showing excavated area.

# APPENDIX C – CHEMICAL LABORATORY TEST RESULTS

Chemical Laboratory
Test Results

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

# FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 23/01933
**Issue Number:** 1 **Date:** 08 March, 2023

**Client:**
Leap Environmental Ltd (Dorking)
Book House
Glebelands Centre,
Vincent Lane,
Dorking,
Surrey
RH4 3HW

**Project Manager:** Emily Frankish
**Project Name:** Antrim Grove Allotments
**Project Ref:** LP2248
**Order No:** LPO-7246
**Date Samples Received:** 02/03/23
**Date Instructions Received:** 02/03/23
**Date Analysis Completed:** 08/03/23

**Approved by:**

Richard Wong
Client Manager

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

**Envirolab Job Number: 23/01933**

**Client Project Name: Antrim Grove Allotments**

**Client Project Ref: LP2248**

| Lab Sample ID | 23/01933/1 | 23/01933/2 | 23/01933/3 | 23/01933/4 | 23/01933/5 | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | 1 | 1 | 1 | 1 | 1 | | | | | |
| Client Sample ID | TS1 | TS2 | TS3 | TS4 | TS5 | | | | | |
| Depth to Top | 0.25 | 0.10 | 0.20 | 0.20 | 0.25 | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 27-Feb-23 | 27-Feb-23 | 27-Feb-23 | 27-Feb-23 | 27-Feb-23 | | | | | |
| Sample Type | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | | | | | |
| Sample Matrix Code | 4AE | 1A | 4A | 4AE | 4AE | | | | | |
| % Stones >10mm$_A$ | 9.0 | <0.1 | <0.1 | <0.1 | <0.1 | | | % w/w | 0.1 | A-T-044 |
| Arsenic$_D^{M\#}$ | 8 | 6 | 7 | 8 | 8 | | | mg/kg | 1 | A-T-024s |
| Cadmium$_D^{M\#}$ | 0.8 | 0.7 | 0.7 | 0.6 | 0.6 | | | mg/kg | 0.5 | A-T-024s |
| Copper$_D^{M\#}$ | 35 | 10 | 14 | 9 | 12 | | | mg/kg | 1 | A-T-024s |
| Chromium$_D^{M\#}$ | 25 | 11 | 11 | 11 | 11 | | | mg/kg | 1 | A-T-024s |
| Chromium (hexavalent)$_D$ | <1 | <1 | <1 | <1 | <1 | | | mg/kg | 1 | A-T-040s |
| Chromium (trivalent) | 25 | 11 | 11 | 11 | 11 | | | mg/kg | 1 | Calc |
| Lead$_D^{M\#}$ | 87 | 12 | 13 | 42 | 13 | | | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | 0.55 | <0.17 | <0.17 | <0.17 | <0.17 | | | mg/kg | 0.17 | A-T-024s |
| Nickel$_D^{M\#}$ | 20 | 10 | 10 | 9 | 9 | | | mg/kg | 1 | A-T-024s |
| Selenium$_D^{M\#}$ | <1 | <1 | 4 | <1 | <1 | | | mg/kg | 1 | A-T-024s |
| Zinc$_D^{M\#}$ | 95 | 30 | 34 | 27 | 29 | | | mg/kg | 5 | A-T-024s |

## REPORT NOTES

**General**

This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

**Soil chemical analysis:**
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

**TPH analysis of water by method A-T-007:**
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

**Electrical Conductivity of water by Method A-T-037:**
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

**Asbestos:**
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

**Predominant Matrix Codes:**
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
**Secondary Matrix Codes:**
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

**Key:**
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve
Subscript "^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
EPH CWG results have humics mathematically subtracted through instrument calculation
TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

**EPH CWG GCxGC ID from TPH CWG**

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

# Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

**Client:** Leap Environmental Ltd (Dorking) , Book House, Glebelands Centre,, Vincent Lane, Dorking, Surrey , RH4 3HW

**Project:** Antrim Grove Allotments

**Clients Project No:** LP2248

**Project No:** 23/01933

**Date Received:** 02/03/2023 (am)

**Cool Box Temperatures (°C):** 7.9

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

# Envirolab Analysis Dates

| Lab Sample ID | 23/01933/1 | 23/01933/2 | 23/01933/3 | 23/01933/4 | 23/01933/5 |
|---|---|---|---|---|---|
| Client Sample No | 1 | 1 | 1 | 1 | 1 |
| Client Sample ID/Depth | TS1 0.25m | TS2 0.10m | TS3 0.20m | TS4 0.20m | TS5 0.25m |
| Date Sampled | 27/02/23 | 27/02/23 | 27/02/23 | 27/02/23 | 27/02/23 |
| A-T-024s | 08/03/2023 | 08/03/2023 | 08/03/2023 | 08/03/2023 | 08/03/2023 |
| A-T-040s | 08/03/2023 | 08/03/2023 | 08/03/2023 | 08/03/2023 | 08/03/2023 |
| A-T-044 | 07/03/2023 | 07/03/2023 | 07/03/2023 | 07/03/2023 | 07/03/2023 |
| Calc | 08/03/2023 | 08/03/2023 | 08/03/2023 | 08/03/2023 | 08/03/2023 |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**