Part 2A Investigation

Treadgold House and Avondale Park Gardens

Royal Borough of Kensington & Chelsea

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Quality information

Prepared by	Checked by	Verified by	Approved by
Holly Fenwick Graduate Environmental Scientist	David Dyson Associate	Rev 0 - Simon Cole Remediation Practice Lead	David Dyson Associate
Emma Toms Senior Consultant		Rev 1, 2, 3 & 4 - David Dyson Associate	

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Prepared for:

Royal Borough of Kensington & Chelsea

Prepared by:

AECOM Limited
Sunley House
4 Bedford Park
Croydon, CR0 2AP, UK

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between and including **October 2021** and **September 2022** and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

The exploratory holes carried out during the fieldwork, which investigate only a small volume of the ground in relation to the size of the investigation area, can only provide a general indication of conditions within that investigation area. The comments made and recommendations given in this Report are based on the ground conditions apparent at the locations of the exploratory holes. There may be exceptional ground conditions elsewhere in the investigation area which have not been disclosed by this investigation and which have therefore not been taken into account in this Report.

The opinions expressed in this Report concerning any contamination found and the risks arising there from are based on current good practice assessment and comparison with available soil guideline values, generic assessment criteria and other guidance values, including Site Specific Assessment Criteria (SSAC) which were generated either by Detailed Quantitative Risk Assessment within the Stage 2 Investigation into Potential Contamination from the Grenfell Tower fire report (AECOM, 2021a) or within this report.

It should be noted that the effects of ground and water borne contamination on the environment are constantly under review, and authoritative guidance values are potentially subject to change. The conclusions presented herein are based on the guidance and guideline values available at the time this Report was prepared, however, no liability by AECOM can be accepted for the retrospective effects of any changes or amendments to guidance or guideline values. Unless otherwise stated in this Report, the assessments made assume that the sampling areas will continue to be used for their current purpose without significant changes.

Reference to historical Ordnance Survey (OS) maps and/or data provides invaluable information regarding the land use history in the investigation area. However, it should be noted that historical evidence will be incomplete for the period pre-dating the first edition and between the release of successive maps and/or data.

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Acronyms and Abbreviations

AGS	Association of Geotechnical and Geoenvironmental Specialists
APG	Avondale Park Gardens
BAF	Bioaccessible Fraction
bgl	Below ground level
BGS	British Geological Survey
BS	British Standard
BSI	British Standards Institution
CI	Confidence Interval
CIRIA	Construction Industry Research and Information Association
CLs	Contaminant Linkages
CLEA	Contaminated Land Exposure Assessment
COC	UK Department of Health Committee on Carcinogenicity
COPC	Chemicals of Potential Concern
CSM	Conceptual Site Model
C4SL	Category 4 Screening Level
Defra	Department for Environment, Food & Rural Affairs
DIV	Dutch Intervention Value
DQRA	Detailed Quantitative Risk Assessment
DVSR	Data Validation Summary Report
EA	Environment Agency
EIC	Environmental Industries Commission
ELCR	Excess Lifetime Cancer Risk
G-BASE	Geochemical Baseline Survey of the Environment
GSC	Generic Screening Criterion
QRA	Quantitative Risk Assessment
HCV	Health Criteria Value
HP	Homegrown Produce
HSE	Health and Safety Executive
IEUBK	Integrated Exposure Uptake Biokinetic
ISO	International Organization for Standardization
LA	Local Authority
LCRM	Land Contamination Risk Management
LLTC	Low Level of Toxicological Concern
LQM	Land Quality Management Ltd
MAP	Multi-Agency Partnership
MDL	Method Detection Limit
mg/kg	Milligrams per kilogram
µg/kg	Micrograms per kilogram
µg/dl	Micrograms per decilitre
NBC	Normal Background Concentration
ng/kg	Nanograms per kilogram
NQMS	National Quality Mark Scheme
PAHs	Polycyclic Aromatic Hydrocarbons

Part 2A	Part 2A of the Environmental Protection Act, 1990 (the 'Contaminated Land regime')
PCLs	Potential Contaminant Linkages
PHE	Public Health England (now re-named as UK HSA)
POSresi	Public Open Space in a residential setting
POSH	Possibility of Significant Harm
PRA	Preliminary risk assessment
QA	Quality Assurance
RBA	Relative Bioavailability
RBKC	Royal Borough of Kensington and Chelsea
Resi-HP	Residential land-use without homegrown produce consumption
RIVM	Dutch National Institute for Public Health and the Environment
RPD	Relative Percent Difference
SSAC	Site Specific Assessment Criterion
SAG	Science Advisory Group
SCL	Significant Contaminant Linkage
SGV	Soil Guideline Values
SIR	Soil Ingestion Rate
SoBRA	Society of Brownfield Risk Assessment
SOM	Soil Organic Matter
SPOSH	Significant Possibility of Significant Harm
SQP	Suitably Qualified Person
Statutory Guidance	2012 Environmental Protection Act, 1990 Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance
S4UL	Suitable 4 Use Level
TDI	Tolerable daily intake
TH	Treadgold House
TN	Technical Notes
TOC	Total organic carbon
UKAS	United Kingdom Accreditation Service
UK HSA	United Kingdom Health Security Agency
UKSHS	UK Soil and Herbage Survey
VROM	Dutch Ministry of Housing, Spatial Planning and the Environment
WHO	World Health Organisation

Executive Summary

AECOM has undertaken land contamination site investigation and risk assessment at two areas of land that were identified as having elevated lead concentrations in soil during the Grenfell Stage 2 investigation. These works have been undertaken during the period October 2021 to April 2022, and completed in accordance with Part 2A of the Environmental Protection Act 1990. The work that AECOM has undertaken has been overseen by RBKC and a National Quality Mark Scheme (NQMS) Suitably Qualified Person (SQP), and reviewed by the Multi-Agency Partnership (MAP).

The objectives of these works were to undertake detailed investigation at the Treadgold House and Avondale Park Gardens sites, in response to the recommendations from the Grenfell Stage 2 investigation. The investigation was required to:

- investigate lead within the soil, including whether the spatial distribution indicated a link to the former brickfield within the areas, and investigate other potential contaminants that could be related to historic non-fire sources;
- carry out tiered risk assessment to establish whether there are potential unacceptable risks, and if so to assess whether there is a significant possibility of significant harm (SPOSH) to human health as defined by Part 2A; and
- to classify each linkage at the two areas into Category 1-4 as defined by Part 2A.

The investigation and assessment of the two sites constitutes a 'detailed inspection' as defined by Paragraph 2.2 of the Part 2A 2012 Statutory Guidance.

The scope of work included:

- Walkover survey of the sites to agree sampling locations and evaluate how residents used the garden areas;
- Collection and analysis of 235 soil samples from 90 hand pit locations at Treadgold House and a further 16 hand pit locations at Avondale Park Gardens.
- Laboratory chemical testing of all soil samples for lead. A sub-set of soil samples was tested for a range of heavy metals, PAHs, and asbestos. Six soil samples from Treadgold House were also tested to assess the bioaccessibility of lead.
- Assessment and interpretation of the laboratory testing data in accordance with the UK's tiered risk assessment process. This included initial screening of data using generic screening criteria and the site specific assessment criteria developed during the Grenfell Stage 2 investigation, with subsequent chemical exposure modelling to calculate updated site-specific assessment criteria.
- Evaluation of the level of risk to human health in accordance with the decision framework set out in the Statutory Guidance for Part 2A.

The investigation found that the source of the lead in soil at Treadgold House and Avondale Park Gardens was most likely the topsoil imported to the site for landscaping, with no evidence that it originated from the Grenfell Tower fire or from fill in the historic brickfield.

The risk assessment was carried out in two tiers, with the first tier comprising the screening of contaminant concentrations against assessment criteria for generic land uses sufficiently conservative to be protective of health at Treadgold House and Avondale Park Gardens. For Treadgold House, the generic land uses included residential without homegrown produce for adult residents, and residential public open space for child residents. For Avondale Park Gardens, the generic land use was residential public open space. The assessment considered chronic (i.e. long term) health effects and assessed average soil concentrations across parts of the investigation areas that might be used most frequently by residents. Average concentrations were assessed across the full investigation area, as well as (for Treadgold House) smaller parts of the garden associated with each ground floor property. Potential hotspot areas were also considered. Where contaminant concentrations did not exceed the assessment criteria, the risk to health was considered to fall into the definition of Category 4 land (i.e. no more than a low risk). Where contaminant concentrations exceeded the generic assessment criteria, these contaminants were taken forwards to detailed quantitative risk assessment.

The DQRA was completed in two steps and was only required for Treadgold House for lead. Step 1 involved calculating site-specific assessment criteria using site-specific information that would be considered to meet the

definition of Category 4 land. Separate Step 1 assessment criteria were calculated for child residents and adult residents. Average soil concentrations were again compared to the Step 1 assessment criterion, and when concentrations did not exceed the criterion the land was considered to fall into Category 4 for the linkage being assessed. When average concentrations exceed the Step 1 assessment criterion, a Step 2 assessment criterion was calculated to identify the threshold at which a significant possibility of significant harm (SPOSH) might exist. Average concentrations at Treadgold House were compared to the Step 2 SSAC to determine whether there was SPOSH. The second tier of risk assessment also considered potential hotspots as well as potential acute and intermediate duration exposure risks to health.

The risk assessment in accordance with Part 2A concluded that:

- AECOM is not aware of any evidence of significant harm occurring at Treadgold House or Avondale Park Gardens associated with the potentially significant contaminant linkages that were investigated;
- Chronic and acute risks to human health associated with exposure to contaminants in soil at Treadgold House and Avondale Park Gardens were considered to fall into the Part 2A definition of Category 4 (i.e. low to no risk), with the exception of child resident chronic exposure to lead in soil at Treadgold House.
- The risk assessment indicated that the chronic exposure risk to health from lead to child residents was within Category 3, but was considerably closer to the boundary with Category 4 (which defines low risk) than to the upper boundary of Category 3, above which a SPOSH is considered to exist. Hence the risk to health is considered to be closer to a low risk than to a SPOSH. Risks to children visiting Treadgold House were considered to fall into Category 4.

  The Statutory Guidance defines Category 3 land as *"…land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted. This recognises that placing land in Category3 would not stop others, such as the owner or occupier of the land, from taking action to reduce risks outside of the Part 2A regime if they choose…."*
- The level of confidence that land does not pose a SPOSH is considered to be very high, with average soil concentrations considered to be representative for exposure having a less than a 2.5% chance of exceeding the Step 2 SSAC. For those contaminant linkages placed into Category 4 this was done with a minimum balance of probabilities level of confidence, with average concentrations more likely than not to be lower than the Step 1 SSAC below which risks were considered to be within Category 4 i.e. low. For those contaminant linkages placed into Category 3 this was also done with a minimum balance of probabilities level of confidence, with average concentrations more likely than not to exceed the Step 1 SSAC above which risks were considered to not necessarily be low.

Therefore, for Treadgold House, although risks to child residents might not be low, the land does not meet the legal definition of Contaminated Land under Part 2A and so there is no obligation under Part 2A to take action to reduce the risks.

Recommendations

RBKC may choose to take action to reduce the risks outside the Part 2A regime. Such measures could include: introduction of clean soils; replacement of soil and turf areas with hardstanding; reducing the potential for access for children to the garden; regular checks of balcony walls at Flats 7 – 10 to confirm that they have not been removed for easier access; and general good management and maintenance of the garden area to minimise the likelihood of residents carrying out their own garden maintenance. If RBKC chooses to take action on a voluntary basis to further reduce risks then it is recommended that a separate remedial options appraisal is completed and a remediation strategy produced.

Following completion of the investigation and risk assessment, it is considered that sufficient information was collected to characterise the site and assess the risk to site users, such that robust decisions could be made with respect to the requirements of the Part 2A Statutory Guidance. Therefore no further investigation is required for RBKC to complete the decision-making required by the Statutory Guidance.

1. Introduction

This report presents the findings of the Part 2A related follow-on actions following the Stage 2 Investigation into Potential Contamination from the Grenfell Tower fire report (AECOM, 2021a), hereafter referred to as the 'Stage 2 investigation'. These works have been completed in accordance with Part 2A of the Environmental Protection Act 1990. The Stage 2 investigation identified elevated lead concentrations at Treadgold House and Avondale Park Gardens but concluded that these were not attributable to the Grenfell Tower fire. However, it was deemed that further works were required to assess whether either Treadgold House or Avondale Park Gardens should be classified as contaminated land under Part 2A.

AECOM Limited (AECOM) was appointed to undertake these works on behalf of the Royal Borough of Kensington & Chelsea (RBKC). The agreed scope of work is described in the Site Investigation Design for Grenfell Stage 2 Follow-up Work, which is included in **Appendix B**. The work that AECOM has undertaken has been overseen and reviewed by the Multi-Agency Partnership (MAP)[1] and the National Quality Mark Scheme (NQMS) Suitably Qualified Person (SQP) Paul Nathanail.

The intrusive investigation into potential land contamination impacts is being carried out under Part 2A (Crown, 1990) and the associated Statutory Guidance (Defra, 2012). This statutory guidance sets out specific requirements on how the intrusive investigation should be undertaken and how the results should be interpreted. The statutory guidance also sets out the actions that should be taken if significant harm or a significant possibility of significant harm (SPOSH) is identified.

The objective of Part 2A is to provide a means of dealing with unacceptable risks to human health and the environment posed by land contamination. This is achieved through the identification of land that poses an unacceptable risk, making that land suitable for use by removing that risk, and doing so in such a way that the burdens faced by individuals, companies and society as a whole are proportionate, manageable and compatible with the principles of sustainable development.

The primary focus of this intrusive investigation is on the risk to human health, and therefore the Part 2A definition of unacceptable risk to human health is of direct relevance. This definition is that "significant harm" is occurring, or there is "a significant possibility of significant harm" (SPOSH). The statutory guidance for Part 2A additionally defines four categories of land when considering if there is a SPOSH from substances in, on or under the land:

- Category 1 – Paragraph 4.19 of the Part 2A Statutory guidance states that "The local authority should assume that a significant possibility of significant harm exists in any case where it considers there is an unacceptably high probability, supported by robust science-based evidence, that significant harm would occur if no action is taken to stop it." Land placed in Category 1 meets the legal definition of Contaminated Land.
- Category 2 – Paragraph 4.25(a) of the Part 2A Statutory guidance states that "Land should be placed into Category 2 if the authority concludes, on the basis that there is a strong case for considering that the risks from the land are of sufficient concern, that the land poses a significant possibility of significant harm, with all that this might involve and having regard to Section 1. Category 2 may include land where there is little or no direct evidence that similar land, situations or levels of exposure have caused harm before, but nonetheless the authority considers on the basis of the available evidence, including expert opinion, that there is a strong case for taking action under Part 2A on a precautionary basis." Land placed in Category 2 meets the legal definition of Contaminated Land.
- Category 3 – Paragraph 4.25(b) of the Part 2A Statutory guidance states that "Land should be placed into Category 3 if the authority concludes that the strong case described in 4.25(a) does not exist, and therefore the legal test for significant possibility of significant harm is not met. Category 3 may include land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted. This recognises that placing land in Category 3 would not stop others, such as the owner or occupier of the land, from taking action to reduce risks outside of the Part 2A regime if they choose. The authority should consider making available the results of its inspection and risk assessment to the owners/ occupiers of Category 3 land". Land placed in Category 3 does not meet the legal definition of Contaminated Land.

[1] The MAP includes representatives from Royal Borough of Kensington & Chelsea, the Environment Agency, Food Standards Agency, UK Health Security Agency (formerly Public Health England), and Ministry of Housing, Communities and Local Government

- Category 4 – Paragraph 4.20 of the Part 2A Statutory guidance states that "The local authority should not assume that land poses a significant possibility of significant harm if it considers that there is no risk or that the level of risk posed is low. For the purposes of this Guidance, such land is referred to as a "Category 4: Human Health case". Land placed in Category 4 does not meet the legal definition of Contaminated Land. This includes land where:
  - no contaminant linkage has been identified.
  - only normal levels of contaminants in soil are present.
  - soil concentrations do not exceed relevant generic assessment criteria (GAC), or relevant technical tools or advice that may be developed in accordance with the Statutory Guidance (e.g. developed of site-specific assessment criteria (SSAC).
  - estimated levels of exposure from soil are likely to form only a small proportion of exposure from other sources.

1.1 Background

The Stage 2 investigation, in accordance with Part 2A, concluded that the sampling did not find detectable concentrations of chemicals in soil that could be linked only to the fire, and that all land investigated directly as part of the Stage 1 and Stage 2 MAP-led Environmental Checks Programme fell into Category 4 (indicating at most a low risk to health), with the exception of Treadgold House and Avondale Park Gardens. The Stage 2 report for these sites identified the following:

- Treadgold House (communal garden to south and west of residential building) – soil concentrations of lead (considered to be from historic pre-fire sources) exceed the threshold for 'low' risk; therefore the land does not meet the definition of Category 4 based on the current data. Uncertainty associated with the range of reported soil concentrations and the manner in which residents may use the area is sufficient to justify a recommendation to undertake further assessment in this area. That further assessment should be designed to confirm whether the land meets the definition of Category 2, or Category 3 by reducing the uncertainty associated with average soil concentrations and attempting to define an improved understanding of how the land is typically used by residents.
- Avondale Park Gardens – high uncertainty associated with average soil concentrations of lead (considered to be from historic pre-fire sources) and how regularly the area is used by residents meant that a decision on the category of land could not be made. Additional sampling to reduce uncertainty is recommended to allow a decision between Category 2, Category 3 and Category 4 to be made.

The Stage 2 investigation therefore recommended further assessment around Treadgold House and Avondale Park Gardens to resolve the uncertainty associated with health risk from exposure to lead in soil associated with historical contamination from before the Grenfell Tower fire.

In response to the findings of the Stage 2 investigation report, RBKC commissioned AECOM to produce a site investigation design for the further assessment recommended at Treadgold House and Avondale Park Gardens. The site investigation design was presented in AECOM's report "Site Investigation Design, Grenfell Stage 2 Follow-up Work" (AECOM, 2021b), which forms the basis of the intrusive investigation and assessment presented in this report and is included as **Appendix B**.

1.2 Objectives

The primary aim of these works was to undertake intrusive investigation works at the Treadgold House and Avondale Park Gardens sites, in response to the recommendations from the Stage 2 investigation.

The specific objectives in relation to these sites include:

- Undertake an appropriate level of intrusive site investigation work to investigate lead within the soil, including whether the spatial distribution of lead appears to be linked to the former brick pit identified in historical mapping in the area. A number of other substances will also be tested that are relevant to the previous site history.
- Carry out a generic quantitative human health risk assessment using existing GSC and SSAC used within the Stage 2 report to establish whether there are potential unacceptable risks to human health as defined by Part 2A.

- Carry out further detailed quantitative human health risk assessments to establish whether there is a significant possibility of significant harm (SPOSH) to human health as defined by Part 2A.
- Classify each potential contaminant linkage as Category 1-4 in accordance with the Statutory Guidance and in doing so provide recommendations on whether any land appears to meet the definition of contaminated land under Part 2A.

The intrusive investigation and assessment of the two sites constitutes a 'detailed inspection' as defined by Paragraph 2.2 of the Part 2A 2012 Statutory Guidance. A plan showing the locations of the Treadgold House and Avondale Park Gardens sites is included as **Figure A1** in **Appendix A**.

1.3 Approach to Developing the Scope of Work

AECOM's approach to developing the scope of works for the two areas (Treadgold House and Avondale Park Gardens) is presented in detail in the Site Investigation Design report (AECOM, 2021b) (included in **Appendix B**) and aimed to fulfil the objectives described in **Section 1.2** above.

All works were designed to adhere to the Contaminated Land Statutory Guidance 2012 and the Environment Agency's Land Contamination Risk Management (LCRM) guidance, including other current good practice guidance referenced within LCRM.

A summary of the approach, based on the detailed approach presented in the Site Investigation Design report (AECOM, 2021b) (included in **Appendix B**), is presented as follows.

The Stage 2 investigation did not consider potential soil contaminants not directly associated with the fire that might also be present in soil as a result of historical land-use activities. Because of this, and at the request of RBKC, the scope of work was developed to include tasks intended to further investigate the potential non-fire related sources of the lead and included an assessment of other potential non-fire related sources and contaminants of concern.

The scope of work was designed to include sufficient detail to make final Part 2A decisions and prepare a remediation strategy (if needed). The scope of work was also developed through liaison with RBKC, including discussion with RBKC Environmental Health and RBKC Housing Management.

The principal approach to the site investigation design was to achieve a non-targeted grid based sampling dataset (in accordance with the recommendations of BS10175:2011+A2:2017) that may be suitable for the application of statistical methods in accordance with the CL:AIRE 2020 statistical guidance (Marriott, 2020). Some targeted sampling was also included to assess the local variability around the Stage 1 and Stage 2 sampling locations and to investigate the potential for deeper contamination associated with the historic brickfield (mapped at the southern edge of the Treadgold House site and across the majority of the Avondale Park Gardens site).

Treadgold House

At Treadgold House, the site investigation design was intended to focus only on the ground level soils in the communal garden to the south and west of the residential building. This is because the highest concentrations of lead in soil were encountered in this communal garden area and a number of residential properties have direct access onto this garden, unlike the communal residential garden to the northeast of the building, which is set slightly away from properties. Soils sampled from raised beds during Stage 2 had lower concentrations of lead and were identified to be suitable for continued use. The distribution and number of sample locations were initially based on one averaging area encompassing the entire communal garden area, plus six sub-areas (the areas immediately outside private access doors for Flats 1-6) within this area requiring a higher sampling density. As described in **Section 2.2**, the part of the garden to the west of the building outside the balconies of Flats 7-10 was supplemented with further sample locations at the time of the sampling works to increase the sampling density where potential unofficial access over balcony walls had been identified. These additional samples were warranted based on the assumption of four potential separate averaging areas associated with residents of Flats 7-10 predominantly using the garden area immediately outside their own balcony.

The samples taken up to 0.2m bgl were located so that between five and ten of the sampling locations were situated within the estimated averaging areas for an individual property (designated as the area outside of the back doors in the southern part of the garden and outside the balconies in the western part of the garden). Samples taken to 0.4m, 0.7m and 1.2m bgl were taken in a regular grid pattern across the full communal garden area to provide a good spatial coverage between the southern area (which has a historical use as a brick works) and the western area (the northern part of which is outside of the footprint of the historical brick works). The sample depth variation also aimed to determine whether contamination can be attributed to the former brickfield. More details on the reasoning for sample locations is given in the Site Investigation Design document (AECOM, 2021b), which is included in **Appendix B**.

Avondale Park Gardens

At Avondale Park Gardens the area was considered to be a single averaging area with samples distributed relatively evenly throughout. The intrusive investigation design was intended to significantly reduce the uncertainty associated with the average soil concentrations of lead in the gardens to the south and west of the building. In addition, the intrusive investigation design at Treadgold House was intended to assess the conceptual model in terms of other potential chemicals of concern from historical land-uses.

At Avondale Park Gardens, the site investigation was intended to cover the entirety of the landscaped communal garden in the middle of the residential cul-de-sac. Only two samples were collected in this area in the Stage 1 investigation, and no samples were collected during the Stage 2 investigation, resulting in very high uncertainty in the average soil concentrations. Neither of the reported lead concentrations exceeded the Step 2 SSAC derived in the Stage 2 report. Therefore, the key aim of the intrusive investigation in this area was to reduce the uncertainty associated with the average soil concentrations and to collect sufficient data to refine the Step 2 SSAC (if this becomes necessary).

Samples taken up to 0.2m bgl were located to provide a good spatial coverage; the aim of these samples was to assess the average concentration of contaminants in the shallow soils to which residents using the site are most likely to be exposed to, whilst deeper samples (up to 0.6m bgl) are intended to provide information on whether contamination present may be related to the historical land use.

The laboratory analytical approach for the site investigation design in both areas was to focus on the total concentrations of lead in soil to identify areas of higher concentrations and to provide a more reliable estimate of average concentrations. In addition, the approach also includes further site-specific lead bioaccessibility testing to help with refinement of Step 2 SSAC.

1.4 Outline Scope of Work

AECOM has completed the following tasks in accordance with the Site Investigation Design report (AECOM, 2021b) and in order to achieve the objectives stated in **Section 1.2** above:

- Task 1: Site Walkover
  - To gather further information about the garden layouts and (if possible) their usage and to confirm site investigation locations.
- Task 2: Soil Sampling
  - Completion of soil sampling at Treadgold House and Avondale Park Gardens sites as detailed in the SID report (AECOM, 2021b).
- Task 3: Laboratory Analysis.
- Task 4: Risk Assessment and Reporting
  - Preparation of this report including risk assessment to establish whether SPOSH exists and to recommend whether the sites fall into Category 1, 2, 3 or 4.

Further details of the completed scope of work are included in **Section 4**.

2. Site Settings

2.1 Site Locations and Descriptions

The two sites discussed in this report are the communal garden of Treadgold House located to the west and south of the building (hereafter for simplicity referred to as Treadgold House) and the communal garden area in the centre of the residential street Avondale Park Gardens (hereafter for simplicity referred to as Avondale Park Gardens). Both are located within the Royal Borough of Kensington and Chelsea (RBKC), centred at approximate grid references 523986 180879 (Treadgold House) and 524025 180718 (Avondale Park Gardens). Their locations are shown on **Figure A1**.

The area surrounding the sites is a densely populated, predominantly residential urban area. The Treadgold House site is a gated communal garden to south and west of the residential building, to which certain properties from the ground floor level have direct access. This direct access is likely to allow and encourage use of the garden in a manner more typical of a private garden for these particular residents. For residents in ground floor properties looking over the western part of the garden, the only access is by climbing over a waist-high balcony wall, which will restrict access to the garden area. Currently, one of the properties has a section of this wall removed, although this has not been sanctioned by RBKC Housing Management and it is intended that the wall will be repaired and maintained such that access to the garden is restricted.

The Avondale Park Gardens site is a gated communal garden area at the centre of a cul-de-sac, surrounded by terraced residential housing for which the residents hold a key.

2.2 Current and Historical Land Uses

2.2.1 Historical – Treadgold House

AECOM has reviewed the environmental setting and historical mapping information from the Stage 1 and Stage 2 investigations relating to Treadgold House. Relevant extracts covering the area of Treadgold House are included in **Appendix M**. Historical mapping from 1874 shows the southern part of the site was occupied by the northern edge of a brickfield with the rest of the site occupied by what appears to be residential terraced housing including gardens. The approximate extent of the brickfield, based on GIS mapping provided by RBKC, is shown in more detail on **Figure A2** in **Appendix A.** This suggests that the southern part of the communal garden under investigation as well as the southern quarter of the communal garden to the west of the building was formerly occupied by the brickfield; whereas the northern three-quarters of the communal garden to the west of the building was beyond the footprint of the former brickfield and within an area occupied by terraced housing. The site was located 400m east of an iron works, with additional terraced housing, including gardens, located north of the investigation area.

By 1896, the brickfield is no longer shown on the maps and there has been redevelopment of the site resulting in terraced housing with a different footprint to the previous map. The investigation area is occupied by what appears to be residential buildings in the south-west corner, south-east corner and northern corner, with adjacent land (likely to be gardens, yards, paths or other associated outdoor space) in the central southern part of the investigation area and in the central part of the garden area to the west of the current Treadgold House. To the south of the site, on the former area of the brickfield there is additional residential development, as well as additional terraced housing to the north of the investigation area.

There is no significant change on site or to the surrounding area on the maps for 1920 to 1951. By 1957, the footprint of the buildings on site has changed; there appears to be some smaller, detached buildings / properties (which have a smaller and different footprint to the mapping from 1951) in the central part of the wider Treadgold House site. Within the communal garden investigation area, residential buildings remain in the northern, south-eastern and south western corners of the site, although the footprints have a different appearance to the earlier mapping and the building in the southwest corner appears to extend further north into the central part of the garden to the west of the present day Treadgold House building. There are no significant changes to the surrounding area noted.

On the 1967 map, the site has been developed into the Treadgold House layout that remains on site to the present day. There are no significant changes to the surrounding area noted.

In 1971, the residential housing to the north and west of the investigation area has been removed, leaving vacant land. There are no significant changes noted in the area to the south and south east of the investigation area. By 1984, the area surrounding the investigation area has been developed into the present day layout, with continued development occurring north of the investigation area until 1996.

2.2.2 Current – Treadgold House

The area to be investigated at Treadgold House is a gated communal garden to the south and west of the building. The investigation area is approximately 0.07 hectares, and the garden is largely covered by turf, with some ground level plant beds containing shrubbery and occasional trees. The garden also contains three raised beds constructed from railway sleepers which are intended as community kitchen garden growing areas. The soil quality in these raised beds was assessed during the Stage 2 investigation and considered to be acceptable. The presence of these raised beds significantly reduces the likelihood that residents would attempt to cultivate home-grown produce in ground level soils. The main ground cover types (turf, partial turf, soil) are noted in **Table C1** in **Appendix C**, and also on the sample logs in **Appendix D**. The main features of the Treadgold House garden (raised beds, ground level beds, locations of paving slabs and trees) are detailed on **Figure A2** in **Appendix A**.

RBKC Housing Management has confirmed that the two external access gates to the garden remain locked and residents within the block do not have keys to these gates. This means that only the ground floor properties have access to the garden: this is summarised in **Table 1** below. An approximate (not surveyed) layout of the key features within Treadgold House gated communal garden are shown on **Figure A2** in **Appendix A**.

Table 1. Summary of Treadgold House Ground Floor Properties

Apartments	Garden Access	Likely Residents
1-6	Direct access to the gated garden	Studio apartments only suitable for single adult occupancy.
7-10	No official direct access to the garden, though evidence provided by RBKC Housing Management suggests that residents may access the garden by climbing over the waist height balcony walls. One of these balcony walls has had a gap cut into it to allow easier access into the garden. There was evidence on-site that the western area of the garden (outside flats 7-10) is used by residents, including a bench, some chairs, a folding table, discarded clothing, a small paddling pool and a deflated bouncy castle. This evidence supports the information given by RBKC Housing Management.	Apartments suitable for families.

Benches and garden decoration outside of the rear doors to flats 1 to 6 suggest use of the gardens by residents. Furthermore, evidence of a deflated bouncy castle, balls and clothing items in the garden suggest some use by children. Based on conversations with the RBKC Housing Management team, this is understood to be infrequent use. There are no restrictions on whether the residents undertake gardening/ planting in the beds at ground level, and whilst on site no evidence of ground level gardening activities was observed. An estate ground maintenance team maintain the ground level plant beds in the garden.

It is noted that although **Figure A2** in **Appendix A** indicates the approximate layout of the gated communal garden, there is a level of detail that it is not possible to capture on the site plan. Twenty locations outside of the 'ground level beds' were noted to be 'partial turf' (TH101, TH103, TH110, TH114, TH117, TH121-TH123, TH129, TH159, TH169, TH174, TH176, TH181-TH187). Details of these locations are also included in **Table C1** in **Appendix C**, and on the sample logs in **Appendix D**. Of these 20 locations, 14 were located in the part of the garden to the west of the building. The 14 locations were distributed throughout this area (though the majority located in Plot 9), with three in Plot 10, seven in Plot 9, three in Plot 8 and one in Plot 7. Of the remaining six, three were located close to the raised growing beds to the south of the building (so may therefore be more worn by more concentrated footfall), one (TH169) was located in the area recessed into the building to the west of Plot 6, one was located in Plot 6, and one was located adjacent to patio stones in Plot 2.

The locations of the partial turf sampling locations suggest that grass cover is thinner in the more shaded area of the garden to the west of the building, as well as around areas of probable more frequent footfall such as raised growing beds and near to patios.

2.2.3 Historical – Avondale Park Gardens

AECOM has reviewed the environmental setting and historical mapping information from the Stage 1 and Stage 2 investigations relating to Avondale Park Gardens. Relevant extracts covering the area of Avondale Park Gardens are included in **Appendix M**.

Historical mapping from 1874 shows the large majority of the investigation area to be located within a brickfield. Only a very small portion in the southeast of the investigation area is indicated to be outside the former brickfield. To the East of the investigation area are industrial units potentially associated with the brickfield. The brickfield extends to the north, west and south of the investigation area.

By 1896, the mapping indicates that the brickfield is no longer present, and the investigation area and immediate surroundings lie within an area labelled as a 'Workhouse'. The website www.workhouses.org.uk indicates that the Workhouse at Avondale Park Gardens included trades such as breaking stone, corn grinding and oakum picking. A church and school have been built west of the investigation area, and another school plus a park to the south. The rest of the surrounding area appears to be occupied by residential terraced housing.

By 1920, the investigation area is still noted to be within the workhouse, but the footprint of the workhouse has changed north and east of the investigation area. There are no significant changes to the surrounding area noted. On the map for 1951, there are no significant changes to the investigation area and surroundings.

By 1957, the investigation area has been redeveloped, and no longer shows a workhouse – the area has been developed into a layout resembling the current site configuration, with a garden occupying the investigation area, surrounded by residential terraced housing on all sides. The historical mapping indicates that the present-day layout with the communal garden area in the centre of the residential street has remained largely unchanged from 1957 through to present-day.

2.2.4 Current – Avondale Park Gardens

Avondale Park Gardens is a gated communal garden which residents have access to and is kept locked with the key held by one of the residents. The investigation area is a landscaped garden with a combination of turf, vegetated shrub borders and trees and covers approximately 0.08 hectares. The main ground level cover types (turf, soil) are noted in **Table C1** in **Appendix C**, and also on the sample logs in **Appendix D**. The main features of the Avondale Park Gardens communal garden (ground level beds and trees) are detailed on **Figure A3** in **Appendix A**. The layout is simple as a single access space with no internal partitioning. Residents are not permitted to excavate soil in the public open space themselves and are therefore unlikely to be exposed to soils deeper than the upper 5-10cm. The area is subject to general maintenance by the RBKC Parks team which may result in the turning over of soil in the plant and shrub beds to depths of around 30cm.

2.2.5 Former Brickfield

The information from the historical and environmental review indicates that the former brickfield (now backfilled), has the potential to have caused contamination at both Treadgold House and Avondale Park Gardens. Specific contaminants associated with infilling of the brickfield have been identified in previous intrusive investigations at Avondale Park, details of which are summarised in **Section 2.4**.

2.3 Geology, Hydrogeology and Hydrology

The geological sequence beneath the sites was summarised in the Stage 1 PRA (TN16) (AECOM, 2019c) and comprised made ground, overlying Langley Silt, overlying Kempton Park Gravel, overlying London Clay Formation.

The presence of variable thickness and composition of made ground in the area (likely associated with the infilling of the former brickfield) is likely to result in variable concentrations of constituents (including some of the COPC) in the surface and shallow soils. The depth and nature of the made ground at the sites is unknown based on previous investigations completed at Treadgold House and Avondale Park Gardens (exploratory locations were not deep enough to encounter the made ground fill) however according to logs available from investigations at nearby Avondale Park (2011), the made ground here was greater than 6m deep (refer to **Section 2.4** below). Although Avondale Park is not located within the area clearly labelled as a brickfield on the historic maps, it was an unlabelled area of open land with a labelled brickfield to the northwest and a kiln in close proximity to the east. Given this setting and the deep made ground encountered, the Phase 1 and Phase 2 investigation reports described in Section 2.4 concluded that the deep made ground was likely to be filled pits either worked and filled between map editions, or simply left unlabelled on the map. On this basis the material encountered in made ground at Avondale Park gives an indication of what could be present in deep fill in other areas of the brickfield.

The Langley Silt and London Clay are classified as Unproductive Strata, whilst the Kempton Park Gravel is classified as a Secondary-A aquifer.

The nearest surface water feature to the sites recorded in the Landmark Envirocheck report obtained for the Stage 2 investigation report is reported to be 242m south west of Grenfell Tower, but this has not been designated and not identified by any other documented evidence reviewed by AECOM and its existence is uncertain. This is the only surface water feature noted within 500m of the sites.

2.4 Previous Ground Investigations

Sampling has previously been completed at Treadgold House and Avondale Park Gardens as part of the Stage 1 and Stage 2 investigation sampling phases related to the Grenfell Tower fire investigations. The relevant data from these intrusive investigations is tabulated in **Appendix G** and discussed within this report.

Also of relevance, are two previous reports in relation to Avondale Park, prepared by MLM Environmental – a Phase II Geotechnical Assessment (MLM Environmental, 2011) and a Phase 1 Preliminary Contamination Assessment (MLM Environmental, 2012). The nearest entrance to Avondale Park is located approximately 50m southeast of the Avondale Park Gardens site. The historical maps for the area of Avondale Park also show brickfields in the area from 1867-1895, therefore has a similar historical land use to that of Avondale Park Gardens and Treadgold House. For this reason, the available reports were used to help identify possible contaminants of concern that may also be present at Avondale Park Gardens and Treadgold House.

The Phase II Geotechnical Assessment report (MLM Environmental, 2011) concluded that there was a significant thickness of Made Ground (up to 6.45mbgl) of 'poor quality' which included deleterious materials. A strong organic odour was also noted from the Made Ground arisings. The Phase I Preliminary Contamination Assessment (MLM Environmental, 2012), also concerning Avondale Park, concluded that 'potentially complete' source pathway receptor linkages are present between the Made Ground and site users, with the potential contaminants of concern identified as metals, PAHs, TPHs, asbestos and ground gas. The assessment further suggested the source is likely associated with the historical brickfield in the area and that similar potential linkages could exist to the surrounding area also underlain by the former brickfield.

The logged shallow Made Ground (<1m) reported in the MLM report for Avondale Park is similar to that encountered at Avondale Park Gardens and Treadgold House, although with a greater proportion of grey / black clayey sandy ash and clinker gravel, which was not encountered at Avondale Park Gardens or Treadgold House.

Based on the conclusions of these two reports from Avondale Park, it was appropriate to consider the risk from the identified contaminants of concern (metals, asbestos, PAHs, TPHs and ground gas) at both Avondale Park Gardens and Treadgold House, as these sites also sit (either partially or wholly) within the footprint of the former brickfield. The available laboratory analytical data for the main COPC (lead, PAHs and asbestos) from Avondale Park is summarised in Appendix N. Asbestos was encountered in four of 78 samples tested, with all four of these being at depths between 0.1m and 0.3m bgl. As no asbestos was encountered in deeper soils potentially associated with brickfield fill then asbestos was considered unlikely to be a COPC associated with the historic brickfield use. Lead concentrations ranged between 16mg/kg and 4,445mg/kg, with the higher concentrations generally encountered in the deeper soils. The arithmetic mean lead concentration in samples shallower than 1m depth was 305mg/kg, whereas the mean concentration for samples 1m depth or deeper was 665mg/kg. This simple observation of apparently higher lead concentrations at depth was considered to provide some evidence that elevated lead concentrations could be associated with brickfield fill. For PAHs, the BaP concentration ranged between 0.17mg/kg and 590mg/kg, with mean and median concentrations of 19.3mg/kg and 3mg/kg respectively. The highest BaP concentrations were generally encountered in the shallow soils indicating that the high PAH concentrations did not appear to be associated with potential brickfield fill materials.

Ramboll (Ramboll, 2014) carried out a ground investigation at Avondale Park in 2014 which included ground gas monitoring of eight monitoring wells. Elevated concentrations of CO_2 and CH_4 were identified however the gas flow remained below the detection limit except for at one location during one monitoring round. The report concluded a worst case Characteristic Situation (CS) of CS2, but this was based on the single occasion on which a gas flow was encountered. All other gas screening values (GSVs) indicated a classification as CS1.

The Ramboll report for Avondale Park reports lead concentrations ranging from 41 – 1,976 mg/kg for a sample set of 52 samples which is similar to the range for Avondale Park Gardens, and slightly lower than for Treadgold House. The PAH concentrations were much higher in certain samples from Avondale Park than detected at Avondale Park Gardens (e.g. benzo(a)pyrene up to 590mg/kg at Avondale Park, compared to a maximum detection of 9.7mg/kg at Avondale Park Gardens and 5mg/kg at Treadgold House).'

A MLM report written for the adjoining Kensington Academy and Leisure Centre (KALC) (MLM, 2012a) site interpreted soil, groundwater and ground gas/vapour sampling. For the ground gas data, the site was classified as NHBC Traffic Light Amber 1 condition due to a maximum CO_2 concentration of >5% (6.9%). However the methane concentrations and flow rates were found to be low. The lead concentrations were reported to be between 14 and 12,000mg/kg, for samples collected up to 2m depth. The sample with a result of 12,000mg/kg was from 0.3-0.4mbgl, and is within the same order of magnitude as the highest concentrations reported at Treadgold House. It is noted that this sampling was completed prior to the redevelopment of the KALC area and therefore this high concentration is not necessarily indicative of current soil conditions in that area.

2.5 Background Soil Chemistry

The focus of the intrusive investigations at Treadgold House and Avondale Park Gardens is on lead in soil, with other heavy metals, asbestos and PAHs also being evaluated. This section summarises the background data sets available for these compounds that were considered during the Stage 1 and Stage 2 Environmental Checks investigations. Where relevant, these background data-sets have been presented and discussed in **Sections 5**, 6 **& 7** of this report.

The Landmark Envirocheck reports presented in the Stage 2 report provide an overview of the background urban soil chemistry for a small number of metal elements, including arsenic, cadmium, chromium, lead and nickel. The data presented in these maps is taken from British Geological Survey (BGS) Geochemical Baseline Survey of the Environment (G-BASE) and London Earth soil chemistry surveys (British Geological Survey, 2010). The BGS GBASE / London Earth sampling project only includes analysis of metals (including lead) and hence there is no data-set for the other COPC from this source.

As part of the Stage 1 assessment, AECOM produced two technical notes related to urban soil pollution ('TN9: Published Data on National and Regional Urban Background Soil Concentrations' (AECOM, 2019a) and 'TN13: Potential Source Contributions to Urban Soil Pollution' (AECOM, 2019b)). TN9 identified a number of useful datasets for helping to define background soil concentrations, including the UK Soil and Herbage Survey (SHS) (Environment Agency, 2007a) (for metals and PAHs), London Earth (British Geological Survey, 2010) (for metals, part of the BGS G-BASE survey as noted above) and Vane, et al., 2014 in the Greater London area (for PAHs).

As part of the Stage 2 assessment, AECOM purchased the licence for the BGS London Earth datasets in the area around Grenfell Tower and the background data for lead was collated. The London Earth project is part of a nationwide project to determine the distribution of chemical elements in the surface environment, namely the Geochemical Baseline Survey of the Environment (G-BASE). Soil samples were collected at a density of four samples from every square kilometre and from a standard depth in the soil profile, 5cm – 20cm. Reported lead concentrations in soil taken from this study within a 5km radius of Grenfell Tower range from 20mg/kg to 10,000mg/kg. After the maximum reported value of 10,000mg/kg (sample location approximately 3km south west of the Tower), the next highest reported background concentration in topsoil within this 5km radius was 3821.3mg/kg (approximately 1km south east of the Tower). The Treadgold House and Avondale Park Gardens sites are located approximately 75m and 240m from the Tower respectively and therefore the background data extending to a 5km range from Grenfell Tower is equally relevant to these sites.

For the UKSHS dataset the two nearest sample locations to the investigation areas are Hyde Park and Richmond Park and these data are also included in the London Earth dataset. As a result the London Earth dataset is considered to be more indicative of local background, although the UKSHS dataset gives an indication of national urban background for comparison. London Earth data are not available for PAHs and therefore background PAH concentrations specific to the local West London area are not available in the same way as for lead.

The normal background concentrations (NBCs) (Johnson, et al., 2012) described in TN9 (AECOM, 2019a) are intended to be utilised in accordance with the Part 2A Statutory Guidance, which states that "*Normal levels of contaminants in soil should not be considered to cause land to qualify as contaminated land, unless there is a particular reason to consider otherwise.*" The NBCs were derived by the BGS in associated with Defra with the explicit objective "*to give guidance on what are normal levels of contaminants in English soils in support of the Part 2A Contaminated Land Statutory Guidance*". It is noted that the values are intended to be used on a 'national to regional scale' and they are derived mainly using the G-BASE (including London Earth) above for which AECOM has identified the specific samples local to the investigation areas. The NBCs have been calculated as the 95% upper confidence limit of the 95th percentile for each dataset and are therefore considered to be upper threshold values. Concentrations of a contaminant are considered to be typical and widespread for the identified contaminant domain up to (and including) the calculated NBC. For lead, the NBC in the urban domain has been defined as 820mg/kg and for benzo(a)pyrene the NBC in urban soils has been defined as 3.6mg/kg.

The literature review reported in TN9 did not identify any sources of information for background soil concentrations of asbestos. Since completion of the Stage 1 assessment, SoBRA has published a paper in 2020 titled 'The Distribution of Asbestos in Soil – what can the data mining of sample results held by UK laboratories tell us?' The SoBRA (2020) paper, and a paper 'Asbestos Contamination on Brownfield Development Sites in the UK' (Hellawell & Hughes, 2021) has been published in Environmental Research.

SoBRA (2020) focused on gaps related to the risk management of asbestos in soil, such as the lack of a collective understanding on the typical background concentrations of asbestos in soil across the UK. As part of the work, anonymised data from five UK laboratories was reviewed.

The anonymised data collated from the five laboratories as part of the study indicated that:

- Asbestos is not detected in the majority of samples;
- The majority of asbestos that is detected is chrysotile;
- The majority of the reported concentrations of free fibres detected in soils are below the method reporting limit of 0.001%wt/wt;
- Anecdotal information from the industry suggests that asbestos is detected at the majority of brownfield sites that are investigated. This data suggests that, on average, asbestos is detected in a small (but nevertheless potentially significant) proportion of samples from those sites.

The Hellawell & Hughes (2021) paper focuses on site investigations that included the collection of soil samples for asbestos contamination analysis. This project analysed the resource of brownfield asbestos data dated 2001-2019, using site investigation data from over 100 reports submitted to a local Borough Council, in Surrey, UK. Despite a high proportion of asbestos-containing samples containing more carcinogenic amphibole type, the results showed the asbestos concentrations to be very low, with 74% of samples having concentrations below the limit of detection of the laboratory and were predominantly of fibrous form. Most of the asbestos was found in the top 1m of made ground soil. Former gasworks were shown to have the highest asbestos detection rates.

Relevant data regarding asbestos based on the findings of the Stage 2 report has been summarised below. The asbestos content from samples previously collected and tested as part of the Stage 2 Environmental Checks investigation can be used to indicate what could be considered normal presence of asbestos in the area surrounding the Treadgold House and Avondale Park Gardens investigation areas. The relevant observations from the Stage 2 investigation are:

- Asbestos was detected in 20 sample areas out of a total of 45 sample areas at Stage 1 and 2 (44%).
- Asbestos was detected in 43 of the 502 soil samples taken across the Stage 1 and Stage 2 investigations (<9%).
- With the exception of the sampling areas of Waynflete Square and Lancaster Walkways, asbestos was identified in a minority of soil samples in each area (typically 1-3 samples out of the 10 samples taken per area). Where asbestos was found it does not therefore appear to be widespread when considering the spatial scale of the sampling in each area.
- The spatial distribution of soil samples identified to contain asbestos does not conform to an evident pattern across the investigation area.
- Of the 43 detections, 21 were reported in soils beneath turf ground cover. Asbestos detections below turf included amosite AIB debris and chrysotile ACM debris. Fragments of debris, if deposited on the surface, are less likely to penetrate turf surfaces than individual fibres or small bundles of fibres, suggesting that at least some of the identified asbestos is more likely to be associated with historic pre-fire contamination.
- Asbestos was detected at or above the reporting limit for quantification (0.001%wt/wt) in eleven samples (GTCS1-43, GTCS1-46, GTCS1-59, GTCS2-S035, GTCS2-S166, GTCS2-S197, GTCS2-S199, GTCS2-S305, 0-2cm, GTCS2-S313, GTCS2-S349, GTCS2-S381) at analytical Step 2 and in two samples (GTCS2-S191 and GTCS2-S349) in Step 3.

It is therefore expected that asbestos could be detected in a minority of samples in land that has been subject to repeated development, such as in London. The locations and concentrations of this asbestos are expected to be variable and unpredictable in most cases. The presence of asbestos in urban soils and made ground is typically known to be sporadic and unpredictable, and this is consistent with the asbestos identified in the Stage 2 assessment.

3. Conceptual Site Model

The conceptual site model (CSM) related to Part 2A potential significant contaminant linkages to be addressed by the scope of works has been developed taking the final CSM presented in the Stage 2 report and augmenting it based on a data-gap analysis completed as part of the site investigation design (AECOM, 2021b) included in **Appendix B**. The data-gap analysis was completed to identify issues associated with potential non-fire related sources and contaminants that require further investigation within this scope of work. This updated CSM relevant to the current assessment of Treadgold House and Avondale Park Gardens is presented in **Table 2** below.

Table 2. Conceptual Site Model

	Sources	Pathways	Receptors	Discussion
Treadgold House (communal gardens to south and west of residential building)	Lead and other metals in soil PAHs in soil Petroleum hydrocarbons in soil	Ingestion of soil and indoor dust Dermal contact with soil (outdoor) Dermal contact with soil derived dust (indoor) Inhalation of dust (indoor and outdoor)	Ground floor residents (flats 1-10) of Treadgold House and their visitors	Treadgold House was not placed into a Part 2A Category previously following the Stage 2 investigation due to the high uncertainty associated with average lead concentrations and uncertainty with the manner that the communal garden is used by residents, and how this relates to standard land use assumptions. The higher concentrations of lead in soil in the south and west part of the gardens could have arisen from a variety of historical sources, including redevelopment works such as stripping and discarding of leaded paint and old roofing materials, or soils being imported from other unknown contaminated sources during redevelopment and landscaping, and nearby historical land-uses such as the brickworks which formerly occupied land now within the southern part of Treadgold House communal gardens. The concentrations of lead previously analysed from the four samples collected in ground level soil in the communal garden to the south and west of were 992mg/kg, 1,168mg/kg, 1,385mg/kg and 2,216mg/kg (during the Stage 2 Environmental Checks intrusive investigation). The historical use of the site as a former brickfield indicates the potential for other COPC to be present, possibly at slightly greater depth than the very shallow samples collected during Stage 1 and Stage 2. Taking into account the historical site investigation completed at Avondale Park (refer to Section 2.4), asbestos, PAHs, other metals and petroleum hydrocarbon fractions have been included as potential COPC due to the potential that the deeper fill of the old brickfield is encountered during the works. Asbestos was also encountered in samples collected at Treadgold House during the Stage 2 investigation, albeit at concentrations considered to be associated with a Category 4 linkage. Metals and PAHs were also assessed during Part 2A and considered likely to fall into Category 4; however they have been included here as a precautionary approach. Petroleum hydrocarbons were not assessed during Stage 2 as they were not considered to be a COPC associated with the Grenfell Tower fire. These contaminants are also expected to cover the most likely COPC that would arise from the residential redevelopment of the site between 1957 and 1967. Ground gas is sometimes considered as a COPC for areas with a historical backfilling. Although gas monitoring as part of a previous Avondale Park investigation (refer to **Section 2.4**) consistently recorded carbon dioxide in ground gas, methane was rarely present and borehole gas flow was recorded on a single occasion. The age of the filling activities (all pre-1967 and likely much earlier) and the lack of borehole gas flow suggested a low risk from ground gas. However, ground gas has been included as a
	Asbestos in soil	Inhalation of dust (indoor and outdoor)		
	Ground gas	Accumulation of ground gas in buildings – inhalation Inhalation of ground gas outdoors		
		Accumulation of ground gas in buildings – explosive atmosphere	Treadgold House (property receptor)	

	Sources	Pathways	Receptors	Discussion
				potential COPC, to be initially evaluated qualitatively during the intrusive investigation. This can be done by observation of whether any fill is present that is likely to generate gas to a greater extent than that encountered in the previous Avondale Park investigation. It is noted that although outdoor gas inhalation has been included as a pathway for completeness, it is considered that outdoor gas inhalation is a linkage that on its own would be likely to cause a negligible risk to residents.
Avondale Park Gardens	Lead and other metals in soil PAHs in soil Petroleum hydrocarbons in soil	Ingestion of soil and indoor dust Dermal contact with soil (outdoor) Dermal contact with soil derived dust (indoor) Inhalation of dust (indoor and outdoor)	Residents of Avondale Park Gardens and their visitors	The higher concentrations of lead in soil in Avondale Park Gardens could have arisen from a variety of historical sources, including soils being imported during redevelopment and landscaping, and historical land-uses such as the brickworks which formerly occupied the land which now includes Avondale Park Gardens. The concentrations of lead encountered during Stage 1 at Avondale Park Gardens were 659mg/kg and 2,099mg/kg. The historical use of Avondale Park Gardens as a brickfield (now backfilled) and the subsequent residential development indicates the potential for other COPC to be present, possibly at slightly greater depth than the very shallow samples collected during Stage 1. Taking into account the historical site investigation completed at Avondale Park and KALC related investigations (refer to Section 2.4), asbestos, PAHs, other metals and petroleum hydrocarbon fractions have been included as potential COPC in the event that deeper fill of the old brickfield is encountered. These contaminants are also expected to cover the most likely COPC that would arise from the subsequent uses as a workhouse and the residential redevelopment of the site between the 1920s and 1950s. The age of filling activities (all pre-1967 and likely earlier), the lack of borehole gas flow in the Avondale Park investigation, and the lack of buildings within the investigation area suggests a very low risk from ground gas. It is noted that although outdoor gas inhalation has been included as a pathway for completeness, it is considered that outdoor gas inhalation is a linkage that on its own would be likely to cause a negligible risk to residents.
	Asbestos in soil	Inhalation of dust (indoor and outdoor)		
	Ground gas	Inhalation of ground gas outdoors		

4. Sampling Investigation

This section sets out the details of the Stage 2 Follow on Soil Sampling exercise, which was carried out in accordance with the final agreed Site Investigation Design for the Stage 2 Follow on Work (AECOM, 2021b), which is included in **Appendix B**.

4.1 Site Walkover

David Dyson and Emma Toms of AECOM completed a walkover of the proposed sampling areas on the 9th November 2021, to identify any potential problems with sampling in the proposed areas, plan logistics for the sampling works, and select specific sampling locations within each area. The AECOM staff were accompanied by a representative from RBKC and the SQP. Letters were sent to the residents in advance to notify them of the walkover and the proposed works. Copies of these letters are included in **Appendix I**.

During the walkover, the indicative sampling locations detailed in the Site Investigation Design document (AECOM, 2021b) were compared to the actual site layouts, and also to available utility drawings. Physical evidence of utilities was also examined during the walkover, such as consideration of the presence of manhole covers and drainpipes. As a result of the walkover, it was identified that there were no significant issues with the indicative sampling locations chosen. No residents were encountered during the walkovers, and therefore no additional information regarding the specific use of the gardens could be gathered at this time. A photolog from the site walkover is included in **Appendix D** and plans showing the locations of the photos are included as **Figure A17** (Treadgold House) and **Figure A18** (Avondale Park Gardens) in **Appendix A**.

4.2 Sampling Locations

Sampling locations were chosen in accordance with the Stage 2 Follow on Site Investigation Design document (AECOM, 2021b).

The sampling locations within each area were finalised during the site walkover and were based on the indicative locations shown on the drawings included in the site investigation design, which is included in **Appendix B**. The Site Investigation Design includes the rationale for the distribution of sampling locations, which comprised the following principles:

- the site investigation design was to achieve a non-targeted grid based sampling dataset (in accordance with the recommendations of BS10175:2011+A2:2017) that may be suitable for the application of statistical methods in accordance with the CL:AIRE 2020 statistical guidance (Marriott, 2020). This was intended allow a more reliable statistical assessment of average concentrations within individual averaging areas; and
- Some targeted sampling was included to assess the local variability around the Stage 1 and Stage 2 sampling locations and to investigate the potential for deeper contamination associated with the historic brickfield (mapped at the southern edge of the Treadgold House site and across the majority of the Avondale Park Gardens site). The targeted samples were excluded from statistical assessments to maintain the validity of the statistical approach.

The strategy for selecting each sample location and the depths of sampling at each location is presented in **Table 2** and **Table 3** of the Site Investigation Design document (AECOM, 2021b), and the proposed laboratory analysis is detailed in **Table 4** of that document, which is included in **Appendix B**. Any minor changes to the locations that were made to the scope compared with the Site Investigation Design document are detailed in **Table C1** in **Appendix C** of this report. A summary of the key scope amendments is included in **Section 4.2.3**.

4.2.1 Treadgold House

At Treadgold House, 90 individual pits were excavated (20 to 0.05m bgl, 43 to 0.2m bgl, 14 to 0.4m bgl, nine to 0.7m bgl, and four to 1.2 m bgl (though three of the four to 1.2m bgl were stopped early at 0.75m, 0.9m and 1.09m due to obstructions)):

1. For a hand pit depth of 0.05m bgl, one sample was taken between 0-0.05m;
2. For a hand pit depth of 0.2m bgl, two samples were taken between 0-0.05m and 0.1-0.2m;
3. For a hand pit depth of 0.4m bgl, three samples were taken between 0-0.05m, 0.1-0.2m and 0.3-0.4m;

4. For a hand pit depth of 0.7m bgl, four samples were taken between 0-0.05m, 0.2-0.1m, 0.3-0.4m and 0.6-0.7m;
5. For a hand pit depth of 1.2m bgl, four samples were taken between 0-0.05m, 0.3-0.4m, 0.6-0.7m and 1.0-1.2m (the deepest sample was not collected in the three 1.2m hand pits that encountered shallower refusals).

The final locations are shown on **Figure A2** and avoided any hardstanding (paths, paving slabs etc.), areas of underground utilities, and potentially intrusive or obstructive locations (such as directly outside windows/doors), whilst maintaining the general pattern of sample distribution to provide relatively evenly spaced grid-based spatial coverage of the identified exposure averaging areas. The final locations take into account the scope amendments described below in Section 4.2.3.

4.2.2 Avondale Park Gardens

At Avondale Park Gardens, 16 pits were excavated (12 to 0.2m bgl and four to 1.0m bgl).At Avondale Park Gardens the target excavation depths were 0.2 m bgl and 1.0 m bgl, with the number of samples taken as follows:

1. For a hand pit depth of 0.2m bgl, two samples were taken between 0-0.05m and 0.1-0.2m;
2. For a hand pit depth of 1.0m bgl, four samples were taken between 0-0.05m, 0.1-0.2m, 0.5-0.6m, and 0.9-1.0m.

The final locations are shown on **Figure A3** and avoided any underground utilities or obstructions such as very densely vegetated borders or tree roots whilst maintaining the general pattern of sample distribution to provide relatively evenly spaced grid-based spatial coverage of the identified exposure averaging areas. The final locations take into account the scope amendments described below in Section 4.2.3.

4.2.3 Scope Amendments during Fieldwork

Treadgold House

A hand pit to 1.2m depth, with potential requirement for follow-on window sampling, was originally proposed to be excavated at TH145 (refer to SID in **Appendix B**). However, due to the relative proximity of an underground utility to location TH145, the 1.2m depth hand pit was switched to location TH142, with TH145 completed as a shallower hand pit to 0.4m depth.

For three locations at Treadgold House (TH142, TH161 and TH170), the proposed depth was not achieved due to obstructions within the hand pit and therefore at these locations, a sample was not collected at the proposed 1.0-1.2m depth.

Based on field observations the decision was taken not to progress any of the 1.2m depth hand pits to 3m depth using window sampling. This decision was based on the fact that fill material had already been encountered within three of these hand pits (therefore deeper drilling was not required to sample it) and the material appeared to be granular construction / demolition type material with a low potential for ground gas generation. In addition it was considered that there would be a high chance of the window sampling drilling method encountering refusal on the construction / demolition material, which typically comprised gravel and cobble of brick and concrete as well as ceramic and glass fragments, in a silty / clayey matrix, with larger concrete obstructions encountered at all three locations at depths between 0.7m and 1.07m. At the fourth location (TH104) apparent natural ground was encountered at 0.7m depth indicating that there was not deeper fill at this location and hence deeper drilling was not necessary. This decision was agreed with RBKC and the SQP at the time of the works, acknowledging that the composition of any different, deeper fill would remain unknown following the investigation. This was considered to be an acceptable uncertainty given the information presented in Section 2.4 regarding the ground gas risk potential of deeper fill associated with the former brickfield.

During the sampling a further 20 locations were added to the scope for Treadgold House (hand pits to 0.05m bgl). This was discussed and agreed between AECOM, RBKC and the SQP to increase the sample density in the garden area to the west of the building where it had become more apparent that access to the garden by children may be occurring over the ground floor balcony walls that face onto this part of the garden.

Avondale Park Gardens

An amendment to the scope at Avondale Park Gardens was made whilst on site, to collect an additional sample from 0.9-1.0m depth in the four deeper hand pits (APG101, APG106, APG113 and APG114). This was because at APG101 and APG114, the material at 0.9-1.0m depth differed from the material at 0.5-0.6m depth, therefore it was considered that collection of additional samples was warranted, to ensure that the Made Ground could be assessed in greater detail. Samples were also collected at the same depth for APG106 and APG113 for completeness, although the material at 0.9-1.0m bgl was not identified to differ significantly from the material at 0.5-0.6m bgl in these locations.

4.3 Sampling Methodology

The sampling method was in accordance with the AECOM ‘Grenfell Stage 2 Follow-on Scope – Soil Sampling Protocol’ included in **Appendix B**. The method included:

- decontamination of sampling equipment between collection of each sample;
- using a stainless steel hand trowel and / or spade for excavating hand pits and collecting samples;
- placing excavated soil on plastic sheeting to prevent contamination of the ground surface;
- using dedicated nitrile gloves for each sample to avoid cross-contamination;
- photographing sample locations and soil arisings as a photographic record of the works;
- making a detailed description of the soil arisings;
- placing sampled soil in clean laboratory supplied sample containers for off-site transport;
- packaging samples for courier shipment to the laboratory in sealed, cooled boxes with chain of custody documentation;
- reinstatement of the ground using residual arisings, topped up with shop bought topsoil and with original turf (if present) replaced on the surface; and
- accurate measurement of the position of each sample location relative to fixed site features.

The sample location IDs were prefixed with TH (Treadgold House) and labelled from TH101-TH190 and APG (Avondale Park Gardens) labelled APG101-APG116. Blind duplicate samples were collected to cover a variety of testing and depths at the sites, and were labelled DUP01-DUP09 (for Treadgold House) and DUP10-DUP11 (for Avondale Park Gardens).

One full set of sample containers (1x tub, 2x 250g glass jar and 1x 60g glass jar) was collected for each soil sample. During the sampling activities, a supply of cool packs was kept in a dedicated project freezer at the Grenfell Tower site office. Each morning, empty sample containers were stored in cool boxes along with frozen cool packs. Fresh frozen cool packs were placed in the cool boxes once the samples had been collected to maintain a low temperature during transport. Samples were then submitted to the laboratory using the laboratory organised overnight courier or an AECOM team member taking the samples to a drop off at the courier depot. For any samples collected after the daily courier pick up, these were kept with two ice packs in the cool box in the Grenfell Tower site office and the ice packs were replaced immediately before collection the next morning. Scans of the signed Chains of Custody documents sent to the laboratory with the samples are presented in **Appendix L**.

During sampling, there were instances where excavated material was too large to fit into the designated sampling jars (for example, cobbles of brick, concrete, metal fragments). This material was described on the sample logs and photographed, however could not be sent to the laboratory for analysis due to its size.

4.4 Sampling Dates and Personnel

The exploratory soil sampling works were undertaken between the 22nd and 26th November 2021 (Treadgold House) and on the 6th December 2021 (Avondale Park Gardens). The AECOM sampling team comprised David Dyson, Emma Toms, Holly Fenwick and Ben Disney. The weather conditions during the sampling are included on the sample logs in **Appendix D**, but the general weather conditions were generally dry and cold, with some sun, except for on 26th November when there were some light rain showers during the morning, and 6th December, when there was steady rain from late morning and throughout the afternoon.

RBKC representatives Robert Tyler, Rebecca Brown and Kesha Smith were in attendance periodically during the sampling. The SQP visited, observed, and took photos of the sampling activities on the 24th November and 6th December 2021.

Sampling was completed with care, and the process was carried out in accordance with the sampling procedure provided in Appendix B of the Site Investigation Design document (**Appendix B** of this report) to ensure that the samples were collected, preserved and transported in line with best practice. The sampling was completed successfully and all proposed locations were sampled as per the Site Investigation Design other than the amendments listed in **Section 4.2.3**.

4.5 Analytical Testing

The full list of samples and their associated analytical testing is included in **Table C1** in **Appendix C**. Full details of the analytical methods, detection limits and laboratory accreditation are given in the Site Investigation Design document (AECOM, 2021b), which is included in **Appendix B**, and in the laboratory certificates, which are included in **Appendix E** and **Appendix F**.

The soil samples collected as part of the works were scheduled for testing for a selection of the following analytes: lead, asbestos (and asbestos quantification where fibres were detected), a suite of 13 metals (including lead)[2], a suite of 9 metals (including lead)[2], PAH-16 and lead bioaccessibility. All samples were analysed for lead, with the other analytes scheduled on a reduced selection of samples as defined by the site investigation design. A summary of the total number of tests completed is included in **Table 3** below.

Table 3. Summary of analytical testing completed

		Number of results			
Investigation Area	Depth (mbgl)	Lead	Asbestos	Other metals	PAH-16
Treadgold House	All	197	74	36	13
	0-0.05	90	62	22	4
	0.1-0.2	66	3	5	0
	0.3-0.4	27	3	4	4
	0.6-0.7	13	2	4	4
	1.1-1.2	1	1	1	1
Avondale Park Gardens	All	38	14	14	14
	0-0.05	16	4	4	4
	0.1-0.2	16	4	4	4
	0.5-0.6	4	4	4	4
	0.9-1.0	2	2	2	2

4.5.1 Treadgold House Bioaccessibility Testing

Following receipt of the lead results for Treadgold House, lead bioaccessibility testing was scheduled on six samples. The samples tested are detailed in **Table 4** below.

Table 4. Samples Scheduled for Lead Bioaccessibility Testing

Sample	Depth (m)	Original Sample Lead Concentration (mg/kg)	Ground Conditions
TH109	0-0.05	1576	Bare soil
TH109	0.1-0.2	8259	Bare soil
TH155	0-0.05	1485	Turf
TH155	0.1-0.2	3623	Turf
TH120	0-0.05	1065	Bare soil
TH169	0-0.05	3649	Turf

[2] '9 metals' includes As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn. '13 metals' includes the '9 metals' plus Ba, Be, B, V

These samples were chosen to provide spatial coverage of the Treadgold House investigation area, cover a variety of surface conditions (turf vs. bare soil) and also capture one of the highest lead concentration of 8,259mg/kg at TH109 (discounting potential outliers >10,000mg/kg). At two locations, both the 0-0.05m and 0.1-0.2mbgl samples were tested, to determine if there was variation in the bioaccessibility result with depth. Testing of the deeper fill material was not carried out as potential exposure of residents to the deeper soils was considered to be much lower and the lead concentrations appeared to be lower in the deeper samples.

4.5.2 Avondale Park Gardens Additional Testing

At Avondale Park Gardens, four additional samples outside the original scope of works were collected between 0.9-1.0m bgl (APG101, APG106, APG113 and APG114). Two of these were scheduled for testing due to observed changes of material within the Made Ground between samples collected at 0.5-0.6m and 0.9-1.0 m (TH101 and TH114), with the changes to the soil type described in detail in the logs in **Appendix D.** The two remaining samples collected (TH106 and TH113) did not appear to display a change in soil type between the shallower and deeper sample therefore these were not scheduled for analysis.

4.5.3 Duplicates

A total of 11 blind duplicate samples were collected during the soil sampling. The duplicate samples were scheduled for the same analytical suite as their corresponding primary soil sample in all cases, except for DUP01 (scheduled for lead and asbestos only), DUP05 (scheduled for lead only) and DUP08 (scheduled for lead only). Duplicates were chosen to ensure a good spatial distribution of testing, in accordance with the total number proposed in Table 4 of the Site Investigation Design document (AECOM, 2021b). This resulted in the above listed duplicates not requiring the same testing as the primary soil sample.

For the purposes of statistics and averaging calculations in this report, the ‘original’ sample concentration has always been used. The concentrations from the duplicate samples are only considered for the purposes of this section of the report.

The sample locations where the blind duplicates were collected, and their corresponding soil samples are summarised in **Table C1** in **Appendix C**. A summary of the total duplicate tests completed is provided in **Table 5**.

Table 5. Summary of duplicate testing completed

Investigation Area	Sample Analysis	No of primary samples tested	Total QA/QC duplicate samples tested
Treadgold House	Lead	197	9
	Asbestos	71	4
	Other metals	36	1
	PAH-16	13	1
Avondale Park Gardens	Lead	38	2
	Other metals, asbestos & PAH-16	14	1

4.5.4 Quality Assurance

The review and checking process for the Field Records was performed as per AECOM Field Procedure ‘FP26 - Field Sampling and Laboratory Quality Assurance and Quality Control Procedures’. The completed field records were checked by the originators on the day of the field work.

Review of field notes was completed as soon as possible for all locations by the project manager David Dyson. The review included performing a detailed check of field data sheets for completeness and accuracy.

4.6 Summary of Ground Conditions

The full description and sampling notes for each sampling location and a photographic log is presented in **Appendix D**.

At Treadgold House, the ground conditions encountered were: topsoil (generally comprising dark brown sandy silt to silty clay with varying amounts of rootlets) overlying Made Ground (generally heterogeneous across the investigation area, comprising sandy gravelly silt to gravelly clay). The topsoil was either exposed in soil beds and borders with varying vegetation cover (e.g. rose bushes, underneath hedges, ivy-covered) or was present beneath grassed areas. The grass cover varied across the garden from good turf entirely covering the soil, through to much thinner grass cover without an appreciable turf thickness, showing exposed soil. The areas with thin grass cover are listed as partial turf in **Table C2** in **Appendix C** and these locations were more frequent in the western part of the garden where the garden is more shaded than by tree cover and the building. In the southern part of the garden, good turf cover was more common and partial turf was more localised.

At the four locations planned to be excavated to 1.2m depth (TH104, TH142, TH161 and TH170), three (all except TH104) were terminated at shallower depths of 0.7m – 1.07m due to refusal within Made Ground typical of construction / demolition materials At TH142 a large concrete obstruction (possible in-situ slab) was encountered at 0.7m depth, which could not be by-passed despite extending the hand pit by 50cm in two directions. At TH161 cobbles of concrete and brick were encountered through the Made Ground in the depth range 0.3m to 0.9m, with a large concrete obstruction encountered at 0.9m depth which prevented further excavation. At TH170, gravel sized brick and glass was encountered throughout the Made Ground from 0.1m to 1.07m depth, with brick cobbles at depths below 0.6m and possible tarmac at 1m depth. The excavation eventually encountered refusal on a concrete obstruction at 1.07m depth. At one location (TH104), natural material (stiff brown to orangish brown clay with decomposed wood fragments) was encountered at 0.7mbgl. The topsoil was generally noted to be approximately 0.2m thick. There were varying amounts of anthropogenic material noted within the topsoil and Made Ground across the investigation area, details of which are included on the sample logs in **Appendix D**.

At Avondale Park Gardens, the ground conditions encountered were topsoil (generally comprising dark brown clayey silt with varying amounts of sand / gravel) to 0.2mbgl, overlying Made Ground (generally comprising gravelly clayey sand) to the base of the deepest hand excavated pits at 1mbgl. Natural material was not encountered within any of the locations at Avondale Park Gardens. The cover on the topsoil was either turf or open soil beds, although the majority of the soil beds were heavily vegetated with shrubs. The turf at Avondale Park Gardens was good quality and provided a barrier to the underlying topsoil. The surface cover at each sampling location in Avondale Park Gardens is listed in **Table C2** in **Appendix C**

Similarly to Treadgold House, there were varying amounts of anthropogenic material noted in the topsoil and Made Ground across the Avondale Park Gardens investigation area, details of which are included on the sample logs in **Appendix D**.

Table 6 presents a summary of the visual or olfactory observations of potential sources of COPC (such as ash, coal, and pieces of metal) identified during the field works. A large proportion of the samples included inert anthropogenic fragments of brick and concrete, and many included plastic fragments and ceramic / tile. These items have been excluded from the below table, but details can be found in the sample logs in **Appendix D**.

Table 6. Visual and Olfactory Observations of Potential Sources of COPC

Sample Location Area	Figure Ref.	Sample location	Depth (m)	Observed Potential Sources of COPC
Treadgold House	A2	TH105	0.1 - 0.2	Occasional ash (up to 1cm)..
		TH106	0.1 - 0.2	Possible ash.
		TH107	0.0 – 0.2	Possible ash, a rounded coal gravel.
		TH114	0.3 – 0.4	Ash.
		TH118	0.1 – 0.2	Piece of ash (approximately 1.5cm).
		TH119	0.4	Ash fragment (~2cm).
		TH127	0.05 – 0.2	Possible ash fragment (2 pieces, <1cm).
		TH187	0 – 0.05	One small piece of charcoal.
Avondale Park Gardens	A3	APG106	0 – 0.2	Onion odour noted – assumed related to bulbs/rootlets present.
		APG107	0.1 – 0.2	Coal fragments.
		APG110	0.1 – 0.2	1cm piece of ash.

Sample Location Area	Figure Ref.	Sample location	Depth (m)	Observed Potential Sources of COPC
		APG111	0 – 0.2	Rare coal.
		APG112	0.1 – 0.2	Approximately 0.5cm piece of ash.

For the samples for which coal or ash were noted at Treadgold House, the lead concentrations range from 192-2412mg/kg, with an arithmetic mean of 1447mg/kg. When compared to the lead dataset summaries presented in Table 21 and Table 22, this does not indicate that the presence of observed ash / coal results in higher concentrations of lead. At Treadgold House, there is no PAH data for these samples.

For the samples for which coal or ash were noted at Avondale Park Gardens, the lead concentrations range from 506-1027mg/kg, with an arithmetic mean of 735mg/kg. When compared to the lead dataset summaries presented in Table 24, this does not indicate that the presence of observed ash / coal results in higher concentrations of the lead. At Avondale Park Gardens there is only PAH concentration for a sample which contained ash (APG110 at 0.1-0.2m) which has PAH concentrations within the same range compared to other samples from Avondale Park Gardens. This does not indicate that the presence of observed ash / coal results in higher concentrations of the PAHs.

4.7 Laboratory Analysis Results

The laboratory results are presented in the analytical test certificates included in **Appendix E and Appendix F** (for Treadgold House and Avondale Park Gardens respectively). Test methods and the accreditation status of each analysis were as per the Site Investigation Design document (AECOM, 2021b) and are also included within the laboratory analytical certificates. The analytical laboratory used for all testing was Element Materials Technology (Element), Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA, UKAS Accreditation No. 4225.

4.7.1 QA/QC

A Data Validation Summary Report (DVSR) has been completed in accordance with the AECOM standard procedures. The completed DVSR is included in **Appendix J** and concludes that the analytical data received for the exploratory samples is suitable for interpretation, with the following minor comments:

- One dilution error made by the laboratory was identified after AECOM queried an unusually high lead concentration and requested a re-analysis of the sample from 0.1-0.2m depth at TH165. This result is discussed in more detail in **Section 4.7.3**.

The analysis of metals is usually completed by first drying and crushing the sample before extraction for analysis. However, when asbestos is identified in the 'as received' sample, the laboratory does not dry and crush the sample as part of the preparation method to avoid the potential for exposure the laboratory analysts to asbestos fibres. This means that the sample is not prepared in the manner consistent with the laboratory accredited method; however, the analytical method is the same as that used for the accredited analysis and undergoes the same internal laboratory QA/QC checks including process blanks, calibration checks and detection limit checks. The data are therefore considered suitable for interpretation.

4.7.2 Relative Percent Difference (RPD) Calculation

The evaluation of the data quality results is determined using duplicate samples submitted to the lab. The results from duplicate samples are used to calculate the Relative Percent Difference (RPD), which is defined as:

$$RPD = 200\frac{(x_1 - x_2)}{(x_1 + x_2)}$$

where x_1 and x_2 are the values of the concentration obtained for an analyte x in duplicate samples, and $(x_1 - x_2)$ is the absolute difference of x_1 and x_2.

All 11 of the duplicate samples taken were analysed by the laboratory. The laboratory was not informed of the location from which the duplicate samples were taken. The RPD 'limits' adopted in this intrusive investigation were:

1. If the value is <10x the laboratory method reporting limit, then the RPD should be <80%.

2. If the concentration is between 10 and 20x the laboratory method reporting limit, then the RPD should be <50%.

3. If the concentration is >20x the laboratory method reporting limit, then the RPD should be <30%.

Based on this, the RPDs for the analysed duplicate samples were considered. The duplicate sample assessment is presented in **Table C2 and C3** in **Appendix C**. For the main COPC the RPDs were identified as acceptable, except in the circumstances listed in **Table 7**:

Table 7. RPD results

Location	Depth	Duplicate sample	COPC	RPD	RPD threshold	Acceptable	Comment
TH101	0-0.05m	DUP01	Lead	30	<30	Y	The RPD of 30 is on the threshold for being acceptable
TH104	0.6-0.7m	DUP02	Lead	76	<30		-
			Mercury	188	<30		-
			Zinc	57	<30		-
TH120	0.3-0.4m	DUP04	Lead	89	<30		-
TH149	0-0.05m	DUP07	Asbestos PCOM	100	<80	N	The original sample result for TH149 is below the detection limit (<0.001%) and the duplicate result is within a factor of three of the quantification limit. This indicates that the RPD is not a reliable indicator.
TH161	0.3-0.4m	DUP08	Lead	32	<30	N	It is noted that the RPD was 32 for this sample, therefore slightly above the threshold of 30 for being acceptable
TH168	0.3-0.4m	DUP09	Lead	50	<30		-
APG103	0.1-0.2m	DUP10	Phenanthrene	80	<30		-
			Anthracene	55	<30		-
			Fluoranthene	42	<30		-
			Pyrene	39	<30		-
			Benz(a)anthracene	39	<30		-
			Chrysene	37	<30		-
			Benzo(a)pyrene	41	<30		-
			Indeno(1,2,3-c,d)pyrene	41	<30		-
			Dibenz(a,h)anthracene	62	<30		-
			Benzo(g,h,i)perylene	45	<30		-
			Benzo(b)fluoranthene	39	<30		-
			Benzo(k)fluoranthene	39	<30		-
			Benzo(b)&(k)fluoranthene	39	<30		-
			Barium	36	<30		-
			Lead	57	<30		-

In total there were 7 of the 11 duplicate samples for which the RPD for individual chemicals was considered 'high'. This is anticipated to be normal for soil samples, due to the expected heterogeneity in the soil - the variation in the results provide an indication of the degree of heterogeneity in the soil. One of the results with a 'high' RPD (asbestos in TH149/DUP07) was for reported concentrations below and within a factor of three of the quantification limit. For reported concentrations this close to the detection limit, the RPD is not a reliable indicator for QA purposes.

The RPD values which are considered 'high' for lead were collected from the following depth intervals:

- 1 out of 3 samples taken between 0 – 0.05m
- 1 out of 4 samples taken between 0.1 – 0.2m
- 3 out of 3 samples taken between 0.3 – 0.4m
- 1 out of 1 sample taken between 0.6 – 0.7m

For lead, RPD exceedances were identified for six of the 11 duplicate samples, although two of these (RPDs of 30% and 32%) were at or extremely close to the threshold of 30%. It is noted that the majority of the samples with 'high' RPDs for lead were collected from deeper than 0.2m bgl. The material deeper than 0.2m bgl was generally described as Made Ground, and included highly heterogeneous material such as cobbles of concrete, slate, brick and flint. The only exception to this is DUP04 where the log does not indicate any obvious heterogeneity in the soil sample. This suggests that the high RPDs noted from the deeper samples reflect the heterogeneity of the Made Ground. Since the deeper Made Ground samples generally reported lower concentrations of the main COPC than the shallower soil samples from 0-0.05m and 0.1-0.2m depth, the greater variability of results in the deeper samples is not considered to have an adverse effect on the data interpretation.

For the shallowest samples (0-0.05m and 0.1-0.2m depth), only two out of seven of the duplicates noted high RPDs for lead. As this is the main dataset of concern for the human health assessment in this report, the analytical data is deemed to be suitable for use for interpretation. It is noted that where average concentrations are calculated for comparison against risk-based screening criteria, the inherent variability of reported soil concentrations means that averages based on fewer samples will have a higher level of uncertainty than those based on a large number of samples.

4.7.3 Lead Analysis – TH165 and TH108

When analysed for lead, the sample at TH165 from 0.1-0.2m depth returned a result of 384,900mg/kg. This appeared to be anomalous when compared to the rest of the data, therefore AECOM asked the laboratory to re-analyse the same sample both 'as received' and 'crushed and dried'. The results of the re-analysis were 4,740mg/kg (as received) and 8,536mg/kg (crushed and dried). Given the large difference between the originally reported result and the results from the re-analysis, AECOM asked the laboratory to investigate a possible cause of the original high concentration. The following feedback was received from the laboratory regarding the original result:

> *…a dilution error appears to be the cause for the initial [very] high reported Pb result…a correction factor x10 higher than prepared has been applied…*
>
> *Reported: 384,900 mg/kg Pb*
> *Actual result: 38,490 mg/kg Pb.*
>
> *…All quality checks are within defined criteria for all testing…Nothing to indicate any issues with the analysis.*
>
> *All other analytes measured in Soil Trace suite shows comparable data across all repeats (with exception of Sb which varies as per Pb) confirming no sample mix-up, suggesting therefore initial elevated Pb is possibly the result of a hotspot/sample heterogeneity.*

The result from the re-analysis is more consistent when compared with the other samples analysed from this site, for example the next highest concentration measured at Treadgold House was TH108 at a depth of 0.3-0.4m with a result of 20,630mg/kg and the next highest concentration reported from the same plot (plot 1) as TH165 was TH167 at a concentration of 2,229mg/kg. For the purposes of the data interpretation, the concentration of 38,490mg/kg has been used as a precautionary approach, however consideration is given to the re-test result of 8,536mg/kg, which indicates a high degree of heterogeneity at this particular location. A copy of the email correspondence with the laboratory has been included in **Appendix E**.

AECOM also queried the results of TH108 at 0.1-0.2m depth (18,960mg/kg) and TH108 at 0.3-0.4m depth (20,630 mg/kg), as these appeared to be potential outliers, with no potential evidence from the soil sample descriptions to justify the high concentrations. The comments received were as follows:

> *Both samples were prepared…on 30/11/21 and were analysed the same day…*
>
> *Both samples required dilutions for their Pb conc. fall within instrument calibration range and were diluted and analysed…on 01/12/21.*
>
> *Excellent agreement is seen between neat and dilution data confirming no dilution errors.*
>
> *All quality control checks are within acceptable limits for the testing - AQC/Ind Cal/Low Cal checks within defined criteria, Process Blank <LOD, Cal R2 > 0.999, peaks on wavelength with no observed inter-element spectral interference.*
>
> *Nothing to indicate any issues with the testing.*
>
> *Happy with reported data for these two samples.*

Therefore, as the laboratory could not identify any specific analytical problems or concerns with the reported concentrations, both samples have been included in the data interpretation. A copy of the email correspondence with the laboratory has been included in **Appendix E**.

4.7.4 Outliers / Statistical Analysis

4.7.4.1 ‘Targeted’ sampling – Treadgold House

A number of ‘targeted’ samples collected during the work – these were samples collected surrounding four of the original Stage 2 samples collected at Treadgold House in 2020 (GTCS2-S274, GTCS2-S275, GTCS2-S279 and GTCS2-S280). Three samples were collected associated with each of the original locations – see **Table 8** for more details. The purpose for these samples were to look for spatial variation of the lead concentrations at these locations. RPDs were calculated comparing the targeted samples taken during November 2021 to the corresponding original sample taken during the Stage 2 sampling to give a measure of variability. Of 36 comparative cluster samples taken only four gave RPDs which would be considered ‘high’ based of the criteria stated in **Section 4.7.2** (summarised in **Table 9**). Therefore, it was deemed that there is a limited degree of variability. As these samples were located close to the original Stage 2 samples, the initial approach has been to exclude them for the purpose of averaging, and any statistical discussions, and therefore are not discussed further in the report. However, the risk assessment section does include averages with the clustered samples also included to determine whether the variability observed is likely to have any significant impact on the interpretation and conclusions of the report.

Table 8. Results summary of ‘Targeted’ Samples excluded from averaging

Original Stage 2 location	Cluster number	‘Targeted’ samples	Concentration (mg/kg)	Inside the former brickfield (yes/no)
GTCS2-S274 (0-0.02m = 1,168mg/kg)	1	TH105 0-0.05m	1,326	No
		TH105 0.1-0.2m	2,412	
		TH106 0-0.05m	1,381	
		TH106 0.1-0.2m	1,488	
		TH107 0-0.05m	1,307	
		TH107 0.1-0.2m	1,122	
GTCS2-S275 (0-0.02m = 992mg/kg)	2	TH1110-0.05m	1,027	No
		TH111 0.1-0.2m	1,273	
		TH112 0-0.05m	1,009	
		TH112 0.1-0.2m	935	
		TH113 0-0.05m	1,270	
		TH113 0.1-0.2m	3,930	
GTCS2-S279 (0-0.02m = 1,385 mg/kg)	3	TH131 0-0.05m	1,893	Yes
		TH131 0.1-0.2m	1,831	
		TH132 0-0.05m	1,692	
		TH132 0.1-0.2m	4,638	
		TH136 0-0.05m	1,615	
		TH136 0.1-0.2m	3,644	

Original Stage 2 location	Cluster number	'Targeted' samples	Concentration (mg/kg)	Inside the former brickfield (yes/no)
GTCS2-S280 (0-0.05m = 2,216 mg/kg)	4	TH148 0-0.05m	1,678	Yes
		TH148 0.1-0.2m	2,031	
		TH149 0-0.05m	1,327	
		TH149 0.1-0.2m	1,920	
		TH150 0-0.05m	1,921	
		TH150 0.1-0.2m	2,434	

Table 9. RPD results for 'Targeted' Samples

Cluster number	Maximum lead concentration (mg/kg)	Mean lead concentration (mg/kg)	Number of 'high' RPDs (total number of samples)
1	2,412	1,458	1 (6)
2	3,930	1,491	2 (6)
3	4,638	2,385	1 (6)
4	2,434	1,932	1 (6)

4.7.4.2 'Targeted' sampling – Avondale Park Gardens

At Avondale Park Gardens, three targeted samples were planned around the original Stage 1 sampling location GTCS1-23. These locations, APG109, APG111 and APG113, are shown on **Figure A3** in **Appendix A** and the lead concentrations from each location are summarised in **Table 10** below.

Table 10 Clustered samples at Avondale Park Gardens

Original Stage 1 location	'Targeted' samples	Concentration (mg/kg)	Average concentration (mg/kg)
GTCS1-23 (0-0.05m = 2,009mg/kg)	APG109 0-0.05m	1923	Mean = 1,328
	APG109 0.1-0.2m	2223	
	APG111 0-0.05m	849	Median = 901
	APG111 0.1-0.2m	901	
	APG113 0-0.05m	782	
	APG113 0.1-0.2m	611	

The reported concentrations from GTCS1-23 and APG109 appear very similar, whereas the concentrations from APG111 and APG113 are markedly lower and more similar to the other concentrations at Avondale Park Gardens. A spatial review of the final sample locations indicates that APG109 was noticeably closer to GTCS1-23 and is also located on the same bare soil within the flower bed, whereas APG111 and APG113 were further away and from beneath turf.

Given these differences it was concluded that the sample results for APG109 would not be included in data averaging for comparison against assessment criteria as this location is represented by the original GTCS1-23 sample. However, it is considered to be appropriate to include data from APG111 and APG113 within data averaging for the risk assessment as they are not representative of the same soil where the higher concentrations were initially encountered at GTCS1-23. As this is not consistent with the originally planned assessment approach, the assessment has also been done with these locations excluded from the site-wide averaging to determine whether there would be any difference in the findings.

The higher concentration at APG109 does confirm the higher lead concentration at GTCS1-23, as the concentration of APG109 was a similar order of magnitude, and therefore could represent a localised 'hotspot' of higher lead concentrations in soil.

4.7.4.3 Outliers – Treadgold House

During the statistical analysis, the recent CL:AIRE 2020 statistical guidance (Marriott, 2020) was considered. Further details of the applicability of this guidance to the data collected at Treadgold House are provided in Section 5.2. Using this guidance for Treadgold House, when the shallow soil sample dataset was considered (0-

0.02m, 0-0.05m and 0.1-0.2m), the statistical testing using Rosner's and Dixon's outlier tests suggested the possible presence of outliers within the dataset. The seven outliers identified by the analysis are detailed in **Table 11** below.

Table 11. Outliers in Treadgold House Shallow Soil Dataset

Location	Depth (mbgl)	Concentration (mg/kg)
TH108	0.1-0.2	18,960
TH165	0.1-0.2	38,490 (retest = 8,536)
TH109	0.1-0.2	8,259
TH162	0.1-0.2	6,245
TH125	0-0.05	6,230
TH156	0-0.05	6,029
TH138	0.1-0.2	5,942

Although identified as possible outliers, these samples have been included in the data-set for the purposes of the assessment in subsequent sections given that:

- there were no field observations to suggest that these samples contained different soil types or different materials within the soil compared to the other samples at the site; and
- The soils are present within the exposure area and therefore represent real concentrations that residents could be exposed to.

4.7.4.4 Outliers – Avondale Park Gardens

Using the same guidance for Avondale Park Gardens, when the shallow soil sample dataset was considered (0-0.05m and 0.1-0.2m), the outlier tests suggested the possible presence of only one outlier within the dataset. This was the sample from Stage 1 (GTCS1-23, 0-0.05m depth) at a concentration of 2,099mg/kg. As for Treadgold House, there were no field observations to suggest this sample contained different soil material, and this concentration is within the exposure area and could represent a real concentration that residents could be exposed to, and therefore this 'outlier' sample has been included for the purposes of the assessment.

5. Generic Quantitative Risk Assessment

5.1 Introduction

Assessment of the data obtained from Treadgold House and Avondale Park Gardens is required to fulfil the requirements of Part 2A of the EPA 1990 and the associated statutory guidance. The objective of this section will be to determine whether either area can be ruled out of meeting the definition of Contaminated Land and potentially fall into Category 4. The risk assessment has been carried out in accordance with the same broad methodology as that adopted for the Stage 2 Investigation for consistency.

The purpose of GQRA as defined in the Part 2A Statutory Guidance is to use generic assessment criteria (GAC) to help decide when land can be excluded from the need for further inspection and assessment, or when further work may be warranted. For Part 2A, one of the primary objectives of the GQRA is to determine whether land can be immediately placed into Category 4. For land where a contaminant linkage (CL) has been identified, the Statutory guidance states that this land should be placed into Category 4 where:

1. The land has only normal levels of contaminants in soils;
2. Contaminant levels do not exceed relevant GAC; or
3. Land where the estimated intake from soil represents only a small proportion of that from other sources (such as diet).

In UK guidance, the term GAC has typically come to be used to refer to assessment criteria derived in accordance with UK guidance and based on tolerable or minimal risk levels. Therefore for this QRA the term generic screening criteria (GSC) has been used to refer to a broader range of criteria including those derived by national organisations outside the UK as well as UK derived criteria that are based on low levels of toxicological concern (LLTCs), namely the Category 4 Screening Levels (C4SLs) published by Defra (Department for Environment, Food and Rural Affairs (Defra), 2012a).

Initially the risk assessment has adopted the existing generic screening criteria (GSC) and the site-specific assessment criteria (SSAC) derived for the Stage 2 report (SSACs are available for lead and BaP) to screen the data collected from both investigation areas as part of this investigation, as well as the data collected during the Stage 1 and Stage 2 Environmental Checks.

To address normal levels of contaminants in soils, the GQRA uses the background data information (particularly the NBCs) presented in **Section 2.5** to screen out – to the extent appropriate – concentrations of contaminants that do not exceed normal levels. In accordance with Paragraph 3.22 of the Part 2A Statutory Guidance *"Normal levels of contaminants in soil should not be considered to cause land to qualify as contaminated land, unless there is a particular reason to consider otherwise. Therefore, if it is established that land is at or close to normal levels of particular contaminants, it should usually not be considered further in relation to the Part 2A regime…".* The NBCs derived by Defra were explicitly intended to meet the definition of "normal levels" as described by the Part 2A Statutory Guidance, and it includes both the natural and diffuse anthropogenic contribution to the concentration of a contaminant in soil.

SSAC from the Stage 2 investigation and NBCs are considered to be relevant to the GQRA because in the context of Part 2A they can be used to decide when land can be excluded from the need for further assessment, or when further work may be warranted. They are considered generic for the purposes of this report because they have not been further modified as part of the current investigation (in the case of the Stage 2 SSAC) or are taken direct from published sources without modification (in the case of the NBCs).

5.1.1 Conceptual Exposure Scenarios

It is necessary for the adopted GSC and the previously derived SSAC to be appropriate and suitable for the conceptual exposure model identified for each site. GSC for use in the UK are typically available for six land use types based on the Contaminated Land Exposure Assessment (CLEA) (Environment Agency, 2009) and Category 4 Screening Level (C4SL) (DEFRA, 2012) guidance. The two scenarios that were considered most appropriate for the two sites during the Stage 2 investigation, and which have been initially adopted for this report are:

- Residential without private gardens where no homegrown produce is assumed (hereafter referred to as "Resi-HP").

- Public open spaces in close proximity to residential property (hereafter referred to as "POSresi").

The applicability of these standard land-use scenarios to Treadgold House and Avondale Park Gardens is discussed in **Table 12** below.

Table 12. Sampling Area Land-use Scenario Selection

Area Name	Discussion
Treadgold House	The communal gardens to the south and west of the building are only accessible to residents of Treadgold House, with a mixture of grass and landscaping comprising vegetated soil borders and beds. A number of mature trees and hedges surround the edges of the garden (as shown indicatively on Figure A2) and the shading that this vegetation causes has resulted in the grass cover in some areas (particularly the garden area to the west of the building) becoming thin and patchy such that the soil is not covered by a protective turf. The communal gardens to the south and west of the building contain some small raised planters for growing produce, however the soil quality in the raised planters was assessed as part of the Stage 2 investigation and was found to be acceptable and suitable for continued use. There was no evidence of crop cultivation in ground level soil borders around the perimeter of the communal garden during the site walkover. The raised beds and consumption of homegrown produce pathway have not been considered further for this assessment. The communal area to the south of the residential building has some doors to individual residential flats that open directly onto the communal garden. There is some evidence from the site walkover that this area is used by these residents in a similar manner to a residential garden as garden chairs / benches were observed during the walkover on the small areas of paving outside the doors. This area to the south of the residential building is continuous with the communal garden to the west of the building and therefore the ground level samples collected in these area have been compared against both the Resi-HP land use GSC and the POSresi land use GSC. RBKC Housing has confirmed that the two external access gates to the garden remain locked and residents within the block do not have keys to these gates. This means that only the ground floor properties (Flats 1 to 6) have formal direct access to the garden. These properties are studio flats, and only suitable for single adult occupation, so would not house families. It was also noted that there are some ground floor flats (Flats 7-10) which could house families, however these do not have formal direct access out into the garden (although evidence observed suggests that some residents from Flats 7-10, potentially including children, may use the area, but the exact frequency and duration of any use is unknown). Potential access to the garden from Flats 7 to 10 would be by climbing over the waist-high ground floor balcony wall, apart from at Flat 9, where part of the concrete barrier of the balcony has been removed by past / current resident(s) to provide direct access to the garden. Discussion with RBKC has indicated that the balcony wall at Flat 9 is to be re-instated and it can be assumed that future occupation of Flats 7-10 will not permit removal of the wall. Regardless of the age of the full time residents, it is acknowledged that children could potentially visit all of Flats 1-10, and therefore be visitors to the southern and western communal gardens. Occupants of individual flats, particularly adults, will tend to spend the majority of their time outdoors in the parts of the garden closest to the access point where personal items (chairs, tables, potted plants etc) are located. However, there would still be expected to be some exposure around the wider garden, for example to access the raised beds for growing fruit or vegetables. For children there may still be a preponderance of outdoor exposure in closer proximity to their access point, which could be driven by a nervousness to not intrude on areas of the garden immediately outside neighbours windows or doors. However the uncertainty associated with this is relatively high given that children may also be likely to identify a particular location(s) in the wider garden for preferential play based on considerations such as denser tree cover for hiding (e.g. in the northernmost part of the garden) or searching out more secluded areas away from parental gaze such as the area where TH169 is located which is not visible from any of the flats. Overall, the residents of Flats 1 to 6 are most appropriately assessed at a generic stage of assessment using the Resi-HP land-use scenario because of their direct and authorised access onto the garden. For residents of Flats 7-10, and child visitors of Flats 1-6, the POSresi land-use is considered to be most appropriate for generic assessment due to the reduced exposure frequency compared to the full residential land-use scenario. For visitors to Flats 1 to 6, one visit a week would be comfortably lower than the assumed exposure frequency for the POSresi scenario. For residents of Flats 7-10, the much more difficult garden access than a standard residential or POSresi scenario is also considered to reduce exposure frequency to below what is assumed for the POSresi scenario, making the assessment suitably conservative.
Avondale Park Gardens	This area is a fenced communal garden in the middle of a residential square. It comprises a grassed area with soil borders planted with trees and shrubs. Generally the area fits the POSresi land-use scenario although the railings around the entire area with a single gate, and the fact that the residential square is not a through route for anyone, means that the exposure frequency and duration assumptions of the POSresi scenario are likely to be conservative for Avondale Park Gardens. Nonetheless sample results have initially been compared against the POSresi GSC whilst acknowledging the likely overly conservative nature of these criteria.

5.1.2 Selection of GSC

The land-use scenarios described in **Section 5.1.1** are applicable to GSC derived in accordance with the UK CLEA (Environment Agency, 2009) and Category 4 Screening Level (C4SL) methodologies (DEFRA, 2012) and may not be applicable for GSC published by other bodies such as the Dutch RIVM (see bullet list below). Where non-UK criteria are used, the assumptions are checked on a case by case basis to confirm that the criteria are sufficiently protective of the land use being investigated (the Dutch IVs do not take into account exposure at allotments, for example).

Health-based GSC are published by a number of authoritative organisations, including in the UK Defra and the Environment Agency, and internationally, the US Environmental Protection Agency (EPA) and the Dutch public health bodies (VROM and RIVM). The derivation of these criteria by these organisations is different – the organisations have each developed technical guidance and methodologies that are slightly different (aligned to their own regulatory frameworks and scientific judgements). The purpose of the criteria however is the same – to define concentrations in soil that do not warrant further action.

The screening criteria used in this assessment (in order of preference are):

1. Category 4 screening levels (C4SLs) (DEFRA, 2012).
2. Suitable for use levels (S4ULs) (Nathanail, McCaffrey, Gillett, & Ogden, 2015).
3. Generic assessment criteria (CL:AIRE/AGS/EIC, 2010).
4. Site-specific assessment criteria (SSAC) derived for the Stage 2 assessment (AECOM, 2021a).
5. Dutch Intervention Values (DIV) (Dutch Ministry of Infrastructure and the Environment, 2013).

The definitions and relevance of these screening criteria to UK guidance and Part 2A are summarised in **Table 13** below. More detailed definitions can be found in the reference documents for these criteria. Where non-UK criteria have been used to screen COPC, further discussion of the suitability in the context of UK guidance is provided in **Section 5.1.4**.

Table 13. Basis and applicability of chosen screening criteria

Screening Criteria	Basis	Applicability to Part 2A
C4SLs	Levels in soil that pose a low risk to human health. Values are derived using the Environment Agency's CLEA model with updated generic land use exposure assumptions and toxicological criteria termed "Low Levels of Toxicological Concern (LLTC).	Intended as "relevant technical tools" to help decide when land falls within Category 4 (no to low risk) for human health. Not intended to define Significant possibility of Significant Harm (SPOSH). The lead LLTC is stated to have been chosen to be above what was considered a value too close to minimal risk.
S4ULs	Levels in soil that pose minimal or no appreciable risk to human health. Values are derived using the Environment Agency's CLEA model with updated generic land use exposure assumptions defined by SP1010. The S4ULs do not use the 'Top 2' homegrown produce assumption that was introduced by the C4SL project. Toxicological criteria remain as health criteria values (HCV) (i.e. TDI or Index Doses as defined for SGVs) as recommended by Environment Agency SR2 guidance.	Signify concentrations that fall within Category 4 and represent no appreciable or minimal risk to health. Do not define SPOSH.
EIC GAC	Intended to compliment SGVs and derived using the CLEA methodology and CLEA model. The EIC GAC were derived using the more precautionary exposure assumptions used for deriving the SGV (compared to the more recent updated exposure assumptions used for C4SL derivation). Toxicological criteria remain as health criteria values (HCV) (i.e. TDI or Index Doses as defined for SGVs) as recommended by Environment Agency SR2 guidance.	As per S4ULs above. Widely considered to be superseded by the S4ULs and C4SLs. Still appropriate and used for COPC for which S4ULs or C4SLs have not been derived.
Stage 2 SSAC (separate criteria generated for Treadgold House and	Based on the C4SL standard land-uses, but with site specific adjustments made to bioaccessibility (site specific data), soil to plant uptake factors (site specific data), and soil ingestion rates (based on an update to the USEPA guidance on which the original CLEA and S4UL soil ingestions rates were based).	The Step 1 SSAC derived in the Stage 2 report were designed to provide an indication of the boundary between Category 3 and Category 4 land. The Step 2 SSAC were designed to provide an indication of where SPOSH might exist (i.e. the boundary

Screening Criteria	Basis	Applicability to Part 2A
Avondale Park Gardens)	The Step 2 SSAC also adopted a higher toxicological threshold for lead and a further reduction in soil ingestion rate.	between Category 3 and Category 1 or Category 2 land).
Dutch Intervention Values (DIV)	Designed to support the Dutch Soil Protection Act 2005 and Soil Quality Decree 2007. DIVs define cases of "severe contamination" if the average concentration of at least one substance exceeds the DIV in at least 25m^3 of soil. DIVs are derived using the CSOIL methodology and are defined for the multi-purpose use of soil (human and ecological). Human health risk requiring intervention is defined as a situation where acute or chronic adverse health effects may occur, or the contamination presents a demonstrable nuisance. The toxicological criteria for threshold substances (those that are not genotoxic carcinogens) are set on the same general basis as the TDI for SGV etc. A different approach is taken for genotoxic carcinogens whereby linear extrapolation methods are used to define soil concentrations that might be associated with an excess lifetime cancer risk (ELCR) of 1 in 10,000 for the exposed population. This ELCR is 10x higher than that typically adopted by the World Health Organisation (WHO) in the derivation of drinking water guidelines, and 100x higher than that used by the US EPA (see below). For asbestos, an ELCR of 1 in 1,000,000 is adopted, 10 times lower than the ELCR typically adopted by the WHO. Extrapolation is not endorsed by the UK Department of Health or the UK Committee on Carcinogenicity but it is a widely adopted approach internationally and has not been shown to underestimate risk relative to the Index Dose approach adopted in the UK.	The exposure assumptions for the multi-use land-use are slightly different to those used in the UK, but the intent is the same – protection of human health from adverse health effects. The values define concentrations in soil that do not pose a risk to humans where intervention would be required and are designed to be used as the first screening stage in a risk assessment process. They are therefore compatible with the use of similar GSC in identifying land that meets the definition of Category 4 (particularly for threshold substances). For this report, Dutch criteria have been adopted for the assessment of asbestos. Further details of the assessment approach are included in Section 5.1.4.

Where screening criteria are presented for a range of different soil organic matter (SOM) contents, the use of values associated with the closest reported SOM have been used. The range of SOM values reported for all of the Stage 1 and Stage 2 soil samples (including for Treadgold House and Avondale Park Gardens) is 2.1% to 45% with a geometric mean of 8.6% and an arithmetic mean of 9.7%. Within that dataset, one sample came from Avondale Park Gardens (10.6% SOM) and four came from Treadgold House (5.9% to 12.9% with arithmetic mean of 10.1%). Samples from this phase of work were not scheduled for SOM analysis as the GSC for the main COPC (lead, asbestos, PAHs (exc. naphthalene) are not sensitive to SOM content. However, screening criteria have been chosen based on a SOM of 6% for UK criteria which are typically reported for either 1%, 2.5% or 6% SOM. Therefore the GSC derived using SOM of 6% are considered to be suitable for use in this report.

5.1.3 Additional Considerations for Specific Contaminant Groups

5.1.3.1 PAHs

The C4SL for benzo(a)pyrene was derived using toxicological studies based on coal tar toxicity from a study by Culp et al., and it is intended to act as a GSC for the additive toxic effects of carcinogenic PAHs. Public Health England (PHE) (Public Health England, 2017) has endorsed this surrogate marker approach for assessing PAH toxicity on the assumption that the PAHs ratios in the samples being assessed are similar to those in the coal tars used for the toxicological studies. The PHE report defines 'similar' as where the ratios of each PAH relative to BaP are within an order of magnitude of the ratios from the test material (in this case the coal tar from Culp et al toxicological study used to derive the C4SL).

The PAH ratios for all samples collected as part of the Stage 1 and Stage 2 Grenfell Tower investigation have been plotted in accordance with the PHE approach. This is shown on the four separate plots[3] of **Figure 1** and **Figure 2** below (for Treadgold House and Avondale Park Gardens respectively). **Figure 1** and **Figure 2** also show in green the order of magnitude ranges used to decide where the PAH ratios are 'similar' to the ratio for the Culp et al toxicological study. For the analysis, the concentration of PAH samples below detection limit were assigned the value of the detection limit.

[3] Data limits on the spreadsheet mean not all data can fit on to one graph.

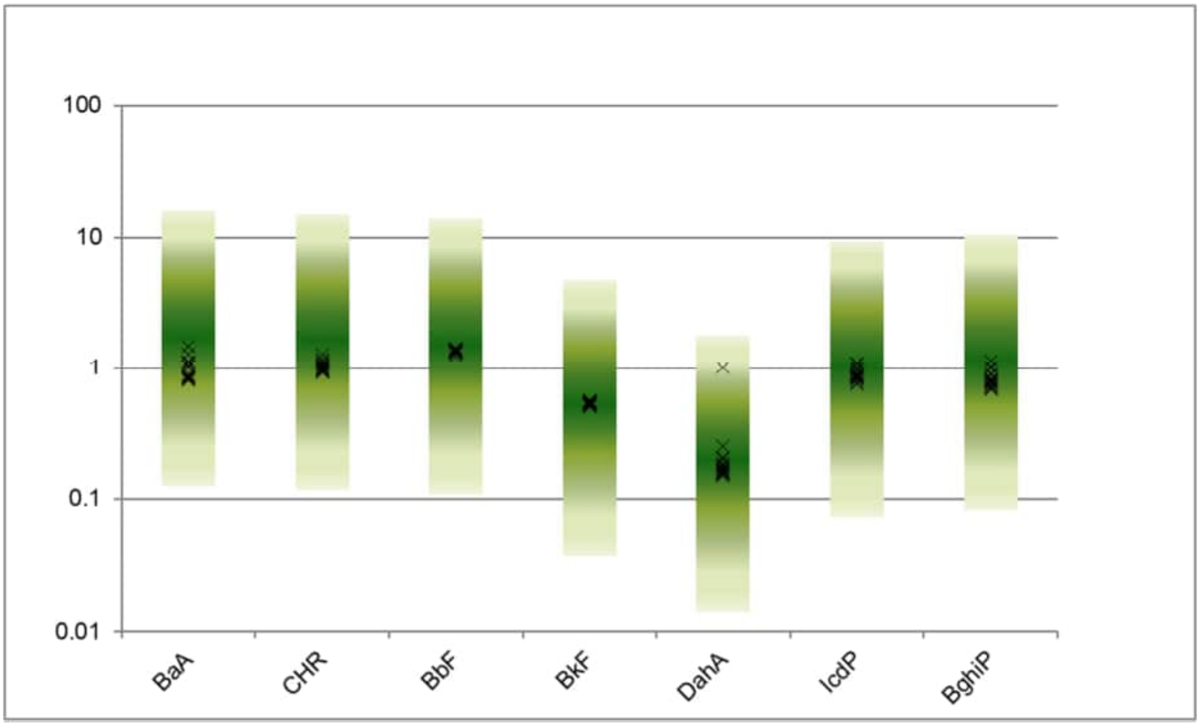

Figure 1. PAH ratio plot for Treadgold House soil sample PAH compositions against Culp et al ratios

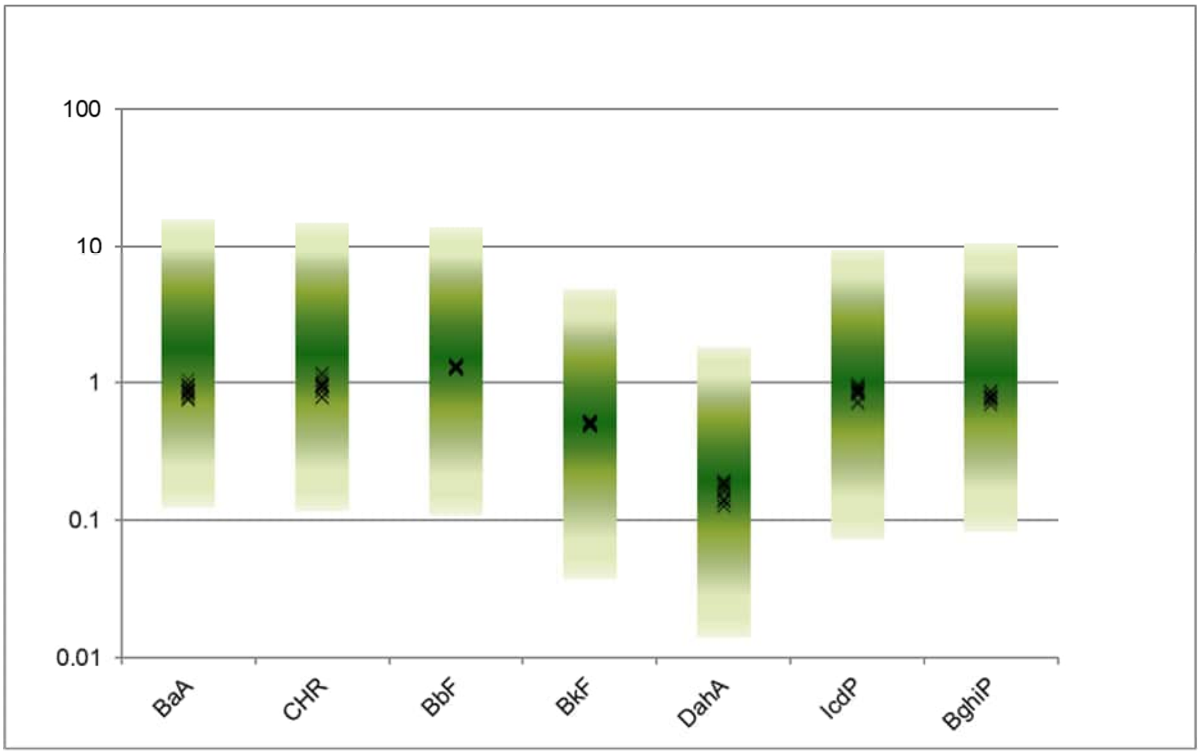

Figure 2. PAH ratio plot for Avondale Park Gardens soil sample PAH compositions against Culp et al ratios

As seen in **Figure 1** and **Figure 2**, there are no samples from Treadgold House or Avondale Park Gardens outside the order of magnitude range for any of the ratios. This indicates that for all of the samples, the BaP surrogate marker approach is considered to be appropriate for evaluation of additive risk from carcinogenic PAHs.

5.1.4 Asbestos

There is no UK regulatory guidance on the assessment of asbestos in soil. Dutch authorities developed a risk assessment methodology that has been adopted/amended for use in other countries and is considered relevant for use here in the absence of UK regulatory guidance. The CIRIA C733 report 'Asbestos in Made Ground' guidance (Nathanail, Jones, Ogden, & Robertson, 2014) identifies six factors to consider in the use of non-UK guidelines for asbestos. These six factors are considered in **Table 14** below.

Table 14. Consideration of applicability of Dutch asbestos methodology for Part 2A

Factor identified in CIRIA C733	Comment
Differences in national policy, guidance and assumptions to soil risk assessment.	No different to UK in so much that the intent is to identify land that poses a level of risk to human health that triggers regulatory intervention.
Differences in asbestos risk modelling and toxicological approaches.	The UK does not have a risk modelling approach for asbestos in soil. The UK toxicological approach to asbestos is set out by the HSE and the preferred risk model is that developed by Hodgson & Darnton (described in CIRIA C733 guidance (Nathanail, Jones, Ogden, & Robertson, 2014). This model continues to be refined by the authors, as does the risk model used by the Dutch. The most recent review of the toxicology by the Health Council of the Netherlands has not been adopted as policy and illustrates the variability in the interpretation of the epidemiological data that has to be accepted in the risk assessment process.
Differences in potency of the different asbestos types.	The Dutch methodology assumes that amphiboles are 10x more potent than chrysotile. The HSE does not differentiate between asbestos type in setting the control limit for occupational exposure. The Hodgson & Darnton model assumes a potency ratio of 1:100:500 for chrysotile, amosite and crocidolite. Of note, the Dutch methodology is based on airborne fibre concentrations not exceeding 100f/m^3 for amphiboles (amosite and crocidolite), and 1000f/m^3 for chrysotile. This is consistent with the WHO air quality guideline value for all asbestos of 1000f/m^3 (all values as measured by transmission electron microscopy).
Differences in climate.	The climate of the Netherlands and the UK is similar.
Whether the approach is likely to overestimate or underestimate risk in a UK context	Taking into account the information within this table the Dutch approach is considered likely to be consistent with risk in a UK context given the similar climatic conditions, and the objective to evaluate asbestos in soil concentrations that give risk to minimal risk.
Appropriateness and applicability of thresholds or toxicological benchmarks.	See above for the air guideline values adopted by the Dutch methodology. Unlike the DIV for other substances, the DIV for asbestos is based on an asbestos fibre concentration in air associated with a 1 in 1,000,000 excess lifetime cancer risk, not the higher 1 in 10,000 risk normally used. Defra concluded in the development of the C4SLs that an ELCR of 1 in 100,000 should constitute minimal risk and an ELCR of 1 in 50,000 could be specified as "low risk" and be used as a generic level for all human genotoxic carcinogens.

A summary of criteria published by the Dutch Ministry of Housing, Spatial Planning and the Environment (VROM) is presented in **Table 15** below. The relevant criterion is 0.01%wt/wt for friable asbestos (relevant to the chrysotile and amosite fibre bundles detected in the samples from Treadgold House where asbestos was identified: TH130 (0.6-0.7m), TH141 (0-0.05m), TH145 (0-0.05m), TH149 (0-0.05m), TH162 (0-0.05m), TH170 (0-0.05m), and GTCS2-S280 from Stage 2). No samples from Avondale Park Gardens identified asbestos. The additional requirement of the Dutch guidance is that the DIV is applied to the average soil concentration in an area up to 1000m^2.

Table 15. Dutch Asbestos in Soil Criteria

Criterion	Assessment Stage	Applicability
0.01% by weight	Tier 1	To be compared to the total concentration of serpentine asbestos (chrysotile) + 10 x concentration of amphibole asbestos (amosite and crocidolite) as an average concentration across an area up to 1000m^2. Designed to be protective of human health under all normal land-uses.
0.1%	Tier 2	To be compared to the concentration of serpentine asbestos (chrysotile) + 10 x concentration of amphibole asbestos (amosite and crocidolite) for non-friable asbestos e.g. fragments of asbestos cement

Criterion	Assessment Stage	Applicability
0.01% by weight	Tier 2	As above but for friable asbestos e.g. asbestos insulation materials, fibre bundles.
0.001% by weight	Tier 3	To be compared to counted respirable asbestos fibres only, and to be compared to the concentration of serpentine asbestos (chrysotile) + 10 x concentration of amphibole asbestos (amosite and crocidolite)

Source: VROM Soil Remediation Circular, 2013

5.1.5 GSC and SSAC for lead from Stage 2

The approach for this report will firstly be to screen the new data against the GSC and previously derived SSACs from Stage 2 (SSAC are available for lead and BaP). These cover the two land use scenarios defined in **Section 5.1.1**. The SSAC that were derived at Stage 2 are considered to be suitable as initial screening criteria as part of the GQRA for the additional data from Treadgold House and Avondale Park Gardens. Stage 2 SSAC were derived separately for Treadgold House and Avondale Park Gardens, although the SSAC derived based on the POSresi land-use scenario were the same for both investigation areas. In the context of this report they are considered to be generic as they have not been modified from the values derived previously, although interpretation of exceedances of the SSAC has been adjusted based on the aims of their derivation. The approach at Stage 2 was to calculate site-specific assessment criteria (SSAC) using the same methods used to derive the C4SLs, but making adjustments to exposure assumptions and parameters based on site specific information, as well as adjusting exposure assumptions based on evolving evidence that has been published since the CLEA guidance and C4SL reports. The Stage 2 DQRA was completed in two steps:

Step 1

- Step 1 comprised the calculation of SSAC where site specific information was used to refine the exposure assessment whilst retaining a low level of risk consistent with Category 4 land (i.e. the precautionary nature of the exposure and toxicological assumptions remained largely unchanged). Step 1 also involved adjustment of the soil ingestion rate based on guidance published by the US EPA in 2017 (US EPA, 2017). This constituted a refinement based on the update of the original documentation reviewed when the Environment Agency and CL:AIRE/Defra selected an appropriate soil ingestion rate for the original CLEA guidance and C4SL derivation.
- In the context of the Stage 2 report, the Step 1 SSAC defined a level of risk that is closer to the Category 4 / Category 3 boundary such that soil concentrations equal to or below the Step 1 SSAC would fall into Category 4, but soil concentrations exceeding the Step 1 SSAC would be less likely to fall into Category 4.

Step 2

- Where soil concentrations exceeded the Step 1 SSAC, these sampling areas were taken forwards to Step 2 which involved the calculation of SSAC that were associated with a higher (i.e. not low) level of risk. This step involved the adoption of alternative exposure assumptions and alternative toxicological values.
- In the context of the Stage 2 report, the Step 2 SSAC defined a level of risk approaching that that could be considered to pose a significant possibility of significant harm. They were intended to provide an indication of where the threshold between Category 2 and Category 3 could be, although this decision must also be weighed against the strength of the evidence, remaining uncertainty and other considerations to be made by the local authority, as described in Paragraphs 4.24 to 4.29 of the Part 2A Statutory Guidance. As such they represent screening values and are not red line values for making final decisions on Part 2A land categories.

The Stage 2 Step 1 SSAC have been used for this GQRA as screening criteria to help place linkages into Category 4 where average concentrations representative of receptor exposure are below these values.

The Stage 2 Step 2 SSAC have not been used to ‘screen out’ any linkages but have been used to assist with the discussion of the likely significance of the reported concentrations where they exceed the Step 1 SSAC.

A summary of the GSC and SSAC to be used are listed in **Table 16** below. Reference should be made to the Stage 2 report for full details of the parameters used for the derived SSAC.

Table 16. Assessment Criteria for Lead from Grenfell Stage 2 Report

Assessment Criteria for Resi-HP & POSresi from Grenfell Stage 2 Report	Site	Value (mg/kg)
GSC Resi-HP	TH	310
SSAC Resi-HP Step 1	TH	357
SSAC Resi-HP Step 2	TH	535
SSAC Resi-HP Step 2 (reduced SIR)	TH	737
GSC POSresi	TH & APG	630
SSAC POSresi Step 1	TH & APG	710
SSAC POSresi Step 2	TH & APG	1070
SSAC POSresi Step 2 (reduced SIR)	TH & APG	1420

Notes:
SIR = soil ingestion rate

5.2 Data Comparison with GSC and NBC

To compare data against each assessment criterion, AECOM has considered the use of the recent CL:AIRE 2020 statistical guidance (Marriott, 2020) as this is the most recent UK-based guidance designed for comparing soil concentrations with critical concentrations. This guidance requires the soil dataset being investigated to satisfy a number of conditions for the use of this statistical assessment to be strictly valid. This includes four main areas: development of a CSM (with particular attention paid to whether the entire area, or receptor based averaging areas are being assessed statistically); simple random, stratified random or stratified systematic sampling adopted; no composite sampling; and data QA including how to deal with non-detects.

These conditions for using the guidance have been met given that the Site Investigation Design (included in Appendix B) used a CSM (summarised in Section 3 of this report) to develop a stratified systematic sampling strategy, with no composite sampling, that would be suitable for statistical assessment of different receptor averaging areas. Data QA demonstrating suitability of the results for interpretation is included in Section 4.7.1 and there are no non-detect results within the datasets assessed statistically in this report.

Whilst the full data-set is not suitable for statistical interpretation due to the presence of some clustered samples and samples collected from varying depths that may not be the same material, sub-sets of the complete data-set have been created as described in the bullet points below to make the average concentrations discussed applicable to average exposure. The main adjustments that have been made include:

- Samples clustered around previous Stage 2 samples have been excluded from the statistical analysis, with only the original Stage 2 sample concentration used. This is discussed further in Section 4.7.4. In order to assess the potential significance of the exclusion of these samples on the data interpretation, datasets including these values have also been presented (on the basis that the clustered samples were all higher than the Stage 2 samples).
- The datasets have been broken down into depth horizons which are generally representative of similar soil types based on field observations. In both sampling areas, the samples from the 0-0.05m depth interval (including Stage 2 samples from 0-0.02m depth) and the 0.1-0.2m depth interval were generally recorded as being a similar soil type and therefore these samples have been grouped together into a single data-set. However, this dataset has been further sub-divided into the 0-0.05m interval and the 0.1-0.2m depth interval to evaluate potential differences with depth that are not apparent based on visual observations.
- The discussion within this section provides information related to outliers in the evaluated datasets: these have been identified using Rosner's or Dixon's outlier tests. Normality testing has indicated that all evaluated datasets (with the exception of barium as described below) were unlikely to be normally distributed, (with a less than 5% probability that the underlying population is normally distributed). Without a detailed interrogation of each of the higher concentrations that could be potential outliers (or could be part of the same data population), a commonly adopted method to easily compare right-skewed datasets is to compare the median (50th percentile) rather than the arithmetic mean; the median is less affected by the most extreme high concentrations in the right-skewed dataset. Datasets with a large difference between the mean and median are likely to be more right-skewed than those with similar values for the mean and median. This approach is adopted in the data assessment below and is discussed for each dataset where

appropriate. For the barium datasets with normal distributions, the arithmetic mean concentrations have been used as the appropriate average concentration. In addition to using the median as recommended by the statistical guidance (Marriott, 2020), geometric mean concentrations have also been considered and are included in the discussion below.

Decisions within Part 2A are typically made 'on the balance of probabilities' and therefore the comparison of soil concentrations with GSC uses average concentrations including median, arithmetic mean and geometric mean rather than upper or lower confidence limits or confidence intervals.

In the discussions below, datasets of varying sizes are evaluated depending on the averaging area. For physically smaller averaging areas there are typically fewer samples and therefore uncertainty associated with the average concentration is likely to be higher. For example at Treadgold House the uncertainty associated with average concentrations in the separate Plot 1 to 10 averaging areas is likely to be higher than the uncertainty in average concentrations for the full Treadgold House investigation area. Similarly for deeper soil horizons fewer samples were collected than in the shallowest horizon of 0-0.05m and therefore the uncertainty associated with average concentrations for the deeper soils is also likely to be higher.

5.2.1 Treadgold House

As discussed in **Sections 3.2.2 and 5.1.1**, the gardens at Treadgold House are accessed predominantly by a limited number of adult residents on a regular basis, with possible use by children, that is likely to be infrequent.

Therefore the chosen criteria are generally deemed appropriate for initial screening, because the criteria assume frequent child exposure which is precautionary compared to frequent adult exposure and/or infrequent child exposure.

This section summarises the data comparison for Treadgold House to GSC and Stage 2 SSAC applicable to the specific land-use. The discussion includes screening of the new data as well as the relevant samples from the Stage 2 dataset (GTCS2-S274, GTCS2-S275, GTCS2-S279 and GTCS2-S280). A summary of the exceedances is presented in **Table 17** (excluding lead – covered in **Section 5.2.1.3**)**,** and the full dataset is presented alongside the applicable GSC (which indicates the GSC source) in the GSC screening tables presented in **Appendix G** as **Table G1**.

Table 17. GSC Exceedances for Treadgold House (excluding lead)

Analytical Suite	Summary of Exceedances	GSC (Resi-HP, sandy loam >3.48% TOC)	Maximum concentration
Asbestos	Detected in 7 samples out of 79 screened	0.01%	<0.001%*
Metals (excluding lead)	Arsenic (17 exceedances out of 36)	40 mg/kg	109.8 mg/kg
	Barium (4 exceedances out of 23)	1300 mg/kg	2009 mg/kg
	Beryllium (23 exceedances out of 23)	1.7 mg/kg	9.8 mg/kg

Notes:

* Duplicate of sample TH149 (DUP07) at 0-0.05m bgl detected a concentration of 0.003% asbestos.

5.2.1.1 Asbestos

For asbestos, although detected in seven samples, all reported concentrations were below the quantification limit of 0.001%, except for the duplicate of sample TH149 at 0-0.05m bgl (0.003% of chrysotile fibre bundles). The health risk from exposure to asbestos in soil at concentrations below the GSC is minimal. Detection of asbestos fibres is expected in urban background, and the assessment of health risk from the asbestos that has been detected has been classified as low (as below the Dutch Tier 2 value of 0.01%), therefore it is considered that human health CLs associated with asbestos from samples taken at Treadgold House would meet the definition of Category 4 land.

5.2.1.2 Metals (excluding lead)

For arsenic, the concentration in 17 samples exceeds the GSC. **Table 18** below summarises the arsenic data in more detail, and shows the concentration ranges by depth. Arsenic in soil concentrations at Treadgold House are shown graphically on **Figures A11** and A**12** in **Appendix A. Figure A11** shows the concentrations in soil in the 0-0.05m depth interval, **Figure A12** shows the concentrations in soil in the 0.1-0.2m depth interval.

Table 18. Arsenic Exceedances for Treadgold House per depth

	Number of results	GSC (sandy loam >3.48% TOC)	Minimum (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum (mg/kg)	Number of exceedances
All samples	36	Resi-HP = 40mg/kg POSresi = 79mg/kg	14.2	40	38.9	44	109.8	17
0-0.05m	22		16.3	44	41.5	45	89.8	14
0.1-0.2m	5		29	64	57.4	65	109.8	3
0.3-0.4m	4		30.7	34	34.5	35	39.9	0
0.6-0.7m	4		14.2	26	23.0	24	31.3	0
1.1-1.2m	1		16.9	-	-	-	16.9	0

The reported mean, geometric mean and median arsenic concentrations for the shallowest sample depths (0-0.05m, 0.1-0.2m) all exceed the Resi-HP GSC but are all lower than the POSresi GSC. All samples in the depth horizons below 0.1-0.2m have concentrations below the Resi-HP and POSresi GSC. The statistical outlier test did not identify any outliers within the 0-0.05m depth dataset, the 0.1-.2m depth dataset, or the combined 0-0.05m and 0.1-0.2m datasets.

Review of **Figure A11** and **Figure A12** indicates that the three highest arsenic concentrations of 81.3mg/kg, 89.8mg/kg and 109.8mg/kg are located in the grassed area of Plot 4, Plot 5 and Plot 6. This area is discussed further in Section 5.2.1.4. Although lower concentrations were reported in the flower beds at the southern end of these plots (the lower concentrations in soil beds could be due to long-term addition of compost or mulch in these areas, although this is uncertain), it is possible that residents of these properties may be exposed to slightly higher average soil concentrations than the site-wide calculated averages. The data collected for arsenic give an overall indication of the concentrations in soils at Treadgold House, however more localised patterns cannot be identified in the same way as may be possible for lead given the reduced density of analytical results.

On this basis it is reasonable to use the average concentrations presented in Table 18 above for risk evaluation purposes, with a sensitivity check carried out to assess the significance of the potentially slightly higher concentrations in the grassed area outside Plots 4, 5 and 6. Further discussion of the significance of the arsenic GSC exceedances is included in **Section 5.2.1.4**.

For barium, the concentration in four samples exceeds the GSC. **Table 19** below summarises the barium data in more detail, and shows the concentration ranges by depth. Barium in soil concentrations at Treadgold House are shown graphically on **Figures A13** and A**14** in **Appendix A. Figure A13** shows the concentrations in soil in the 0-0.05m depth interval, **Figure A14** shows the concentrations in soil in the 0.1-0.2m depth interval.

Table 19. Barium Exceedances for Treadgold House per depth

	Number of results	GSC (Resi-HP, sandy loam >3.48% TOC)	Minimum (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)	Number of exceedances
All samples	23	1300 mg/kg	119	676	625	781	2009	4
0-0.05m	9		389	803	790	879	1654	1
0.1-0.2m	5		676	1361	1,220	1304	2009	3
0.3-0.4m	4		411	487	508	517	681	0
0.6-0.7m	4		125	381	299	335	452	0
1.1-1.2m	1		119	-	-	-	119	0

The reported mean, geometric mean and median barium concentrations for the different sample depths do not exceed the GSC apart from the mean and median for the 0.1-0.2m bgl depth dataset. However, exposure will be primarily to the shallowest soils, with potentially a small contribution from the 0.1-0.2m depth horizon. When the 0-0.05m and 0.1-0.2m bgl depth samples are combined in a single dataset the mean, geometric mean and median concentrations (1,031mg/kg 643mg/kg and 990mg/kg respectively) are below the Resi-HP GSC. The statistical outlier test did not identify any outliers within the 0-0.05m depth dataset, the 0.1-0.2m depth dataset, or the combined 0-0.05m and 0.1-0.2m datasets. A dataset normality test indicated that the 0-0.05m dataset, 0.1-0.2m dataset and the dataset combining these depths together, all follow a normal distribution (at 5% significance). Hence the mean concentration is likely to be most suitable for assessing average exposure. On this basis it is reasonable to use the average concentrations presented in Table 19 above for risk evaluation purposes.

Review of **Figure A13** and **Figure A14** indicates that three of the four highest barium concentrations which exceed the GSC are located in the grassed area of Plot 3, Plot 4 and Plot 5. Although lower concentrations were reported in the flower beds at the southern end of these plots, it is possible that residents of these properties may be exposed to slightly higher average soil concentrations than the site-wide calculated averages. Since this pattern is also similar to that described above for arsenic, this cluster of samples has been considered further and is discussed in Section 5.2.1.4. The data collected for barium give an overall indication of the concentrations in soils at Treadgold House, however more localised patterns cannot be identified in the same way as may be possible for lead given the reduced density of analytical results.

Further discussion of the significance of the barium GSC exceedances, including a sensitivity check to assess the significance of the potentially slightly higher concentrations in the grassed area outside Plots 3, 4 and 5, is included in **Section 5.2.1.4**.

For beryllium, the concentration in all samples exceeded the GSC. **Table 20** below summarises the beryllium data in more detail, and shows the concentration ranges by depth. Beryllium in soil concentrations at Treadgold House are shown graphically on **Figures A15** and A**16** in **Appendix A. Figure A15** shows the concentrations in soil in the 0-0.05m depth interval, **Figure A16** shows the concentrations in soil in the 0.1-0.2m depth interval.

Table 20. Beryllium Exceedances for Treadgold House per depth

	Number of results	GSC (sandy loam >3.48% TOC)	Minimum (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)	Number of exceedances
All samples	23	Resi-HP GSC = 1.7 mg/kg POSresi GSC = 2.2 mg/kg	2.0	2.9	3.5	3.9	9.8	23
0-0.05m	9		2.0	3.5	3.6	4.0	8.2	9
0.1-0.2m	5		2.3	4.9	4.9	5.6	9.8	5
0-0.05m and 0.1-0.2m	14		2.0	3.8	4.0	4.6	9.8	14
0.3-0.4m	4		2.3	2.5	2.7	2.8	3.7	4
0.6-0.7m	4		2.3	2.6	2.9	3.1	4.8	4
1.1-1.2m	1		2.5	-	-	-	2.5	1

The reported mean, geometric mean and median concentrations for the different sample depths all exceed the GSC. The higher soil concentrations appear to be in the shallower samples and when the 0-0.05m and 0.1-0.2m depth samples are combined into a single dataset the mean, geometric mean and median concentrations (4.6mg/kg, 4.0mg/kg and 3.8mg/kg respectively) exceed the Resi-HP GSC by between two and three times (the POSresi GSC was exceeded by approximately two times). The statistical outlier test did not identify any outliers within the combined 0-0.05m and 0.1-0.2m datasets at a 1% significance level and this dataset was indicated to be non-normally distributed, indicating that the median or geometric mean may be more appropriate averages to use for the assessment than the arithmetic mean. On this basis it is reasonable to use the average concentrations presented in Table 20 above for risk evaluation purposes.

Review of **Figure A15** and **Figure A16** indicates that the three highest beryllium concentrations (7.4mg/kg, 8.2mg/kg and 9.8mg/kg) are located in the grassed area of Plot 3, Plot 4 and Plot 5; this pattern is similar to that observed for arsenic and barium. Although lower concentrations were reported in the flower beds at the southern end of these plots, it is possible that residents of these properties may be exposed to slightly higher average soil concentrations than the site-wide calculated averages. This cluster of samples has been considered further in Section 5.2.1.4 to assess the significance of the potentially slightly higher concentrations. The data collected for beryllium give an overall indication of the concentrations in soils at Treadgold House, however more localised patterns cannot be identified in the same way as may be possible for lead given the reduced density of analytical results.

A box and whisker plot showing the beryllium concentrations at Treadgold House is included in **Figure 3** below. The box and whisker plot shows individual sample concentrations (filled circles), the minimum value (lower whisker – excludes outliers[4]), the maximum value (upper whisker – excludes outliers), 25th and 75th percentiles (lower and upper boundaries of the box), median (horizontal line through box), and arithmetic mean (cross). These plots provide a simple way to visually compare different datasets to help identify differences in the different datasets and demonstrate the right skewed nature of the datasets.

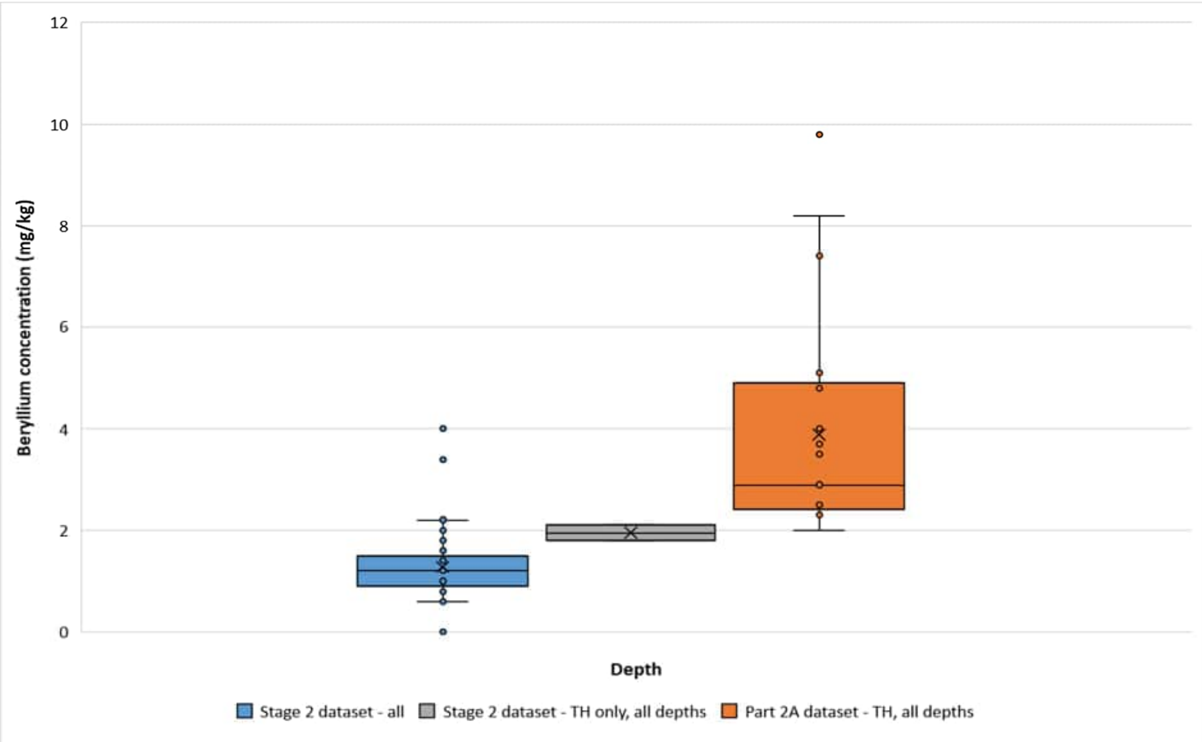

Figure 3 – Box and whisker plot showing the beryllium concentrations at Treadgold House (TH) compared to the Stage 2 Environmental Checks dataset (data from the 2021 Part 2A investigation sampling shown in orange)

The concentrations in soil at Treadgold House appear to be noticeably higher than the concentrations in soil that were reported during the Stage 2 Environmental Checks sampling. This may indicate that beryllium concentrations in the investigation area are above what might be considered normal background levels.

Further discussion of the significance of the beryllium GSC exceedances is included in **Section 5.2.1.4**.

5.2.1.3 Lead

Table 21 summarises the exceedances for lead when compared to the GSC and the Step 1 and Step 2 SSAC from the Grenfell Stage 2 investigation for both Resi-HP and POSresi land uses, for comparison. As described in Section 5.1.5, the Stage 2 Step 1 SSAC have been used as screening criteria to decide whether land could fall into Category 4. However, the Stage 2 Step 2 SSAC have been used only to provide an indication of the potential significance of the exceedances of the Stage 2 Step 1 SSAC, they have not been used as a screening tool to exclude data from the DQRA described in Section 6.

[4] The **Excel** box and whisker plot function considers any data value to be an "**outlier**" if it is 1.5 times the inter-quartile range (IQR) larger than the third quartile or 1.5 times the IQR smaller than the first quartile.

Lead in soil concentrations at Treadgold House are shown graphically on **Figures A4, A5, A6** and A**7** in **Appendix A.** **Figure A4** shows the concentrations in soil in the 0-0.05m depth interval, **Figure A5** shows the concentrations in soil in the 0.1-0.2m depth interval, **Figure A6** shows the concentrations in soil in the 0.3-0.4m depth interval, and **Figure A7** shows the concentrations in soils for the 0.6-0.7m depth interval.

Table 21. Lead Exceedances for Treadgold House per depth

	Number of results	Minimum (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum (mg/kg)	Number of exceedances GSC Resi-HP 310 mg/kg	Number of exceedances Stage 2 Step 1 SSAC Resi-HP 357 mg/kg	Number of exceedances Stage 2 Step 2 SSAC Resi-HP 737 mg/kg	Number of exceedances GSC POSresi 630 mg/kg	Number of exceedances Stage 2 Step 1 SSAC POSresi 710 mg/kg	Number of exceedances Stage 2 Step 2 SSAC POSresi 1420 mg/kg
All samples	201	148	1381	1334	1810	38490	195	193	160	174	162	95
0-0.02m & 0-0.05m	94	233	1396	1320	1515	6230	93	91	82	87	83	45
0.1-0.2m	66	148	1745	1825	2934	38490	64	64	58	61	58	44
0.3-0.4m	27	309	1090	1059	1829	20630	26	26	17	21	17	6
0.6-0.7m	13	150	541	508	596	1233	11	11	3	5	4	0
1.1-1.2m	1	507	N/A	N/A	N/A	507	1	1	0	0	0	0

For lead, the data were screened against the GSC and the Stage 2 Step 1 SSAC, as well as the least conservative Step 2 SSAC derived in the Stage 2 investigation report. Initially, the samples were grouped by depth, and then averages for each depth were calculated. When compared to the GSC, the average lead concentrations (mean, geometric mean and median) for each sample depth down to 0.4mbgl all exceed the criteria for both the Resi-HP and POSresi land uses. For samples below 0.4mbgl, the average lead concentrations (mean and median) for these datasets do not exceed for the GSC for the POSresi land use, however do exceed the GSC for the Resi-HP criteria. The same outcome occurs when the average lead concentrations are compared to the Stage 2 Step 1 SSAC (i.e. the three averages all exceed the POSresi and Resi-HP criteria down to depths of 0.4mbgl, but the averages only exceed the Resi-HP criterion at the 0.6-0.7m depth). These exceedances are discussed in more detail in **Section 5.2.1.3.1**.

Review of **Figure A4** suggests that there could be a higher frequency of the higher lead concentrations in soil at 0-0.05m depth in the soils within Plots 3, 4, 5 and 6: this observation is strengthened by similar patterns for arsenic, barium and beryllium. The pattern is less obvious on **Figure A5** at the 0.1-0.2m depth horizon, with the highest concentrations (red and dark orange highlighted locations) appearing more widely distributed throughout the entire investigation area. The potential significance of an averaging zone with higher lead concentrations in the vicinity of Plots 3, 4, 5 and 6 is considered alongside the plot-specific breakdowns in the discussion below.

A box and whisker plot showing the lead concentrations at Treadgold House is included in **Figure 4** below. The box and whisker plot shows individual sample concentrations (filled circles), the minimum value (lower whisker – excludes outliers[5]), the maximum value (upper whisker – excludes outliers[5]), 25th and 75th percentiles (lower and upper boundaries of the box), median (horizontal line through box), and arithmetic mean (cross). These plots provide a simple way to visually compare different datasets to help identify differences in the different datasets and demonstrate the right skewed nature of the datasets. A statistical evaluation of all the Treadgold House datasets shown in **Figure 4** indicate that there is strong evidence that the data distributions are not normal i.e. there is less than a 5% chance that the datasets follow a normal distribution.

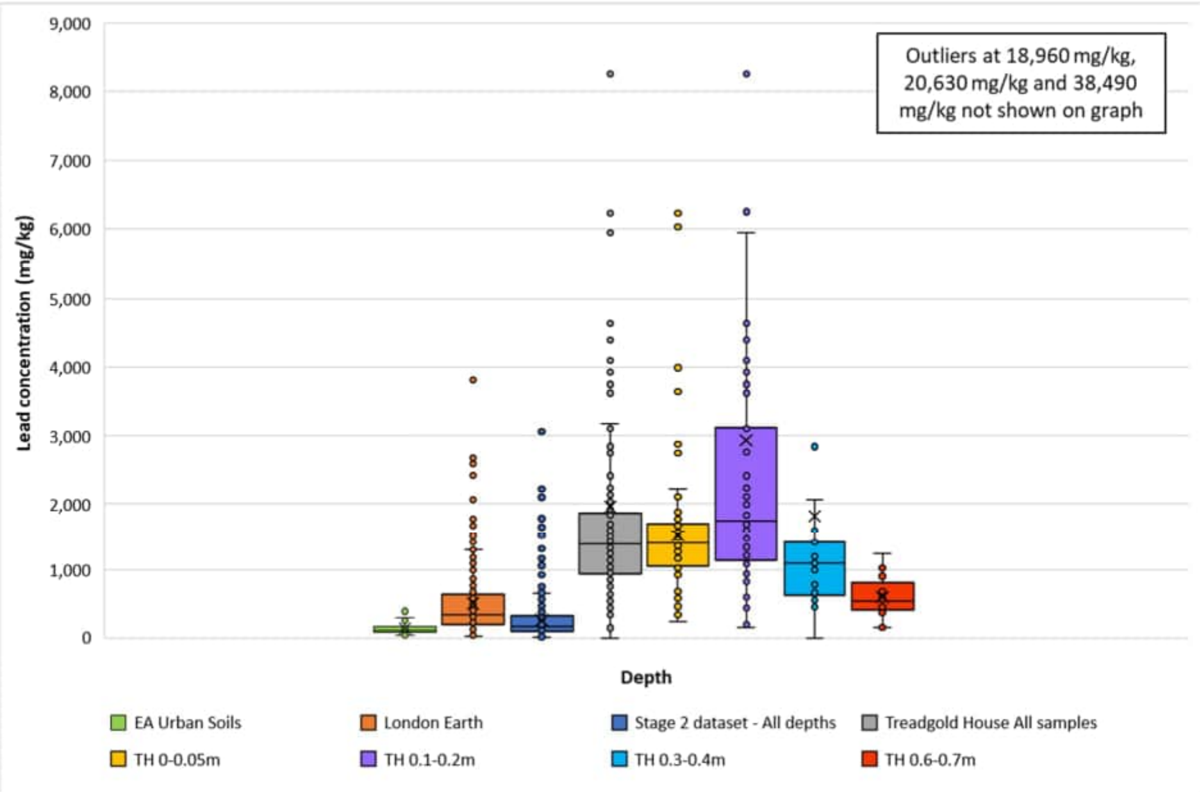

Figure 4 – Box and whisker plot showing the lead concentrations at Treadgold House (TH) investigation area compared to EA Urban Soils and London Earth background datasets and the Stage 2 Environmental Checks dataset

[5] The **Excel** box and whisker plot function considers any data value to be an "**outlier**" if it is 1.5 times the inter-quartile range (IQR) larger than the third quartile or 1.5 times the IQR smaller than the first quartile.

The box and whisker plot for Treadgold House shows that lead concentrations are generally higher (particularly for the shallower datasets) than the London Earth (British Geological Survey, 2010) and EA Urban Soils (Agency, 2007) datasets. The concentrations are also higher than the Stage 2 results. Soil concentrations at Treadgold House are also generally above the NBC of 820mg/kg, which was defined as the 95% upper confidence limit of the 95th percentile of background data within the urban domain, and as such is regarded as an upper threshold value for the urban domain. The data comparison with the various background sources shown in **Figure A4** and summarised above suggests that lead in soil at Treadgold House is present at concentrations considerably higher than the typical urban background, both locally and nationally. This indicates that the land cannot be placed immediately into Category 4, but that further risk-based assessment is required to decide what Category the land falls into. One aim of the intrusive investigation was to determine whether the deeper fill / Made Ground at the site related to infilling of the old brickfield footprint could represent a source for the elevated lead concentrations. However, based on the samples collected, the average (mean and median) lead concentrations for the sample depths below 0.4mbgl are all lower than the averages for the shallower sample depths. The sample depth dataset with the highest concentrations is 0.1-0.2mbgl, which supports the conclusions from the Stage 2 report that the contamination at the site is not linked to the Grenfell Tower fire (samples at 0-0.05m might be expected to be highest if it were), and also suggests that the contamination is not related to the deeper Made Ground encountered between 0.4m and 1.2m bgl. Although the Made Ground at 0.4 – 1.2m bgl might not be representative of the fill from deeper historic brickworks excavations; the fact that this horizon exists with concentrations apparently lower than the overlying topsoil suggests that the topsoil has been placed more recently as part of landscaping. This shallow topsoil could not have been impacted with high lead concentrations by mixing from deeper fill given the presence of this intervening layer of Made Ground.

The soil to which the residents and users of the gardens would have greatest exposure to would be at the shallowest depths, and therefore the greatest risk is considered to be from the soils located within the top 0.2mbgl. It is noted that for these depths, the averages (mean and median) all exceed the Resi-HP assessment criteria (including the least conservative Step 2 SSAC derived at Stage 2, of 737 mg/kg) and both averages exceed the least conservative POSresi Step 2 SSAC derived at Stage 2, of 1420 mg/kg. In addition to this, comparison of the data to the NBC background value for lead of 820mg/kg (for urban soils – as detailed in **Section 2.5**) indicates that the mean and median lead concentrations calculated here (for datasets shallower than 0.4mbgl) exceed that which might be expected for an urban environment. Since the NBC is defined as an upper threshold value for the urban environment (England-wide), its exceedance by mean and median concentrations suggests that the concentrations at Treadgold House are unusually elevated. Further detailed assessment is therefore required to assess the risk to residents from lead in soils at Treadgold House.

Soils / Made Ground at depths of 0.3m and deeper appear to have lower concentrations than the soils in the upper 0.2m, although there is more uncertainty associated with average concentrations in the deeper horizons as fewer samples were collected. However the Made Ground deeper than 0.2m was often more compacted and dense, and difficult to excavate using hand tools, and therefore it would be less likely that residents or maintenance workers would have exposure to this material. This reduced accessibility and likelihood of exposure offsets the uncertainty associated with a smaller number of samples.

5.2.1.3.1 Treadgold House Averaging Areas

The data for Treadgold House were split into plots corresponding to the individual ground floor flats which have direct access to the gated communal garden. It is considered that the greatest risk to residents is from the shallowest soil represented by samples from depths of 0-0.02m, 0-0.05m and 0.1-0.2m depth. The data is summarised in **Table 22**, and the plot areas are shown on **Figure A2** in **Appendix A**. **Table C1** (**Appendix C**) lists the samples and their corresponding ‘Plot’ number, for the purposes of statistical calculations.

Plots 1 to 6 correspond to ground floor studio flats which have formal direct access onto the communal garden (southern part). Plots 7 to 10 also correspond to ground floor flats, however these have closed ground level ‘balconies’, and do not have formal direct access onto the communal garden (western part). However, as discussed previously, there is evidence that residents from these flats use the communal garden space, and barrier between Flat 9 and the garden has been removed to allow more ready access.

- The majority of samples are included within one of the ‘Plot’ areas, with the following exceptions:GTCS2-S275, TH111, TH112 and TH113 – these four samples have been included within both Plot 8 and 9, as the samples sit on the boundary;
- TH121 – this is excluded from any of the ‘plot’ areas due to its location away from either a ground floor door access or ‘balcony’;

- TH169 – this is excluded from any of the 'plot' areas due to its location away from either a ground floor door access or 'balcony';
- TH170 – although close to the boundary of Plot 6, this location is situated behind some screening and pots which have been placed by the resident, therefore is less readily accessible by someone using the access from Flat 6.

Comparison of the average concentrations presented in Table 22 with GSC and SSAC from the Stage 2 report is provided below the table. It is noted that with the data broken down in this manner the individual datasets are relatively small and there is therefore a higher degree of uncertainty associated with the average concentrations than for the larger site-wide dataset. For this reason the median, geometric mean and arithmetic mean are all presented to provide a range of possible average concentrations that could be representative for exposure.

Table 22. Lead Exceedances for Treadgold House per Plot

	Depths Ranges (m)	Number of results	Minimum detection (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)
All samples – Treadgold House	0-0.02/0-0.05m, 0.1-0.2m, 0.3-0.4, 0.6-0.7 & 1.1-1.2	201	148	1,381	1,334	1,959	38,490
Plot 1	0-0.05	5	233	925	778	927	1,489
	0.1-0.2	5	148	1,997	1,911	8,774	38,490
	0-0.05 and 0.1-0.2	10	148	1,158	1,334	4,850	38,490
	0.3-0.4	1	-	-	-	-	451
	0.6-0.7	1	-	-	-	-	469
	All	12	148	965	1,036	4,119	38,490
Plot 2	0-0.05	6	1,068	1,586	1,536	1,563	1,941
	0.1-0.2	5	1,329	1,738	2,388	2,836	6,245
	0-0.05 and 0.1-0.2	11	1,068	1,700	1,805	2,141	6,245
	0.3-0.4	2	1,090	1,140	1,138	1,140	1,189
	0.6-0.7	1	-	-	-	-	715
	All	14	715	1,586	1,631	1,896	6,245
Plot 3	0-0.05	7	926	1,415	1,586	1,974	6,029
	0.1-0.2	7	995	2,119	2,169	2,411	3,752
	0-0.05 and 0.1-0.2	14	926	1,589	1,665	2,193	6,029
	0.3-0.4	1	-	-	-	-	1,095
	0.6-0.7	1	-	-	-	-	903
	All	16	903	2,365	1,716	2,044	6,029
Plot 4 – with cluster samples (TH148, TH149 and TH150)	0-0.05	11	584	1,432	1,507	1,673	3,996
	0.1-0.2	9	596	1,766	1,501	1,652	2,434
	0-0.05 and 0.1-0.2	20	584	1,647	1,421	1,664	3,996
	0.3-0.4	2	634	1,738	1,342	1,738	2,841
	0.6-0.7	1	-	-	-	-	685
	All	23	584	1,616	1,439	1,628	3,996
Plot 4 – without cluster samples (TH148, TH149 and TH150)	0-0.05	8	584	1,395	1,466	1,685	3,996
	0.1-0.2	6	596	1,684	1,264	1,414	2,107
	0-0.05 and 0.1-0.2	14	584	1,454	1,376	1,569	3,996
	0.3-0.4	2	634	1,738	1,342	1,738	2,841
	0.6-0.7	1	-	-	-	-	685
	All	17	584	1,432	1,316	1,537	3,996

	Depths Ranges (m)	Number of results	Minimum detection (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)
Plot 5 – with cluster samples (TH131, TH132 and TH136)	0-0.05 & 0-0.02	11	717	1,615	1,491	1,576	2,766
	0.1-0.2	10	994	2,524	2,345	2,809	5,942
	0-0.05 and 0.1-0.2	21	717	1,736	1,590	2,163	5,942
	0.3-0.4	1	-	-	-	-	1,649
	0.6-0.7	1	-	-	-	-	541
	All	23	541	1,692	1,745	2,070	5,942
Plot 5 – without cluster samples (TH131, TH132 and TH136)	0-0.05 & 0-0.02	8	717	1,392	1,410	1,517	2,766
	0.1-0.2	7	994	1,876	2,070	2,568	5,942
	0-0.05 and 0.1-0.2	15	717	1,398	1,687	2,007	5,942
	0.3-0.4	1	-	-	-	-	1,649
	0.6-0.7	1	-	-	-	-	541
	All	17	541	1,398	1,576	1,900	5,942
Plot 6	0-0.05	9	758	1,557	1,679	2,017	6,230
	0.1-0.2	9	661	1,508	1,538	1,755	4,405
	0-0.05 and 0.1-0.2	18	661	1,542	1,559	1,886	6,230
	0.3-0.4	3	526	638	659	673	854
	0.6-0.7	1	-	-	-	-	575
	All	22	526	1,454	1,358	1,661	6,231
Plot 3 to Plot 6 combined (without cluster samples)	0-0.05	32	584	1,424	1,535	1,800	6,230
	0.1-0.2	29	596	1,722	1,724	2,039	5,942
	0-0.05 and 0.1-0.2	61	584	1,508	1,622	1,913	6,230
Plot 7	0-0.05	7	342	1,260	1,182	1,335	2,148
	0.1-0.2	4	192	2,469	1,437	2,206	3,693
	0-0.05 and 0.1-0.2	11	192	1,515	1,209	1,651	3,693
	0.3-0.4	4	550	1,229	1,145	1,269	2,069
	0.6-0.7	1	-	-	-	-	456
	All	16	192	1,257	1,160	1,481	3,693
Plot 8 – with cluster samples (TH111, TH112 and TH113)	0-0.05 & 0-0.02	14	754	1,408	1,373	1,428	2,103
	0.1-0.2	6	935	1,540	1,889	2,220	4,102
	0-0.05 and 0.1-0.2	20	754	1,448	1,563	1,665	4,102
	0.3-0.4	3	1,240	1,407	1,412	1,420	1,612
	0.6-0.7	1	-	-	-	-	1,233
	All	24	754	1,415	1,485	1,617	4,102
Plot 8 – without cluster samples (TH111, TH112 and TH113)	0-0.05 & 0-0.02	11	754	1,525	1,460	1,516	2,103
	0.1-0.2	3	1,473	1,606	2,133	2,394	4,102
	0-0.05 and 0.1-0.2	14	754	1,541	1,584	1,704	4,102
	0.3-0.4	3	1,240	1,407	1,412	1,420	1,612
	0.6-0.7	1	-	-	-	-	1,233
	All	18	754	1,499	1,532	1,631	4,102
Plot 9 – with cluster samples	0-0.05	10	426	1,027	973	1,130	2,871
	0.1-0.2	4	935	4,839	3,182	7,478	18,960

	Depths Ranges (m)	Number of results	Minimum detection (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)
(TH111, TH112 and TH113)	0-0.05 and 0.1-0.2	14	426	1,186	1,435	2,944	18,960
	0.3-0.4	3	991	2,870	3,886	8,164	20,630
	0.6-0.7	1	-	-	-	-	483
	All	23	426	1,186	1,541	3,677	20,630
Plot 9 – without cluster samples (TH111, TH112 and TH113)	0-0.05	9	426	1,042	934	1,142	2,871
	0.1-0.2	3	1,418	8,259	6,055	9,546	18,960
	0-0.05 and 0.1-0.2	12	426	1,259	1,490	3,243	18,960
	0.3-0.4	3	991	2,870	3,886	8,164	20,630
	0.6-0.7	1	-	-	-	-	483
	All	16	426	1,259	1,662	3,993	20,630
Plot 10 – with cluster samples (TH105, TH106 and TH107)	0-0.05 & 0-0.02	12	340	1,295	1,108	1,243	2,748
	0.1-0.2	6	441	899	949	1,125	2,412
	0-0.05 and 0.1-0.2	18	340	1,226	1,247	1,203	2,748
	0.3-0.4	4	309	506	471	488	630
	0.6-0.7	2	150	152	151	152	153
	1.1-1.2	1	-	-	-	-	507
	All	25	150	676	770	977	2,748
Plot 10 – without cluster samples (TH105, TH106 and TH107)	0-0.05 & 0-0.02	9	340	1,168	1,041	1,211	2,748
	0.1-0.2	3	441	609	566	575	676
	0-0.05 and 0.1-0.2	12	340	874	894	1,052	2,748
	0.3-0.4	4	309	506	471	488	630
	0.6-0.7	2	150	152	151	152	153
	1.1-1.2	1	-	-	-	-	507
	All	19	150	630	629	810	2,748

Based on splitting the data into individual 'plots' associated with flats 1 to 6 (which have direct access onto the gated communal garden area) and flats 7 to 10 (which will not have long-term direct access onto the communal garden area), the calculated median, geometric mean and arithmetic mean concentrations for both the 0-0.05m depth and 0.1-0.2m depth datasets in each plot all exceed the GSC and Stage 2 Step 1 SSAC for both the Resi-HP and POSresi land-use scenarios. As all three averages for all shallow datasets exceed these GSC and Step 1 SSAC, there is a high degree of confidence in these exceedances.

It is noted that the average concentrations of the additional averaging zone covering Plot 3 to Plot 6 (inclusive) all also exceed the GSC and Stage 2 Step 1 SSAC for both land-use scenarios, although the exceedances are not markedly different in magnitude from the exceedances for the individual Plots 1 to 6 in this southern part of the communal garden. This holds if other averaging zones with possible clusters of higher lead concentrations are considered – such as Plots 1 to 3 combined, Plots 2 & 3 combined, or Plots 5 & 6 combined.

All of these calculated averages in the shallower 0-0.05m and 0.1-0.2m datasets (except Plot 10 without cluster samples at 0.1-0.2m depth) also exceed the Stage 2 Step 2 SSAC for the Resi-HP scenario, and many also exceed the Stage 2 Step 2 SSAC for the POSresi land-use. This indicates a potentially significant degree of exceedance of the GSC and Stage 2 Step 1 SSAC and therefore further assessment is required to determine the degree of risk to residents.

5.2.1.4 Part 2A Risk Evaluation

The soil sampling data from Treadgold House indicate that this site can be classified as Category 4 for most COPC based on the site averages being below the GSC. The exceptions to this are arsenic, beryllium and lead, which are discussed in further detail below. In addition, further discussion is provided in relation to barium for the area of potentially higher concentrations exceeding the GSC within the grassed areas of Plots 3, 4 and 5.

Arsenic

Average arsenic concentrations in soil very slightly exceeded the Resi-HP GSC but are approximately half of the POSresi GSC. For Plots 1 to 6 where adults are the residents of concern within a land-use scenario similar to Resi-HP, the marginal exceedances of the Resi-HP GSC (mean and median concentrations for 0-0.05m + 0.1-0.2m depth samples in Plots 1 to 6 combined are a factor of 1.2 above the GSC) are not considered to represent a risk beyond Category 4 given the lower sensitivity adults compared to the child receptors on which the GSC are based. The 1.2 factor exceedance is not considered to be significant in the context of the reduced sensitivity of the adult residents.

For children that may be residents in Flats 7 to 10 the land-use scenario is closer to POSresi than Resi-HP. This is supported by the Step 1 SSAC calculated for lead in Section 6.1, which describes a lower risk exposure scenario than the standard POSresi scenario (i.e. reduced exposure frequency); hence the POSresi land-use is precautionary in the context of child receptors at Treadgold House. Mean and median soil concentrations in the area covering Plots 7 to 10 combined are all lower than the POSresi GSC and therefore any linkages associated with arsenic and child residents are considered to be within Category 4.

Rosner's outlier test indicates that there are no outliers within the arsenic shallow soil dataset (0-0.05m + 0.1-0.2m depth samples) and therefore the average concentrations are reasonable to use for average exposure assessment. The non-normal nature of the dataset indicates that the median might be the most appropriate average, although because the mean and median are quite similar, there is no difference in the outcome or conclusions of assessment whether the mean or median is adopted.

Although no outliers were identified, an area of potentially slightly higher concentrations was observed in the area outside Plots 4, 5 and 6. As this area is outside the properties only occupied by adults, the resi-HP and POSresi GSC are overly precautionary for the GQRA. Setting up the CLEA model with the residential (lifetime exposure C4SL) land use and using the female residential C4SL receptor and adult C4SL HCVs (i.e. LLTCs for the adult receptor), a GSC of 360mg/kg was generated. This is approximately three times higher than the maximum arsenic concentration reported on site and therefore the risk to adult receptors in Plots 4, 5 and 6 is considered to meet the definition of Category 4 land, even considering the slightly higher concentrations reported in this area.

Beryllium

For beryllium, the risk driving pathway is the inhalation of dust indoors and a mean daily intake (for inhalation) of 0.0015µg/day has been applied to the derivation of the GSC (1.7mg/kg for Resi-HP land-use, 2.2mg/kg for POSresi land-use). If the MDI is removed from the calculation, a soil-only POSresi GSC of 4.4mg/kg is calculated. For the Resi-HP scenario, the soil-only GSC is 3.45mg/kg. This is the soil concentration at which intake (via inhalation) from soil sources is equal to the HCV of 5.7E-5µg/kg-bw/day. Taking the inhalation MDI of 1.5E-03µg/day published in the S4UL report (Nathanail, McCaffrey, Gillett, & Ogden, 2015) and adjusting for a child bodyweight of 20kg, the exposure from soil at soil concentrations around 4mg/kg is approximately 75% of the exposure from background air. In the context of Part 2A, the soil-only GSC are particularly relevant as Paragraph 4.21(d) of the Statutory Guidance states that land should be placed into Category 4 if the *"estimated levels of exposure to contaminants in soil are likely to form only a small proportion of what a receptor might be exposed to anyway through other sources of environmental exposure".* In this case the exposure from soil is smaller than the proportion from background: soil exposure is expected to be approximately 40-45% of the total exposure, with background exposure accounting for 55-60% of the exposure. Taking the principle of the Statutory Guidance, this suggests that the GSC including background exposure is overly precautionary and a more appropriate criterion could be the soil-only GSC, or at least some value between the two.

The mean and median soil concentrations presented in Table 20 demonstrate that average soil beryllium concentrations in the upper 20cm of soil are very similar to the soil-only GSC, indicating that inhalation exposure from soil could be lower than exposure from background inhalation. The statistical testing indicated that the combined 0-0.05m and 0.1-0.2m dataset was not normally distributed, and the calculated geometric mean for this dataset was 4mg/kg, with the median being 3.8mg/kg. These values are higher than the Resi-HP soil-only GSC, but lower than the POSresi soil-only GSC. For the 0-0.05m depth data-set only, which are the soils most likely to cause dust generation (dust inhalation is the risk-driving pathway for beryllium), the geometric mean of 3.6mg/kg and the median of 3.5mg/kg are only marginally higher than the Resi-HP GSC of 3.45mg/kg.

The beryllium GSC is based on an inhalation health criteria value (HCV) selected as the Air Quality Guideline of 0.2ng/m^3, which was derived using a NOAEL of 0.02µg/m^3 for sensitisation and chronic beryllium disease (CBD). An uncertainty factor (UF) of 100 was applied to account for the greater exposure time of the general public (x10) and the potential presence of susceptible individuals (x10). The S4UL toxicological review identifies other published inhalation reference concentrations of 0.02µg/m^3 based on no appreciable health risk for non-cancer effects. The S4UL report identifies a value of 0.0042µg/m^3 for an excess lifetime lung cancer risk of 1 in 100,000. The air quality guideline basis for the S4UL is therefore the most precautionary choice of the available toxicological thresholds that were reviewed for the HCV selection process. The other potential non-threshold inhalation HCV based on reference concentration of 0.02µg/m^3 published by two organisations would result in a GSC of 17mg/kg, whilst remaining protective of a 1 in 100,000 ELCR for lung cancer.

Furthermore, if the CLEA model is set up for the Resi-HP scenario, a soil concentration of approximately 8mg/kg is required to achieve the indoor air concentration equal to the air quality guideline. For the POSresi scenario, a soil concentration of 6.9mg/kg is required. This discrepancy occurs because of the way that the GSC calculation uses a precautionary inhalation HCV based on an air quality guideline of 0.2ng/m^3 and assuming an adult weighing 70kg with an inhalation rate of 20m^3/day. Both of these concentrations are approximately double the average concentrations reported in soil at Treadgold House, further supporting the precautionary nature of the GSC derivation.

Another precautionary factor within the derivation of the beryllium GSC is the assumption of 100% bioavailability. Research published in July 2021 (Islam, 2021) reported a beryllium bioaccessibility of 18% for the inhalation route using the simulated epithelial lung fluid (SELF) test method. The beryllium inhalation HCV is based on occupational exposure studies and therefore a proportion of this reduced bioaccessibility is likely to be ‘built in’ to the HCV. However, occupational workers typically work with beryllium fumes or beryllium dust rather than soil dust with sorbed beryllium and those substances are likely to be more bioaccessible and bioavailable than beryllium sorbed to soil dust. Therefore the relatively low bioaccessibility of beryllium in soil dust is likely to translate to a relative bioavailability somewhat below the precautionary 100% value adopted for the GSC derivation.

The Part 2A Statutory guidance states that Generic Assessment Criteria (GAC) describe levels of contamination from which risks should be considered to be comfortably within Category 4. The Statutory guidance indicates that the smallest exceedances of GAC which could reach the upper boundary of Category 4 are *‘a few times’,* but could be orders of magnitude depending on the specific contaminant and exposure scenario. This guidance must be considered on a contaminant specific basis but where GAC are based on the precautionary tolerable intake/minimal risk principles of SR2 (EA, 2009), as well as the precautionary exposure assessment approach of SR3 (Environment Agency, 2009), then it is reasonable to use the ‘few times to orders of magnitude’ guidance as a line of evidence for where linkages remain in Category 4. Since the beryllium GSC is based on these precautionary approaches then this guidance is considered appropriate in this case. The GSC exceedances for mean beryllium concentrations – taking the combined 0-0.05m and 0.1-0.2m depth dataset – is a factor of 2.7 above the Resi-HP GSC and a factor of 2.2 above the POSresi GSC. If the median (3.8mg/kg) or geometric mean (4.0mg/kg) of this dataset, or the mean (4mg/kg), geometric mean (3.6mg/kg) or median (3.5mg/kg) of the 0-0.05m depth dataset, is used then the exceedances are of a smaller magnitude.

The discussion above of ‘soil-only’ GSC; the precautionary nature of the HCV; the modelled soil concentrations required to achieve the AQG in indoor air; the precautionary assumption of 100% bioavailability; and the Statutory Guidance indication of where Category 4 lies in relation to GAC, support the conclusion that these minor exceedances of the GSC should not cause linkages associated with beryllium in soil to be outside the Category 4 classification as there is a high degree of conservatism incorporated into the GSC.

Although no outliers were identified, an area of potentially slightly higher concentrations was observed in the area outside Plots 3, 4 and 5. As this area is outside the properties only occupied by adults, the resi-HP and POSresi GSC are overly precautionary for the GQRA. Setting up the CLEA model with the residential (lifetime exposure C4SL) land use and using the adult female residential C4SL receptor and HCVs from the LQM/CIEH S4UL report, a GSC of 9.6mg/kg was generated. This is very similar to the maximum beryllium concentration reported on site of 9.8mg/kg, and is higher than the median, geometric mean and mean concentrations of 8.2mg/kg, 8.4mg/kg and 8.5mg/kg for this cluster based on three samples. Therefore the risk to adult receptors in Plots 3, 4 and 5 is considered to meet the definition of Category 4 land, even considering the slightly higher concentrations reported in this area, given our evaluation that the critical receptor is an adult not a child.

Barium

Although the site-wide average concentrations are lower than the GSC, an area of possibly higher concentrations was identified in the grassed area in Plot 3, Plot 4 and Plot 5. The confidence associated with this is relatively low since there are only three samples; however, these are the three highest reported barium concentrations of 1,500mg/kg, 1,654mg/kg and 2,009mg/kg.

This area is outside the properties only occupied by adults, and therefore the GSC (an EIC/CL:AIRE/AGS GAC) is overly precautionary as it is based on a child receptor. Setting up the CLEA model with the residential (lifetime exposure C4SL) land use, using the female adult residential C4SL receptor and adopting the barium HCVs and physchem parameters used for the EIC/CL:AIRE/AGS GAC, an adult GSC of 14,000mg/kg was generated. This is approximately seven times higher than the maximum barium concentration reported on site and therefore the risk to adult receptors in Plots 3, 4 and 5 is considered to meet the definition of Category 4 land, even considering the slightly higher concentrations reported in this area.

A single exceedance of the barium GSC was reported at sample location TH119 at a depth of 0.1-0.2m bgl, with the reported concentration of 1,361mg/kg marginally exceeding the GSC of 1,300mg/kg. A shallower sample at 0-0.05m depth was not analysed for barium at this location. Given the relatively low number of samples analysed for barium, it is not possible to conclude with a high level of confidence that other soils in the western part of the garden might not have barium concentrations exceeding the GSC. However on the balance of the evidence it is considered to be reasonable to conclude that average barium concentrations in soil are not likely to exceed the GSC. The lines of evidence include:

- site-wide average concentrations have been reported below the GSC;
- all other samples collected to the west of the building have reported barium concentrations less than the GSC; and
- evidence from multiple heavy metals indicates that the area where the concentrations seem to be highest is in the part of the garden to the south of the building, where the nearby sensitive receptor is adult residents of Flats 1 to 6.

Lead

Lead concentrations reported in **Table 21** and **Table 22** generally exceed the Resi-HP GSC by factors of five to six, with the POSresi GSC also exceeded by factors of between two and four. The Stage 2 Step 1 SSAC for both the Resi-HP and POSresi scenarios were also generally exceeded by similar factors as the GSC exceedances. Table 21 and Table 22 also show that many of the calculated average concentrations also exceed the Step 2 SSAC derived during the Stage 2 investigation, which were intended to help define concentrations that could be towards the upper end of Category 3 where it approaches Category 2. Given the average soil concentrations encountered, the assessment of lead in soil at Treadgold House has been taken forwards to a more detailed stage of risk assessment presented in **Section 6**.

5.2.2 Avondale Park Gardens

As previously described at Stage 2, this area is a fenced communal garden in the middle of a residential square. It comprises a grassed area with soil borders planted with trees and shrubs. This scenario is unchanged from the understanding at Stage 2. Generally the area fits the POSresi land-use scenario although the railings around the entire area with a single gate, and the fact that the residential square is not a through route for anyone, means that the exposure frequency and duration assumptions of the POSresi scenario are likely to be conservative for Avondale Park Gardens.

Therefore, the sample results for Avondale Park Gardens have again been compared against the POSresi GSC, as well as the derived Stage 2 SSAC for POSresi. The data for Avondale Park Gardens have not been further subdivided into plots due to the understanding of use of the area – there are no fixed fences and no direct access from properties, therefore frequent targeted use in any given area of the gardens cannot be quantified.

The discussion includes screening of the new data as well as the relevant samples from the Stage 1 dataset (GTCS1-23 and GTCS1-24). A summary of the exceedances is presented in **Table 23,** and the full dataset is presented alongside the applicable GSC (which indicates the GSC source) in the GSC screening tables presented in **Appendix G** as **Table G2**.

Table 23. GSC Exceedances for Avondale Park Gardens

Analytical Suite	Summary of Exceedances	GSC (POSresi, sandy loam >3.48% TOC)	Maximum detection
Lead	Exceeded GSC in 26 of 40 samples	630	2,223 mg/kg

For Avondale Park Gardens, no asbestos was detected, and no COPC other than lead were found to exceed the GSC for POSresi.

Table 24 summarises the exceedances for lead when compared to the GSC and the various POSresi SSAC derived during the Stage 2 investigation. As mentioned in **Section 4.7.4**, location APG109 has been removed for calculating averages, on the basis of it being located very close to original location GTCS1-23. Data-sets both including and excluding locations APG111 and APG113 are presented in Table 24, with the reasons for this discussed in **Section 4.7.4.2.** Statistical evaluation shows that GTCS1-23 is an outlier (as is APG109 if included in the dataset), with no other outliers in the shallow soil datasets (0.05m, 0.1-0.2m and 0.05 & 0.1-0.2m in Table 23). Whether this outlying value is included or not, statistical testing indicates that the shallow soil datasets are not normally distributed and therefore the median or geometric mean concentration may be more suitable for using as an average for exposure assessment. Lead in soil concentrations at Avondale Park Gardens are shown graphically on **Figures A8, A9** and A**10** in **Appendix A. Figure A8** shows the concentrations in soil in the 0-0.05m depth interval, **Figure A9** shows the concentrations in soil in the 0.1-0.2m depth interval and **Figure A10** shows the concentrations in soil in the 0.5-0.6m depth interval.

Table 24. Lead Exceedances for Avondale Park Gardens

	Number of results	Screening criteria (POSresi)	Minimum mg/kg	Median mg/kg	Maximum mg/kg	Arithmetic Mean mg/kg	Geometric Mean mg/kg
All samples	38	GSC = 630 mg/kg Step 1 SSAC = 710 mg/kg Step 2 SSAC = 1070 mg/kg Step 2 SSAC (reduced SIR) = 1420 mg/kg	381	686	2099	757	717
All samples (excluding APG111 & APG113)	33		381	673	2099	762	719
0.05m	17		519	765	2099	854	804
0.05m (excluding APG111 & APG113)	15		519	763	2099	860	802
0.1-0.2m	15		509	668	1027	694	681
0.1-0.2m (excluding APG111 & APG113)	13		506	668	1027	685	672
0.05 & 0.1-0.2m	32		506	707	2099	779	744
0.05 & 0.1-0.2m (excluding APG111 & APG113)	28		506	686	2099	778	739
0.5-0.6m	4		381	705	1038	707	646
0.5-0.6m (excluding APG113)	3		381	941	1038	787	719
0.9-1.0m	2		394	497	600	497	486

The samples were grouped by depth, and then averages for each sample depth were calculated. This approach enabled an assessment of whether the deeper fill / Made Ground at the site related to infilling of the old brickfield footprint could represent a source of lead. Although only two samples were collected from the deepest horizon (0.9-1.0m), the reported concentrations at this depth were lower than or similar to concentrations in shallow horizons at the same locations and therefore there is no evidence that the deeper fill is the cause of the elevated concentrations in the shallower soils. Thus it is more likely that imported soils used during the original landscaping of the area in its current layout are the source of the elevated lead concentrations at the site. The shallowest samples (0-0.05mbgl) represented the highest averages, although the averages across all depths are of similar order of magnitude.

Whether using the datasets including APG111 and APG113 or not, the median, mean and geometric mean averages for samples from 0-0.05m, 0.1-0.2 and 0.5-0.6m exceed the GSC for POSresi, but only slightly, and the averages for 0.9-1.0m depth do not exceed the GSC. All three averages for the sample group from 0-0.05m depth, and the mean and geometric mean for the combined 0-0.05m and 0.1-0.2m datasets exceeded the Stage 2 Step 1 SSAC; none of the average concentrations exceeded the Step 2 SSAC. The significance of these exceedances is discussed further in **Section 5.2.2.1** below.

Review of **Figure A8**, **Figure A9** and **Figure A10** confirms the presence of a potential hotspot in the area of locations GTCS1-23 and APG109 located in the flower bed on the central western part of the site. No other clear zoning of different concentration ranges are evident on these Figures. The potential hotspot in the western flower bed is discussed further in **Section 5.2.2.1**.

A box and whisker plot showing the lead concentrations at Avondale Park Gardens is included in **Figure 5** below. The box and whisker plot shows individual sample concentrations (filled circles), the minimum value (lower whisker), the maximum value (upper whisker), 25th and 75th percentiles (lower and upper boundaries of the box), median (horizontal line through box), and arithmetic mean (cross). This plot provides a simple way to visually compare different datasets to help identify differences in the different datasets and demonstrate the right skewed nature of the datasets.

The box and whisker plot for Avondale Park Gardens shows that compared to the London Earth dataset, the lead concentrations are within the range of this background data, although the mean, median and 25th / 75th percentiles are generally a little higher (particularly for the shallower datasets).

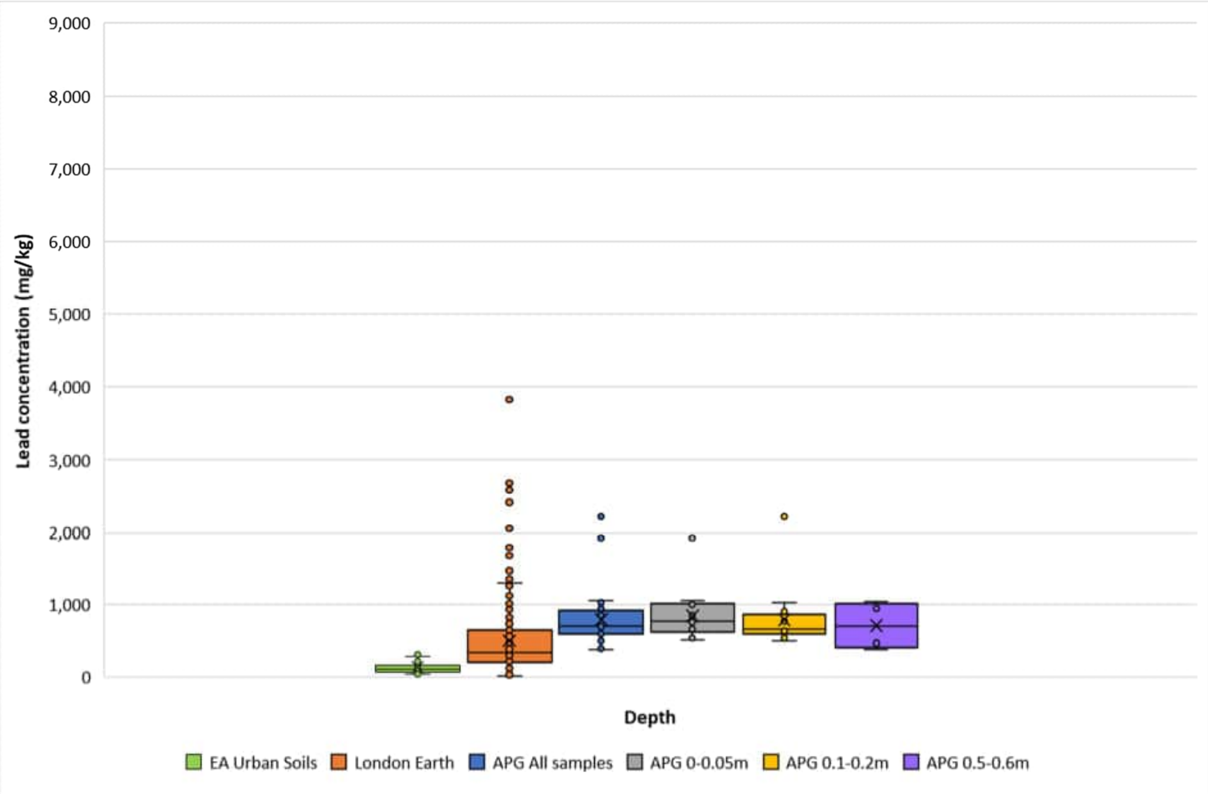

Figure 5 – Box and whisker plot showing the lead concentrations at Avondale Park Gardens compared to EA and London Earth background datasets

It is also noted that all of the average concentrations presented in Table 24, with the exception of the arithmetic mean concentration of 0-0.05m depth samples, are lower than the NBC of 820mg/kg.

The NBC is defined as the upper 95% confidence limit of the 95th percentile (of the dataset used to derive the value) and is intended as an upper threshold value for soils in an urban setting. The average concentrations at Avondale Park Gardens are generally lower than, but relatively close to, the NBC (with the exception described above) and therefore can be considered to be towards the upper end of what is considered normal within an urban environment.

5.2.2.1 Part 2A Risk Evaluation

Only the mean, geometric mean and median for the sample group from 0-0.05m depth, and the mean and geometric mean for the combined 0-0.05m and 0.1-0.2m datasets exceeded the Stage 2 Step 1 SSAC; none of the average concentrations exceeded the Step 2 SSAC. The Stage 2 Step 1 SSAC was considered to be representative of the upper end of Category 4 within a standard POSresi scenario. However, the parameters used are considered overly conservative given the actual use of the land at Avondale Park Gardens; the land is fenced off, with locked gate, and no one uses this as a regular through route. Therefore, the exposure frequency is much reduced compared to the standard scenario. Only a minor reduction in the exposure frequency (in days / year) would increase the derived Stage 2 Step 1 SSAC to be above all of the median and geometric mean soil concentrations. For example reducing the number of days outdoors per year from 170 to 122 (1 in 3 days per year outdoor exposure) would increase the Stage 2 Step 1 SSAC to 804mg/kg (based on a time-weighted average reduction in the SIR to 53mg/day from the value of 60mg/day used for the Stage 2 Step 1 SSAC). This is higher than all calculated average concentrations with the exception of the mean (854mg/kg) for 0-0.05cm depth samples. Since the maximum concentration of 2,099mg/kg is indicated to be the only outlier at a 1% significance level by the Dixon's outlier test, and the data distributions are all indicated to be non-normal with or without the outlier included, the median (765mg/kg) or geometric mean (804mg/kg) are considered to be a more reasonable measure of the average for site-wide exposure.

An alternative approach is to consider an adjusted Stage 2 Step 1 SSAC based on the reduced SIR described for lead in Section 6.1. If this approach is used (resulting in an SIR of 45mg/day input to the CLEA model) then the updated Stage 2 Step 1 SSAC is 946mg/kg.

All median and geometric mean concentrations are equal to or below the Step 1 SSAC based on slightly reduced outdoor exposure compared to the standard POSresi assumptions, and all mean, median and geometric mean concentrations are lower than the revised Stage 2 Step 1 SSAC based on a reduction in exposure frequency from 170 days per year to 122 days per year (which is considered to be reasonable based on the known use of the Avondale Park Gardens site). On this basis the additional soil sampling data from Avondale Park Gardens indicate that this site can be classified as Category 4, and therefore the risk to human health is low.

Paragraph 4.21(b) of the Statutory Guidance indicates that land should be placed in Category 4 where there are only normal levels of contaminants in soil. The average soil concentrations at Avondale Park Gardens appear to be close to the upper bound (i.e. the NBC) of the concentrations that are considered typical of urban environments, based on the majority of average concentrations shown in Table 24 being below the NBC. The provides further evidence that the land at Avondale Park Gardens can be classified as Category 4 land.

It is noted that whilst the maximum concentration is an outlier within the Avondale Park Gardens site, it is still appropriate to assess chronic risk from these soils in the outlier area using average concentrations across the entire Avondale Park Gardens area. This is because under typical usage of the land, a person may be exposed to all areas of the site and higher exposure from any time spent in the outlier area will be balanced against lower exposure in all other areas. The duration of time spent in the outlier area is not expected to be any higher than time spent in other areas – in fact it may be less as the area with the maximum concentration is a relatively inaccessible soil bed with dense shrubs.

A discussion of acute risks from lead in soil is presented in **Section 6.4** in the context of Treadgold House. However, the principles of the discussion are similar for Avondale Park Gardens such that acute health risks from lead in soil are considered to be low. In addition, **Section 6.4** considers intermediate duration exposure and overt health effects such as stomach pains. Such health effects would not be expected for soil concentrations less than approximately six times higher than a GSC based on a blood lead target level of 3.5µg/dL. The maximum lead concentration at Avondale Park Gardens (2,099mg/kg) is 3.3 times higher than the POSresi GSC of 630mg/kg and therefore it is considered that risk of intermediate exposure duration overt health effects from lead in soil at Avondale Park Gardens is low and falls within Category 4.

6. Detailed Quantitative Risk Assessment

In accordance with the tiered approach to land contamination risk management (LCRM) prescribed in UK guidance (Environment Agency, 2020), the next tier of assessment following completion of the GQRA described in **Section 5** is the detailed quantitative risk assessment (DQRA).

The objective of the DQRA is to estimate and evaluate the level of health risk in the context of Part 2A. For this report, the detailed estimation of risk is based on the adoption of site-specific exposure parameters and the review and adjustment (if appropriate) of the toxicological criteria used to define the level of health risk.

The outcome of the GQRA concluded that the reported concentrations of lead in soil at Treadgold House exceeded GSC and Stage 2 Step 1 SSAC for the Resi-HP and POSresi scenarios. This indicates that the land might exceed the level of risk associated with Category 4. In addition, the exceedance of Stage 2 Step 2 SSAC for lead based on a Resi-HP and POSresi land-use scenario for most of the calculated average concentrations indicated that the risk to human health posed by the land could exceed that defining a SPOSH, and therefore fall into Category 1 or Category 2. Critically however, this assumption is based on the garden being used by children in a manner consistent with either the Resi-HP or POSresi scenario assumptions, and assumes that the target blood lead concentration of 5µg/dL used for the Step 2 SSAC derivation is appropriate for defining significant harm.

The DQRA presented below takes into account further site-specific information gathered as part of this intrusive investigation to address the uncertainties in land-use and exposure that exist following the GQRA. The main site-specific considerations include:

- Additional lead bioaccessibility data; and
- Improved understanding of garden usage based on information provided by RBKC Housing Management, information which was corroborated by evidence observed by AECOM during the site walkover and sampling works.

The approach to this DQRA has been to update the site-specific assessment criteria (SSAC) in the same way that they were derived in the Stage 2 report – but to capture more detailed site-specific exposure assumptions and parameters. This has been done in accordance with the ‘Step 1’ and ‘Step 2’ process as follows, with more details of all adopted assumptions and parameters presented in Section 6.1 and Section 6.3:

1. Step 1 comprises the calculation of SSAC for lead where site specific information is used to refine the exposure assessment (including adjusting exposure frequency assumptions for child receptors based on a POSresi starting point, and update of the lead bioaccessibility data) whilst retaining a low level of risk (i.e. using the C4SL low level of toxicological concern (LLTC)) consistent with Category 4 land (i.e. the precautionary nature of the exposure and toxicological assumptions remains largely unchanged). Step 1 also involves adjustment of the soil ingestion rate (SIR) based on guidance published by the US EPA in 2017 (US EPA, 2017), and derivation of an SSAC specific to an adult receptor. The SIR adjustment is based on an update of the original documentation reviewed when the Environment Agency and CL:AIRE/Defra selected an appropriate soil ingestion rate for the original CLEA guidance and C4SL derivation. The updated value is considered to be appropriate for derived generic criteria such as GAC and C4SLs. Further details of the SIR used are presented in Section 6.1.3.

   In the context of this report, the Step 1 SSAC define a level of risk that is closer to the Category 4 / Category 3 boundary such that soil concentrations equal to or below the Step 1 SSAC would fall into Category 4, but soil concentrations exceeding the Step 1 SSAC would be less likely to fall into Category 4.

2. Where soil concentrations exceed these Step 1 SSAC, these are taken forwards to Step 2 which involves the calculation of SSAC that are associated with a higher (i.e. not low) level of risk. This may involve the adoption of alternative exposure assumptions and/or alternative toxicological values.

   In the context of this report, the Step 2 SSAC define a level of risk approaching that that could be considered to pose a significant possibility of significant harm. They are intended to provide an indication of where the upper boundary of Category 3 could be, although this decision must also be weighed against the strength of the evidence, remaining uncertainty and other considerations to be made by the local authority, as described in Paragraphs 4.24 to 4.29 of the Part 2A Statutory Guidance. It is considered that if average concentrations are lower than the Step 2 SSAC then it is unlikely that there is sufficient evidence for the land to meet the definition of Contaminated Land. However, if minor exceedances of the Step 2 SSAC were identified, a more holistic review of the other considerations may be required to decide whether the land should be determined as Contaminated Land.

The inclusion of a more detailed understanding of the site-specific usage at Treadgold House and Avondale Park Gardens is likely to mean that the SSAC derived as part of the Stage 2 Environmental Checks were relatively conservative. At the time of the Stage 2 investigation, this was necessary given the higher uncertainty associated with average soil concentrations due to far fewer sample results being available compared to the current investigation.

6.1 Step 1 SSAC Derivation

For the Step 1 derived SSAC, the two following scenarios have been considered:

1. Child receptor occupying Flats 7 to 10;
2. Adult receptor occupying Flats 1 to 6.

This is based on information received from RBKC regarding the configuration and occupancy of the flats at Treadgold House with direct access to the gated shared garden area. The flats with direct access (Flats 1 to 6) are single occupancy studio flats, therefore suitable for single adults only. There are some ground floor flats (flats 7-10) which could house families, however these do not have formal direct access out into the garden (although it is understood that there may be infrequent use of the garden by children). Although AECOM did not encounter any children in the garden during the work, there was a deflated paddling pool and deflated bouncy castle discarded in the garden, indicating previous use by children. Potential access to the garden from Flats 7 to 10 would be by climbing over the waist-high ground floor balcony wall. AECOM was able to observe the balcony walls during the site works and confirm their configuration. It is noted that at Flat 9, the balcony wall has been removed to allow direct access to the garden. However, it is understood by AECOM that this will be temporary and that RBKC Housing Management intend to reinstate this barrier and maintain the integrity of the balcony walls in the long-term. Therefore, the scenario with the balcony wall removed is not considered here, as this will not be a long-term feature. A photo of the cut-away balcony wall is included as Photo 16 of the walkover survey photographic log in Appendix D.

The exposure parameter adjustments used for the calculation of SSAC in each of these scenarios are based on a combination of changes to the following parameters:

1. Additional site-specific soil lead bioaccessibility testing data;
2. Inclusion of an adult receptor as well as the previously evaluated child receptor;
3. Reasonable adjustments to the exposure frequency for children using the garden area given the unofficial and inconvenient access; and
4. Updated soil ingestion rate taken from recent USEPA guidance, which is considered to be a more up to date source of information for deriving generic criteria such as GAC and C4SLs. Further information is provided in Section 6.1.3.

A summary of the lead bioaccessibility data-sets and the selection of representative modelling input parameters for ingestion rate, receptor age, exposure durations occupancy periods and exposure periods, is presented in the following report sections below.

6.1.1 Lead Bioaccessibility Testing

The lead bioaccessibility testing provides an estimate of the proportion of the COPC present in the soil that would be available to be absorbed by the digestive system if it were ingested. Bioaccessibility results are therefore only appropriate for site-specific adjustment of the soil and dust ingestion exposure pathway. The results provided by the laboratory are presented in **Appendix E** and have been summarised in the report sections below.

6.1.1.1 Lead Bioaccessibility

A summary of the lead bioaccessibility test results available for Treadgold House, from both Stage 2 and the follow-on sampling, is presented in **Table 25** below.

Table 25. Soil Bioaccessibility Data Summary for Lead

Location	Depth	Original sample Pb concentration (mg/kg)	Total Pb in bioaccessibility test (mg/kg)	Bioaccessible fraction (BAF) gastric (%)	Bioaccessible fraction (BAF) gastric & intestinal (%)
GTCS2-S274A	0-0.02	1168	1296	62	21
GTCS2-S279A	0-0.02	1385	1626	57	20
GTCS2-S280A	0-0.05	2216	1989	61	16
TH109	0-0.05	1576	2238	80	32
TH109	0.1-0.2	8259	4321	74	27
TH120	0-0.05	1065	1118	72	26
TH155	0-0.05	1485	1676	80	21
TH155	0.1-0.2	3623	3482	60	17
TH169	0-0.05	3649	2243	68	11

The gastric phase of the test is run using an approach simulating a fasted biological state with the lowest expected stomach pH values. Lower pH results in higher extraction of lead (its solubility increases with decreasing pH).

The approach taken for this assessment is to use the gastric phase BAF reported by the laboratory. This is precautionary and likely to overestimate longer term time-weighted bioaccessibility where a proportion of lead extraction in the stomach will occur during periods of higher pH after people have eaten.

The average (mean) BAF of all samples from Treadgold House summarised in the table above is 68%, which is slightly higher than the relative bioavailability (RBA) of 60% adopted for the oral exposure pathway in the derivation of the lead C4SL (CL:AIRE, 2014), and also slightly higher than the mean calculated in the Stage 2 report (66%). It is worth noting that the average BAF for the gastric+intestinal extraction phase (higher pH) for all samples was 21%, more than three times lower than the stomach phase. If even a part of this much lower bioaccessibility at higher pH values is factored into the overall long term bioaccessibility then it would likely be reasonable to reduce the expected bioaccessibility somewhere below 60%. However, the initial precautionary site-specific approach to deriving SSAC adopts the mean value of 68% as a reasonable representative of the average BAF across the site investigation area.

Calculation of SSAC in the CLEA model requires input of the RBA, which is not necessarily the same as the BAF. The RBA is the ratio of the bioavailability of the contaminant in soil to the bioavailability of the contaminant in the critical study used to derive the health criteria (i.e. in this case the LLTC). To estimate the RBA from soil BAF data accurately, some knowledge of the BAF from the diet using the same test method would be needed. Since this information is not available, a more general approach to selecting the RBA to be used for deriving the SSAC is required. The C4SL project presented data from a study which used the UBM method (effectively the same test as the bioaccessibility test method used for this intrusive investigation) to test lead BAF in urban soils in the UK. It was noted that if the dietary RBA estimated using the UBM method was 100% then the results from the UK urban soils study would be similar to the RBA of 60% assumed in the IEUBK model and which was adopted for derivation of the C4SL. Since the C4SL Research Project considered that average soil BAFs of 68% from samples collected in London were consistent with the use of a default RBA of 60% for calculating the C4SLs, then it is considered reasonable and precautionary to use the mean value of 68% BAF from this site-specific study as the input for the RBA. The selected RBA value of 68% for lead for derivation of the Step 1 SSAC is included in **Table 29**. A sensitivity discussion adopting a lower RBA value for the Step 2 SSAC is included in Section 6.3.

6.1.2 Exposure Frequency, Occupancy Period and Exposure Duration

For the adult receptor scenario in Flats 1 to 6, the standard residential land-use without homegrown produce has been taken as the starting point given the direct access to the garden from Flats 1 to 6 and the presence of raised beds containing good quality soil for homegrown produce. The exposure frequencies, occupancy periods and exposure durations adopted are based on the CLEA default values used for derivation of a residential C4SL adopting a lifetime averaging approach and therefore defines exposure assumptions for adults in a residential setting (the values are taken unchanged from the CLEA methodology).

For the child receptor in Flats 7 to 10, the POSresi land-use has been adopted as the starting point as this considers a child of 4-9 years old. This seems more reasonable than the 0-6 year old child considered in the residential land-use scenario given the unofficial access over a waist-high balcony wall. The C4SL report also states that the POSresi scenario would include *"the smaller areas commonly incorporated in newer developments as informal grassed areas or more formal landscaped areas with a mixture of open space and covered soil with planting."* The C4SL report also states that the land is *"a predominantly grassed area of up to 500 m^2 (0.05 ha) and a considerable proportion of this (up to 50%) may be bare soil. The site is in close proximity to residential housing and is regularly used by children for playing and may be used for informal sports activities such as a football "kickabout"."* This is consistent with the investigation area at Treadgold House, which covers an area of approximately 700m^2, has areas of bare soil (but not more than 50%), has been used for playing (e.g. deflated paddling pool observed), and could be used for informal sports activities.

However, the POSresi scenario assumes that children have free and authorised access to the open space, which is not the case at Treadgold House as residents of Flats 7-10 do not have formally authorised access to the garden; the gate is kept locked and children would have to climb over the waist-high balcony wall. In addition, the well maintained communal garden to the north-east corner of the Treadgold House building if freely accessible to residents and therefore residents of Flats 7-10 may be more likely to spend time in this alternative garden than the more shaded garden to the west of the building that they do not have such easy access to.

Because of this greater barrier to garden access than is assumed in the POSresi land-use scenario, and the alternative garden available to the northeast of the building, it is considered reasonable to reduce the outdoor exposure frequency for soil and dust ingestion compared to the 170days/year assumed for the POSresi scenario. A reasonable reduced exposure frequency has been adopted based on children playing in the communal garden each day during school holidays, when they are likely to spend more time around the home, and only 2 days per week for the rest of the spring / summer months between April and October. Due to the reduced day light hours, poorer weather and difficult access to the garden, it is considered that children from the flats are highly unlikely to use the gated communal garden during the winter months on a regular basis. Therefore the outdoor exposure frequency for Step 1 has been reduced to 111 days/year. A summary of the justification for this number is detailed in **Table 26**. Indoor exposure frequency has not been altered and remains at 365 days/year.

Table 26. Step 2 Outdoor Exposure Frequency (day/year) for a child receptor at Treadgold House

Parameter	Weeks	Days	Justification
Number of weeks April-October	30.5	-	-
Number of weeks holiday	10	70 days	Easter, May half term, summer, October half term.
Number of weeks (non-holiday)	20.5	41 days	2 days per week that children may play in the garden
Total number of days		111 days/year	

6.1.3 Soil Ingestion Rate

The soil ingestion rates (SIRs) to be used for the two different Step 1 SSAC receptors (child in Flats 7-10, adult in Flats 1-6) will differ.

The soil ingestion rate (SIR) for children of 100mg/day that was adopted in the UK CLEA guidance was based on the recommendation from the US EPA 2006 Child-Specific Exposure Factors Handbook (USEPA, Child-Specific Exposure Factors Handbook (External Review Draft). Report EPA/600/R/06/096A, 2006). The C4SL report provided a review of the more recent US EPA Exposure Factors Handbook from 2011 (USEPA, 2011), which continued to recommend a soil ingestion rate of 100mg/day for children in a residential setting. However, the C4SL report considered reducing the SIR for the derivation of C4SLs on the basis of apparent conservatism within the SIR estimates. Ultimately however, the value of 100mg/day originally adopted by the CLEA guidance was retained to maintain a precautionary approach given the uncertainty with this parameter.

For adults, the CLEA guidance adopted a SIR of 50mg/day. This was based on recommended averages from USEPA (1997) and Otte et al (2001), although a third study (Paustenbach, 2000) was also quoted, which concluded that a value between 5mg/day and 25mg/day would be reasonable for adults. The C4SL report noted that (USEPA, 2011) also recommended a CTE for adult SIR of 50mg/day and this value was retained for the derivation of C4SLs for adult receptors.

Subsequent to the publication of the CLEA guidance and C4SL reports (excluding the 2021 C4SLs[6]), the US EPA Exposure Factors Handbook guidance was updated in 2017 (US EPA, 2017). The USEPA 2017 guidance provided a range for the central tendency estimates (CTEs) for SIR based on a variety of studies, and differing SIRs for different age groups. These are summarised in **Table 27** below and the USEPA 2017 guidance provides a detailed review of the studies used to choose these values. It is not clear why the 2021 vintage C4SLs did not use the 2017 USEPA data.

Table 27. Soil Ingestion Rates from (US EPA, 2017)

Age Group	Soil and dust ingestion general population central tendency (mg/day)[a]
<6 months	40
6 months to <1year	70 (60 – 80)
1 to <2 years	90
2 to <6 years	60
1 to <6 years	80 (60 – 100)
6 to <12 years	60 (60 – 60)[i]
12 years through adult	30 (4 – 50)[j]

a. Ranges are provided in parentheses, when applicable, and represent the range of means from the various studies. Ranges are not provided for age groups for which the recommendations are based on a single study.

The derivation of Step 1 SSAC is intended to adopt a site-specific approach and also reduce any conservatism in the C4SL approach such that the value is closer to (but does not exceed) the Category 3/ Category 4 boundary than the C4SLs are intended to be. In accordance with this aim, the age-specific CTE SIR of 60mg/day published in USEPA 2017 for the 2 to <6 years age group and the 6 to <12 years age group has been adopted as the starting point for child exposure. These higher age-groups have been used because child residents at Treadgold House have to informally access the garden over a waist-high (for an adult) balcony wall and therefore children using the garden will be weighted to higher age groups that can more easily physically access the garden.

It is considered reasonable to take this approach on the basis that the USEPA 2017 guidance is an update to the earlier 2006 and 2011 versions of the same guidance, which are therefore now superseded in the U.S. A UK-based review of appropriate SIRs has not been carried out since the C4SL report in 2014 and therefore the updated USEPA guidance has not yet been considered for inclusion in UK guidance. CLEA and the C4SL report equated their child SIR to the recommendation from USEPA 2006, which was maintained in USEPA 2011, although the S4UL report described a number of likely conservatisms within the adopted value of 100mg/day. These conservatisms included the evidence that soil ingestion may be lower in winter rather than summer months; however the key studies used to derive CTEs by the USEPA were conducted during summer months when exposure to soil is likely to be higher. In addition, the C4SL report referenced a study that found little difference in SIR between children living in houses with and without gardens; the conclusion being that a proportion (possibly the majority) of soil ingestion occurs in settings away from the home. Hence soil ingestion of potentially contaminated soils in particular garden is likely to be overestimated.

As the most recent USEPA guidance has recommended a lower SIR for use in risk assessment based on re-appraisals of SIR studies and new studies completed between 2011 and 2017, this lower value of 60mg/day has been adopted for the Step 1 SSAC.

This SIR of 60mg/day has been further modified, to account for the reduction of outdoor exposure frequency as discussed in **Section 6.1.2**. In accordance with the C4SL guidance, the 60 mg/day is approximately equally weighted between indoor ingestion of soil derived dust and outdoor soil ingestion. The contribution from indoor exposure remains at 100% (365 days), however the outdoor exposure has been reduced to approximately one third (111 days instead of 365 days). Hence the 60mg/day SIR only occurs on 111 days per year within the

[6] C4SLs for trichloroethene, tetrachloroethene and vinyl chloride were published in 2021; however the methodology adopted the exposure assumptions taken directly from the 2014 C4SL SP1010 report and an updated review of exposure assumptions (e.g. SIR) was not carried out.

garden area. For the CLEA model, a single SIR value is required and so to incorporate the reduced number of days spent outdoors a time-weighted average SIR has to be calculated. The calculation for the modified SIR for the child receptor is included in **Table 28** below.

Table 28. Calculation of Modified Child Receptor SIR for Step 1 SSAC

Initial SIR (based on Table 23 – 1-<6 year old)	Indoor Contribution	Outdoor Contribution	Modified Step 1 SIR
60 mg/day	30 mg/day (100%)	9 mg/day (30% of 30 mg/day)	30 + 9 = 39 mg/day*

* The adoption of an SIR of 39mg/day for the Step 1 SSAC is required for modelling. This does not mean that the SIR is 39mg/day on the 111 days per year that the child is assumed to use the garden; rather it is a time-weighted average across the year with this approach needed due to the input and calculation setup of the CLEA model. The base literature sourced SIR that this site-specific value is based on is 60mg/day.

For the adult receptor, a soil ingestion rate of 30 mg/day has been selected based on the data presented in **Table 27,** and a further Step 1 modification to this is not warranted as there are adult receptors which have direct access onto the communal garden area from their properties.

The value of 30mg/day, which is reduced from the adult SIR of 50mg/day adopted by CLEA and the C4SL guidance, is considered to be reasonable along the same lines of reasoning as that presented above for the child SIR.

6.1.4 Step 1 SSAC Parameters Summary

A summary of the parameters used to derive the updated Step 1 SSAC for this report are summarised in **Table 29** below.

Table 29. Summary of Step 1 SSAC Modelling Parameters

	Treadgold House – Updated Step 1 SSAC (child receptor)	Treadgold House – Updated Step 1 SSAC (adult receptor)
Soil and dust ingestion	Y	Y
Dust inhalation - indoor and outdoor	Y	Y
Dermal contact - indoor and outdoor	Y	Y
Inhalation of vapours - indoor and outdoor	Y	Y
Critical receptor	3-<9 yrs female child	Female adult - 16 – 75 years
Exposure duration	6 years	59 years
Occupation period	20 - 24 hrs	16 hours / day – indoors 1 hour / day - outdoors
Exposure frequency – indoor	365 days	365 days
Exposure frequency – outdoor	111 days	365 days
Soil ingestion rate	39 mg/kg	30mg/day
RBA – Pb only	0.68	0.68

6.1.5 Toxicological Criteria

Lead was addressed as part of the C4SL Research Project (CL:AIRE, 2014), the objective of which was to develop GSC suitable for use within the Part 2A framework and would define a level of exposure risk towards the upper end of the Category 4 definition (i.e. low risk).

The toxicological concept developed for the C4SL Research Project was the Low Level of Toxicological Concern (LLTC), and the values ultimately selected for oral exposure for lead for children and adults were:

1. Lead (child receptor): LLTC of 1.4 micrograms per kilogram bodyweight per day (µg/kg-bw/day).
2. Lead (adult receptor): LLTC of 0.63 micrograms per kilogram bodyweight per day (µg/kg-bw/day).

For lead, the LLTC was defined as the dietary dose that would result in a geomean blood lead concentration (BLC) of 3.5µg/dL in young children and adults. This value was chosen by Defra as it was considered to represent a low level of risk in relation to the toxicological effects of lead on neuro-behaviour (for the child receptor) and the cardiovascular system (for the adult receptor). It does not represent minimal risk: a lower potential blood lead target level of 1.6µg/dL was considered by Defra to be "too close to minimal risk to support its use in the derivation of the more pragmatic C4SLs". The UK's current public health intervention concentration for blood lead is set at 5µg/dL (UK HSA, 2021). (PHE, 2021a) states that *"it is important to note that a blood lead concentration of less than 5µg/dL (0.24µmol/L) is still associated with adverse health effects".* (PHE, 2021a) goes on to say that BLCs of less than 5µg/dL are associated with adverse cognitive effects (academic achievement and IQ decrements) in children. There is not considered to be a threshold for such adverse cognitive effects and these effects do not easily fit into the definition of significant harm within the Part 2A Statutory guidance (refer to Section 7.1.2) and therefore the target BLC of 3.5µg/dL is considered to be suitable for using as the toxicological criterion for the Step 1 SSAC.

In accordance with the methodology for deriving the lead C4SL (CL:AIRE, 2014), a separate inhalation LLTC is not used for lead since the oral LLTC has been derived based on a blood lead target for multiple exposure routes: the blood lead target has been converted to a daily intake using the IEUBK biokinetic model and this intake is applied to the CLEA model as the oral LLTC described above.

Initially, for the derivation of the SSAC, the LLTC used for the C4SLs have been retained so that the SSAC continue to reflect a low risk to human health. Where reported soil concentrations continue to exceed these SSAC, further consideration of alternative health risk thresholds have been considered in **Section 6.3** in relation to what would constitute an "unacceptable risk" under Part 2A.

6.1.6 Soil Contribution to Indoor Dust

The adopted SIR is based on an approximate assumption that 50% of the exposure comes from outdoor soil and 50% of the exposure comes from indoor dust. This is based on discussion presented within the C4SL report. However, it is possible that the indoor dust ingestion contribution from the investigation area will be considerably reduced based on the lower exposure frequency adopted for the child Step 1 SSAC (refer to Section 6.1.2). If the indoor dust ingestion was reduced proportionate to the exposure frequency (as was done for the outdoor soil ingestion) then an overall site-specific SIR of 18mg/day (for a child receptor) could be proposed.

This approach is not considered to be sufficiently precautionary for Step 1 SSAC in order to maintain sufficient confidence that the SSAC is representative of Category 4; however, an indicative SSAC has been derived using this lower SIR of 18mg/day as part of a sensitivity assessment for Step 1.

6.1.7 Exposure Modelling

The Environment Agency CLEA model v1.071 (EA, 2015) has been used to calculate SSAC for Treadgold House as part of the DQRA. These SSAC derived for Step 1 are presented in **Table 30** below. The CLEA model inputs and outputs are presented in **Appendix K**[7].

Table 30. Updated Step 1 Site-specific Assessment Criteria

	GSC (mg/kg)		Updated Step 1 SSAC (mg/kg)	
	Resi-HP	POSresi	Adult receptor	Child receptor
Lead	310	630	2150	1,060

Based on the sensitivity assessment adopting an SIR of 18mg/day for the reduced soil contribution to indoor dust (refer to Section 6.1.6), the updated Step 1 SSAC for a child receptor would be 2,280mg/kg. This is discussed in Section 6.2 below.

[7] Note that the input SIR in the CLEA model in Appendix K appears as 0.04g/day. However this is due to rounding of the actual input value of 0.039g/day to two decimal places.

6.2 Comparison of Site Data with Updated Step 1 SSAC – Treadgold House

A summary of the datasets for COPC at Treadgold House to be compared against the Step 1 SSAC is presented in **Table 31.** The approach to statistical assessment of the data described in **Section 5.2** has also been adopted here.

Table 31. Treadgold House Updated Step 1 SSAC Data Comparison

Treadgold House Dataset	Number of samples	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	SSAC mg/kg
Lead (0-0.02m, 0-0.05m, 0.1-0.2m)	160	148	38,490	2,101	1,487	1,509	2150 – adult 1,060 – child

An alternative child SSAC of 2,280mg/kg, based on a reduced indoor dust ingestion component is also discussed in this section.

6.2.1 Child Residents

The mean lead concentrations in shallow soil (i.e. upper 20cm) at Treadgold House (Table 31) exceed the SSAC derived for the child receptor by approximately a factor of two, with the median and geometric mean concentrations exceeding the child Step 1 SSAC by a factor of approximately 1.5. It is noted that none of the calculated average concentrations exceed the less precautionary indicative SSAC of 2,280mg/kg based on reduced indoor dust ingestion. With reference to Table 22**,** the median, geometric mean and arithmetic mean concentrations of all data-sets for shallow soil (upper 0.2m) presented for Plots 7 and 8 exceeded the Step 1 SSAC by between a factor of one and three. For Plot 7, the median, geometric mean and arithmetic mean concentrations exceeded the Step 1 SSAC by factors of 1.2, 1.1 and 1.3 respectively in 0-0.05m depth soils; and by factors of 2.3, 1.4 and 2.1 respectively in 0.1-0.2m depth soils. For Plot 8 (without cluster samples), the median, geometric mean and arithmetic mean concentrations exceeded the Step 1 SSAC by factors of 1.4, 1.4 and 1.4 respectively in 0-0.05m depth soils; and by factors of 1.5, 2.0 and 2.3 respectively in 0.1-0.2m depth soils. Average concentrations in Plot 7 and Plot 8 did not exceed the indicative SSAC of 2,280mg/kg with the exception of the median for 0.1-0.2m depth soils in Plot 7, and the arithmetic mean for 0.1-0.2m depth samples in Plot 8 (without cluster samples). Neither of these datasets is likely to be representative for exposure, with the shallower sample (0-0.05m depths) dataset or the combined 0-0.05m and 0.1-0.2m depth dataset most suitable for risk evaluation.

For Plots 9 and 10, there was greater variability in the reported average concentrations and the datasets for Plot 9 and Plot 10 compared to the child Step 1 SSAC are summarised in **Table 32** below. Soil data are reported with and without the cluster samples – differences are discussed in the text below the table.

Table 32. Summary of Data for Plot 9 and Plot 10, Treadgold House

	Depths Ranges (m)	Number of results	Minimum detection (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)
Plot 9 – with cluster samples (TH111, TH112 and TH113)	0-0.05	10	426	1,027	973	1,130	2,871
	0.1-0.2	4	935	4,839	3,182	7,478	18,960
	0-0.05 and 0.1-0.2	14	426	1,186	1,435	2,944	18,960
	0.3-0.4	3	991	2,870	3,886	8,164	20,630
	0.6-0.7	1	-	-	-	-	483
	All	23	426	1,186	1,541	3,677	20,630
Plot 9 – without cluster samples (TH111, TH112 and TH113)	0-0.05	9	426	1,042	934	1,142	2,871
	0.1-0.2	3	1,418	8,259	6,055	9,546	18,960
	0-0.05 and 0.1-0.2	12	426	1,259	1,490	3,243	18,960
	0.3-0.4	3	991	2,870	3,886	8,164	20,630
	0.6-0.7	1	-	-	-	-	483

	Depths Ranges (m)	Number of results	Minimum detection (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)
	All	16	426	1,259	1,662	3,993	20,630
Plot 10 – with cluster samples (TH105, TH106 and TH107)	0-0.05 & 0-0.02	12	340	1,295	1,108	1,243	2,748
	0.1-0.2	6	441	899	949	1,125	2,412
	0-0.05 and 0.1-0.2	18	340	1,226	1,247	1,203	2,748
	0.3-0.4	4	309	506	471	488	630
	0.6-0.7	2	150	152	151	152	153
	1.1-1.2	1	-	-	-	-	507
	All	25	150	676	770	977	2,748
Plot 10 – without cluster samples (TH105, TH106 and TH107)	0-0.05 & 0-0.02	9	340	1,168	1,041	1,211	2,748
	0.1-0.2	3	441	609	566	575	676
	0-0.05 and 0.1-0.2	12	340	874	894	1,052	2,748
	0.3-0.4	4	309	506	471	488	630
	0.6-0.7	2	150	152	151	152	153
	1.1-1.2	1	-	-	-	-	507
	All	19	150	630	629	810	2,748

For Plot 9, the arithmetic mean concentration of the 0-0.05m depth samples marginally exceeds the SSAC and the median and geometric mean are marginally lower than the SSAC, both with and without inclusion of the 'cluster' sample located in this area. As the median or geometric mean are considered to be a more appropriate average to estimate exposure due to the non-normal dataset distribution, the average concentration in Plot 9 for soils at 0-0.05m depth is likely to be lower than the Step 1 SSAC. However for the samples at 0.1-0.2m depth the average concentrations are considerably higher than the SSAC due to the small number of samples and two notably higher individual concentrations (18,960mg/kg at TH108 and 8,259mg/kg at TH109). Exposure to these soils at 0.1-0.2m is expected to be significantly less than the soils at 0-0.05m depth and so these average concentrations are not representative of the soils that residents will mostly be exposed to. If the 0-0.05m and 0.1-0.2m combined dataset is considered then the arithmetic mean, geometric mean and median concentrations (2,944mg/kg, 1,435mg/kg and 1,186mg/kg respectively) exceed the SSAC by factors of 2.8, 1.4 and 1.1 respectively. Only the arithmetic mean in the combined 0-0.05m and 0.1-0.2m depth dataset exceeds the higher indicative SSAC of 2,260mg/kg.

For Plot 10 the mean, geometric mean and median concentrations at 0-0.05m depth slightly exceed the SSAC (with the exception of geometric mean in dataset without cluster samples), but the average concentrations at 0.1-0.2m depth (without cluster samples) do not exceed the SSAC (the arithmetic mean marginally exceeds the SSAC with cluster samples included). When the 0-0.05m and 0.1-0.2m depth datasets are combined for Plot 10, the average concentrations (mean = 1,041mg/kg, geometric mean = 894mg/kg, median = 676mg/kg) do not exceed the SSAC if cluster samples are excluded. However, the mean and median slightly exceed the SSAC if cluster samples are included, though the geometric mean does not exceed the SSAC (mean = 1,203mg/kg, geometric mean = 1,052mg/kg, median = 1,226mg/kg). This indicates that the level of uncertainty due to small-scale variability associated with reported lead concentrations in shallow soil may be too high in Plot 10 to decide whether average soil concentrations are above or below the Step 1 SSAC. For Plot 10, all estimated average concentrations are comfortably lower than the higher indicative SSAC of 2,260mg/kg.

Average concentrations (particularly the geometric means and medians that are likely to be the most appropriate averages for estimating exposure given the non-normal datasets) in the datasets for the shallowest soils (0-0.05m) for the full investigation area and Plots 7 to 10 slightly exceed the child Step 1 SSAC for lead with the exception of the scenarios at Plot 9 and Plot 10 described above, where some average concentrations exceed the SSAC and some do not exceed the SSAC depending on the specific dataset considered. Given this outcome, it is considered that the investigation area poses a risk to health higher than the low level that defines the upper boundary of Category 4 land. As such, risks to child residents of Flats 7-10 for lead in soil has been taken forwards to Step 2 DQRA described in **Section 6.3** below. It is noted that all average concentrations likely to be representative for exposure are lower than the indicative SSAC of 2,260mg/kg; this highlights the uncertainty associated with the relatively low magnitude exceedances of the Step 1 SSAC.

The Step 1 SSAC can also be used as an initial screen for child visitors to Flats 1 to 6, but is considered to be highly precautionary for the following reasons:

- If it is assumed that a child visits once a week, the exposure frequency will be 52 days per year, which is less than half the exposure frequency adopted for the Step 1 SSAC.
- The contribution to total soil and dust ingestion for a child visitor would be an extremely small proportion of their total soil and dust ingestion, which would be largely dominated by exposure at their own home and other settings away from home (e.g. nursery, school, local parks).

These two factors would be expected to more than double the SSAC as it would apply to child visitors. Given that geometric mean soil concentrations in Plots 1 to 6 (refer to Table 22) are all less than two times higher than the child Step 1 SSAC (except 0.1-0.2m depth in Plot 2), these exceedances are not considered to be significant for child visitors and linkages associated with child visitors to Flats 1 to 6 would fall into Category 4 (no to low risk).

6.2.2 Adult Residents

For the adult receptor, the average (median, geometric mean and arithmetic mean) concentrations for all samples across the full investigation area in the depth range 0-0.05m and 0.1-0.2m are lower than the adult Step 1 SSAC. With reference to Table 22, all median and geometric mean concentrations in Plots 1 to 6 do not exceed the Step 1 SSAC, with the exception of the median and geometric mean for 0.1-0.2m depth in Plot 5 (if cluster samples are excluded) and the geometric means for Plot 2 at 0.1-0.2m depth and Plot 3 at 0.1-0.2m depth. However, exposure to the soils at 0.1-0.2m will be less than those soils at 0-0.05m depth and if the combined 0-0.05m and 0.1-0.2m datasets are considered then the median (1,700mg/kg, 1,589mg/kg and 1,784mg/kg for Plots 2, 3 and 5 respectively) and geometric mean (1,877mg/kg, 1,855mg/kg and 1,877mg/kg for Plots 2, 3 and 5 respectively) concentrations do not exceed the adult Step 1 SSAC for lead. Even if the averaging zone covering Plots 3 to 6 that was discussed in Section 5.2.1.3 and Table 22 is considered, the median and geometric mean concentrations for all depths (0-0.05m, 0.1-0.2m and combined 0-0.05 and 0.1-0.2m) are lower than the adult Step 1 SSAC for lead.

For Plots 1, 2, 3 and 5, mean concentrations for datasets at 0.1-0.2m depth exceed the adult Step 1 SSAC. However, where these data are combined with the 0-0.05m datasets for a more representative estimate of typical soil lead concentrations, only the mean concentrations at Plot 1 (4,850mg/kg), Plot 3 (2,193mg/kg) and Plot 5 (2,163mg/kg with cluster samples included) exceed the SSAC. The mean concentration in the combined 0-0.05m and 0.1-0.2m depth dataset in Plot 1 is caused by a single high individual concentration in the 0.1-0.2m depth samples causing a highly right-skewed dataset. For Plot 1 this is a single result of 38,490mg/kg at TH165. The statistical assessment indicates that if this results remains in the dataset then, using a non-parametric bootstrap method, there is a 95% confidence interval (CI) on the mean of between 951mg/kg and 16,380mg/kg. This is an extremely large range indicating high uncertainty associated with this dataset. Removing the maximum result reduces the upper boundary of the 95% CI to 1,556mg/kg – lower than the Step 1 SSAC. For Plots 3 and 5, the 95% CIs are 1,635mg/kg-3,143mg/kg and 1,707mg/kg-2,841mg/kg respectively. This indicates lower uncertainty than for Plot 1, but still indicates some potential for average concentrations to exceed the Step 1 SSAC.

With these combined depth datasets, both the median and the geometric mean concentrations are lower than the SSAC in all Plots. Since all the higher average concentrations are within the 0.1-0.2m depth horizon, and a statistical assessment indicates that the datasets are not normally distributed, it is considered most appropriate to use the median or geometric mean concentration (rather than the arithmetic mean) as being the most representative average soil concentration for assessing exposure risk, as it is less weighted towards the higher individual values.

For Plots 7, 8, 9 and 10, the mean, geometric mean and median concentrations in the 0-0.05m depth datasets are all lower than the adult Step 1 SSAC. For the 0.1-0.2m depth datasets, the mean and median concentrations exceed the adult Step 1 SSAC for Plot 7; however, the geometric mean is lower than the Step 1 SSAC. For 0.1-0.2m depth samples in Plot 8 (both with and without cluster samples) the mean concentration exceeds the adults Step 1 SSAC but the median and geometric mean concentrations are lower than the SSAC. Within Plot 9 (with and without cluster samples) all three average concentrations in the 0.1-0.2m depth dataset exceeded the Step 1 SSAC and in Plot 10 (with and without cluster samples) none of the averages exceeded the SSAC for the 0.1-0.2m depth. The average concentrations in Plots 7 to 10 at 0.1-0.2m depth are based on a small number of samples and are strongly influenced by outliers. Adults are also much less likely to be exposed to the soils at 0.1-0.2m depth compared to those at 0-0.05m depth. When the datasets for 0-0.05m and 0.1-0.2m depth are combined in these plots, all median and geometric mean concentrations are lower than the adult Step 1 SSAC. Only the arithmetic mean concentration in Plot 9 (with and without cluster samples) exceeds the SSAC, by factor of 1.5 (without cluster samples).

Taking the above into account, the fact that all calculated median and geometric mean concentrations for the 0-0.05m depth and combined 0-0.05m and 0.1-0.2m depth datasets are lower than the adult Step 1 SSAC means that the lead in soil linkage associated with exposure to adult occupants of Treadgold House falls into Category 4. For Plot 9 where the arithmetic mean concentrations of the combined 0-0.05m and 0.1-0.2m depth dataset slightly exceed the SSAC, normality testing indicates that the dataset is not normally distributed and therefore the median or geometric mean is considered to be more suitable for assessing exposure risk than the arithmetic mean. In cases where concentrations are higher than the SSAC in the deeper 0.1-0.2m depth horizon in some Plots, this is not expected to cause unacceptable exposure even if soils in soil beds are mixed to some extent, because the higher concentrations in 0.1-0.2m depth soils will be 'diluted' by the lower concentrations in shallower 0-0.05m depth soils. This is particularly true because the garden area is managed by RBKC Housing and therefore residents are much less likely to dig into the deeper soils beneath the surficial layer in order to maintain the garden in a well-kept state. If the garden area became entirely privately managed at some future time then the impact on overall exposure of the higher concentrations in the 0.1-0.2m depth horizon should be evaluated in the context of the future change to the land-use.

6.2.3 Outliers

Across the full garden area, seven potential 'high' outliers were identified in the 0-0.05m + 0.1-0.2m dataset using Rosner's outlier test (at 1% significance level), with concentrations ranging between 5,942mg/kg and 38,490mg/kg. No 'low' outliers were identified. Of the seven outliers, five were within the deeper soils at 0.1-0.2m depth and shallower samples at the same locations were not identified as outliers from the dataset. The seven outliers are distributed throughout the garden area, with one outlier in each of Plots 1, 2, 3, 5 and 6, and two of the seven outliers in Plot 9. The two outliers in the 0-0.05m depth horizon were located at TH125 (Plot 6) and TH156 (Plot 3) with concentrations of 6,230mg/kg and 6,059mg/kg respectively: of these, TH125 was situated in a turfed area where the turf will help to reduce exposure to the soil, whereas TH156 was located on bare soil at the edge of a soil border flower bed. The deeper outliers are located in Plots 1, 2, 5 and 9 (2 samples). Of the five deeper outliers (all identified in the 0.1-0.2m depth samples), three were in grassed areas (TH108, TH138 and TH165), and two were in bare soil areas (TH109 and TH162).

Of the seven outliers, five are located in the garden area to the south of the building within Plots 1 to 6. An averaging zone of potentially higher concentrations within this area - covering Plots 3 to 6 – was considered as part of the risk evaluation in Section 5.2.1.3.1. The mean, geometric mean and median concentrations in this averaging zone did not exceed the adult Step 1 SSAC. Further breakdowns of the data into alternative averaging zones focussing on the areas where outliers were found indicate a similar outcome, as follows:

- The mean, median and geometric mean concentrations of soils from 0-0.05m and 0.1-0.2m depth in combined Plots 1, 2 and 3 were 2,936mg/kg, 1,580mg/kg and 1,334mg/kg.
- The mean, median and geometric mean concentrations of soils from 0-0.05m and 0.1-0.2m depth in combined Plots 2 and 3 were 2,170mg/kg, 1,693mg/kg and 1,694mg/kg.
- The mean, median and geometric mean concentrations of soils from 0-0.05m and 0.1-0.2m depth in combined Plots 5 and 6 were 2,052mg/kg, 1,654mg/kg and 1,559mg/kg).

Although the arithmetic mean concentrations in the first two groupings above exceeded the adult Step 1 SSAC, the datasets are not normally distributed and the median and geometric mean concentrations are considered to be more appropriate for assessing average exposure, particularly as the majority of the highest concentrations are in the deeper samples and therefore exposure will be weighted towards the lower concentrations in the surface (0-0.05m depth) samples.

This suggests that the outliers do not represent spatial zones where higher concentrations are clustered to the extent that they could cause exposure to average soil concentrations significantly above the averages for the dataset as a whole. This is supported by the relatively high density of sampling, with each sampling location no more than approximately three metres from the next nearest location and at least 5 sample locations situated within each Plot averaging area. In the absence of any other lines of evidence for significant hotspots (i.e. there were no field observations of potential significant soil differences in the statistical outlier samples), then the overall dataset average concentrations calculated for different averaging areas are considered to be suitable for comparison against the SSAC, and separate hotspot areas do not need to be considered. The conclusions drawn in Section 6.2.1 and Section 6.2.2 are therefore considered to be appropriate.

6.3 DQRA Step 2 – Potentially Unacceptable Risk Threshold for Treadgold House

Step 2 builds on the SSAC derived in Step 1, which were presented in **Table 30**. The objective of Step 2 is to identify concentrations where the level of risk approaches that which could be considered to pose a significant possibility of significant harm. This means identifying a concentration at which it can be considered that the risk is definitely not low, and that the possibility of significant harm is such that it could be considered significant by the relevant regulatory authority (subject to the tests of the overarching objectives of Part 2A).

6.3.1 Step 2 Toxicological Threshold

Since the SSAC derived in Step 1 are based on low levels of toxicological concern, one element of the approach to Step 2 is to adopt an alternative toxicological threshold that defines a higher level of risk.

For lead, a toxicological threshold associated with a 5µg/dL blood lead level has been adopted for Step 2. This is in comparison to the blood lead level used to define the LLTC of 3.5µg/dL, which itself is set at a level where adverse health effects have been reported (refer to Section 6.1.5). 5µg/dL is the UKHSA concentration for triggering individual case intervention in England. Given that adverse health effects have been reported at concentrations lower than 5µg/dL, it is considered that this threshold which indicates the point at which health authorities should intervene on the basis that there is likely to be a specific lead source and in order to reduce the harm is a reasonable threshold to define 'significant harm'. It is noted that although the blood lead concentration of 5µg/dL is not a risk-based concentration, the value was one of a number of values considered as part of the C4SL derivation for use as the LLTC before the concentration of 3.5µg/dL was ultimately chosen. In addition the value of 5µg/dL is slightly lower than the highest risk-based blood lead level of 5.6µg/dL reported as a possible choice for the child LLTC in Table 2.5 of the C4SL lead report (CL:AIRE, 2014). The HCV calculated as part of the C4SL Research Project as being equivalent to a blood lead level of 5µg/dL was 2.1µg/kg-bw/day (child receptor) and this value has been used as the input for deriving the Step 2 SSAC for lead.

Further adjustment to the SIR is adopted for calculation of the Step 2 SSAC for the child receptor scenario that could represent a level of risk closer to SPOSH. Based on the USEPA 2017 guidance a lower SIR of 45mg/day has been adopted as the starting point for calculating a site-specific SIR. This value of 45mg/day is based on the mid-point of the SIR for 6-<12yrs age range (60mg/day) and for the 12-adult age range (30mg/day) in USEPA 2017. This is considered to represent a lower estimate of the CTEs presented in USEPA 2017 and is justified on the basis that the communal gardens are likely to be very infrequently used by children younger than 6 years old due to the waist-high barrier restricting access from the flats. Further support for this lower SIR starting point includes the following:

- The C4SL report refers to a study by Van Wijnen et al (1990) that indicates that published soil ingestion rates are likely to over-estimate exposure during winter months;
- The Van Wijnen et al (1990) study concluded that soil ingestion is often more likely to be from areas away from the home such as parks, streets, shops, nurseries and schools;
- The C4SL report refers to a meta-analysis study by Stanek et al (2012) which indicated mean and median SIRs of 26mg/day and 33mg/day respectively. These values are notably lower than the SIRs used for the Step 1 SSAC and are also lower than the starting point SIR for the Step 2 SSAC;
- (US EPA, 2017) provides an additional summary of the data from the Stanek et al. (2012) study and presents the estimated SIR with data from a study located close to the Anaconda Superfund site removed[8]. These estimated mean and median SIRs were 43mg/day and 41mg/day, which are still lower than the Step 1 SSAC and starting point of 45mg/day being adopted for the Step 2 SSAC. (US EPA, 2017) reports that the data for the Stanek et al (2012) study were collected during summer and early autumn; data confined to this part of the year has been interpreted as likely to overestimate ingestion averaged across the year, as discussed in the C4SL report and noted above;

In addition to the lower starting point for the site-specific SIR, the contribution from the ingestion of indoor dust has been factored down to 30% of the assumed 50% contribution to the combined SIR of 45mg/day. The CLEA guidance (Environment Agency, 2009) states that it is difficult to separate out oral ingestion contributions from soil

[8] It was considered that because the children lived close to a Superfund site there may be additional efforts taken to limit soil ingestion in the area.

and indoor dust and for that reason a combined soil and dust ingestion rate is used. The C4SL report (CL:AIRE, 2014) notes that the contribution to the combined ingestion rate is likely to be split approximately equally, with half of the total ingestion coming from outdoor soil and half coming from indoor dust. The reduction in the indoor dust ingestion rate is based on the same justification as for the Step 1 SSAC, with exposure to the garden considered to occur on 111 days out of 365 days per year. The Van Wijnen study referred to in the C4SL report and noted above concluded that soil and dust ingestion is likely to be from a wide variety of sources unrelated to the immediate residential surroundings. It follows that the proportion of indoor dust in a property will be derived from many different sources and not just the garden area. This is intended to reflect the fact that the much reduced exposure in the investigation area will translate to a lower contribution of soils from the garden to the total indoor dust.

The calculation of the modified SIR for the Step 2 SSAC is presented in **Table 33** below.

Table 33. Calculation of Modified Child Receptor SIR for Step 2 SSAC

Initial SIR (based on Table 23 – mid-point of 6-<12 year old and 12-adult.)	Indoor Contribution	Outdoor Contribution	Modified Step 2 SIR
45 mg/day	6.75 mg/day (30% of 22.5mg/day)	6.75 mg/day (30% of 22.5 mg/day)	6.75 + 6.75 = 13.5 mg/day*

* The adoption of an SIR of 13.5mg/day for the Step 2 SSAC is required for modelling. This does not mean that the SIR is 13.5mg/day on the 111 days per year that the child is assumed to use the garden; rather it is a time-weighted average across the year with this approach needed due to the input and calculation setup of the CLEA model. The base literature sourced SIR that this site-specific value is based on is 45mg/day.

Based on the above justification, the derived Step 2 SSAC for the child receptor is 4,530mg/kg, as detailed in **Table 34**. The CLEA input and output sheets are presented in **Appendix K**[9]

Table 34. Updated Step 2 SSAC for a child resident receptor at Treadgold House

	Treadgold House (child resident receptor)
Step 2 SSAC	**Lead**
Step 2 SSAC* (mg/kg)	4,530

*5µg/dL blood lead target. Note that if the risk-based blood lead concentration of 5.6µg/dL had been adopted then the derived SSAC would be 5,180mg/kg, assuming a dose of 2.4µg/kgbw/day to achieve 5.6µg/dL blood lead (Figure 2.4 of lead C4SL report (CL:AIRE, 2014)).

The Step 2 SSAC of 4,530mg/kg has been derived to identify a soil concentration that could be close to defining SPOSH, and would therefore be an unacceptable concentration in the context of Part 2A.

Lead bioaccessibility and bioavailability was discussed in Section 6.1.2 and a site-specific bioaccessible fraction and relative bioavailability value of 68% was adopted for derivation of the Step 1 and Step 2 SSAC. However, the discussion in Section 6.1.2 noted that the adopted value could be conservative on the basis that this value is the stomach phase results of the UBM test method that simulates conditions in a fully fasted condition at the lowest pH. The stomach + intestinal average BAF from the UBM test was calculated as 21%, considerably lower than the value adopted.

There is no interpretative guidance associated with the UBM test method and which BAF of the stomach or stomach+intestinal BAF is the most appropriate for use in risk assessment, and therefore a reduced BAF and RBA has been considered as part of the sensitivity assessment in Section 6.3.1 below. It is noted that the use of 68% RBA for the Step 1 SSAC relies on the assumption that the dietary BAF if measured using the UBM test method (stomach-only) would be 100%. It is not necessarily the case that a dietary BAF using the stomach+intestinal method would also be 100% - it may be lower given the lower extraction pH used - and therefore the BAF of 21% could not be adopted directly as the RBA. For example, the BAF of 21% would equate to an RBA of 40% if dietary BAF was 50% using the UBM stomach+intestinal test method. For the purposes of

[9] Note that the input SIR in the CLEA model in Appendix K appears as 0.01g/day. However this is due to rounding of the actual input value of 0.0135g/day to two decimal places.

the sensitivity assessment an RBA of 45%, calculated as the mid-point between the stomach-only BAF (68%) and stomach+intestinal BAF (21%) has been adopted.

6.3.2 Sensitivity Assessment

Table 35 below shows the impact of changing the different parameters on the resulting SSAC. The POSresi GSC is used as the starting point, and the impact of varying the RBA, soil ingestion rate, outdoor exposure frequency and toxicological criteria on the resulting SSAC are detailed.

Table 35: SSAC Sensitivity Matrix

Parameter	POSresi GSC	Step 1 Child Receptor SSAC	Step 2 Child Receptor SSAC Development Progression			Indicative Step 2 SSAC if RBA also reduced to 45%
RBA	0.6	0.68	0.68	0.68	0.68	0.45
Contribution of outdoor soil to indoor dust (%)	100	100	100	30	30	30
Soil ingestion rate (mg/day)	75	39	29.25	13.5	13.5	13.5
Exposure frequency - outdoor	170	111	111	111	111	111
Toxicological Criteria (µg/kg-bw/day)	1.4	1.4	1.4	1.4	2.1	2.1
Resulting SSAC (mg/kg)	630	1,060	1,410	3,020	**4,530**	6,790

The sensitivity assessment demonstrates that the biggest contributing parameter change to the difference between the Step 1 and Step 2 SSAC is the change in the contribution of outdoor soil to indoor dust, which more than doubles the SSAC. It is noted that because the soil ingestion rate presented in Table 35 is a time-weighted average for modelling purposes it is linked to exposure frequency, for which there is relatively high uncertainty. The selected value of 111 days per year is considered to be a reasonable assumption for adjusting the soil ingestion rate based on site-specific conditions and in the majority of individual cases is considered likely to over-estimate the days spent in the garden each year. The residual uncertainty associated with this value is therefore considered to be acceptable in the context of risk assessment under Part 2A. The changes to the toxicological criteria and the starting point for the SIR increase the SSAC by approximately 50%. The indicative SSAC shown in the final column of Table 35 shows that a reduction of the RBA to 45% would further increase the SSAC by approximately 50%. However, this has not been included in the base derivation of the SSAC given the uncertainty associated with the application of BAF from the UBM test method to RBA within CLEA discussed previously.

The alternative use of a blood lead concentration target of 5.6µg/dL referred to in the note beneath **Table 34** has only a relatively minor effect on the SSAC compared to the sensitivities assessed in **Table 35.** The SSAC of 5,180mg/kg using the 5.6µg/dL blood lead level is much closer to the adopted SSAC of 4,530mg/kg than the other indicative SSAC shown in **Table 35** above. In the context of the discussion below, the conclusions therefore are unaffected by the selection of 5µg/dL compared to 5.6µg/dL for deriving the Step 2 SSAC.

6.3.3 Comparison of Site Data with Step 2 SSAC

The shallow soil sampling data at Treadgold House have been compared to the Step 2 SSAC in **Table 36** below.

Table 36. Treadgold House Step 2 SSAC Data Comparison

	Depths Ranges (m)	Number of results	Minimum detection (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)
Treadgold House (full garden area to the south and west of the residential building)	0-0.05 & 0-0.02	94	233	1,396	1,320	1,515	6,230
	0.1-0.2	66	148	1,745	1,825	2,934	38,490
	0-0.05 & 0-0.02+ 0.1-0.2	160	148	1,487	1,334	2,101	38,490
	0.3-0.4	27	309	1,090	1,059	1,829	20,630
	0.6-0.7	13	150	541	508	596	1,233
	1.1-1.2	1	507	-	-	-	507
	0-0.02/0-0.05m, 0.1-0.2m, 0.3-0.4, 0.6-0.7 & 1.1-1.2	201	148	1,381	1,334	1,959	38,490
Plot 7	0-0.05	7	342	1,260	1,182	1,335	2,148
	0.1-0.2	4	192	2,469	1,437	2,206	3,693
	0-0.05 + 0.1-0.2	11	192	1,515	1,209	1,651	3,693
	0.3-0.4	4	550	1,229	1,145	1,269	2,069
	0.6-0.7	1	-	-	-	-	456
	All	16	192	1,257	1,160	1,481	3,693
Plot 8 – with cluster samples (TH111, TH112 and TH113)	0-0.05 & 0-0.02	14	754	1,408	1,373	1,428	2,103
	0.1-0.2	6	935	1,540	1,889	2,220	4,102
	0-0.05 + 0.1-0.2	20	754	1,448	1,563	1,665	4,102
	0.3-0.4	3	1,240	1,407	1,412	1,420	1,612
	0.6-0.7	1	-	-	-	-	1,233
	All	24	754	1,415	1,485	1,617	4,102
Plot 8 – without cluster samples (TH111, TH112 and TH113)	0-0.05 & 0-0.02	11	754	1,525	1,460	1,516	2,103
	0.1-0.2	3	1,473	1,606	2,133	2,394	4,102
	0-0.05 + 0.1-0.2	14	754	1,541	1,584	1,704	4,102
	0.3-0.4	3	1,240	1,407	1,412	1,420	1,612
	0.6-0.7	1	-	-	-	-	1,233
	All	18	754	1,499	1,532	1,631	4,102
Plot 9 – with cluster samples (TH111, TH112 and TH113)	0-0.05	10	426	1,027	973	1,130	2,871
	0.1-0.2	4	935	4,839	3,182	7,478	18,960
	0-0.05 + 0.1-0.2	14	426	1,186	1,435	2,944	18,960
	0.3-0.4	3	991	2,870	3,886	8,164	20,630
	0.6-0.7	1	-	-	-	-	483
	All	23	426	1,186	1,541	3,677	20,630
Plot 9 – without cluster samples (TH111, TH112 and TH113)	0-0.05	9	426	1,042	934	1,142	2,871
	0.1-0.2	3	1,418	8,259	6,055	9,546	18,960
	0-0.05 + 0.1-0.2	12	426	1,259	1,490	3,243	18,960
	0.3-0.4	3	991	2,870	3,886	8,164	20,630
	0.6-0.7	1	-	-	-	-	483
	All	16	426	1,259	1,662	3,993	20,630
Plot 10 – with cluster samples	0-0.05 & 0-0.02	12	340	1,295	1,108	1,243	2,748
	0.1-0.2	6	441	899	949	1,125	2,412

	Depths Ranges (m)	Number of results	Minimum detection (mg/kg)	Median (mg/kg)	Geometric Mean (mg/kg)	Arithmetic Mean (mg/kg)	Maximum detection (mg/kg)
(TH105, TH106 and TH107)	0-0.05 + 0.1-0.2	18	340	1,226	1,247	1,203	2,748
	0.3-0.4	4	309	506	471	488	630
	0.6-0.7	2	150	152	151	152	153
	1.1-1.2	1	-	-	-	-	507
	All	25	150	676	770	977	2,748
Plot 10 – without cluster samples (TH105, TH106 and TH107)	0-0.05 & 0-0.02	9	340	1,168	1,041	1,211	2,748
	0.1-0.2	3	441	609	566	575	676
	0-0.05 + 0.1-0.2	12	340	874	894	1,052	2,748
	0.3-0.4	4	309	506	471	488	630
	0.6-0.7	2	150	152	151	152	153
	1.1-1.2	1	-	-	-	-	507
	All	19	150	630	629	810	2,748
Plots 7 to 10 – without cluster samples	0-0.05	36	340	1,316	1,151	1,311	2,871
	0.1-0.2	13	192	1,606	1,769	3,567	18,960
	0-0.05 & 0.1-0.2	49	192	1,414	1,290	1,909	18,960

Note: Grey shading indicates concentrations exceeding the Step 2 SSAC

All arithmetic mean, geometric mean, median and maximum concentrations in Plots 7 to 10 were well below the Step 2 SSAC, with the exception of the values at Plot 9 within the 0.1-0.2m depth range, where the maximum, arithmetic mean, geometric mean and median exceeded the Step 2 SSAC by factors of 4.2, 2.1, 1.3 and 1.8 respectively. If the higher SSAC of 6,790mg/kg (using RBA of 45%) is considered, then the median concentration in Plot 9 (with cluster samples), and the geometric mean in Plot 9 (without cluster samples), do not exceed the Step 2 SSAC.

With the exception of the Plot 9 datasets, the upper bound of the 95% confidence interval for all datasets in Table 36 was also below the Step 2 SSAC, indicating a high degree of confidence that the average concentrations do not exceed the Step 2 SSAC.

Exposure to soil in Plot 9 is expected to be more heavily weighted to the shallowest horizon (0-0.05m depth) and the mean, geometric mean and median concentrations calculated for the combined 0-0.05m and 0.1-0.2m depth datasets were below the Step 2 SSAC. It is noted that calculated average concentrations within Plot 9 at 0.1-0.2m depth decrease substantially when the additional cluster sample is added, the dataset increasing from three samples to four samples. This highlights the potential for additional samples to substantially change average concentrations calculated using small datasets, especially when the highest value in the small dataset is an outlier (refer to Section 6.3.2.1 below), as in this case. For Plot 9 0-0.05m and 0.1-0.2m data (without cluster samples) , the estimated upper bounds of the 80% and 95% confidence intervals were calculated as 6,257mg/kg (lower than the high-end SSAC of 6,790mg/kg) and 8,309mg/kg respectively. This indicates a degree of uncertainty associated with whether the average concentrations exceed the Step 2 SSAC. However, these upper bounds are heavily influenced by the two maximum concentrations (TH108 and TH109, both at 0.1-0.2m depth) which have previously been identified as dataset outliers. Hence the median and geometric mean concentrations are considered to be much more appropriate for assessment of exposure risk in this area and the median and geometric mean concentrations are comfortably below the Step 2 SSAC.

As there are no physical boundaries between the different plots, consideration of a slightly wider area which is equally likely to represent an averaging area for a specific child can also provide a larger dataset to improve the confidence in the calculated averages being representative for exposure. In the case of the western part of the garden, the data from 0-0.05m, 0.1-0.2m and combined 0-0.05+0.1-0.2m depths have been included in **Table 36** for Plots 7 to 10 combined. In this scenario the median and geometric mean concentrations in the 0-0.05m depth dataset are 1,316mg/kg and 1,151mg/kg respectively. When the 0.1-0.2m depth soils are added to this dataset the median and geometric mean increase slightly to 1,414mg/kg and 1,290mg/kg respectively, with the high outlier concentration in this dataset not having nearly as much effect on the averages than when the much smaller dataset exclusively within Plot 9 is considered.

All of the datasets presented in **Table 34** above are indicated to follow non-normal right-skewed distributions, with the median or geometric mean therefore likely to be a more reasonable estimate for average soil lead concentrations. The median and geometric mean concentrations for the shallowest horizon (0-0.05m) which is likely to dominate exposure, range between 934mg/kg and 1,535mg/kg. These concentrations are approximately 20% to 35% of the Step 2 SSAC, indicating that average soil concentrations are unlikely to pose a SPOSH to human health. The concentrations are much closer to the Step 1 SSAC of 1,060mg/kg and are therefore closer to the boundary between Category 3 and Category 4 than the upper boundary of Category 3.

6.3.3.1 Outliers

Dataset outliers were discussed in Section 6.3.2 as part of the data discussion for the Step 1 SSAC. Of the seven outliers identified, two were located in the western garden area occupied by Plots 7 to 10. These were 0.1-0.2m depth samples at TH108 (18,960mg/kg) and TH109 (8,659mg/kg), both within Plot 9. The shallower samples at both locations reported much lower concentrations (2,871mg/kg and 1,576mg/kg respectively) and the next nearest samples at 0.1-0.2m depth located at TH107 and TH110 reported concentrations of 1,122mg/kg and 1,418mg/kg. These two outlier concentrations therefore do not seem to represent an area that should be considered as a separate hotspot for averaging zone purposes, and the discussion of average concentrations in Section 6.3.2 above is considered to be appropriate for assessing exposure risk.

6.3.3.2 Summary

The average lead in soil concentrations presented in **Table 36** above do not exceed the Step 2 SSAC in all areas with the exception of Plot 9. For Plot 9, although some of the calculated averages in the standalone 0.1-0.2m depth samples exceed the Step 2 SSAC, these data are not representative for exposure assessment and the average concentrations for the 0-0.05m dataset and the combined 0-0.05m and 0.1-0.2m dataset do not exceed the Step 2 SSAC.

Given the discussion above, it is deemed that although the risk to the child receptor from lead is not low (since representative average concentrations exceed the Step 1 SSAC), there is not a strong case for SPOSH, because the Step 2 SSAC derived using the detailed understanding about the use of the communal garden at Treadgold House are not exceeded. Human health linkages associated with lead in soil at Treadgold House therefore fall into Category 3 land. All parts of the investigation area are considered to fall into Category 3 because the large majority of average concentrations calculated exceed the Step 1 SSAC, with some marginal scenarios for Plot 9 and Plot 10. This is discussed in detail in Section 6.2.1. It is considered appropriate to apply the Category 3 classification across the full investigation area because of the uncertainty associated with the calculated averages and the lack of a physical barrier between any of the defined Plot averaging areas. This means that it is not appropriate to define different land categories for Plots where the average concentrations are close to the Step 1 SSAC, compared to adjacent Plots where the average concentrations are comfortably higher than the Step 1 SSAC. For this reason, it is considered to be appropriate to apply the Category 3 classification across the full investigation area, including Plots 9 and 10 where average (median and geometric mean) concentrations are close to the Step 1 SSAC.

Further discussion is presented in **Section 7**. The full set of data screened against the Step 2 SSAC is included in tables with data grouped per plot in **Appendix H**.

6.4 Health Risk from Acute and Intermediate Duration Exposure

For lead, acute toxic effects discussed by ATSDR (ATSDR, 2020) and SoBRA (SoBRA, 2020) suggest that one-off exposure to high lead concentrations in soil is not a cause for concern, since acute toxic effects of lead are linked to high blood lead levels, which are unlikely to be affected by a single exposure event. SoBRA did not set an acute GAC for lead due to the uncertainty associated with the effect of a one-off exposure to high lead concentrations in soil on blood lead concentrations.

The Committee on Toxicity (COT) (Committee on Toxicity, 2013) stated that acute toxicity of lead salts in experimental animals is low. In humans, COT noted that colic is a characteristic early symptom of acute lead poisoning following high exposures – for example, in the workplace. High workplace exposures would typically be more consistent and continuous than one-off exposures to a very localised patch of soil with a high lead concentration. Given the lack of evidence that such one-off exposures have the potential to cause problematic acute toxicity, the risk of acute toxicity from one-off exposures to very localised high concentrations in soils is considered to be low.

For intermediate duration lead exposure which could occur over a period of weeks or months to average soil concentrations in a residential setting, the ATSDR report (ATSDR, 2020) indicates that overt health effects are generally not observed at blood lead levels less than 30µg/dL but that overt gastrointestinal and neurological toxicity are observed as concentrations increase above 30µg/dL, with severity increasing with blood lead level. The report notes that lead induced encephalopathy has been reported at blood lead concentrations <100µg/dL but is more commonly associated with blood lead >100µg/dl. ATSDR reported that in a review of 96 cases of death due to acute lead poisoning in children, death occurred at blood lead >100µg/dL. A similar picture of overt lead toxicity being linked to blood lead levels is reported in the SoBRA acute GAC report (SoBRA, 2020). Three cases of lead poisoning in children were reported in the SoBRA GAC report where blood lead levels of 36µg/dl, 22 – 35µg/dl, and 25.6µg/dl.

The available information suggests that intermediate exposure duration lead toxicity could start to be observed at blood lead levels around 30µg/dl, with a precautionary range of 20 – 40µg/dL. The Step 1 SSAC that have been derived are based on a target blood lead level of 3.5µg/dl which is 6 times lower than the 20µg/dL value identified as a lower precautionary limit for an approximate level for the onset of intermediate duration health effects. Figure 2.3 of the lead C4SL report indicates that blood lead levels do not increase proportionately with dose and for soil and dust ingestion exposure the dose would need to (for example) more than double in order for the blood lead concentration to double. Since exposure to lead in the scenarios evaluated in Step 1 of the DQRA is dominated by soil and dust ingestion, it could be expected that soil concentrations would need to be around 6 to 10 times higher than an SSAC derived based on 3.5µg/dL blood lead before health effects at intermediate duration exposures might start to appear.

Since the mechanism for the reported intermediate exposure duration health effects is the same as for chronic effects (raised blood lead level), any average soil concentrations which do not substantially exceed (i.e. by a factor of 6 to 10) an SSAC based on a blood lead of 3.5µg/dL should not be a concern for intermediate duration health effects. To be conservative, the lower end of this range can be considered (i.e. a factor of 6). This would give an intermediate duration SSAC of 6,360mg/kg (i.e. 6 x 1,060mg/kg) for Treadgold House. For Avondale Park Gardens, as an updated SSAC has not been derived in this report, the Step 1 SSAC from the Stage 2 report (710 mg/kg) has been used, which would give an intermediate duration SSAC of 4,260 mg/kg.

For Treadgold House, none of the average soil concentrations for any of Plots 1-10 (taking the higher of the mean or the median) exceed the intermediate duration SSAC noted above that could begin to indicate a potential for adverse health effects. Across the entire sampling area, only four samples have reported concentrations above 6,360mg/kg. Two of these are located at TH108 at depths of 0.1-0.2m and 0.3-0.4m. The shallowest sample (0-0.05m) at this location had a reported concentration of 2,871mg/kg, indicating that the majority of exposure in this area is likely to be to soils with concentrations lower than the intermediate duration SSAC. The two other locations with a reported concentration above the intermediate duration SSAC were TH165 at a depth of 0.1-0.2m and TH109 at a depth of 0.1-0.2m. The shallower (0-0.05m) sample at these locations had a reported concentration of 1,489mg/kg and 1,576mg/kg respectively, again indicating that the majority of exposure in these area will be to soils with concentrations below the intermediate duration SSAC. Hence adverse health effects from intermediate duration exposure to lead in soil do not need to be considered further in the context of the soil concentrations identified during the investigations at Treadgold House.

For Avondale Park Gardens, the maximum lead concentration of 2,223 mg/kg is well below the intermediate duration SSAC, therefore the adverse health effects from lead in soil do not need to be considered further in the context of the soil concentrations identified during the investigations at Avondale Park Gardens.

Given the above discussion, any human health linkages associated with acute and intermediate duration adverse health effects are considered to fall into Category 4, since one-off acute exposure risks are qualitatively considered to be low, and the indicative intermediate duration SSAC discussed above is based on chronic Step 1 SSAC (and Step 1 is intended to assist with deciding the Category 3/4 boundary below which risks are considered to be low).

7. Part 2A Risk Evaluation

This Part 2A risk evaluation is based on the COPC in soil measured during the Stage 1, Stage 2 and follow-on work intrusive investigations within the western and southern gated gardens at Treadgold House and Avondale Park Gardens. In places, a particular focus has been placed on lead since lead was the only COPC considered to be of sufficient concern for DQRA to be needed.

7.1 Introduction

In accordance with the 2012 Statutory Guidance for Part 2A of the Environmental Protection Act 1990, Local Authorities must consider a range of factors when deciding whether land should be determined as Contaminated Land.

Land which is shown to be causing Significant Harm, as defined by the Statutory Guidance, should be determined as Contaminated Land. For land where there is not any direct evidence of Significant Harm, it may still be determined as Contaminated Land if there is a Significant Possibility of Significant Harm (SPOSH).

When assessing land for SPOSH, initially, it must be shown that a possibility of significant harm (POSH) exists. Beyond that, the Statutory Guidance describes 4 categories of land (refer to **Section 7.1.3**) to be used to assist when deciding whether a POSH is significant or not.

7.1.1 Expectations for Detailed Inspection

The Statutory Guidance indicates that the detailed inspection of land should obtain sufficient information to decide whether it is contaminated land in line with the description of risk assessment in Section 3 of the guidance. Inspection should be stopped if, on the basis of the information gathered, there is no longer a reasonable possibility that a significant contaminated linkage exists on the land.

The risk assessment process for deciding whether land meets the definition of contaminated land should have regard to good practice such that robust decisions can be made in line with the Statutory Guidance. Specifically, the risk assessment should be scientifically based, authoritative, relevant to the risks arising from the presence of contaminants in soil, and appropriate to inform regulatory decisions in accordance with Part 2A and the Statutory Guidance.

7.1.2 Definitions of Significant Harm and Possibility of Significant Harm

The Part 2A statutory guidance definition of significant harm includes: death; life threatening diseases (e.g. cancers); other diseases likely to have serious impacts on health; serious injury; birth defects; and impairment of reproductive functions. The adverse health effects that can be caused by sufficiently high exposure to lead falls within this definition. High enough chronic exposure to lead can cause serious kidney (renal) damage and heart (cardiovascular) effects such as high blood pressure. In children it can adversely affect the development of the brain and nervous system. High enough short to medium term exposure to lead can cause adverse 'acute' health effects such as gastrointestinal and neurological toxicity, encephalopathy, and in extreme cases, death.

To demonstrate significant harm, Paragraph 4.4 of the Statutory Guidance states that *"Conditions for determining that land is contaminated land on the basis that significant harm is being caused would exist where: (a) the local authority has carried out an appropriate, scientific and technical assessment of all the relevant and available evidence; and (b) on the basis of that assessment, the authority is satisfied on the balance of probabilities that significant harm is being caused (i.e. that it is more likely than not that such harm is being caused) by a significant contaminant(s)."*

The Statutory Guidance states that the evidence required to decide whether there is a possibility of significant harm (POSH) to human health includes:

- the estimated likelihood that significant harm might occur to an identified receptor, taking account of the current use of the land in question.
- the estimated impact if the significant harm did occur i.e. the nature of the harm, the seriousness of the harm to any person who might suffer it, and (where relevant) the extent of the harm in terms of how many people might suffer it.

To estimate the likelihood that a specific form of significant harm might occur the Statutory Guidance further states that the following information should be considered:

- The estimated probability that the significant harm might occur:
  - if the land continues to be used as it is currently being used; and
  - where relevant, if the land were to be used in a different way (or ways) in the future but within what the land can reasonably be used for without significant redevelopment that would require an application through the Town and Country Planning Act.
- The strength of evidence underlying the risk estimate. It should also consider the key assumptions on which the estimate of likelihood is based, and the level of uncertainty underlying the estimate.
- An estimate of the timescale over which the significant harm might become manifest, to the extent that this is possible and practicable.

The estimated impact (seriousness of harm) is determined by the toxicological endpoint (often defined as a toxicological point of departure (such as a benchmark dose)) and the margin of exposure (how close to or in excess of that dose the exposure is predicted to be). If a POSH is established, the available information must be interpreted to decide whether that possibility is significant i.e. is a significant possibility of significant harm (SPOSH).

7.1.3 Significant Possibility of Significant Harm

The decision on whether the POSH is significant is a regulatory decision to be taken by the relevant local authority. In deciding whether the POSH is significant, the authority is deciding whether the POSH posed by contamination in, on or under the land is sufficiently high that regulatory action should be taken to reduce it, with all that that would entail.

In considering whether a SPOSH exists, the local authority should consider the number of people who might be exposed to the risk in question and/ or the number of people it estimates would be likely to suffer harm. The Statutory Guidance defines four land categories associated with risk to human health, which are intended to assist in the decision making when evaluating the POSH and if required, SPOSH, for any Part 2A assessment.

7.1.4 Four Categories of Land

The Statutory Guidance defines four Categories for land being investigated under Part 2A in the context of SPOSH. **Category 1** describes land where there is an unacceptably high probability, supported by robust science-based evidence, that significant harm would occur if no action is taken to stop it. **Category 4** describes land where there is little evidence for a POSH, there is no risk or that the level of risk posed is low. This includes land where: no contaminant linkage has been identified; only normal levels of contaminants in soil are present; soil concentrations do not exceed relevant GSC; or estimated levels of exposure from soil are likely to form only a small proportion of exposure from other sources.

Categories 2 and 3 occupy the area where a POSH is considered to exist and a decision must be made as to whether the POSH is significant (Category 2, and the Site to be determined as Contaminated Land) or is not significant (Category 3, and the Site is not to be determined as Contaminated Land). The Statutory Guidance indicates that for human health:

- *"Land should be placed into Category 2 if the authority concludes, on the basis that there is a strong case for considering that the risks from the land are of sufficient concern, that the land poses a significant possibility of significant harm. Category 2 may include land where there is little or no direct evidence that similar land, situations or levels of exposure have caused harm before, but nonetheless the authority considers on the basis of the available evidence, including expert opinion, that there is a strong case for taking action under Part 2A on a precautionary basis.*
- *Land should be placed into Category 3 if the authority concludes that a strong case does not exist, and therefore the legal test for significant possibility of significant harm is not met. Category 3 may include land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted. This recognises that placing land in Category 3 would not stop others, such as the owner or occupier of the land, from taking action to reduce risks outside of the Part 2A regime if they choose.*

In making its decision on whether land falls into Category 2 or Category 3, the local authority should first consider its assessment of the possibility of significant harm to human health, including the estimated likelihood of such *harm, the estimated impact if it did occur, the timescale over which it might occur, and the levels of certainty attached to these estimates."*

If the authority considers that it cannot make a decision in line with the factors noted in the paragraph above, it should consider other factors which it considers are relevant to achieving the overarching objectives of Part 2A. Additional factors for consideration include:

(a) the likely direct and indirect health benefits and impacts of regulatory intervention. This would include benefits of reducing or removing the risk posed by contamination. It would also include any risks from contaminants being mobilised during remediation (which would in any case have to be considered under other relevant legislation); and any indirect impacts such as stress-related health effects that may be experienced by affected people, particularly local residents. If it is not clear to the authority that the health benefits of remediation would outweigh the health impacts, the authority should presume the land falls into Category 3 unless there is strong reason to consider otherwise.

(b) The authority's initial estimate of what remediation would involve; how long it would take; what benefit it would be likely to bring; whether the benefits would outweigh the financial and economic costs; and any impacts on local society or the environment from taking action that the authority considers to be relevant.

The decision is a positive legal test, meaning that the starting assumption should be that land does not pose a significant possibility of significant harm unless there is reason to consider otherwise.

7.2 Part 2A Evaluation

7.2.1 Sufficiency of Detailed Inspection and Risk Assessment

The detailed inspections completed at Treadgold House and Avondale Park Gardens have obtained sufficient information, using recognised good practice techniques and risk assessment, to decide whether or not the land meets the definition of Contaminated Land with a sufficient level of confidence.

The site investigation was designed to provide sufficient soil data that average contaminant concentrations in soil could be estimated and used to estimate health risks to known human receptors. A quantitative assessment of ground gas risk was not completed following the decision during the ground investigation to not attempt deeper drilling using window sampling techniques for the potential installation of gas monitoring wells. This decision was made based on the concrete obstructions encountered during hand pitting at depths of 0.7m and the low ground gas risk identified in the preliminary CSM presented in **Table 2**.

The human health risk assessment was carried out using the tiered process outlined in the Part 2A Statutory guidance, with a preliminary risk assessment used to identify potentially significant contaminant linkages to be investigated, followed by soil concentrations being compared against suitable generic criteria, before advancing to a detailed tier of risk assessment when potentially unacceptable risks could not be ruled out at the generic tier of assessment.

Both the generic and detailed quantitative risks assessments (GQRA and DQRA) were completed in accordance with nationally and internationally recognised good practice and peer-reviewed published guidance, in particular with reference to the UK Contaminated Land Exposure Assessment (CLEA) methodology; the CL:AIRE C4SLs guidance; and the USEPA 2017 exposure factors handbook update for soil and dust ingestion rates. To assist with the requirement to place land into a specific Category with respect to the Part 2A Statutory Guidance, the DQRA involved the derivation of Step 1 SSAC designed to be representative of the Category 3/4 boundary, and Step 2 SSAC designed to give an indication of when a SPOSH might exist (i.e. the Category 1/3 or 2/3 boundary).

The risk assessment has considered uncertainties associated with the derivation of the SSAC, how the uncertainties could impact interpretation, and whether these uncertainties are within acceptable bounds for appropriate decision-making. One example of uncertainty is the exposure frequency adopted (i.e. how often does a resident access the garden). A value of 111 days was selected for child residents and whilst it is acknowledged that this exposure frequency could be exceeded in a few isolated cases, it was considered that in the majority of cases the value would be an over-estimation therefore tending to the precautionary side for the assessment and hence suitable for decision-making in the context of Part 2A of the EPA. Based on the assessment, it is considered unlikely that the exposure frequency will be exceeded to the extent that the conclusions of the report will change.

Based on the risk assessments completed, the following conclusions have been made consistent with the requirements of the Part 2A Statutory Guidance. The risk assessment and conclusions are based on the continued use of the investigation area as a managed residential garden with continued layout and access in accordance with that described in this report. Re-evaluation may be needed if these conditions change significantly, with the main changes that could potentially affect the conclusions being:

- Ease of access by child residents to the garden is increased either by providing residents with keys to the side gates, or by creating authorised access to the garden via the ground floor balconies of Flats 7 to 10;
- Crops for homegrown consumption are grown in ground level soils. This is likely to increase the exposure risk due to the theoretical sensitivity of the plant uptake pathway for lead. Currently, since the garden landscape is managed by RBKC and raised beds containing soil with much lower lead concentrations have been provided for homegrown produce, the CSM does not include consumption of home-grown produce; and
- The upper 10cm of soils are stripped for re-landscaping / re-turfing but leaving the soils at 10-20cm depth that have a lower sampling density (hence greater uncertainty) and appear to contain higher lead concentrations.

7.2.2 Significant Harm

The assessment has not identified any conditions for which there is evidence that significant harm is being caused by contaminants in soil.

7.2.3 Low or No Risk – Category 4

Land has been placed in Category 4 where it is considered to pose no more than a low risk to human health, either through screening the COPC concentrations using GSC and Step 1 SSAC, or by virtue of the COPC being present at normal levels in soil. **The land at Avondale Park Gardens has been placed in Category 4.**

This is on the basis that median lead soil concentrations in the shallowest horizons tested are lower than an indicative Step 1 SSAC of 804mg/kg discussed in **Section 5.2.2.1**. This decision is on the balance of probabilities, i.e. it is more likely than not that the average concentrations fall below this SSAC.

Average soil concentrations at Avondale Park Gardens also appear to be close to the upper bound (but still within) the concentrations that are considered typical of urban environments, based on the majority of average concentrations shown in Table 24 in Section 5.2.2.1 being below the NBC. The NBC is defined as the upper 95% confidence limit of the 95th percentile (of the dataset used to derive the value) and is intended as an upper threshold value for soils in an urban setting. The average concentrations at Avondale Park Gardens are generally lower than, but relatively close to, the NBC and therefore can be considered to be towards the upper end of what is considered normal within an urban environment.

Whilst the maximum concentration at the Avondale Park Gardens site is a statistical outlier and may represent a local area of higher concentrations, it is still appropriate to assess chronic risk from these soils in the outlier area using average concentrations across the entire Avondale Park Gardens area. This is because under typical usage of the land, a person may be exposed to all areas of the site and higher exposure from any time spent in the outlier area will be balanced against the lower exposure in all other areas. The duration of time spent in the outlier area is not expected to be any higher than time spent in other areas – in fact it may be less as the area with the maximum concentration is a relatively inaccessible soil bed with dense shrubs.

In addition, all contaminant linkages at Treadgold House other than lead in soil chronic exposure for child residents have been placed into Category 4. This is on the basis that average concentrations in soil either do not exceed GSC, GSC are demonstrated to be sufficiently precautionary that minor exceedances would not elevate risks above the Category 4 level (e.g. for beryllium), or average concentrations do not exceed the Step 1 SSAC (e.g. for lead in soil to adult receptors in all parts of the garden i.e. Plots 1 to 10). Placing these linkages into Category 4 has been done on a balance of probabilities approach i.e. average concentrations fall below the GSC or SSAC. There is a much higher level of confidence that these linkages do not meet the definition of Contaminated Land. The upper bound of 95% confidence intervals did not exceed the Step 2 SSAC (i.e. less than 2.5% chance of the true mean concentration exceeding the child Step 2 SSAC) for all datasets evaluated in Section 6.3.3. The only exception to this was for Plot 9 where a very broad confidence interval was calculated due to two high outlier concentrations in a relatively small dataset. However even in Plot 9, the upper bound of the 80% confidence internal did not exceed the highest Step 2 SSAC based on 45% RBA (i.e. less than 10% chance of the true mean concentration exceeding the child Step 2 SSAC based on 45% RBA). A very high level of confidence exists that there are not unacceptable acute health effects caused by lead in soil, with all average concentrations being below the indicative intermediate duration SSAC and only four individual samples exceeding the value. Of these four samples, none were within the shallowest sampling horizon of 0-0.05m and the shallowest samples at these locations were reported with concentrations less than half of the indicative intermediate duration SSAC.

7.2.4 Significant Possibility of Significant Harm

For Treadgold House, the sampling area could not immediately be placed into Category 4 due to average lead soil concentrations exceeding the GSC and Step 1 SSAC for child residents. Therefore an assessment of whether a significant possibility of significant harm exists has been carried out following the Statutory Guidance approach of placing the land into one of the three remaining categories (described in **Section 7.1.4**).

This area was assessed further using DQRA, with the only COPC for the DQRA being lead. The DQRA involved a process of refinement of the generic assessment criteria initially used (GSC, NBC and Stage 2 SSAC) to make them more site specific and progressively less precautionary. The Treadgold House gated communal garden area is therefore discussed below in the context of:

- Possibility of Significant Harm – Likelihood, Impact and Timescale;
- Uncertainty; and
- Objectives of the Contaminated Land Regime.

For the communal garden to the south and west of the residential building, the majority of the mean, geometric mean and median lead concentrations for shallow soils exceeded the GSC, NBC, Stage 2 SSAC[10] and Step 1 SSAC derived in **Section 6** of this report. Therefore taking a balance of probabilities approach, it was concluded that this part of the land at Treadgold House could pose a risk to health that is not low and therefore falls into either Category 1, Category 2 or Category 3.

For the communal gardens to the south and west of the residential block there is a possibility of this land being used in some respects in a manner similar to a private garden since a number of back doors to private properties open directly onto the garden, which is securely fenced, not accessible to the public, and only directly accessible to a small number of residents. The presence of patio chairs and a barbecue in the area also indicates usage similar to a private garden in some respects. However, the fact that the garden is managed by the housing association and its communal use are likely to reduce exposure to soils compared to a typical private garden as exposure during gardening will be reduced. The properties with direct access onto the communal garden (Flats 1 to 6) are social housing studio flats which RBKC has confirmed are only used to house single adults. A Step 1 SSAC was derived to take into account an adult resident and the representative average soil lead concentrations in the garden area (all Plots 1 to 10, plus the garden considered as a single averaging area) were considered to be lower than this SSAC. As a result it was concluded that risks to an adult receptor would not pose a SPOSH and therefore that the communal gardens would fall into Category 4 considering an adult receptor and would pose a low risk to this receptor.

The properties which could house children (Flats 7 to 10) do not have official direct access onto the communal garden, and therefore SSAC were derived for considering the risk to a child receptor who might live in one of these flats at Treadgold House, with the key conceptual adjustments to take account of the more restricted and limited access being a reduction in exposure frequency and reduction in indoor dust proportion from the garden soil. In addition, the target blood lead level was increased to 5µg/dL for calculation of the Step 2 SSAC to be consistent with the UK Heath Security Agency's case intervention threshold, and soil ingestion rates were revised (compared to the GSC derivation) based on updated guidance published by USEPA in 2017. The average (mean, geometric mean and median) lead concentrations in soil within all averaging areas (i.e. Plots 1 to 10 plus the entire garden considered as a single averaging area) exceeded the Step 1 SSAC for the child receptor, but were lower than the Step 2 SSAC and lower than the indicative intermediate duration SSAC.

In addition, although a number of individual sample concentrations exceeded the Step 1 and Step 2 SSAC, the highest concentrations were generally in the slightly deeper soil horizon (0.1-0.2m) rather than the shallowest sampled horizon (0-0.05m). Since the gardens are managed by RBKC Housing conclusions are based on the assumption that residents will not be digging within the garden and if limited digging does occur it will be an infrequent occurrence, reducing the potential exposure to the highest soil concentrations. For any individual resident it is acknowledged that there is variability in terms of the frequency of garden use and whether they are likely to attempt any digging for their own localised landscaping. However it is considered more likely than not

[10] The Stage 2 SSAC were generated as part of the Grenfell Environmental Checks programme of work.

that exposure frequency will be lower than the 111 days per year that child residents have been assumed to use the garden, and that residents will not engage in digging activities given that the gardens are managed by RBKC Housing and there are dedicated raised beds available for growing homegrown produce. These assumptions are therefore considered reasonable when deciding whether SPOSH exists.

On this basis it was considered that although the risk to the child resident from lead is not low, there is not a strong case for SPOSH. The conclusion is based on the use of average soil concentrations looking at various averaging areas and averaging zones across the investigation area. Although individual sample concentrations may exceed the Step 2 SSAC (intended to be indicative of concentrations approaching those that could pose a SPOSH), it is appropriate to assess risk using average concentrations because exposure is not focussed on isolated locations, and higher concentrations in one area are balanced out by lower concentrations in another area.

Therefore based on this assessment, this area of land falls into **Category 3**.

The Statutory Guidance defines Category 3 land as *"…land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted. This recognises that placing land in Category3 would not stop others, such as the owner or occupier of the land, from taking action to reduce risks outside of the Part 2A regime if they choose…."*

The average lead in soil concentrations – which are typically in the range 1,000mg/kg to 2,000mg/kg depending on the averaging area and the depth combinations assessed – are considerably closer to the Step 1 SSAC of 1,060mg/kg than the Step 2 SSAC of 4,530mg/kg. The 97.5% upper confidence limit of the average concentrations for all data-sets representative of average exposure were also lower than the Step 2 SSAC, indicating less than a 2.5% chance that average concentrations exceed the Step 2 SSAC. This provides a very high level of confidence that average soil concentrations do not represent SPOSH. The level of confidence that the average concentrations definitely exceed the Step 1 SSAC is lower, and it is on the balance of probabilities that the land falls into Category 3 rather than Category 4. It is also noted that none of the average concentrations considered to be reasonable for exposure assessment exceeded an alternative child Step 1 SSAC derived as a sensitivity assessment using a reduced contribution soil contribution to indoor dust. Whilst this SSAC was not considered sufficiently precautionary to definitely be within Category 4 it indicates a reasonable degree of uncertainty associated with the Category 3/4 boundary and demonstrates that the land is likely to be relatively close to Category 4.

In Section 6.3.1 an alternative Step 2 SSAC was derived using a target blood lead level of 5.6µg/dL which could have been justified on the basis that it is a risk-based toxicological threshold rather than the value of 5µg/dL which was ultimately selected based on the UKHSA's case intervention concentration. The higher blood lead target results in a higher SSAC (i.e. higher threshold for reaching SPOSH and Category 2) and therefore provides some additional confidence that the soil concentrations at the Site do not exceed the threshold between Category 2 and Category 3.

The discussion above indicates that the level of risk to child receptors caused by the lead in soil, whilst not necessarily low, is much closer to the boundary between Category 3 and Category 4 (below which the risk is considered low) than it is to the boundary between Category 2 and Category 3.

7.3 Updated CSM

Following the Part 2A risk evaluation, the CSM initially presented in **Section 3** has been updated and is presented in **Table 37** below.

Table 37. Final CSM following Follow-on Intrusive Investigation

	Sources		Pathways		Receptors	Discussion
Treadgold House (communal gardens to south and west of residential building)	Lead in soil at Treadgold House (communal gardens to south and west of residential building	➡	Ingestion of soil and indoor dust Dermal contact with soil (outdoor) Dermal contact with soil derived dust (indoor) Inhalation of dust (indoor and outdoor)	➡	Ground floor residents (flats 1-10) of Treadgold House and their visitors	Treadgold House has been placed into Category 3, based on the assessment of the lead concentrations encountered in shallow soils, and the understanding of the use of the communal gardens, based on exposure to child residents. Linkages associated with lead exposure to adult residents and visitors are considered to be associated with the Category 4 level of risk. The higher (i.e. above NBC) concentrations of lead in soil in this area could have arisen from soils being imported from other unknown contaminated sources during redevelopment and landscaping. It is unlikely that the source of the lead is the historical land-uses such as the brickworks which formerly occupied land now within the southern part of Treadgold House, as the samples collected from the deeper Made Ground contained lower concentrations of lead compared to the shallower soils. The statutory guidance defines Category 3 as: *'land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted. This recognises that placing land in Category3 would not stop others, such as the owner or occupier of the land, from taking action to reduce risks outside of the Part 2A regime if they choose…."*
Avondale Park Gardens	Lead in soil at Avondale Park Gardens	➡	Ingestion of soil and indoor dust Dermal contact with soil (outdoor) Dermal contact with soil derived dust (indoor) Inhalation of dust (indoor and outdoor)	➡	Residents of Avondale Park Gardens and their visitors	The land at Avondale Park Gardens has been placed into Category 4, based on the assessment of the lead concentrations encountered in shallow soils, and the understanding of the use of this area of land. As with Treadgold House, it does not appear that the higher concentrations of lead present in this area are related to the historical land uses, as the samples collected from the deeper Made Ground contained lower concentrations of lead compared to the shallow soils. No further assessment or action is required at Avondale Park Gardens.

8. Conclusions and Recommendations

The primary aim of these works was to undertake a detailed inspection of Treadgold House and Avondale Park Gardens, in response to the recommendations from the Grenfell Stage 2 investigation.

The specific objectives in relation to these sites included:

- Undertake an appropriate level of intrusive site investigation work to investigate lead within the soil, including whether the spatial distribution of lead appears to be linked to the former brick pit identified in historical mapping in the area. A number of other substances relevant to the previous site history were also to be included.
- Carry out a quantitative human health risk assessment using existing GSC and SSAC used within the Stage 2 report to establish whether there is SPOSH.
- Carry out further detailed quantitative human health risk assessments to establish whether there is a significant possibility of significant harm (SPOSH) to human health as defined by Part 2A.
- Classify each potential contaminant linkage as Category 1-4 in accordance with the Statutory Guidance and in doing so provide recommendations to the Local Authority on whether any land appears to meet the definition of contaminated land under Part 2A.

The intrusive investigation and assessment of the two sites constitutes a ‘detailed inspection’ as defined by Paragraph 2.2 of the Part 2A 2012 Statutory Guidance. A plan showing the locations of the Treadgold House and Avondale Park Gardens sites is included as **Figure A1** in **Appendix A**.

Conclusions for each of these objectives in turn are summarised as follows:

Undertake an appropriate level of intrusive site investigation work

Intrusive sampling was completed at Treadgold House and Avondale Park Gardens which included the collection of 197 soil samples from 90 hand pit locations at Treadgold House and a further 38 soil samples from 16 hand pit locations at Avondale Park Gardens. Samples were collected from multiple depth horizons to provide an indication of contaminant variability with depth and allow an interpretation of whether the lead previously identified at elevated concentrations in soil could be due to the former brickworks occupying the majority of the Avondale Park Gardens area and the southern part of the Treadgold House area.

Primarily, samples were analysed for lead, which was the COPC identified from the Grenfell Stage 2 investigation as remaining of concern in these two areas. In addition, a sub-set of samples were tested for asbestos, heavy metals, PAHs and asbestos. Six samples from Treadgold House were analysed for lead bioaccessibility.

The findings of the investigation indicated that the source of the lead in soil at Treadgold House (refer to **Section 5.2.1.3**) and Avondale Park Gardens (refer to **Section 5.2.2**) was most likely to have been topsoil imported to the site for landscaping, with no evidence (based on the evaluation of lateral and vertical variations in soil concentrations) that it originated from the Grenfell Tower fire or from fill in the historic brickfield.

The Part 2A conclusions summarised in further text below are based on a high sampling density, with no significant hotspots requiring separate investigation identified during the data assessment. The assessment indicates that the land does not meet the definition of contaminated land with a high degree of confidence and therefore in accordance with paragraph 2.13 of the Statutory Guidance, it is concluded *“that there is no longer a reasonable possibility that a significant contaminant linkage exists on the land”* and that *“the authority should not carry out any further inspection in relation to that linkage”.*

With reference to Paragraph 3.12 of the Statutory Guidance, the understanding of the risks has been developed through the recommended staged process of risk assessment and since the findings of this assessment have concluded that the land is not contaminated land, it is considered that the process of risk assessment does not need to continue.

It is noted that there were some deep samples from the proposed Site Investigation Design document which could not be collected due to obstructions at depth during excavation, and therefore a greater uncertainty over the characterisation of the deeper soils, due to limit number of samples. However given the site use, there is limited opportunity for site users to have exposure to this material due to its depth below surface and this change to the investigation design is not considered to have significantly affected the assessment. The material that was encountered appeared to be typical of mixed construction and demolition rubble that is observed on many former brownfield sites, Further work to sample this material is not considered to be required.

Carry out generic and detailed quantitative human health risk assessment using existing GSC and SSAC used within the Stage 2 report to establish whether there are potential unacceptable risks to human health as defined by Part 2A.

The results were assessed for risk to human health taking into account the concentrations of COPCs that could be present in soil as a result of historical land uses.

Section 5 presents the Part 2A-compliant generic quantitative risk assessment and identified only lead at Treadgold House as potentially presenting an unacceptable risk to human health (both child and adult receptors) for chronic exposure and warranting further more detailed risk assessment, described under the sub-heading below. All other linkages, including those associated with the other COPC investigated, those associated with acute health effects, and all linkages at Avondale Park Gardens, were considered to fall within the definition of Category 4 land, posing no more than a low risk to human health.

Carry out further detailed quantitative human health risk assessments to establish whether there is a significant possibility of significant harm (SPOSH) to human health as defined by Part 2A.

Section 6 presents the Part 2A-compliant detailed quantitative risk assessment and this did not identify any contaminant linkages associated with a SPOSH (i.e. Category 1 or Category 2 land) to human health. However, the risk from exposure to lead in shallows soils by children resident at Treadgold House was considered to be not low, and therefore the communal gardens to the south and west of Treadgold House are considered to fall into Category 3. The average soil concentrations were considerably closer to the Step 1 SSAC indicative of the Category 3/4 boundary (below which the risk is considered low) than they were to the Step 2 SSAC indicative of the Category 2/3 boundary.

Since none of the land was considered to meet the definition of contaminated land, and this conclusion was made with a high degree of confidence, no further detailed quantitative risk assessment is required in accordance with paragraph 3.12 of the Statutory Guidance.

Whilst the assessment considered various different averaging areas as sub-sets of the full investigation area at Treadgold House, described as Plots 1 to 10 within the report, the Category 3 land conclusion is considered to apply to the full Treadgold House investigation area, since average concentrations in all averaging areas exceeded the Step 1 SSAC, with marginal scenarios at Plot 9 and Plot 10. Although it is possible that children could focus their play on areas of the garden closest to their home and the garden access point (ground floor balcony), there is no physical restriction to their movement across the full area and it would therefore be unreasonable to exclude Plots 9 and 10, or the area of the garden to the south of the building from the Category 3 designation.

The risk assessment considered uncertainty including (but not limited to) exposure frequency, contribution of garden soil to indoor dust, and target blood lead level. For exposure frequency and indoor dust contribution, a balanced but precautionary approach was taken such that parameters were selected that were considered reasonable and more likely than not to be precautionary, whilst acknowledging the variability for any individual resident. For the Step 2 blood lead target a precautionary approach was taken by selecting the UKHSA case intervention concentration rather than an alternative slightly higher risk-based value that would have resulted in a higher (and less precautionary) SSAC. In these cases discussion was provided describing the impact of choosing differing values for the parameters.

Uncertainty associated with the definition of the Category 3/4 boundary was highlighted by the derivation of an alternative higher Step 1 SSAC – which the average soil concentrations did not exceed – as part of a sensitivity analysis. Whilst this SSAC was not considered sufficiently precautionary to definitely be within Category 4 the sensitivity analysis indicated a reasonable degree of uncertainty associated with the Category 3/4 boundary and demonstrated that the land is likely to be relatively close to Category 4. Uncertainty associated with the definition of the Category 2/3 boundary was highlighted by the derivation of an alternative higher Step 2 SSAC using the risk-based blood lead threshold of 5.6µg/dL rather than the UKHSA intervention concentration of 5µg/dL. This highlighted the potential for conservatism within the assessment demonstrating a greater level of confidence that soil concentrations would not exceed the Category 2/3 boundary.

Classify each potential contaminant linkage as Category 1-4 in accordance with the Statutory Guidance and in doing so provide recommendations on whether any land appears to meet the definition of contaminated land under Part 2A.

Avondale Park Gardens (and its associated potential significant contaminant linkages) was evaluated to fall into Category 4, which describes land posing 'no to low risk'. Category 4 land does not meet the definition of Contaminated Land under Part 2A.

For Treadgold House, the available evidence indicates that risk to health for adult residents and their (child or adult) visitors at Flats 1 to 6 from lead in soil meets the definition of Category 4 land, which describes land posing 'no to low risk'. Category 4 land does not meet the definition of Contaminated Land under Part 2A.

For Treadgold House, the available evidence indicates that the risk to health for child residents from lead in soil does not meet the definition of Categories 1 and 2 or of Category 4 and therefore falls into Category 3. It is noted that the risk assessment indicated that the risk associated with this linkages is closer to the Category 3/4 boundary (below which risks are considered low) than it is to the Category 2/3 boundary. According to the Part 2A guidance (paragraph 4.25(b)) , the following is applicable for Category 3 sites with respect to human health:

'*Land should be placed into Category 3 if the authority concludes that the strong case described in 4.25(a)* [Category 2] *does not exist, and therefore the legal test for significant possibility of significant harm is not met. Category 3 may include land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted. This recognises that placing land in Category 3 would not stop others, such as the owner or occupier of the land, from taking action to reduce risks outside of the Part 2A regime if they choose. The authority should consider making available the results of its inspection and risk assessment to the owners/occupiers of Category 3 land.'*

Therefore, for Treadgold House, although risks to child residents might not be low, the land does not meet the legal definition of Contaminated Land under Part 2A there is no obligation under Part 2A to take action to reduce the risks.

Recommendations

RBKC may choose to take action to reduce the risks outside the Part 2A regime. Such measures could include: introduction of clean soils; replacement of soil and turf areas with hardstanding; reducing the potential for access for children to the garden; regular checks of balcony walls at Flats 7 – 10 to confirm that they have not been removed for easier access; and general good management and maintenance of the garden area to minimise the likelihood of residents carrying out their own garden maintenance. If RBKC chooses to take action on a voluntary basis to further reduce risks then it is recommended that a separate remedial options appraisal is completed and a remediation strategy produced.

Following completion of the investigation and risk assessment, it is considered that sufficient information was collected to characterise the site and assess the risk to site users, such that robust decisions could be made with respect to the requirements of the Part 2A Statutory Guidance. Therefore no further investigation is required for RBKC to complete the decision-making required by the Statutory Guidance.

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Appendix A Figures

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LEGEND

Investigation

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
AVONDALE PARK GARDENS & TREADGOLD HOUSE INVESTIGATION AREAS

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AECOM
Midpoint
Alencon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

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Rev
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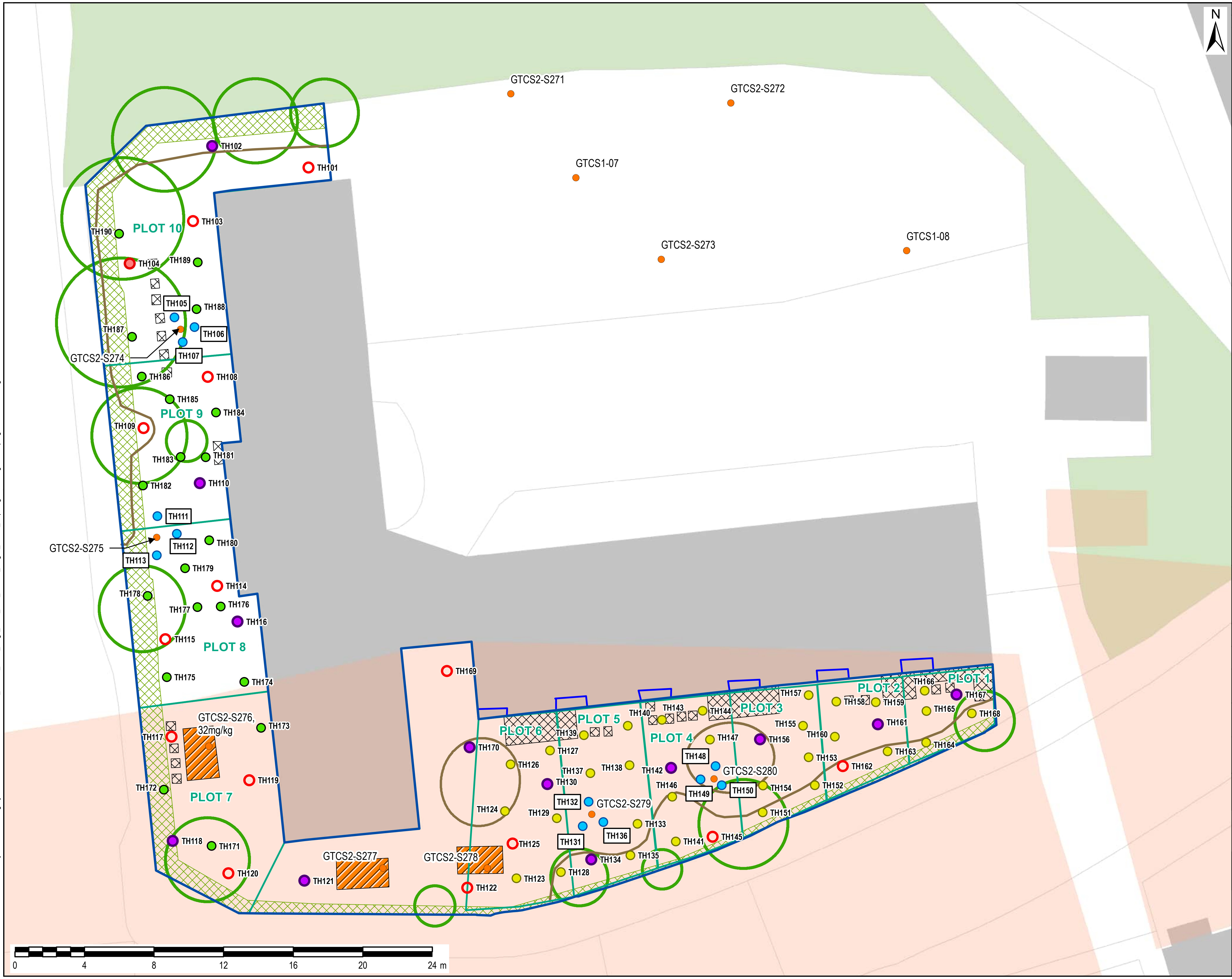

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LEGEND

- Hand Excavated Pit to 0.7m Depth
- Hand Excavated Pit to 0.4m Depth
- Hand Excavated Pit to 1.2m depth (or terminate when natural ground encountered)
- Sampling Locations to 0.2m Depth to Gain Understanding of Spatial Variability
- Sampling Locations to 0.2m Depth to Reduce Uncertainty in Average Soil Concentrations in Close Proximity to Private Doors Opening onto the Garden
- Sampling Locations to 0.05m Depth
- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Stage 1 & 2 Sampling Locations
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Raised Bed Location
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- THXXX Samples not used in Averaging Calculations

Notes:

GTCS-XX	Stage 1 Samples
GTCS2-XXX	Stage 2 Samples
THXX	Part 2A Follow on Samples

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE LAYOUT & SAMPLING LOCATIONS

Drawn	Checked	Approved	Date
SM	EJ	DD	26/04/2022

AECOM Internal Project No.	Scale @ A3
60632092	1:200

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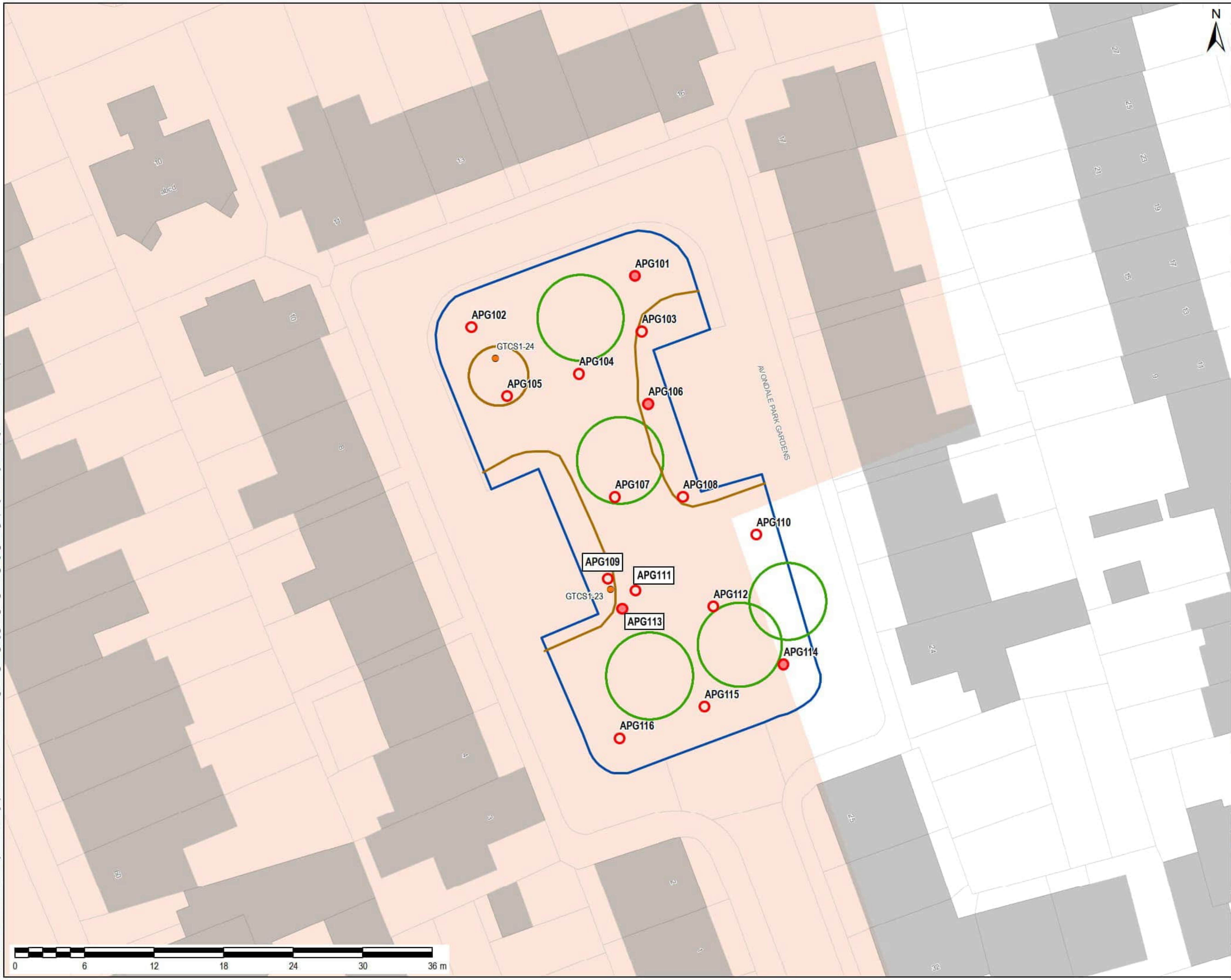
Drawing Number	Rev
FIGURE A2	01

File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\FI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 2 - Stage 2 Sampling Locations - Treadgold House.mxd



File Name: \\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 3 - Stage 2 Sampling Locations - Communal Space at Avondale Park Gardens.mxd

LEGEND

- Investigation Area: Communal Space at the Communal Space at Avondale Park Gardens
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Hand Excavated Pit to 0.2m Depth
- Hand Excavated Pit to 1.0m Depth
- Stage 1 Sampling Locations
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Ground Level Beds (Not Surveyed)
- APGXX Samples not used in Averaging Calculations

Notes:
GTCS1-XX Stage 1 Samples
APGXX Part 2A Follow on Samples

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
COMMUNAL SPACE AT AVONDALE PARK GARDENS LAYOUT AND SAMPLE LOCATIONS

Drawn	Checked	Approved	Date
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FIGURE A3	02

LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Raised Beds Location

Lead Soil Concentration*

mg/kg

- < 630
- 630 - 1060
- 1060 - 2150
- 2150 - 4530
- > 4530

* The ranges have been assigned based on the following criteria:
630 mg/kg (GSC POSresi), 1060 mg/kg (Updated Step 1 SSAC Child Receptor), 2150 mg/kg (Updated Step 1 SSAC Adult Receptor) and 4530 mg/kg (Updated Step 2 SSAC Child Receptor).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE
LEAD SOIL CONCENTRATIONS
(0-0.05M)

Drawn	Checked	Approved	Date
SM	EJ	DD	26/04/2022

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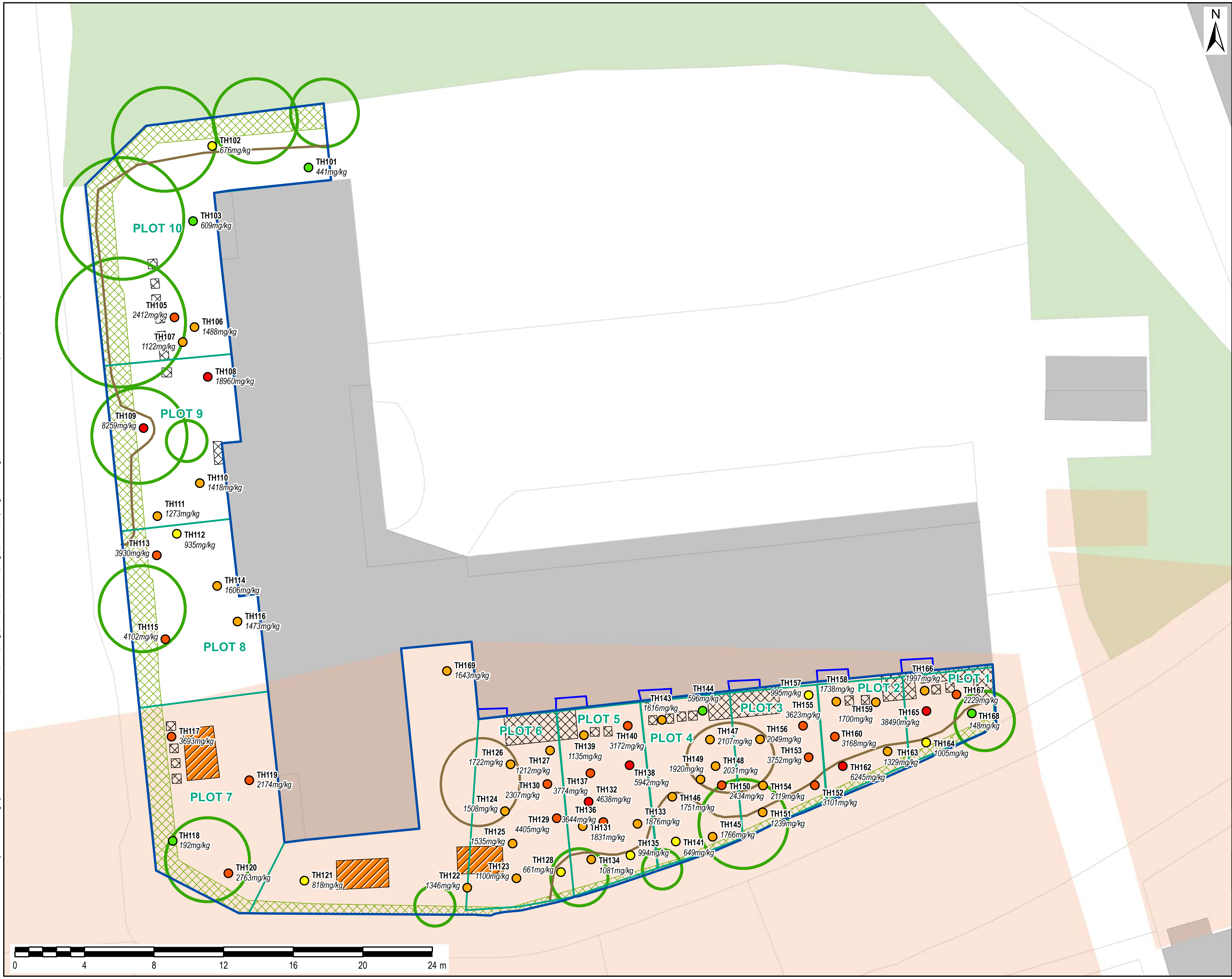
Drawing Number	Rev
FIGURE A4	01

File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\FI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 4 - Treadgold House Lead Soils Concentrations (0-0.5m) - Adult Receptor Scenario.mxd



File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 5 - Treadgold House Lead Soils Concentrations (0.1-0.2m) - Adult Receptor Scenario.mxd

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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- Raised Beds Location
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest

Lead Soil Concentration*

mg/kg

- < 630
- 630 - 1060
- 1060 - 2150
- 2150 - 4530
- > 4530

* The ranges have been assigned based on the following criteria:
630 mg/kg (GSC POSresi), 1060 mg/kg (Updated Step 1 SSAC Child Receptor), 2150 mg/kg (Updated Step 1 SSAC Adult Receptor) and 4530 mg/kg (Updated Step 2 SSAC Child Receptor).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE LEAD SOIL CONCENTRATIONS (0.1-0.2M)

Drawn	Checked	Approved	Date
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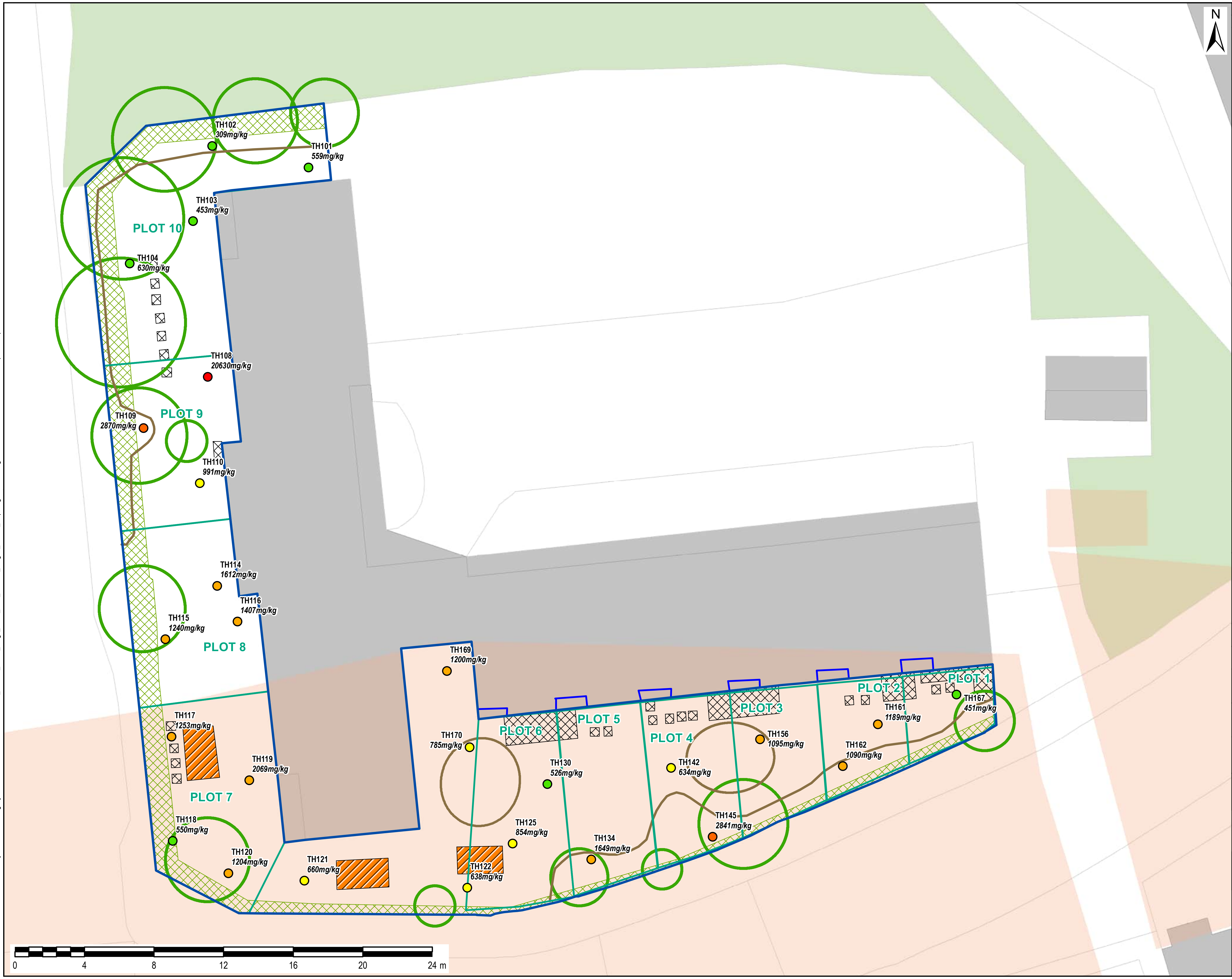
FIGURE A5	01



File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\FI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 6 - Treadgold House Lead Soils Concentrations (0.3-0.4m).mxd

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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- Raised Beds Location
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest

Lead Soil Concentration*

mg/kg

- < 630
- 630 - 1060
- 1060 - 2150
- 2150 - 4530
- > 4530

* The ranges have been assigned based on the following criteria:
630 mg/kg (GSC POSresi), 1060 mg/kg (Updated Step 1 SSAC Child Receptor), 2150 mg/kg (Updated Step 1 SSAC Adult Receptor) and 4530 mg/kg (Updated Step 2 SSAC Child Receptor).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE
LEAD SOIL CONCENTRATIONS
(0.3-0.4M)

Drawn	Checked	Approved	Date
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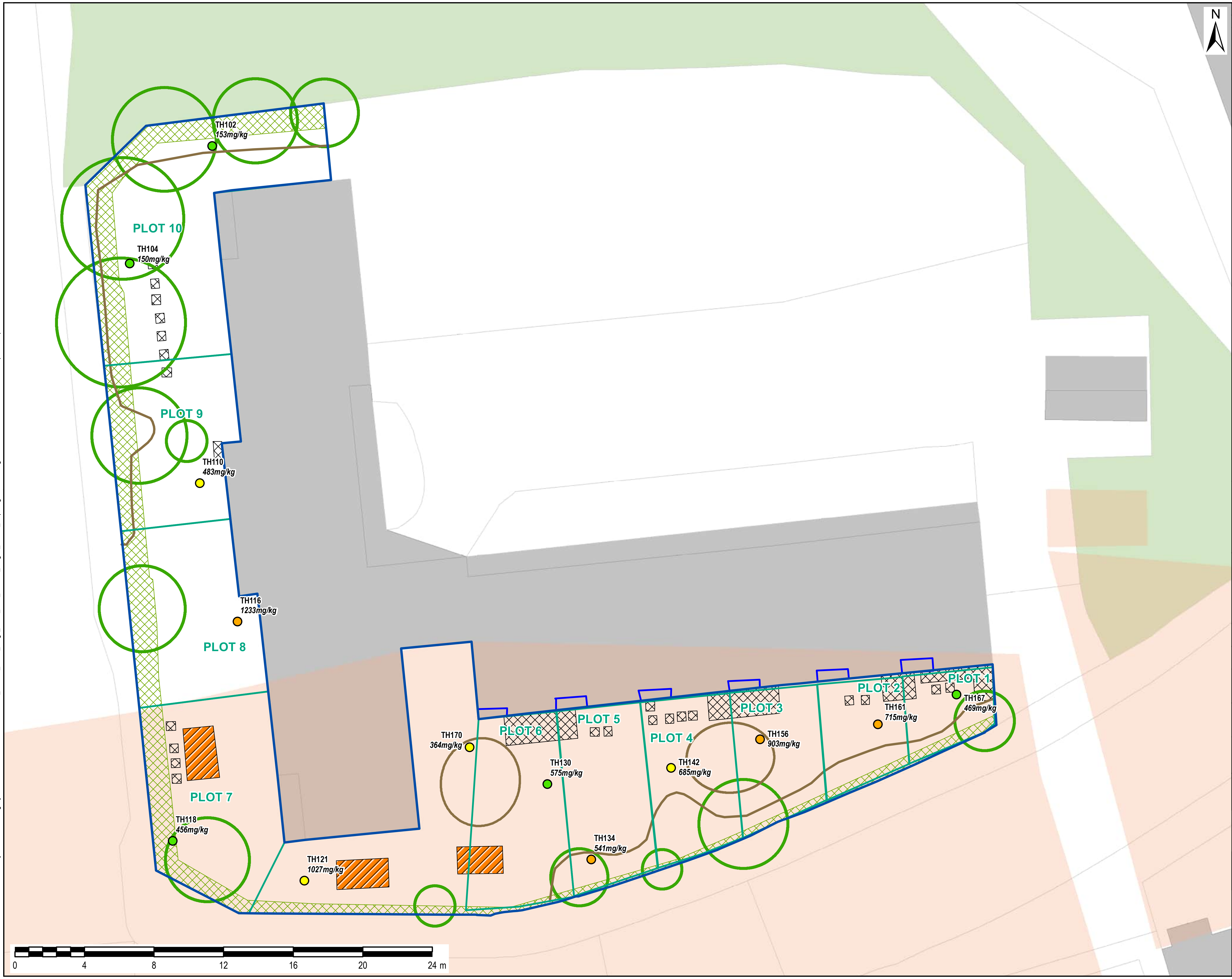
FIGURE A6	01



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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- Raised Beds Location
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest

Lead Soil Concentration*

mg/kg

- < 630
- 630 - 1060
- 1060 - 2150
- 2150 - 4530
- > 4530

* The ranges have been assigned based on the following criteria:
630 mg/kg (GSC POSresi), 1060 mg/kg (Updated Step 1 SSAC Child Receptor), 2150 mg/kg (Updated Step 1 SSAC Adult Receptor) and 4530 mg/kg (Updated Step 2 SSAC Child Receptor).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE
LEAD SOIL CONCENTRATIONS
(0.6-0.7M)

Drawn	Checked	Approved	Date
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FIGURE A7	01

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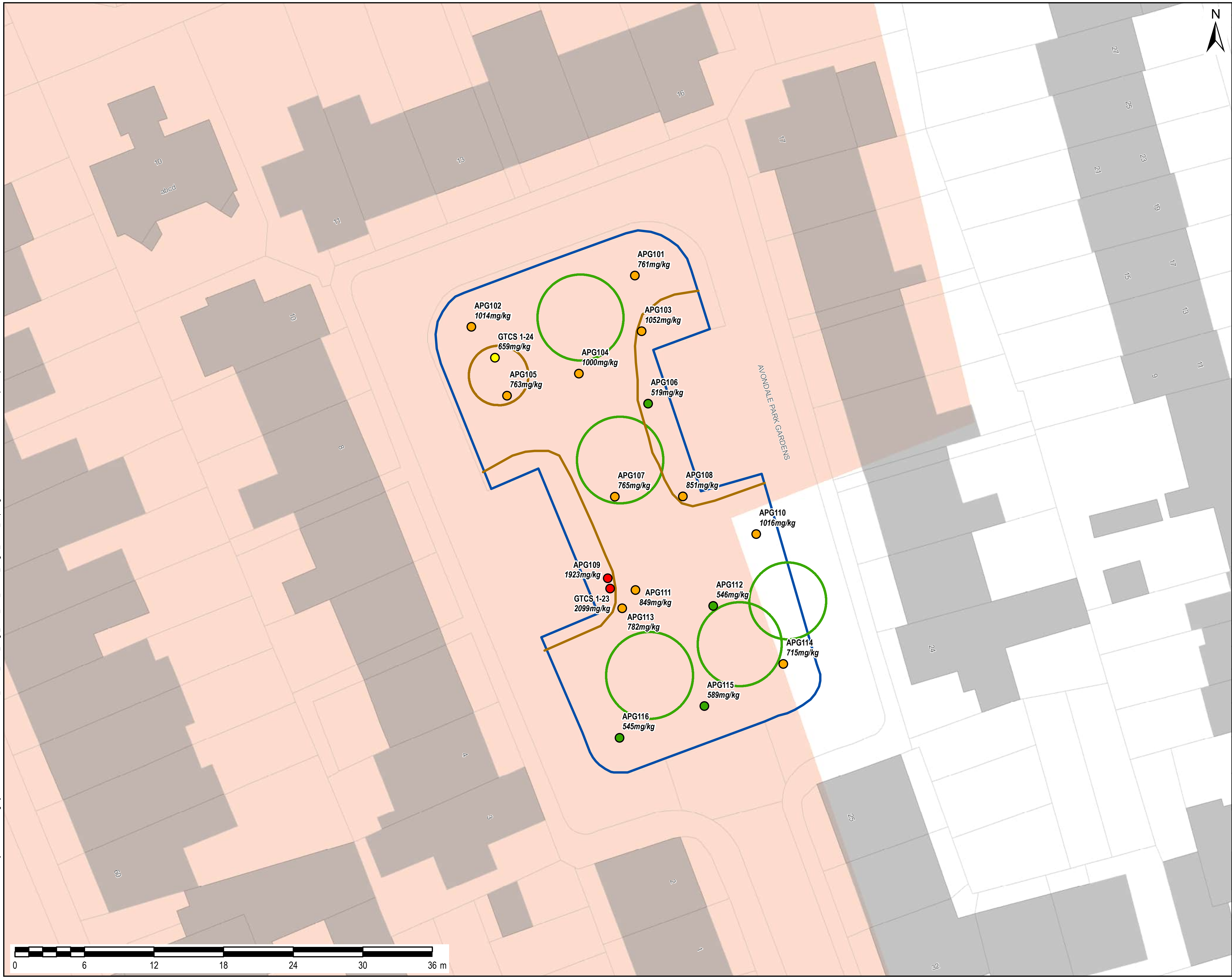

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LEGEND

- Investigation Area: Communal Space at the Communal Space at Avondale Park Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest

Lead Soil Concentration*

mg/kg

- < 630
- 630 - 710
- 710 - 1070
- > 1070

* The ranges have been assigned based on the following criteria: 630 mg/kg (GSC POSresi), 710 mg/kg (Stage 2 Step 1 SSAC POSresi) and 1070 mg/kg (Stage 2 Step 2 SSAC POSresi).

Client

ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title

PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title

AVONDALE PARK GARDENS LEAD SOIL CONCENTRATIONS (0-0.05M)

Drawn	Checked	Approved	Date
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Drawing Number	Rev
FIGURE A8	01

File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 8 - APG Lead Soils Concentrations (0-0.5m) - POSresi Scenario.mxd

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LEGEND

- Investigation Area: Communal Space at the Communal Space at Avondale Park Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest

Lead Soil Concentration

mg/kg

- < 630
- 630 - 710
- 710 - 1070
- > 1070

* The ranges have been assigned based on the following criteria: 630 mg/kg (GSC POSresi), 710 mg/kg (Stage 2 Step 1 SSAC POSresi) and 1070 mg/kg (Stage 2 Step 2 SSAC POSresi).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
AVONDALE PARK GARDENS LEAD SOIL CONCENTRATIONS (0.1-0.2M)

Drawn	Checked	Approved	Date
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FIGURE A9	01

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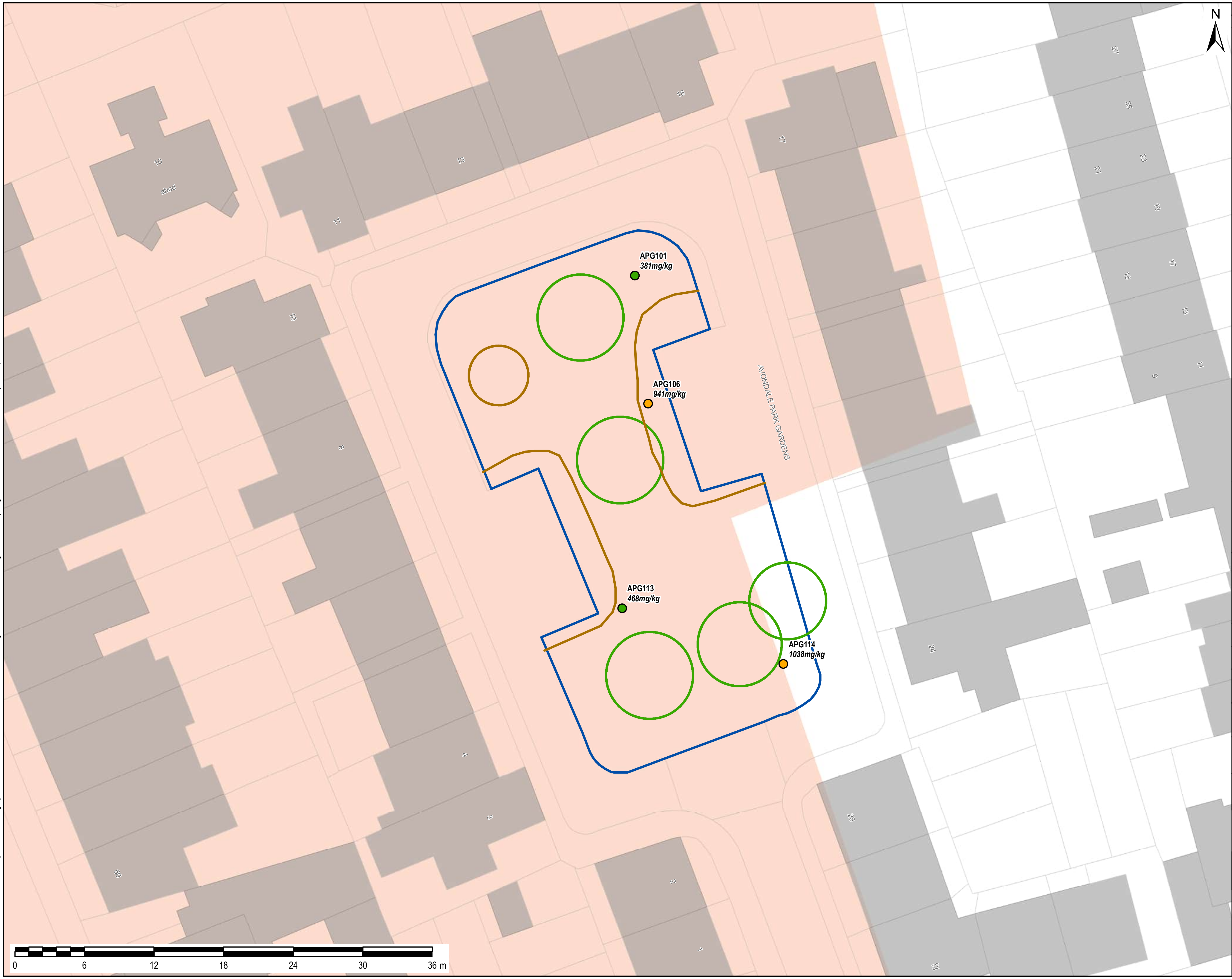

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- Investigation Area: Communal Space at the Communal Space at Avondale Park Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest

Lead Soil Concentration*

mg/kg

- < 630
- 630 - 710
- 710 - 1070
- > 1070

* The ranges have been assigned based on the following criteria: 630 mg/kg (GSC POSresi), 710 mg/kg (Stage 2 Step 1 SSAC POSresi) and 1070 mg/kg (Stage 2 Step 2 SSAC POSresi).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
AVONDALE PARK GARDENS
LEAD SOIL CONCENTRATIONS
(0.5-0.6M)

Drawn	Checked	Approved	Date
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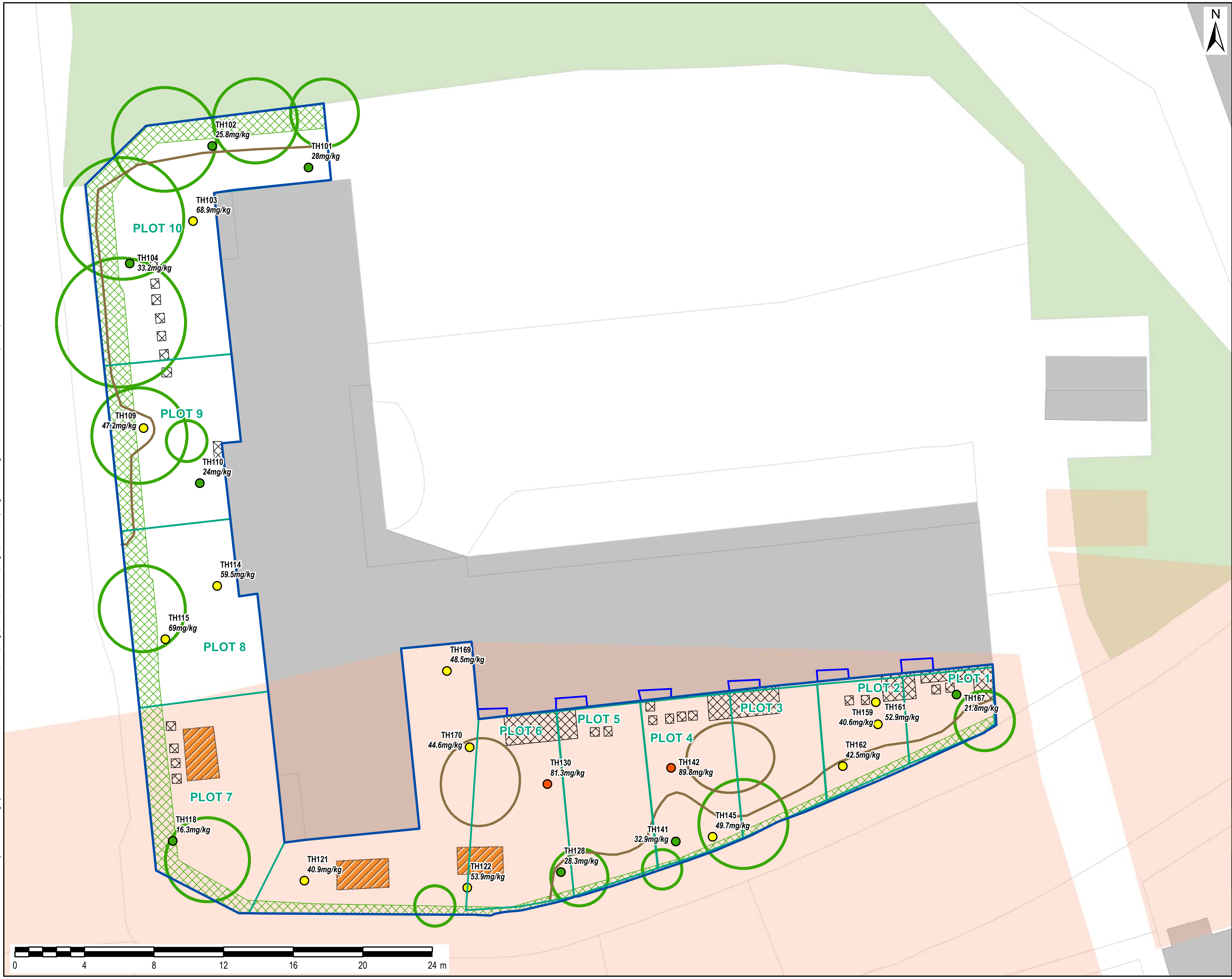
Drawing Number	Rev
FIGURE A10	01

File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 10 - APG Lead Soils Concentrations (0.5-0.6m).mxd



File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 11 - Treadgold House Arsenic Soils Concentrations (0-0.05m).mxd

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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Raised Beds Location

Arsenic Soil Concentration*

mg/kg

- < 40
- 40 - 79
- >79

* The ranges have been assigned based on the following criteria: 40 mg/kg (GSC Resi-HP) and 79 mg/kg (GSC POSresi).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE ARSENIC SOIL CONCENTRATIONS (0-0.05M)

Drawn	Checked	Approved	Date
SM	EJ	DD	26/04/2022

AECOM Internal Project No.	Scale @ A3
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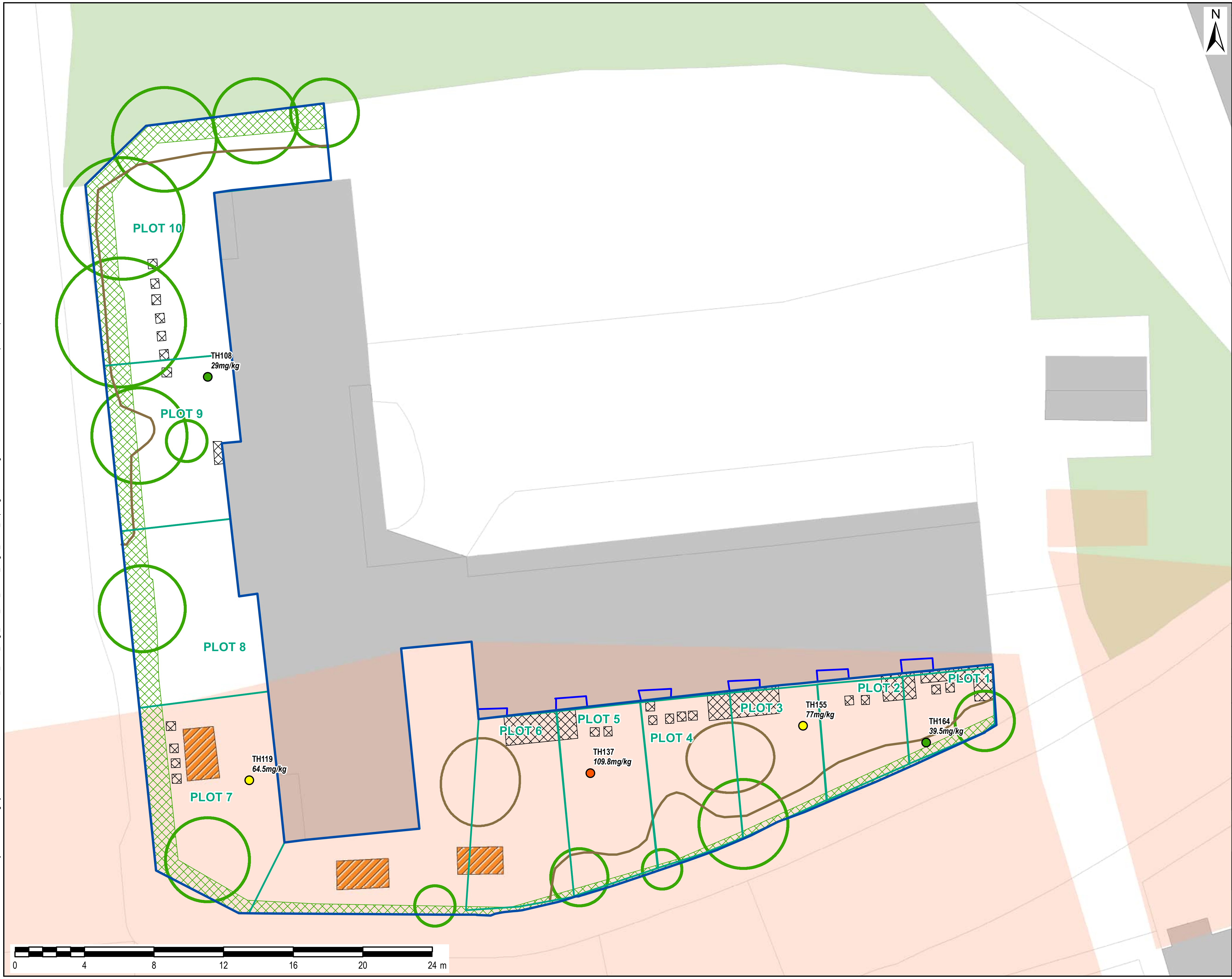
FIGURE A11	01



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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Raised Beds Location

Arsenic Soil Concentration*

mg/kg

- < 40
- 40 - 79
- >79

* The ranges have been assigned based on the following criteria: 40 mg/kg (GSC Resi-HP) and 79 mg/kg (GSC POSresi).

Client

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Project Title

PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title

TREADGOLD HOUSE ARSENIC SOIL CONCENTRATIONS (0.1-0.2M)

Drawn	Checked	Approved	Date
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Drawing Number	Rev
FIGURE A12	01

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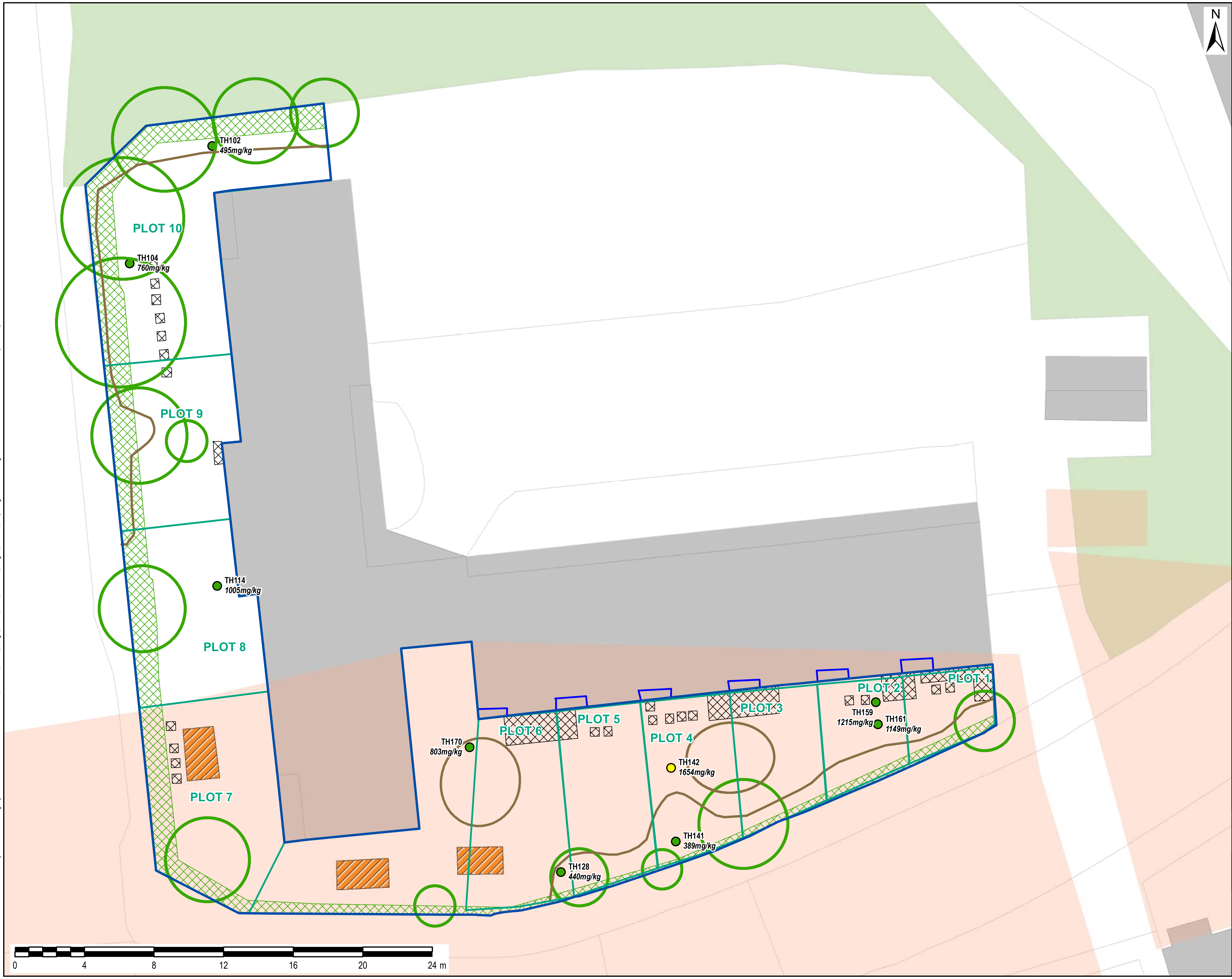

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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Raised Beds Location

Barium Soil Concentration*

mg/kg

- < 1300
- > 1300

* The ranges have been assigned based on the following criteria: 1300 mg/kg (GSC Resi-HP).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE
BARIUM SOIL CONCENTRATIONS
(0-0.05M)

Drawn	Checked	Approved	Date
SM	EJ	DD	26/04/2022

AECOM Internal Project No.	Scale @ A3
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FIGURE A13	01

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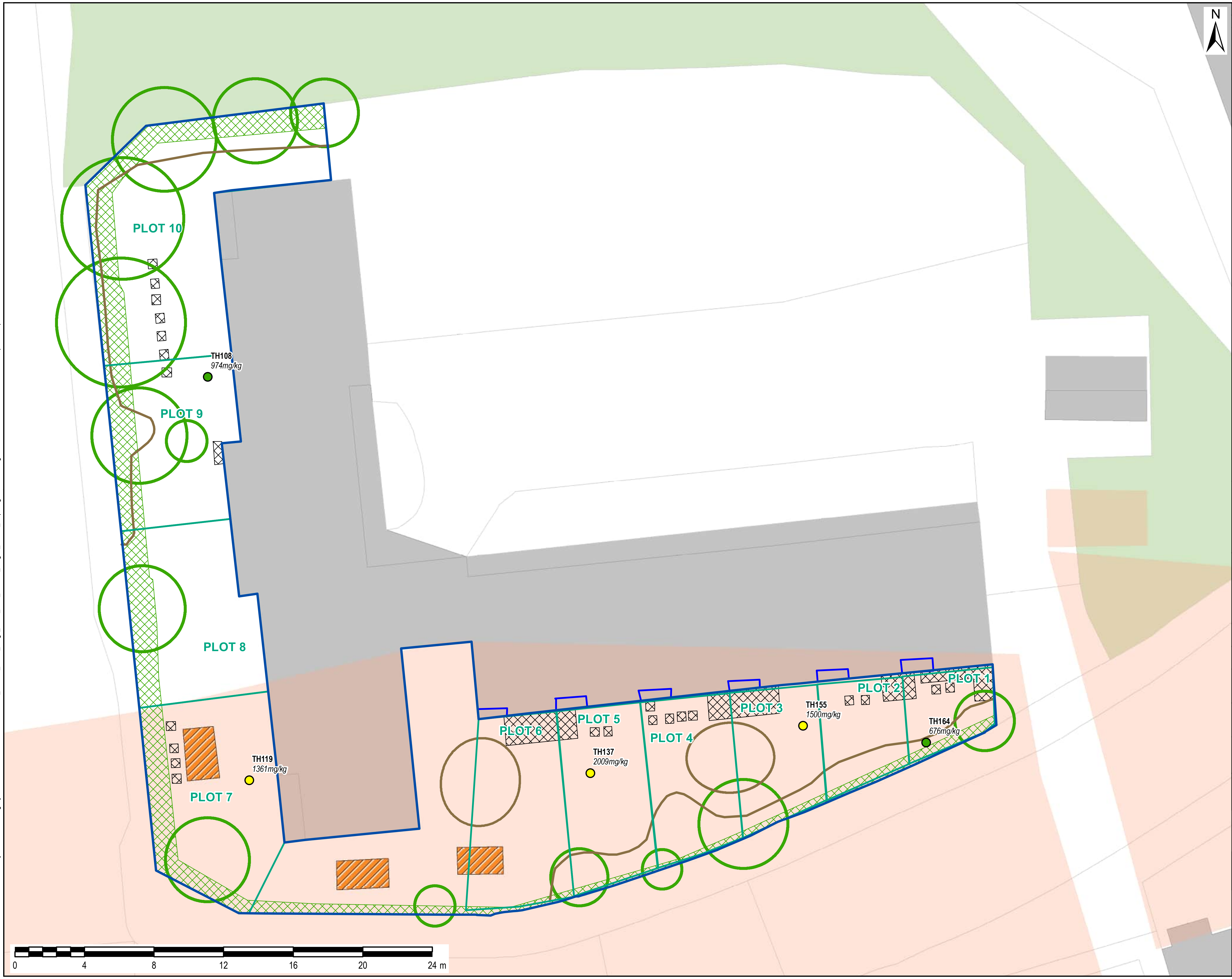

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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Raised Beds Location

Barium Soil Concentration*

mg/kg

- < 1300
- > 1300

* The ranges have been assigned based on the following criteria: 1300 mg/kg (GSC Resi-HP).

Client
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Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE
BARIUM SOIL CONCENTRATIONS
(0.1-0.2M)

Drawn	Checked	Approved	Date
SM	EJ	DD	26/04/2022

AECOM Internal Project No.	Scale @ A3
60632092	1:200

AECOM
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Alencon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
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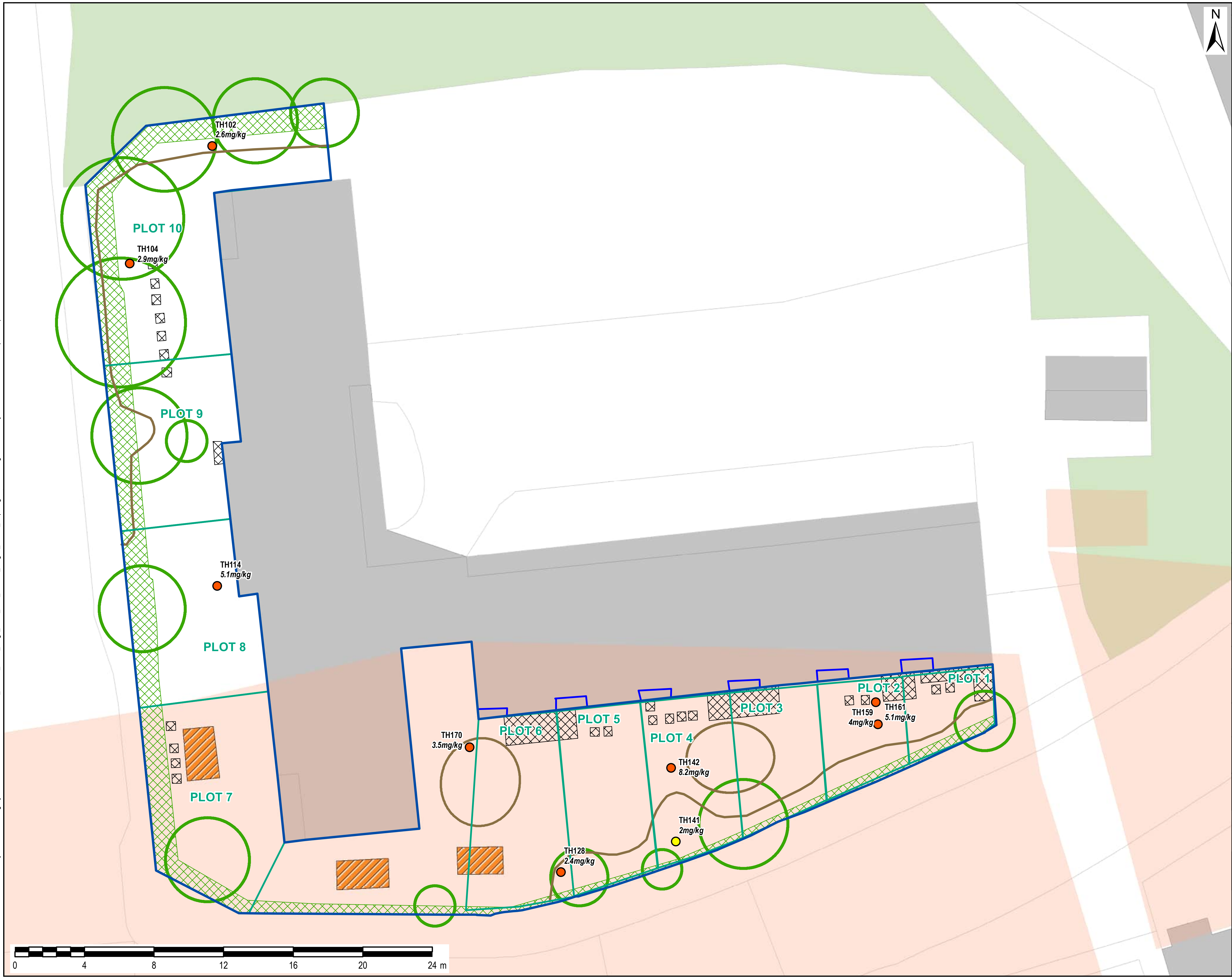
Drawing Number	Rev
FIGURE A14	01

File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 14 - Treadgold House Barium Soils Concentrations (0.1-0.2m).mxd



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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Raised Beds Location

Beryllium Soil Concentration

mg/kg

- < 1.7
- 1.7 - 2.2
- > 2.2

* The ranges have been assigned based on the following criteria: 1.7 mg/kg (GSC Resi-HP) and 2.2 mg/kg (GSC POSresi).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE BERYLLIUM SOIL CONCENTRATIONS (0-0.05M)

Drawn	Checked	Approved	Date
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Drawing Number
FIGURE A15

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01

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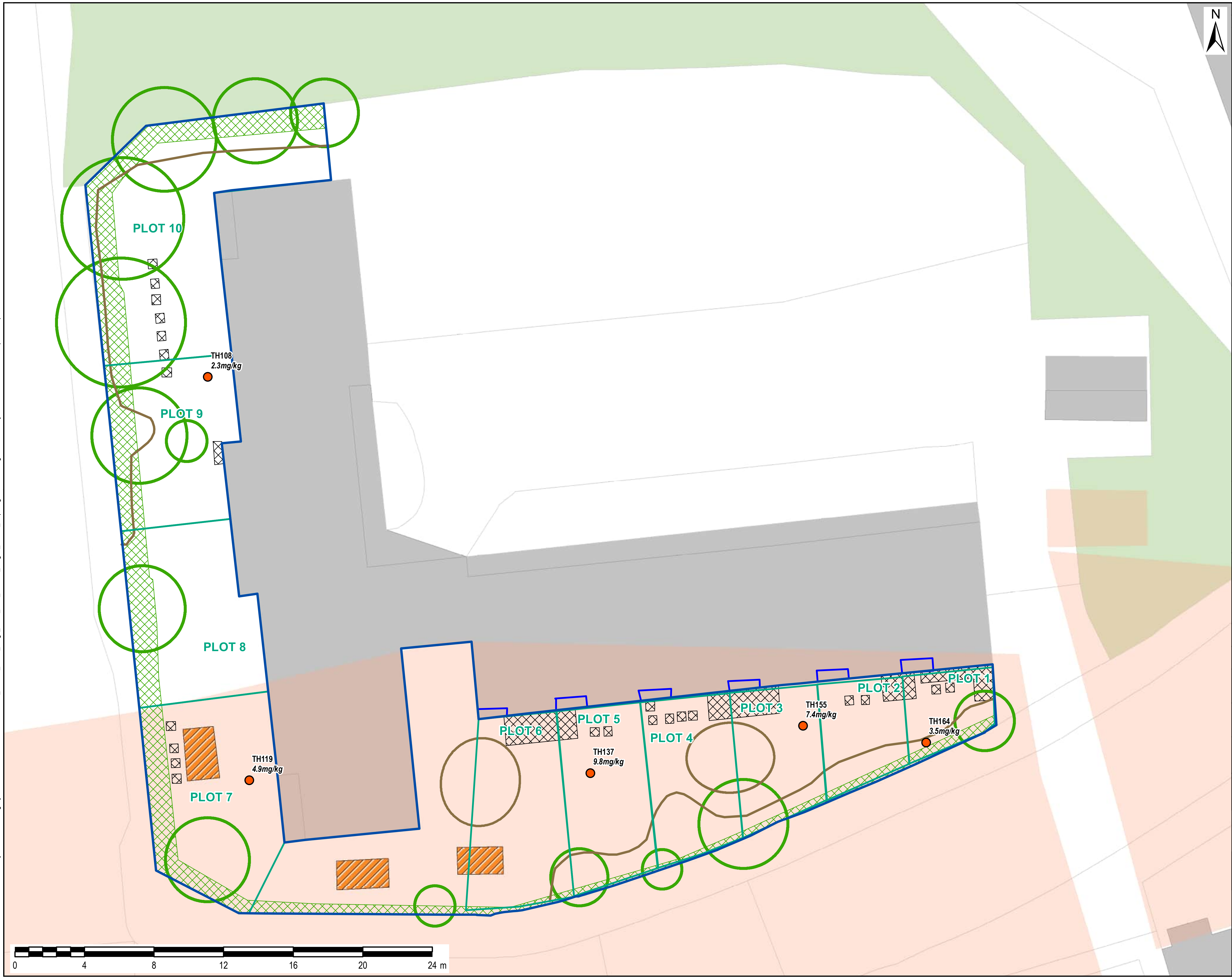

LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Raised Beds Location

Beryllium Soil Concentration

mg/kg

- < 1.7
- 1.7 - 2.2
- > 2.2

* The ranges have been assigned based on the following criteria: 1.7 mg/kg (GSC Resi-HP) and 2.2 mg/kg (GSC POSresi).

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
TREADGOLD HOUSE BERYLLIUM SOIL CONCENTRATIONS (0.1-0.2M)

Drawn	Checked	Approved	Date
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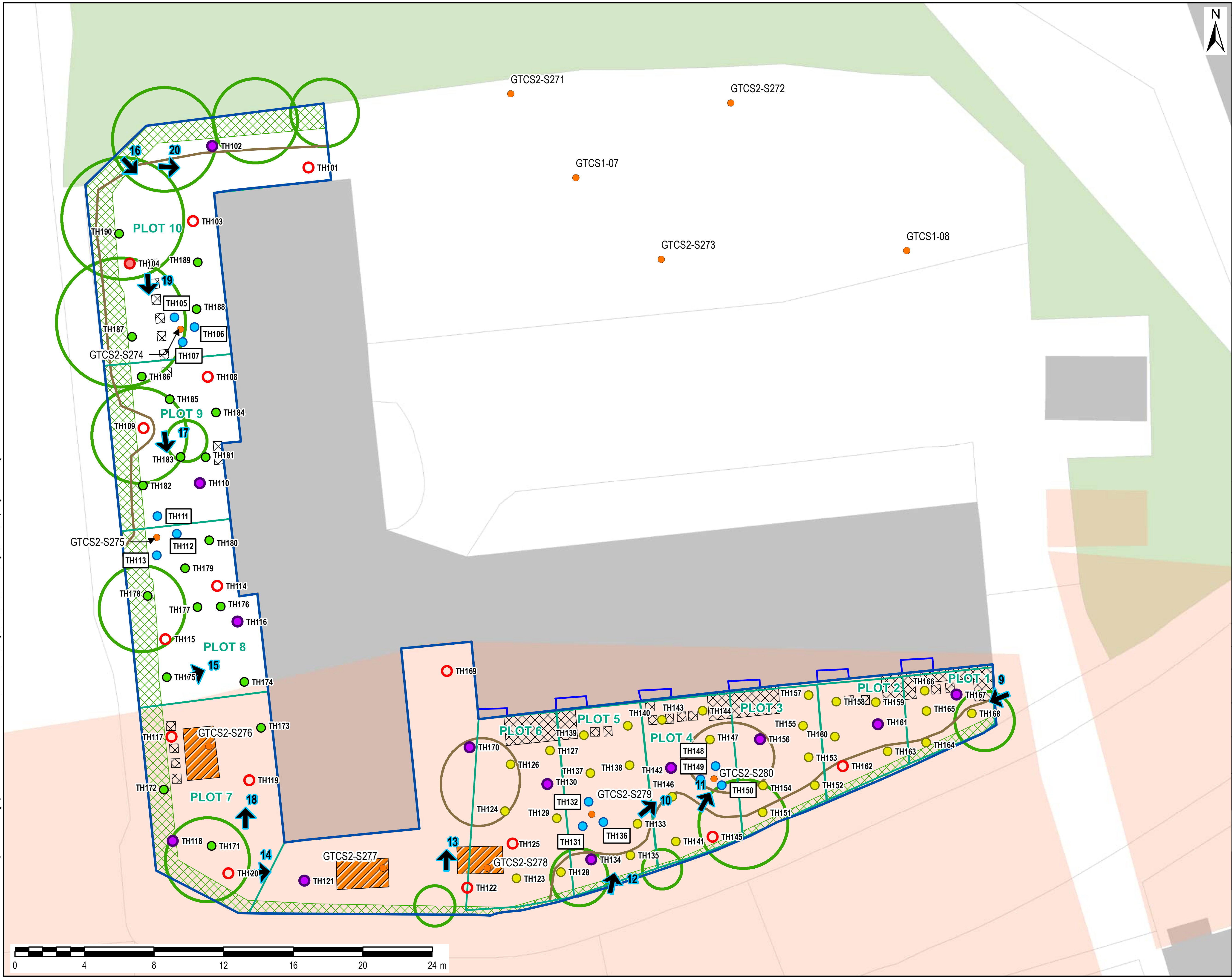
Drawing Number	Rev
FIGURE A16	01

File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 16 - Treadgold House Beryllium Soils Concentrations (0.1-0.2m).mxd



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LEGEND

- Investigation Area: Communal Gardens to South and West of Residential Building
- Indicative Exposure Averaging Areas for Private Residential Properties
- Approximate Locations of Residential Property Doors onto Gardens
- Approximate Location of Ground Level Beds (Not Surveyed)
- Stage 1 & 2 Sampling Locations
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Paving Slabs/Hardstanding (Not Surveyed)
- Approximate Location of Hedging (Not Surveyed)
- Raised Bed Location
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Hand Excavated Pit to 0.7m Depth
- Hand Excavated Pit to 0.4m Depth
- Hand Excavated Pit to 1.2m depth (or terminate when natural ground encountered)
- Sampling Locations to 0.2m Depth to Gain Understanding of Spatial Variability
- Sampling Locations to 0.2m Depth to Reduce Uncertainty in Average Soil Concentrations in Close Proximity to Private Doors Opening onto the Garden
- Sampling Locations to 0.05m Depth
- Site Walkover Photo
- THXXX Samples not used in Averaging Calculations

Notes:

GTCS-XX	Stage 1 Samples
GTCS2-XXX	Stage 2 Samples
THXX	Part 2A Follow on Samples

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Project Title

PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title

TREADGOLD HOUSE
SITE WALKOVER PLAN

Drawn	Checked	Approved	Date
SM	EJ	DD	26/04/2022

AECOM Internal Project No.	Scale @ A3
60632092	1:200

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Alencon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
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Drawing Number	Rev
FIGURE A17	01

File Name:\\na.aecomnet.com\lfs\EMEA\Croydon-UKCRD1\Legacy\UKCRD1FP001\UFI\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 17 - Treadgold House Site Walkover Plan.mxd

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LEGEND

- Investigation Area: Communal Space at the Communal Space at Avondale Park Gardens
- RBKC Identified Potentially Contaminated / Areas of Geo-environmental Interest
- Hand Excavated Pit to 0.2m Depth
- Hand Excavated Pit to 1.0m Depth
- Stage 1 Sampling Locations
- Approximate Location of Trees (Not Surveyed)
- Approximate Location of Ground Level Beds (Not Surveyed)
- Site Walkover Photo
- APGXX Samples not used in Averaging Calculations

Notes:

GTCS1-XX Stage 1 Samples
APGXX Part 2A Follow on Samples

Client
ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title
PART 2A INVESTIGATIONS: TREADGOLD HOUSE & AVONDALE PARK GARDENS

Drawing Title
COMMUNAL SPACE AT AVONDALE PARK GARDENS SITE WALKOVER PLAN

Drawn	Checked	Approved	Date
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AECOM Internal Project No.	Scale @ A3
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Midpoint
Alençon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
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Drawing Number: **FIGURE A18**
Rev: **02**

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Appendix B Site Investigation Design

Site Investigation Design

Grenfell Stage 2 Follow-up Work

Royal Borough of Kensington and Chelsea

Project number: 60632092

1 October 2021

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
David Dyson Associate	Katie Bruce	Simon Cole	Liz Philp

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	22 July 2021	Working draft for discussion		Liz Philp	Operations Director
1	6 August 2021	Revised draft		Liz Philp	Operations Director
2	7 September 2021	Revised draft		Liz Philp	Operations Director
3	1 October 2021	Final		Liz Philp	Operations Director

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Prepared for:

Royal Borough of Kensington and Chelsea

Prepared by:

David Dyson
Associate
M: +44-(0)7799 647 173
E: david.dyson@aecom.com

AECOM Limited
Sunley House
4 Bedford Park, Surrey
Croydon CRO 2AP
United Kingdom

T: +44 20 8639 3500
aecom.com

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between **15 July 2021** and **1 October 2021** and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

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Tables

1. Introduction

The report has been prepared by AECOM Limited (AECOM) on behalf of the Royal Borough of Kensington and Chelsea (RBKC) to describe the scope of works for follow-on actions following the Stage 2 Investigation into Potential Contamination from the Grenfell Tower fire[1]. This report also summarises the existing information and includes a data-gap analysis to inform and justify the design of the scope of work. The work has been completed in accordance with AECOM quote “Proposal for Site Investigation Design following on from Grenfell Stage 2” dated 27th July 2021.

1.1 Background

The Stage 2 investigation into potential land contamination impacts from the Grenfell Tower fire concluded that:

- Stage 2 sampling did not find detectable concentrations of chemicals in soil that could be linked only to the fire.
- The human health risk assessments for each individual sampling area concluded that the risk to human health from the chemicals of concern in soil did not exceed ‘low’ (and were classed as 'Category 4' sites under Part 2A of the Environmental Protection Act) for all sampling areas except for lead concentrations at Treadgold House (communal garden to south and west of the building) and Avondale Park Gardens.
- For Treadgold House and Avondale Park Gardens, it was concluded that it was not possible to decide whether or not lead in soil poses a significant possibility of significant harm – as defined by the Statutory Guidance to Part 2A of the Environment Protection Act 1990. This was due to high uncertainty associated with average soil concentrations and with the way the land is used by residents.
- The Stage 2 Investigation has therefore recommended further assessment around Treadgold House and Avondale Park Gardens to resolve the uncertainty associated with health risk from exposure to lead in soil associated with historic contamination from before the Grenfell Tower fire.

In response to the findings of the Stage 2 report, RBKC produced a document titled: “High level summary of actions proposed in Kensington and Chelsea following completion of Stage 2.” The RBKC document was prepared as part of RBKC’s initial planning for procurement of services and was given agreement in principle by the multi-agency partnership (MAP) that had overseen the Stage 1 and Stage 2 investigations. The document included proposed additional sampling works at Treadgold House and Avondale Park Gardens (as recommended by the Stage 2 report) as well as proposals for precautionary works at five additional sampling areas.

1.2 Objectives

1.2.1 Part 2A Sites

The objectives of the scope of work presented in this document that relate to the two sites being inspected under Part 2A include:

- Undertake an appropriate level of intrusive site investigation work to investigate lead within the soil, including whether the spatial distribution of lead appears to be linked to the former brick pit identified in historical mapping in the area. A number of other substances will also be tested that are relevant to the previous site history.
- Carry out a generic quantitative human health risk assessment using existing GSC and SSAC used within the Stage 2 report to establish whether there are potential unacceptable risks to human health as defined by Part 2A.
- Carry out further detailed quantitative human health risk assessments to establish whether there is a significant possibility of significant harm (SPOSH) to human health as defined by Part 2A.
- Classify each potential contaminant linkage as Category 1-4 in accordance with the Statutory Guidance and in doing so provide recommendations on whether any land appears to meet the definition of contaminated land under Part 2A.

[1] AECOM Limited, 11 June 2021. Grenfell Investigation into Potential Land Contamination Impacts. Stage 2 Investigation, Tier 2 and Tier 3 Risk Assessment. Project number: 60632092/LORP0001

- Identify any further actions that are needed (e.g. assessment, treatment or monitoring) to reduce or manage identified risks from contaminants in the soil, either under Part 2A or to a higher standard where this is required by the Council.
- Produce a remediation options appraisal and draft remediation plan if further action is required (be it remedial or risk management related).

The inspection of the two sites constitutes a 'detailed inspection' as defined by Paragraph 2.2 of the Part 2A 2012 Statutory Guidance.

1.2.2 Non-Part 2A Sites Precautionary Works

The objectives of the scope of work presented in this document related to the non-Part 2A sites identified for precautionary works include:

- Undertaking limited soil sampling for delineation purposes (where necessary and requested by the site manager)
- Overseeing the soil removal, installation of geo-membranes (if appropriate) and soil replacement, including carrying out limited confirmatory soil samples, where requested.
- Assisting with the production of site management plans, where required.
- Identify any further actions that are needed to address risks from asbestos and lead in the soil.

1.3 Approach to Developing the Scope of Work

1.3.1 Part 2A Assessments

AECOM's approach to developing the scope of works for the two areas that are continuing to be assessed in accordance with Part 2A of the EPA (i.e. Treadgold House and Avondale Park Gardens) has been to consider RBKC's high level summary of actions as a the starting point, and to develop a scope that AECOM considers appropriately fulfils the objectives described in Section 1.2 above.

The Grenfell Stage 2 investigation did not consider potential soil contaminants not directly associated with the fire that might also be present in soil as a result of historic land-use activities. Because of this, and at the request of RBKC, the scope of work includes tasks intended to further investigate the potential non-fire related sources of the lead and includes an assessment of other potential non-fire related sources and contaminants of concern.

At the request of RBKC, the scope of work has also taken into account RBKC's desire to avoid multiple phases of work so that RBKC can act quickly in the event that remedial works are required. The scope of work is designed to include sufficient detail to make final Part 2A decisions and prepare a remediation strategy (if needed).

The scope of work has also been developed through liaison with RBKC, including discussion with RBKC Environmental Health and RBKC Housing. The outcome of these discussions are included in the sub-sections below.

For the Part 2A sites – Treadgold House and Avondale Park Gardens – the principal approach to the site investigation design is to achieve a non-targeted grid based sampling dataset (in accordance with the recommendations of BS10175:2011+A2:2017) that may be suitable for the application of statistical methods in accordance with the CL:AIRE 2020 statistical guidance (Marriott, 2020). This should allow a more reliable statistical assessment of average concentrations within individual averaging areas. Some targeted sampling has also been included to assess the local variability around the Stage 1 and Stage 2 sampling locations and to investigate the potential for deeper contamination associated with the historic brickfield (mapped at the southern edge of the Treadgold House site and across the majority of the Avondale Park Gardens site). The data from targeted sampling will be considered separately when statistical averaging is adopted for the data assessment.

At Treadgold House, the site investigation design is intended to focus only on the ground level soils in the communal garden to the south and west of the residential building. This is because the highest concentrations of lead in soil were encountered in this communal garden area and a number of residential properties have direct access onto this garden. Soils sampled from raised beds had lower concentrations of lead and were identified at Stage 2 to be suitable for continued use. Direct contact human health exposure pathways are not active in areas of hard paving and the communal garden to the northeast of the residential building had lower lead concentrations in soil and does not have direct access from private properties. Only four ground level samples are available from the Stage 2 investigation in the communal garden to the south and west of the building, giving relatively low confidence to the average soil concentrations. To the west of the building, the two reported sample concentrations both exceeded the Step 1 SSAC derived in the Grenfell Stage 2 report, and the average concentration of the two samples to the south of the building exceeded the Step 2 SSAC. An exceedance of the Step 2 SSAC indicates a possibility that the land could fall into Category 2 and therefore that remediation would be required. The investigation is therefore intended to significantly reduce the uncertainty associated with the average soil concentrations of lead in the gardens to the south and west of the building. In addition, investigation at Treadgold House is intended to assess the conceptual model in terms of other potential chemicals of concern from historic land-uses. The information from the investigation is to be used to draw conclusions in accordance with Part 2A..

At Avondale Park Gardens, the site investigation is intended to cover the entirety of the landscaped communal garden in the middle of the residential road. Only two samples were collected in this area in the Stage 1 investigation, resulting in very high uncertainty in the average soil concentrations. Neither of the reported lead concentrations exceeded the Step 2 SSAC derived in the Stage 2 report. Therefore the key aim of the investigation in this area is to reduce the uncertainty associated with the average soil concentrations; although it is intended to collect sufficient data to refine the Step 2 SSAC (if this becomes necessary).

The laboratory analytical approach for the site investigation design in both areas is to focus on the total concentrations of lead in soil to identify areas of higher concentrations and to provide a more reliable estimate of average concentrations. In addition, the approach also includes further site-specific assessment lead bioaccessibility to help with refinement of Step 2 SSAC.

1.3.2 Non-Part 2A Precautionary Works

For the precautionary works at the other five sites that are not being regulated in accordance with Part 2A, AECOM's approach is to develop a practical and pragmatic scope of work that will achieve RBKC's objectives (summarised in Section 1.2 above) based on:

- the outline summary of actions presented by RBKC (and agreed in principle by MAP); and
- additional information provided by RBKC housing and managers of the individual sites during telephone conversations on 28th and 29th July 2021.

2. Part 2A Investigation Sites

2.1 Conceptual Site Model

The conceptual site model related to Part 2A potential significant contaminant linkages to be addressed by the scope of works was presented in Section 9.3 of the Grenfell Stage 2 report and is summarised in Table 1 below. Additional data-gap analysis is included in Table 1 below that was not part of the Grenfell Stage 2 report. The data-gap analysis is included to identify issues associated with potential non fire related sources and contaminants that require further investigation within the scope of work.

Table 1. Conceptual Site Model for Part 2A Sites

Sources	Pathways	Receptors	Discussion	Data-gap Analysis
Lead in soil at Treadgold House (communal gardens to south and west of residential building)	Ingestion of soil and indoor dust Dermal contact with soil (outdoor) Dermal contact with soil derived dust (indoor) Inhalation of dust (indoor and outdoor) NOTE: ingestion of soil and dust likely to be the dominant exposure pathway for residents.	Residents of Treadgold House	The communal garden to the south and west of Treadgold House was not placed into a Part 2A Category due to the high uncertainty associated with average lead concentrations and uncertainty with the manner that the communal garden is used by residents, and how this relates to standard land use assumptions. The higher concentrations of lead in soil in this area could have arisen from a variety of historic sources, including redevelopment works such as stripping and discarding of leaded paint and old roofing materials, soils being imported from other unknown contaminated sources during redevelopment and landscaping, and nearby historic land-uses such as the brickworks which formerly occupied land now within the southern part of Treadgold House. Although it is considered that there is not currently the evidence required by the Statutory Guidance to place this CL into Category 1 or Category 2, further assessment within this area would be of benefit in order to more reliably conclude on the Part 2A land category and decide whether the land meets the definition of Contaminated Land.	AECOM has reviewed the environmental setting and historical mapping information from the Stage 1 and Stage 2 Grenfell investigations with particular focus on Treadgold House. Historical mapping from 1874 shows the southern part of the site occupied by the northern edge of a brickfield with the rest of the site occupied by what appears to be a residential terrace including gardens. By 1896 the brickfield is no longer shown on the maps and there appears to be additional residential development in the southern area of the site that had previously been within the brickfield boundary. An apparently similar residential layout is present up to and including the map of 1957. On the 1967 map the site has been developed into the Treadgold House layout that remains on site to the present day (2020 OS map). The Grenfell investigation review of the RBKC Planning portal did not identify any site investigation information on the Treadgold House site. The information from the historical and environmental review indicates that the former brickfield (now backfilled) and redevelopment of the site from the terraced residential housing to the current residential building have the potential to have caused contamination at the Site. Specific contaminants associated with infilling of the brickfield cannot be identified easily without knowledge of the fill materials. A site investigation carried out in Avondale Park, which is also located on the old infilled brickworks, was provided to AECOM by RBKC during the Grenfell Stage 2 investigation. Further review of that investigation indicates that reported concentrations of asbestos and PAHs exceeded the criteria adopted by the authors for the park area. However, some metals and petroleum hydrocarbon fractions were also reported at concentrations with potential to exceed screening criteria for higher sensitivity (e.g. residential) land uses. Other potential contaminants tested in the soils as part of the Avondale Park investigation included cyanides, thiocyanate, total phenols, BTEX and MTBE. These compounds were very rarely, if at all, detected at concentrations above the laboratory detection limit and on that evidence do not appear to be contaminants of concern associated with the brickfield fill. Therefore in addition to lead, some further assessment of asbestos, PAHs, other metals and petroleum hydrocarbon fractions is recommended in the event that potential deeper fill of the old brickfield is encountered at Treadgold House. These contaminants are also expected to cover the most likely COPC that would arise from the residential redevelopment of the site between 1957 and 1967. Landfill gas is sometimes considered as a potential contaminant of concern for areas with historic backfilling. The evidence from the Avondale Park investigation, which included gas monitoring at eight wells on four separate occasions, indicated that although carbon dioxide was consistently recorded in ground gas, methane was rarely present above the instrument detection limit and borehole gas flow was not identified on any occasion except during one of the four monitoring visits at a single monitoring well. The age of the filling activities (all pre-1967 and likely to have been considerably earlier than that) and the lack of borehole gas flow suggests a low risk from ground gas; however, this will be reviewed further based on the evidence of the type and extent of potential fill materials from the proposed site investigation. If the evidence from the additional investigation works suggests a potentially elevated ground gas risk relative to that reported for Avondale Park then installation of

Sources	Pathways	Receptors	Discussion	Data-gap Analysis
				ground gas wells will be considered. Based on current evidence this is not currently considered to be necessary and hence does not form part of the initial proposed scope. Any such change to the scope would be raised and discussed with RBKC.
Lead in soil at Avondale Park Gardens	Ingestion of soil and indoor dust Dermal contact with soil (outdoor) Dermal contact with soil derived dust (indoor) Inhalation of dust (indoor and outdoor) NOTE: ingestion of soil and dust likely to be the dominant exposure pathway for residents.	Residents of Avondale Park Gardens and their visitors.	The high uncertainty associated with the assessment at Avondale Park Gardens means that a final decision has not been made for whether the land could pose SPOSH. It is considered that there is still some potential that the land could meet the definition of Contaminated Land, or fall into either of Category 3 or Category 4. The higher concentrations of lead in soil in this area could have arisen from a variety of historic sources, including soils being imported from other unknown contaminated sources during redevelopment and landscaping, and nearby historic land-uses such as the brickworks which formerly occupied the land of which now includes Avondale Park Gardens. This was identified during the site history review as part of Stage 1 of the Grenfell investigation and the former brickworks area can be seen as the shaded area on Figure 2 and identified as 'RBKC identified potentially contaminated land' and 'RBKC identified areas of Geoenvironmental Interest' in the key. Limited further assessment – comprising shallow soil sampling and analysis for lead and lead bioaccessibility – within this area would be of benefit in order to more reliably conclude on the Part 2A land category.	AECOM has reviewed the environmental setting and historical mapping information from the Stage 1 and Stage 2 Grenfell investigations with particular focus on Avondale Park Gardens. Historical mapping from 1874 shows the entire site located within a brickfield. By 1896, the mapping indicates that the brickfield is no longer present and the site lies within an area labelled as a 'Workhouse'. Other parts of the earlier brickfield surrounding the site have undergone residential development by 1896 including a school and a church. A building layout similar to the earlier 'Workhouse' remains surrounding the site until the map of 1951 although it is not labelled as such, and the residential houses surrounding the communal garden area are believed to have been built in the 1920s. The OS mapping indicates that the present day layout with the communal garden area in the centre of the residential street was in place by 1957, and has remained largely unchanged on all maps through to the most recent present day map (2020). The Grenfell investigation review of the RBKC Planning portal did not identify any site investigation information on the Avondale Park Gardens site. The information from the historical and environmental review indicates that the former brickfield (now backfilled), the workhouse and the residential development of the site between the 1920s and 1950s have the potential to have caused contamination at the Site. Specific contaminants associated with infilling of the brickfield cannot be identified easily without knowledge of the fill materials. The website www.workhouses.org.uk indicates that the Workhouse at this location included trades such as breaking stone, corn grinding and oakum picking. The discussion related to the previous investigation at Avondale Park in the row above for Treadgold House is also relevant for the historic use of Avondale Park Gardens within the brickfield. As such, some further assessment of asbestos, PAHs, other metals and petroleum hydrocarbon fractions is recommended in the event that potential deeper fill of the old brickfield is encountered at Avondale Park Gardens. These contaminants are also expected to cover the most likely COPC that would arise from the subsequent uses as a workhouses and the residential redevelopment of the site between the 1920s and 1950s. Landfill gas is sometimes considered as a potential contaminant of concern for areas with historic backfilling. However, as noted above in relation to Treadgold House the risk from landfill gas based on investigations at Avondale Park appears to be low. At Avondale Park Gardens the risk is further reduced given the absence of habitable buildings on the area of land being investigated. Potential risks from landfill gas will be reviewed further based on the evidence of the type and extent of potential fill materials from the proposed site investigation. If the evidence from the investigation works suggests a potentially elevated ground gas risk relative to that reported for Avondale Park then installation of ground gas wells will be considered. Based on current evidence this is not currently considered to be necessary and does not form part of the initial proposed scope. Any such change to the scope would be raised and discussed with RBKC.

2.2 Site Investigation Scope of Work

2.2.1 Outline Scope of Work

The scope of work designed for the sites includes:

- Task 1: Site walkover
- Task 2: Soil sampling
- Task 3: Laboratory analysis
- Task 4: Reporting and risk assessment
- Task 5: Residents liaison

2.2.2 Task 1: Site Walkover

A site walkover to be completed at Treadgold House and Avondale Park Gardens to choose precise sampling locations. The walkover will aim to identity whether there are any obstructions to the proposed soil sampling plan and where there are, to recommend alternative locations.

The walkover will be observed, at least in part, by the Suitably Qualified Person (SQP). The indicative proposed locations are discussed in Section 2.2.3 below and indicated on Figure 1 and Figure 2.

The site walkover to include a discussion with RBKC housing representatives and residents that have access to the communal gardens (where this can be arranged by RBKC). This will aim to identify:

- how the gardens are used by the residents in terms of typical activities, frequencies and durations, and spatial extent. This to include understanding whether residents tend to limit their use of the garden to specific sub-areas (e.g. at Treadgold House the area immediately outside private access doors) and if so what the minimum size of this sub-area is; and
- whether there are any known sources of the lead in soil (such as prior renovations where lead paint could have been stripped from windows or fences, or information on the source of imported soils in the communal garden).

Based on the layout of the communal garden, the most likely uses of the garden in a generic 'planned use' scenario has initially been considered when choosing sampling locations, and the proposed locations are described in Section 2.2.3. AECOM will consider whether any additions or adjustments to the site investigation work described below is necessary based on the information gathered during the site walkover task. Potential changes to the scope will be raised and discussed with RBKC.

2.2.3 Task 2: Soil sampling

The soil sampling strategy for each area is described below. In all cases, samples are to be collected in accordance with the methodology included in Appendix B. The SQP will observe the sampling activities on at least one day.

2.2.3.1 Treadgold House

The design includes the collection of soil samples from 70 locations in the communal garden at Treadgold House. With the four existing sample locations this provides 74 locations with data for lead concentrations in soil.

The sampling to be completed using a combination of hand excavated pits and – if necessary – window sampling to be employed at up to 4 locations to investigate the potential for the elevated lead concentrations to be linked to the former backfilled clay pit indicated to have historically occupied the southern part of the communal garden (shaded area on Figure 1). A hand starter pit will be excavated at all potential window sampling locations to a minimum of 1.2m depth. If natural London Clay soils are encountered within the hand pit then window sampling to greater depth will not be needed. If the hand pit remains in made ground to 1.2m depth, window sampling will be used to investigate made ground and potential fill materials to greater depth.

Of the 70 locations, 43 to be excavated to a maximum of 0.2m depth, 14 to be excavated to a maximum of 0.4m depth, 9 to be excavated to a maximum of 0.7m depth, and 4 to be excavated to a maximum of 3m depth (or until natural ground is encountered, whichever is shallower). Between 2 and 4 samples to be collected from each location for laboratory analysis. The sampling strategy is presented in Table 2 below.

Table 2. Sampling Strategy

Type of Sample Location	No. of hand pits	No of samples per pit*	Sample Depths (m)	Justification
Hand pits to 0.2m	43	2	0-0.05 0.1-0.2	The hand pits to 0.2m depth are located in the areas outside the doors of the private properties that open directly onto the communal garden. The locations have been selected so that between 5 and 10 sampling locations are situated within the estimated averaging areas for an individual property – this is shown on Figure 1. In addition, three hand pits to 0.2m depth have been included around the four existing Stage 2 ground level sampling locations to provide an indication of local variability in topsoil concentrations. The number of samples in the averaging area of each property will provide an improved degree of confidence in the average concentrations in soil compared to the Stage 2 report. The samples taken from 0-0.05m depth will provide surface soil information comparable to the data collected during the Stage 1 and Stage 2 investigations. The samples collected at 0.1-0.2m depth will help identify variability in soil conditions at different depth horizons and assist with the design of any future remedial strategy.
Hand pits to 0.4m	14	3	0-0.05 0.1-0.2 0.3-0.4	The locations of the hand pits to 0.4m, those to 0.7m, and WS to up to 3m depth have been designed in a regular grid pattern across the full communal garden area to provide a non-judgmental dataset suitable for statistical analysis across the full sampling area. The locations are relatively evenly split between the south garden area which is indicated to have been formerly occupied by a brick field and the western garden area which was not occupied by the brick field. Three of the WS locations have been placed in the area mapped to be in the former brickfield area to identify possible deeper sources of the lead that has been identified in shallow soil. One WS location has been placed in the non-brickfield area to provide a point of comparison. The samples collected from 0-0.05m depth will help characterise the surface soil similar to topsoil sampled during Stage 1 and Stage 2 investigations. The samples collected from 0.1-0.2m and 0.3-0.4m depth will be used to identify potential differences between different soil horizons and evaluate whether soils >0.3m could be left in-situ in the event that shallower topsoil required removal. Samples collected from 0.6-0.7m depth will be used to assess soil quality below the maximum likely depth of future soil replacement to evaluate potential long-term mixing effects with this deeper soil and assist with the design of any future remedial strategy. Samples collected from >1m depth will be used to evaluate the quality of fill material that could be associated with the former brickfield to conclude whether high concentrations in shallow topsoil could be linked to this. This deeper sample not needed if natural soils encountered shallower than 1m depth.
Hand pits to 0.7m	9	4	0-0.05 0.1-0.2 0.3-0.4 0.6-0.7	
WS to 3m	4	4	0-0.05 0.3-0.4 0.6-0.7 >1m (representative of any fill encountered)	

** where observations of unexpected contamination are made for which characterisation and delineation requires more than the currently allotted number of samples, additional samples will be taken as a contingency at the discretion of AECOM's supervising engineer. The analytical requirements of these samples will be discussed with RBKC before scheduling for analysis.*

The design locations are shown on Figure 1 and have been positioned to investigate two potential conceptual exposure scenarios:

1. **Public open space in a residential setting where the full communal garden is a single averaging area:** the locations to be excavated to 0.4m, 0.7m and 3m depth are evenly distributed throughout the communal garden being investigated in a grid pattern on roughly 5-6m centres. These 27 locations, plus the four from the Stage 2 investigation, will result in a significant reduction in the uncertainty associated with average soil concentrations across the full communal garden area compared to the existing 4 samples. The communal garden covers an area of approximately 700m^2, which is generally consistent with the 500m^2 area assumed in the UK's residential public open space land-use scenario. The sample locations are split

relatively evenly between the area along the southern boundary which is shown to have been formerly occupied by a brickfield (shaded area on Figure 1) and the area to the west of the building that is outside this shaded area. This is designed to provide a reasonable balance in the dataset to evaluate whether there could be a difference in lead concentrations in soil caused by this historic mapping feature. The different depth samples proposed in the table above are also designed to help to answer this question, provide more certainty with respect to the conceptual site model, and help design any future remediation where this is needed.

2. **Residential land use with a private garden but no homegrown produce consumption[2]:** The current understanding is that there are six residential properties that have doors leading directly out from the southern edge of the building onto the communal garden (doors roughly indicated as blue rectangles on Figure 1). Worst-case exposure averaging areas for residents of these six properties have been assumed to be the parts of the garden immediately backing onto the access door and wall of each property. These areas are shown indicatively with green boundaries on Figure 1. These six averaging areas cover areas of between approximately 25m^2 and 50m^2, which is smaller than the 100m^2 size assumed for a private garden in the CLEA residential land-use scenario. (SR3 notes that 85% of gardens are larger than 100m^2). In order to provide an improved level of confidence in the average soil concentrations (compared to Stage 2) within each of these exposure averaging areas, 37 sampling locations to 0.2m depth shown as yellow circles on Figure 1 have been added to the sampling plan, resulting in between 5 and 10 sampling locations within any one averaging area. This results in sample spacing on an approximate 2-3m grid. The results from these locations are designed to provide an improved level of confidence in the average soil concentrations compared to the Stage 2 investigation, and be suitable for RBKC's requirements for making decisions under Part 2A.

In addition to the non-targeted sample locations identified in points 1 and 2 above, a further 12 targeted sampling locations to 0.2m depth are marked on Figure 1 as blue circles. These have been included to provide information associated with the degree of localised variability in soil concentrations in close proximity to the four Grenfell Stage 2 sampling locations. Deeper samples at the window sampling locations have also been included to target potential fill materials associated with the historic brickfield. The targeted nature of these samples (clusters around the Stage 2 locations as well as the deeper samples at window sample locations) will be taken into account when assigning the datasets to which statistical testing will be applied.

Assessment of the data from Treadgold House will also consider potential differences in soil concentrations between grassed areas and areas of plant beds with exposed soil to help with understanding variations across the area.

2.2.3.2 Avondale Park Gardens

The design includes the collection of soil samples from 16 locations in the public open space at Avondale Park Gardens. Three of these to be in proximity to the previous location GTCS1-23, to delineate the potential higher concentrations recorded at this location during the Grenfell Stage 1 investigation. With the two existing sample locations this will provide 18 locations with data for lead concentrations in soil.

12 of the 16 hand pits to be excavated to a maximum depth of 0.2m. Residents are not permitted to excavate soil in the public open space area themselves and are therefore unlikely to be exposed to soils any deeper than the upper 5 to 10cm. General maintenance of the public open space may result in turning over of soil in plant and shrub beds to depths in the order of 30cm, or occasionally deeper for more substantial works. Because of this, 4 of the 16 hand pits to be excavated to 1m depth to provide information as to the soil quality below the depth that could potentially require remediation (0.3m is sometimes used as a soil replacement depth in public landscaped areas) depending on the findings of the sampling. Deeper sampling is designed to also enable an assessment of whether there is any evidence of impact from the former brickfield (shaded area in Figure 2), workhouse or subsequent residential redevelopment that is mapped in the area that could be the cause of the lead concentration exceeding the GSC in the shallow soil. Two samples are to be collected for analysis at each of the 0.2m depth locations: one from a depth of 0-5cm to be comparable to those already collected during Stage 1 and one from a depth of 10-20cm to give an indication of slightly deeper soil quality. At the four locations excavated to 1.0m depth, one sample to be collected from 0-0.05m, one from 10-20cm depth and one from 50-60cm depth. Sampling depths should be adjusted slightly to avoid sampling across distinct soil horizons if these are observed during the sampling process. Multiple sampling depths are designed to allow an assessment of whether there is any change in soil condition between the topsoil and subsoil and could be used to refine remediation requirements, if there are any.

[2] Although raised beds are present in the communal garden, the Stage 2 report showed that the soil quality in these beds was significantly better than the ground level soils and they were suitable for use without any further assessment required.

The sampling strategy is presented in Table 3 below.

Table 3. Sampling Strategy

Type of Sample Location	No. of hand pits	No of samples per pit	Sample Depths (m)	Justification
Hand pits to 0.2m	12	2	0-0.05 0.1-0.2	The hand pits to 0.2m depth (excluding those clustered around the Stage 1 sampling location GTCS1-23) provide an unbiased grid-based sampling coverage of the exposure averaging area in the public open space. The shallower samples at 0-0.05m depth will provide a suitable dataset for identifying an average concentration most representative of the exposure to residents using the site. The deeper samples at 0.1-0.2m will give an indication of any variability in soil conditions with depth that maintenance workers or any residents tending the flower shrub beds could be exposed to.
Hand pits to 1.0m	4	3	0-0.05 0.1-0.2 0.5-0.6	The 0-0.05m depth samples and 0.1-0.2m depth samples provide the same function as the samples in the shallower hand pits described above. The sample from 0.5-0.6m depth will provide some information on whether there may be contaminants in deeper fill material associated with the historic land uses including the infilled brickfield, the workhouse and its subsequent residential development and may be useful for the design of any necessary remedial measures.

The locations are shown on Figure 2 and are evenly distributed throughout the public open space being investigated in an approximate grid pattern at roughly 8-10m intervals, with the exception of the three samples surrounding GTCS1-23. The acquisition of soil concentrations at 18 locations is designed to provide a significant reduction in the uncertainty associated with average soil concentrations compared to the existing two samples.

The area is a landscaped garden with a combination of turf, vegetated shrub borders and trees. The layout is generally as a single space with no internal partitioning that would suggest anything other than a single averaging area. However, the data assessment will consider potential differences in soil concentrations between grassed areas and areas of plant beds with exposed soil to help with understanding variations across the area. The shading on Figure 2 indicates that much of the area – with the exception of a small portion in the south-eastern corner – was formerly occupied by a brickfield. The unshaded area is considered to be too small to require delineation from the rest of the area as it is unlikely to be practical or cost-effective to delineate it to the extent that it could be demonstrated to have a significantly different lead concentration in soil to the rest of the area. The area of the communal space is approximately 800m^2, which is closest in assumed area to the POSresi land use scenario (assumes approximately 500m^2, compared to the 5,000m^2 area assumed for POSpark). It is reasonable to assume that the communal garden at Avondale Park Gardens is typical of the open space in close proximity to residential properties envisaged by the C4SL Project[3]. The 18 sample locations are therefore considered suitable for assessing average soil concentrations within a single averaging area.

2.2.4 Task 3: Laboratory Analysis

The laboratory analysis designed for each of the sampling areas is shown in Table 4 below.

Table 4. Laboratory Analysis

Investigation Area	Sample Analysis	No of samples	QA/QC samples
Treadgold House	Lead	180 (all samples)	9 duplicates
	Asbestos	74 (1 sample at each of 70 locations, + 4 samples from >1m depth)	4 duplicates

[3] Contaminated Land: Applications in Real Environments (CL:AIRE), 20th December 2013. SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report.

Investigation Area	Sample Analysis	No of samples	QA/QC samples
	Metals* & PAH-16	26 (all samples from window sampling locations plus 10 further shallow (0-0.05 or 0.1-0.2m) samples) Plus As, Ba, Be, Cd, Cr, Cu, Hg, Ni and V in additional 13 samples (shallowest sample in selection of 0.4m and 0.7m depth hand pits)**	1 duplicate
	Contingency for TPH CWG depending on observations in deeper fill	16 (all samples from window sampling locations)	1 duplicate
	Lead bioaccessibility (only to be scheduled if required for risk assessment decision making†)	5 (from 0-0.05m depth samples distributed across the area) 3 (from any potential fill materials identified in window sample boreholes)	1 duplicate
Avondale Park Gardens	Lead	40 (2 samples at each of 12 sampling locations to 0.2m depth, 3 samples at the 4 locations to 1m depth)	2 duplicates
	Metals*, asbestos & PAH-16	12 (1 sample from 0-0.05m or 0.1-0.2m depth at 8 locations (consistent level of shallow sampling with Stage 2) and 4 samples from 0.5-0.6m depth)	1 duplicate
	Lead bioaccessibility (only to be scheduled if required for risk assessment decision making†)	3 (from 0-0.05m depth samples distributed across the area)	-
Contingency for unexpected contamination to cover both Treadgold House and Avondale Park Gardens	To be confirmed based on field observations. Could include metals suite, TPH CWG, PAH-16, asbestos, VOCs+TICs, SVOCs+TICs, cyanides	20	1 duplicate

* includes As, Ba, Be, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, V, Zn

** the additional nine metals (As, Ba, Be, Cd, Cr, Cu, Hg, Ni and V) have been added to 23 samples because beryllium was identified in Stage 1 samples at concentrations slightly exceeding GSC. Once lead and beryllium are proposed for analysis there is no additional cost to analyse up to 10 metals; hence the inclusion of this extended list.

† soil bioaccessibility tests will only be scheduled after the standard soil results have been initially screened against the Stage 2 SSAC and it is judged – in consultation with RBKC – that potential lower bioaccessibility could change the outcome, or additional data could help with reducing the level of uncertainty to a reasonable level.

The contingency listed in Table 4 above is anticipated to be used in two potential scenarios:

1. Where field observations indicate potential contaminants that have not be analysed at all (e.g. organic odours and staining requiring VOC analysis or blue staining indicating cyanide contamination)
2. Where contaminants such as PAHs, metals or TPH are encountered in deeper soils or in the small number of shallow samples currently planned to be scheduled for these analyses at concentrations exceeding residential GSC, then the contingency may be used to analyse an increased number of shallow samples for the same analyses.

2.2.5 Task 4: Risk Assessment and Reporting Requirements

Assessment and reporting for Treadgold House and Avondale Park Gardens is required to fulfil the obligations of Part 2A of the EPA 1990 and the associated statutory guidance.

The objective of the reporting will be to determine whether the areas under investigation meet the definition of Contaminated Land, and which Category of land they fall into. The risk assessment is to be carried out in accordance with the same broad methodology as that adopted for the Grenfell Stage 2 Investigation for consistency. The assessment and reporting requirements have been broken down as follows:

2.2.5.1 Factual Reporting

This to include:

- Details of the site walkover and sampling works, including:
  - site plans annotated with key features and photos showing an overview of all the sampling locations;
  - sample descriptions (logs) including observations of potential sources of contamination;
  - photos of sampling works;
  - records of sample chains of custody; and
  - laboratory analytical certificates and QA/QC information.

2.2.5.2 Risk Assessment

The risk assessment to include:

- Update to the conceptual site model taking into account findings of the intrusive investigation;
- Generic quantitative risk assessment using existing GSC and SSAC from the Stage 2 report. This to include statistical evaluation of data in accordance with the CLAIRE 2020 statistical guidance.
- Further detailed quantitative human health risk assessments – using newly acquired lead bioaccessibility data and any adjustments to land-use exposure assumptions that are considered reasonable following the land use discussions with residents – to establish whether there are unacceptable risks to human health as defined by Part 2A. The existing Step 1 and Step 2 SSAC to initially be updated using the additional lead bioaccessibility data, the proposed sampling strategy for this is summarised in Table 4. These SSAC may then be further updated depending on the outcome of potential discussions with residents during the site walkover, if any exposure assumptions can reasonably be adjusted compared to the standard Resi and POSresi scenarios. These updates to the SSAC are designed to improve the confidence in the decision-making in relation to whether the land meets the definition of Contaminated Land.
- Discussion, risk evaluation and conclusions of the findings of the soil sampling exercise, investigation and risk assessment.
- Recommendations of whether any land appears to meet the definition of contaminated land, under Part 2A.
- Classification of each site as Category 1-4 in accordance with the Statutory Guidance.
- Identification of any further actions that are needed to address risks from contaminants in the soil.

2.2.5.3 Options Appraisal and Remediation Strategy

Where an area under investigation meets the definition of Contaminated Land i.e. there is an unacceptable risk to human health, a remediation options appraisal and remediation strategy is required, taking into account the requirements of the Part 2A Statutory Guidance.

The options appraisal and remediation strategy are to be prepared in consultation with RBKC (particularly the Pollution Control, Housing and Parks teams) to incorporate specific requirements from those departments.

2.2.6 Task 5: Liaison with Residents

At the request of RBKC, the scope of works includes two residents liaison events for each of the Part 2A sites (i.e. 4 events in total). One of these to occur prior to the sampling and assessment works described in this document, and one to occur after the works were completed. Each event to consist of a half-day attendance at an informal event with the AECOM representative available to answer questions about the proposed scope and the findings of the work once completed.

3. Precautionary Works Sites

3.1 Conceptual Site Model

RBKC identified five sampling areas where potential contaminant linkages, though not considered to require further action in accordance with Part 2A of the EPA, would benefit from precautionary works. The proposals for precautionary works were developed by RBKC as part of the 'RBKC summary of actions' document, which was reviewed and approved in principle by MAP. These are summarised in Table 5 below:

Table 5. Summary of RBKC Proposed Precautionary Actions

Area Name	Potential Linkage	Possible Actions	Sampling Requirements and Management Plans
8. St Anne's and Avondale Primary School and Nursery	Lead concentration of 3,056mg/kg in a single sample with a planted soil bed. Category 4 linkage (i.e. low to no risk)	Discussion with school management. Possible replacement of impacted soil Alternatively cover with turf to minimise exposure Verification of any imported soils Provide PHE advice to school	If a decision is taken to replace the soil, limited sampling should be undertaken to confirm the extent of the soil replacement.
15. St Quintin's Community Kitchen Garden	Asbestos detected at concentrations below the detection limit (<0.001%wt/wt) in two adjacent raised bed samples in SE of the site indicating possible localised source. Category 4 linkage (i.e. low to no risk) One sample in ground level soil contained asbestos at less than detection limit. Site user access to ground level soils minimal.	Discussion with site management. Possible replacement of impacted soil in raised beds Verification of any imported soils Provide PHE advice to site managers	If a decision is taken to replace the soil, limited sampling should be undertaken to confirm the extent of the soil replacement.
18. Portland Road Kitchen Garden	Lead and asbestos present in ground level soils at the north end of the site at higher concentrations than elsewhere on site and exceeding GSC. Could be representative of localised higher concentrations at northern end of site. Category 4 linkages (i.e. low to no risk)	Discussion with site management. Possible replacement of impacted soil in growing beds and exposed paths at northern end of site. Verification of any imported soils Provide PHE advice to site managers Manage future works at site in accordance with CAR and CARsoil guidance	If a decision is taken to replace the soil, limited sampling should be undertaken to confirm the extent of the soil replacement. Produce site management plan.
21. Lancaster West Walkway Kitchen Garden	Asbestos encountered in soils in open space areas and in raised beds in CKG area. However, concentrations either below detection limit or less than GSC for all but two samples, one of which is in CKG area at depth of 0.5-0.6m. Category 4 linkage (i.e. low to no risk)	Discussion with site management. Possible replacement of impacted soil in growing beds where asbestos has been encountered. Verification of any imported soils Provide PHE advice to site managers Manage future works at site in accordance with CAR and CARsoil guidance	If a decision is taken to replace the soil, limited sampling should be undertaken to confirm the extent of the soil replacement. Produce site management plan.
40. Waynflete Square	Asbestos reported in 11 of 26 samples, generally at low concentrations (8 of 11 below detection limit of <0.001%wt/wt). Asbestos concentration exceeded the GSC in 3 samples.	Manage future works at site in accordance with CAR and CARsoil guidance.	Produce site management plan.

Area Name	Potential Linkage	Possible Actions	Sampling Requirements and Management Plans
	Category 4 linkage (i.e. low to no risk)	Provide PHE advice to site managers Produce asbestos management plan for the area	

AECOM held further discussions with the managers of these sites on 28th and 29th July with Rebecca Brown of RBKC also present. The outcome of these discussions included:

- St Anne's and Avondale Primary School and Nursery: It was agreed that some limited delineation around the single sample with elevated lead concentrations would be completed before any excavations took place in order to minimise any volume of soil requiring removal.
- St Quintin's Community Kitchen Garden: It was agreed that all soils in Plots 30-34 would be replaced as these included the two samples with asbestos detected. In addition, the RBKC kitchen garden team indicated that they would also replace the soils in Plots 25 to 29 as part of wider improvement works needed in this area to replace rotten wooden boards.
- Portland Road Kitchen Garden: This site is undergoing considerable re-design in the near future and it was agreed that no immediate sampling or soil replacement would be needed. The ground level soils in the northern part of the site will no longer be used for growing edible crops and will be planted and maintained by the RBKC team rather than plot holders. All growing for human consumption will be within soils in raised beds or planters, not at ground level. It was agreed that a brief management plan would be prepared to outline the ground conditions and appropriate mitigation measures for long-term management and maintenance of the site.
- Lancaster West Walkway Kitchen Garden: The RBKC kitchen garden team indicated that they would replace all soils in growing areas to a depth of 60cm, with a geotextile marker layer installed at the base of the replacement soils. Mature permanent trees or bushes would not be removed but best endeavours would be made to replace soils surrounding them.
- Waynflete Square: A management plan should be prepared to record ground conditions and identify appropriate mitigation measures for long-term management and maintenance of the site.

3.2 Scope of Work

The scope of work designed for the precautionary works sites includes:

3.2.1 St. Anne's and Avondale Primary School

The design includes the collection of samples from three locations in the landscaped soil beds in the vicinity of GTCS2-S072 to help delineate the area of potentially elevated soil impact that may be replaced for precautionary purposes.

Samples to be taken from depths of 0-5cm (to be comparable to the Stage 2 samples) and from a depth of 30-40cm at each location to help define the spatial extent and depth of soil replacement. It is not expected that soils would need to be replaced to a depth greater than 30cm given the use of this area.

All the samples to be analysed for lead, with one composite sample to be collected and analysed for a wider suite suitable for soil characterisation for waste disposal purposes.

Following delineation of the area to be excavated, a method statement to be produced outlining the required steps for the safe removal and replacement of soils in this area. This is to include:

- Identification of area and volume of soil to be removed;
- Requirements for supervision and record-keeping of soil removal and validation of imported soils;
- Soil waste disposal requirements (including waste classification); and
- Validation reporting requirements to provide evidence of the completed works.

Following agreement of the soil removal scope with RBKC, AECOM will undertake one visit to the site area during the removal of soil and collect evidence of the soil removal. It is understood that the soil removal and replacement works will be managed by the relevant RBKC team.

A subsequent visit to the site (if at a different time to the soil removal) will be completed during the importation of fresh soils and one validation sample will be collected for every $50m^3$ of imported soils (assuming all from the same source) or a minimum of three samples. AECOM has assumed that RBKC will provide AECOM with the details of soil volume to be imported and the source of those soils in advance of the visit to collect validation samples. The validation samples will be tested for a suite of metals, asbestos screen, speciated PAHs and petroleum hydrocarbons (analysed for CWG carbon banding with aliphatic/aromatic split).

3.2.2 St Quintins CKG

The design scope includes a visit to the site area during the removal of soils from Plots 25 – 34 and collect evidence of the soil removal. It is understood that the soil removal and replacement works will be managed by the RBKC Kitchen Gardens team.

A subsequent visit to the site is required during the importation of fresh soils and one validation sample will be collected for every $50m^3$ of imported soils (assuming all from the same source) or a minimum of three samples. AECOM has assumed that RBKC will provide AECOM with the details of soil volume to be imported and the source of those soils in advance of the visit to collect validation samples. The validation samples will be tested for a suite of metals, asbestos screen, speciated PAHs and petroleum hydrocarbons (analysed for CWG carbon banding with aliphatic/aromatic split).

Following receipt of the validation results from the laboratory, a brief validation report to be prepared describing the works completed (including photos) and with the laboratory testing results, including certificates of origin (to be provided by RKBC) for the replacement soils.

3.2.3 Lancaster West Walkways

The design scope includes a visit to the site area during the removal of soils from the growing areas and collect evidence of the soil removal. This to include photographs and measurements to demonstrate that soil has been removed to the proposed depth of 60cm. It is understood that the soil removal and replacement works will be managed by the RBKC Kitchen Gardens team.

Observation and collection of evidence of the installation of a geotextile marker layer before observing and collecting evidence of the replacement soils being imported to the required 60cm thickness.

Once the soils have been imported one validation sample will be collected for every $50m^3$ of imported soils (assuming all from the same source) or a minimum of three samples. AECOM has assumed that RBKC will provide AECOM with the details of soil volume to be imported and the source of those soils in advance of the visit to collect validation samples. The validation samples to be tested for a suite of metals, asbestos screen, speciated PAHs and petroleum hydrocarbons (analysed for CWG carbon banding with aliphatic/aromatic split).

Following receipt of the validation results from the laboratory, a brief validation report to be prepared describing the works completed (including photos) and with the laboratory testing results, including certificates of origin (to be provided by RKBC) for the replacement soils.

The preparation of a site maintenance management plans for this area (full Lancaster West Walkways area, not just growing sites), to include a factual description of soil conditions at the Site, and appropriate precautionary exposure mitigation measures for workers involved in maintenance of these areas. It is intended that the management plan will be a brief document (up to 2 pages of text) including a plan illustrating the key points.

3.2.4 Portland Rd CKG and Waynflete Square

The preparation of site maintenance management plans for these areas, to include a factual description of soil conditions at the Site, and appropriate precautionary exposure mitigation measures for workers involved in maintenance of these areas. It is intended that the management plan will be a brief document (up to 2 pages of text) including a plan illustrating the key points.

3.2.5 Laboratory Analysis

The laboratory analysis for each of the sampling areas is shown in Table 5 below.

Table 6. Laboratory Analysis

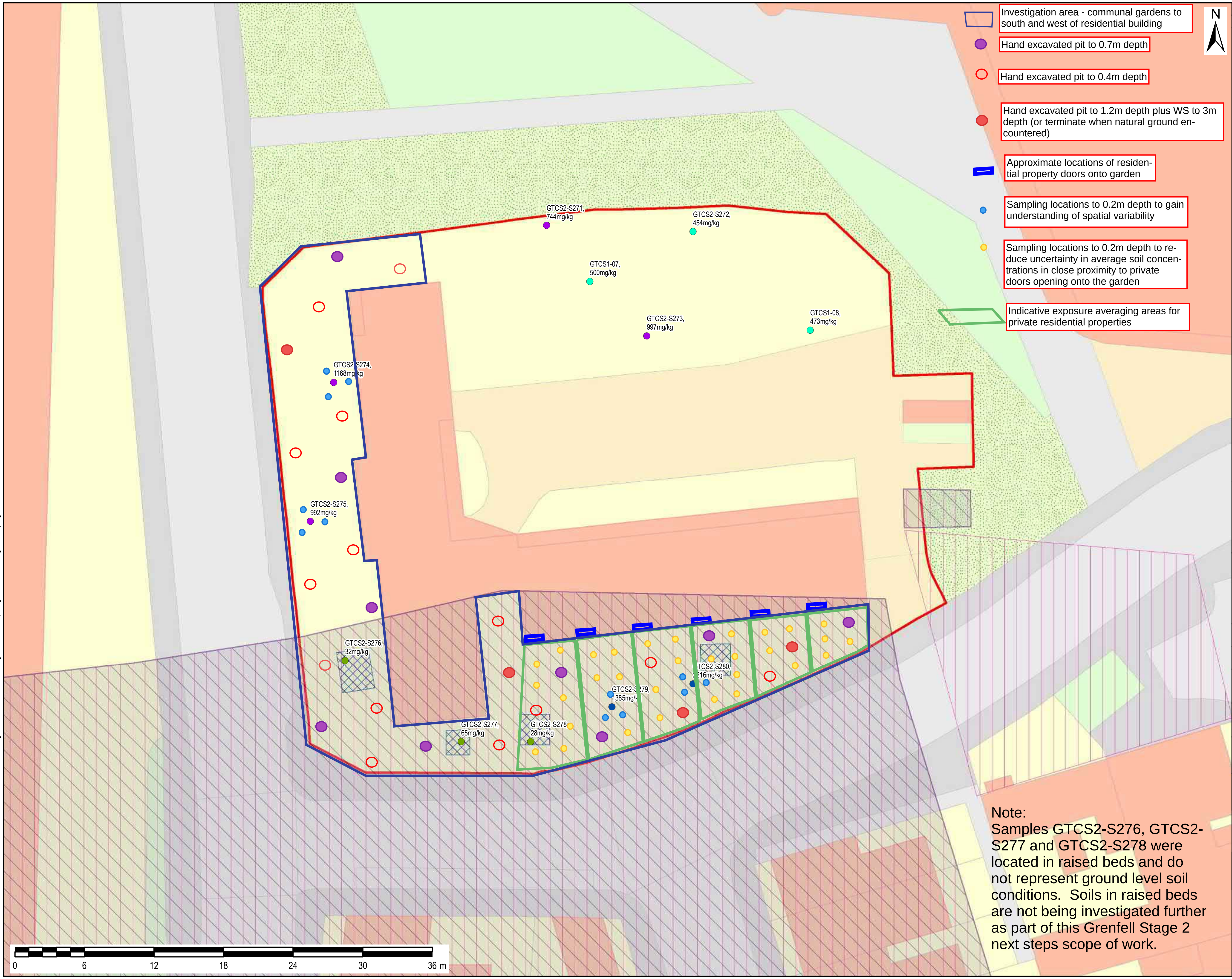
Column heading	Sample Type	Sample Analysis	No of samples	QA/QC samples
8. St Anne's and Avondale Primary School and Nursery	Existing soils for delineation purposes	Lead	6 (2 samples at each of 3 locations)	1 duplicate
	Existing soils for waste classification	Metals suite, PAH-16, asbestos screen, petroleum hydrocarbons (CWG)	1 (for waste classification)	
	Imported soils for verification purposes	Metals suite, PAH-16, asbestos screen, petroleum hydrocarbons (CWG)	1 per 50^3 or minimum of 3 Assume 3 for costing	1 duplicate
15. St Quintin's Community Kitchen Garden	Imported soils for verification purposes	Metals suite, PAH-16, asbestos screen, petroleum hydrocarbons (CWG)	1 per 50^3 or minimum of 3 Assume 3 for costing	1 duplicate
21. Lancaster West Walkway Kitchen Garden	Imported soils for verification purposes	Metals suite, PAH-16, asbestos screen, petroleum hydrocarbons (CWG)	1 per 50^3 or minimum of 3 Assume 5 for costing	1 duplicate

3.2.6 Reporting

For the precautionary works sites, the following reporting is required:

- For Avondale Primary School, a soil replacement method statement to be produced, with a brief validation letter report to be produced following the soil replacement works describing the works completed and the soil validation evidence. It is intended that this will be a brief document (1 page of text) including a plan illustrating the key points.
- For St. Quintin's CKG and Lancaster West Walkways CKG, a brief validation letter report to be produced following the soil replacement works describing the works completed and the replacement soil validation evidence.
- Management plans for Waynflete Square, Portland Road CKG and Lancaster West Walkways to provide information on the ground conditions for any construction or maintenance workers involved in below ground activities in these areas. The management plans to take into account the Health and Safety at Work Regulations and – specifically related to asbestos – CAR 2012, CAR-SOIL and the CL:AIRE JIWG Decision Support Tools for receptor ranking and work categories. It is intended that the management plan will be a brief document (up to 2 pages of text) including a plan illustrating the key points.

Appendix A Figures



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LEGEND

- Site Outline
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- RBKC Sites of Geoenvironmental Interest based on Historic Maps
- Food Growing Sites

Lead - mg/kg

- <200
- 200-630
- 630-1300
- >1300

Stage 1 - Soil

Name - Ground Cover (Cover Type)

GTCS1–7 - Turf
GTCS1–8 - Bare soil - undisturbed

Stage 2 - Soil

Name - Ground Cover (Cover Type)

GTCS2–S271 - Bare soil - undisturbed
GTCS2–S272 - Bare soil - undisturbed
GTCS2–S273 - Turf
GTCS2–S274 - Turf
GTCS2–S275 - Turf
GTCS2–S276 - Bare soil - disturbed (Raised vegetable bed)
GTCS2–S277 - Bare soil - disturbed (Raised vegetable bed)
GTCS2–S278 - Bare soil - disturbed (Raised vegetable bed)
GTCS2–S279 - Turf
GTCS2–S280 - Bare soil - disturbed

Client

ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title

GRENFELL STAGE 2 NEXT STEPS SCOPE OF WORK

Drawing Title

28 TREADGOLD HOUSE

PROPOSED SAMPLING LOCATIONS

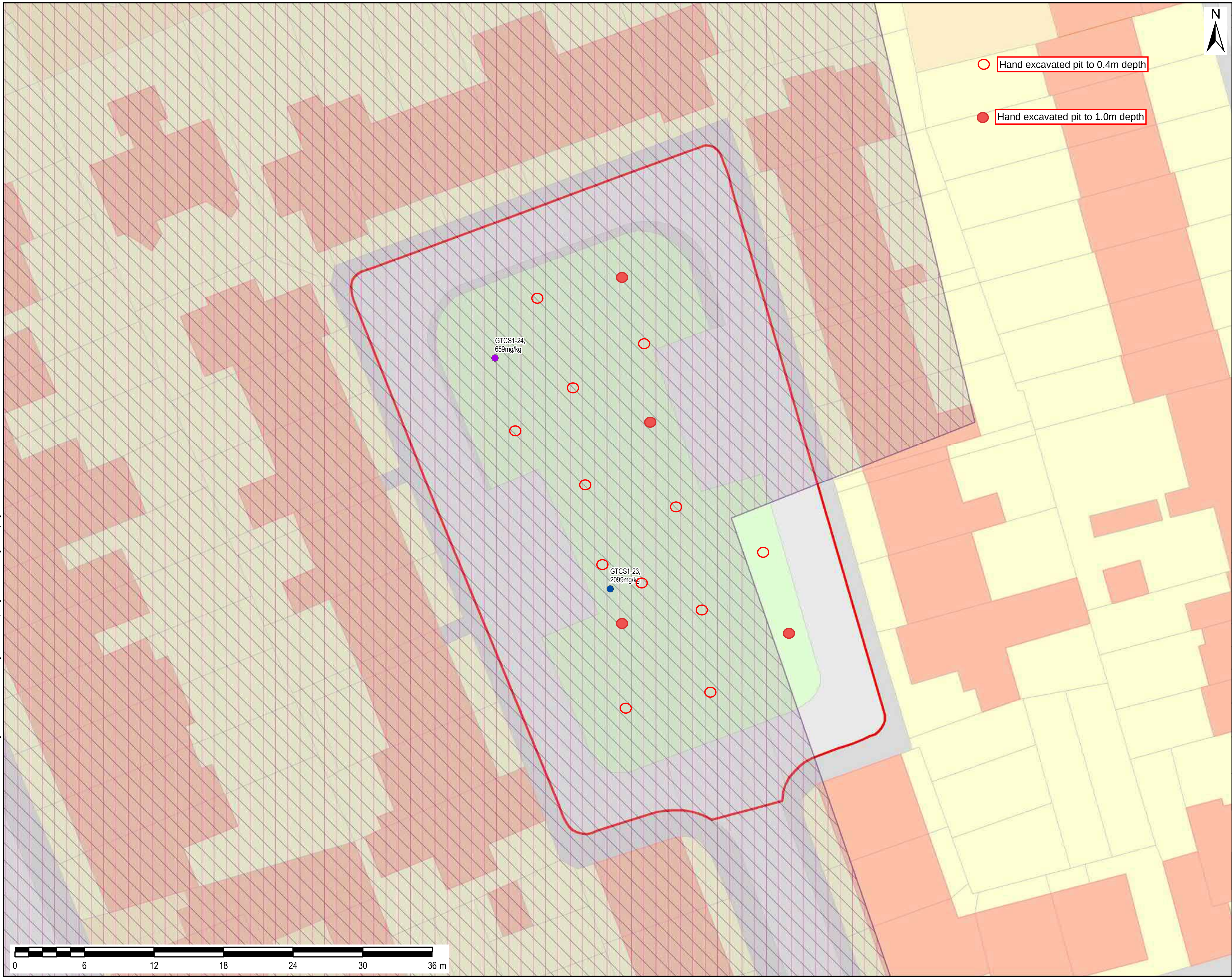
Drawn	Checked	Approved	Date
GM	KB	DD	28/05/2021

AECOM Internal Project No.	Scale @ A3
60632092	1:300

AECOM
Midpoint
Alençon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

Drawing Number	Rev
FIGURE 1	01

File Name:\\eu.aecomnet.com\EMIA\UKCRD1\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure G1-G45 - Stage 2 Sampling Locations - All Sites_Contaminates_Lead.mxd



LEGEND

- Site Outline
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- RBKC Sites of Geoenvironmental Interest based on Historic Maps

Lead - mg/kg

- <200
- 200-630
- 630-1300
- >1300

Stage 1 - Soil

Name - Ground Cover (Cover Type)

GTCS1-23 - Turf

GTCS1-24 - Turf

Client

ROYAL BOROUGH OF KENSINGTON & CHELSEA

Project Title

GRENFELL STAGE 2 NEXT STEPS SCOPE OF WORK

Drawing Title

43

COMMUNAL SPACE AT AVONDALE PARK GARDENS

PROPOSED SAMPLING LOCATIONS

Drawn	Checked	Approved	Date
GM	KB	DD	28/05/2021

AECOM Internal Project No.	Scale @ A3
60632092	1:300

AECOM
Midpoint
Alençon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

Drawing Number: FIGURE 2

Rev: 01

File Name:\\eu.aecomnet.com\EMIA\UK\CRD1\Jobs\PR-458020_Grenfell_Tower_Stage_2\900_CAD_GIS\950_Stage2_GIS\02_Maps\Figure G1-G45 - Stage 2 Sampling Locations - All Sites_Contaminates_Lead.mxd

Appendix B Sampling Procedure

Remediation Services

Grenfell Stage 2 Follow-on Scope – Soil Sampling Protocol

1. Purpose and Scope

This document describes the standard field procedure to be used by AECOM Remediation Services personnel to collect soil samples for the Grenfell Stage 2 Follow-on Scope of Work. It relates specifically to the collection of soil samples from the following types of location:

- Surface or near-surface soil (primarily 0-5cm)
- Sub-surface soil to a maximum depth of 120cm.
- Deep soils to a maximum depth of 300cm.

The soil samples are to be collected for subsequent laboratory analysis, and for the logging of the soil conditions encountered.

The objective is to collect a sample that is representative of the soil condition at the chosen sample location, including both the chemical composition and the geological consistency of the material.

Identified sample locations are indicated on Figure 1 and Figure 2 of the AECOM report 'Site Investigation Design, Grenfell Stage 2 Follow-up Work'.

The individual samples should be of ground that appears to be representative of the typical ground conditions in the area being sampled. If there is visual and/or olfactory evidence of localised potentially contaminated soil, an additional targeted sample should also be taken in a visually/olfactorily uncontaminated location.

In all cases, care needs to be taken not to change the chemistry of the sample. This means minimising the disturbance of the soil and minimising the time taken to take the sample as far as reasonably practicable. It also means storing and transporting the sample as per the guidelines below.

2. Procedure

1. **Decontaminate equipment**. prior to first use each day and after collection of each sample, all equipment that comes into contact with samples should be decontaminated (see AECOM FP07 Decontamination of Equipment). This should involve the use of de-ionised water and plant-based detergent.
2. **Prepare sample containers**. Ensure that all necessary laboratory sample containers are available and correctly labelled. Minimum information should include project code, sample code (including depth if relevant), and time/date. Refer to laboratory chain of custody for full information requirements. If sample pre-coded barcodes are being used, check that barcodes refer to correct sample code.
3. **Identify sample location**. Sample locations are indicated in the site investigation design document. These are indicative locations and are subject to site conditions and constraints. If on the day of sampling specific locations are not accessible, alternative locations can be chosen. Consult with the Project Manager if this situation arises. Sampling locations should be consistent with the overarching aims of the sampling and consistent with the strategy set out in the site investigation design document.
4. **Photograph sample location**. Sampling locations should be photographed using a trial pit board / pre printed sheet with size and colour scales. The sample location code must be as pre-agreed with the Project Manager, and the sample location should be recorded using GPS coordinates and/or by surveying or by reference to a detailed site plan, so that the locations can be re-visited if necessary. If a GPS is used, its calibration must be checked by recording the coordinates of at least two known site features (such as corners of major buildings.
5. **Wear dedicated disposable gloves at each location**. Use a dedicated clean pair of disposable nitrile (powder free) gloves should be worn at each location and all reasonable measures taken when conducting the work to avoid cross-contamination of samples.

6. **Damp down sample area.** If the ground is damp, no further damping down is required. If the ground is dry and dusty, damp down the ground before and during sampling using a hand-held water mister. This helps minimise the generation of airborne dust (and asbestos fibres if present) during sampling. Avoid excessive use of water which would make sample more difficult to handle.
7. **Clear sampling area**. Remove vegetation and surface debris that is not to be sampled. Sampling area should be a minimum of 30cm x 30cm square. Lay down an approximate 150cm x 50cm piece of clean un-used plastic sheeting next to the sample location, on which the soil targeted for sampling will be placed.
8. **Confirm sampling depth requirements**. Samples need to be taken (dependent on specific location) at the following depths:
   a. 0-5cm;
   b. 10-20cm;
   c. 30-40cm'
   d. 60-70cm;
   e. >1m
9. **Confirm requirement for duplicate sample at sample location**. Duplicate samples are required at 5% of locations.
10. **Excavate soils to reach target sampling depth**. Using a decontaminated stainless-steel spade and/or fence-post scissor shovels a hand pit should be excavated to the depth of the next required sample at the specific location. Arisings from the hand excavation should be placed on the plastic sheeting with shallow to deep soils from left to right. If turf is present carefully remove as much soil as possible from the turf [note step 11 below for VOC samples – a core should be taken through the turf for the VOC sample if possible]. The soil removed from the turf should form as much of the 0-5cm sample as possible.
11. **Collect soil sample.** Samples for VOC testing must be taken before the soil at the designated sampling depth is disturbed. The sample vial for VOC laboratory analysis should be filled immediately to minimise volatile losses and the sampling must be done in accordance with BS10176:2020. This requires the use of methanol containing vials and the use of dedicated miniature corers/plungers to extract the required soil plug. Where the soil is too coarse or non-cohesive for the use of the corer/plunger, soil should be sampled using the trowel. If the use of a trowel is required, ensure soil disturbance is kept to a minimum and that the soil is placed in the methanol containing vial as quickly as possible. ***Refer to FP27 for further details on the specific method for VOC samples.*** After the VOC sample has been taken, using a decontaminated unpainted stainless-steel hand trowel a square area 30cm x 30cm of soil should be removed from the required depth interval and placed on to the clean piece of plastic sheeting in preparation for taking the remainder of the required sample for laboratory analysis.
12. **Mix soil sample and fill required pre-labelled laboratory sample containers.** Plant roots and other debris should be removed as far as is reasonably practicable from the remainder of the sample. If the soil is sufficiently granular, the resulting soil should be thoroughly mixed on the sheet using the hand trowel before being placed in the required laboratory sample containers (see below for laboratory sample container requirements). See AECOM FP24 Soil Sample Volume Reduction and Sub-sampling by Cone and Quartering for a method for sample mixing. If the sample is cohesive and cannot be easily mixed this should be noted in the field records and the sample transferred to the sample containers without mixing.
13. **Collect further samples at greater depth within hand excavated pit**. Repeat Steps 10 to 12 until all samples have been collected from the multiple specified sampling depths at each location. Where samples are specified as >1m depth, this sample should be collected from the first encountered material that is in the judgement of the AECOM environmental engineer potentially representative of fill material within the historically backfilled brickfield. If natural London Clay is encountered at depths shallower than 1m then the sample specified at >1m is not required and the sampling location can be terminated when London Clay is encountered.
14. **Excavate soils to 3m depth using a percussive (windowless sampling) drilling technique**. At four specified locations shown on Figure 1 in the site investigation design, soils are to be excavated to a maximum depth of 3m or until natural London Clay soils are encountered, whichever is shallower. The drilling will be completed in accordance with the drillers method statements and soil 'cores' in plastic liners will be placed on the ground adjacent to the drilling location. The liner will be cut open safely by the drilling

operative in accordance with their method statement to expose the soil core for the AECOM engineer to log and sample.

15. **Collect soil sample from drilling core liner**. One sample will be collected in accordance with Steps 10 to 12 above from the first encountered material that is in the judgement of the AECOM environmental engineer potentially representative of fill material within the historically backfilled brickfield. The remainder of the core will be inspected to the full drilled depth and contingency samples will be collected where the AECOM environmental engineer judges that there is visual and/or olfactory evidence of potential contamination.

16. **Duplicate samples**. Where specified in the sampling plan these samples should be taken following the cone and quartering of the original sample, not by taking a further sample from the ground adjacent to the original sample.

17. **Record oversize fraction that could not be sampled**. Oversize fractions of sample that cannot be sampled in the required containers should be described in the field notes for each individual sample.

18. **Record logging description of soil**. A written record of the soil strata encountered should be made using AECOM's soil logging proforma. Soil descriptions should be in accordance with BS590:2015+A1:2020 and AGS guidance on the description of anthropogenic materials.

19. **Photograph sampled location and filled sample containers**. Photograph the filled sample containers alongside the sampled location. Use the same trial pit board / pre printed sheet with colour and size scale as per Step 4.

20. **Secure samples for transportation**. Samples should be securely packaged for transportation as soon as possible using the appropriate packaging containers provided by the laboratory. Samples should be stored and transported according to the analytical laboratory guidance provided, including sealing to prevent evaporative losses and maintenance of a stable temperature (generally in the range 0-4 degrees C where practicable to do so).

21. **Reinstate sample location**. Backfill sample hole using excavated soil and replace turf (if originally present). Compress soil lightly in layers by foot when backfilling to minimise future depression of soil in area of sampling (not applicable in raised beds used for growing crops). A bagged supply of certified topsoil should be available to complete reinstatement as necessary. If further reinstatement or turf replacement is required, this will be recorded in the site notes for subsequent implementation.

22. **Photograph reinstated location**. This photograph should aim to replicate that taken in Step 4 and should be sufficient to show that reinstatement is satisfactory.

23. **Complete and check sample Labelling and Chain of Custody.** Ensure all required information is provided on sample labels and chain of custody (see Step 2). Sample time and sample location are not entered on the Chain of Custody for duplicate samples. This information must be recorded with the site personnel's notes or on a detailed plan for future QA/QC procedures.

3. Responsibilities

It is the responsibility of the Project Manager to produce and communicate the Sampling Plan to field staff and ensure that this Sampling Protocol aligns with that Sampling Plan.

It is the responsibility of field staff to understand and comply with the Sampling Plan and this Sampling Protocol.

4. Equipment

a. 1 x small clean stainless-steel (unpainted) trowel, spade, scissor shovels

b. 1 x set of laboratory sample containers, including:

    i. 1 x 950ml plastic tub.

    ii. 1 x 270ml amber glass jar.

    iii. 2 x 74ml amber glass jar (only where TPH CWG and VOCs required).

    iv. 2 x 40ml glass liquid vial with methanol preservative (only where VOCs required)

c. 1 x clean plastic sheeting

d. 1 x chilled sample container

e. 1 x container of de-ionised water (plus detergent if required)

f. 1 x hand held or backpack-type water sprayer (if ground conditions are expected to be dry and dusty).

g. 1 x disposable cleaning cloths

h. 1 x camera

i. 1 x digital device to record and submit field notes, soil log, and chain of custody

5. Terms and Definitions

Not required.

6. References

a. AGS Guide to Environmental Sampling, Association of Geotechnical and Geoenvironmental Specialists, 2019

b. AGS Guidance on the Description of Anthropogenic Materials – A Practitioners' Guide, Association of Geotechnical and Geoenvironmental Specialists, 2018

c. BS5930:2015+A1:2020 Code of practice for ground investigations, British Standards Institution, 2020

d. BS 101075:2011+A2:2017 Investigation of potentially contaminated sites – Code of practice, British Standards Institution, 2017

e. BS 10176:2020 Taking soil samples for determination of volatile organic compounds (VOCs) – Specification, British Standards Institution, 2020

f. BS ISO 18400-102:2017 Soil quality – Sampling. Part 102: Selection and application of sampling techniques, British Standards Institution, 2017

g. BS ISO 18400-105:2017 Soil quality – Sampling. Part 105: Packaging, transport, storage and preservation of samples, British Standards Institution, 2017

h. BS ISO 18400-201:2017 Soil quality – Sampling. Part 201: Physical pretreatment in the field, British Standards Institution, 2017

i. BS ISO 18512:2007 Soil Quality – Guidance on long and short-term storage of soil samples, British Standards Institution, 2007

j. AECOM Soil Logging Guide version 2, 2019

k. AECOM Field Procedure FP24 Soil Sample Volume Reduction and Sub-sampling by Cone and Quartering, Version 1.1, June 2019

l. AECOM Field Procedure FP27 Soil Sampling for VOCs, Version 1.0, September 2020

7. Records

a. Laboratory Chain of Custody

b. Soil logging record

c. Photographic record

d. Daily field diary

8. Appendices

a. Attachment 1 – Soil logging forms

9. Change Log

List the change history pertaining to this document including if it was identified differently throughout its life-cycle:

Rev #	Change Date	Description of Change	Location of Change

Attachment 1

Grenfell Stage 2 Follow-up Work - Soil Sampling Proforma

Project Reference:	**Date:**							
Sample Area Name:								
Sample Area No.:				**Sampling Time :**				
Weather Conditions:								
Field team:								
Sample Location ID				**Samples taken (tick)**				
				0 - 0.05m	**0.1 - 0.2m**	**0.3 - 0.4m**	**0.5- 0.6m**	**0.6- 0.7m**	**>1m (specify precise depth interval)**

Photo *(tick in box when done)*	**Photo taken 0 - 0.05m**	**Photo taken 0.1 - 0.2m**	**Photo taken 0.3 - 0.4m**	**Photo taken 0.5- 0.6m**	**Photo taken 0.6- 0.7m**	**Photo taken >1m (specify precise depth interval)**	**Photos checked**	**Photographer name**
undisturbed sample location								
Samples excavated on plastic sheeting								
Samples in sampleware								
Sample location reinstated								

Sample log

Observed CoPC:	
(note of any ash etc.)	
Further reinstatement required (Yes or No)	
Sample location marked on map with measurements (tick)	
Tools decontaminated after sampling and reinstating (tick when decontaminated)	

Additional Notes

Soil Sampling for VOC Analysis Using Methanol Preservation

FP27

1. Purpose and Scope

The purpose of this procedure is to set out the default approach to sampling soil for VOC analysis in accordance with BS10176:2020. This procedure is only applicable to sampling for VOCs, not for other less volatile contaminants. It does include analysis for VOCs, BTEX (and potentially GRO, subject to laboratory capabilities and requirements).

The procedure is mainly applicable to fine to medium grained cohesive or moderately cohesive soils that can be sub-sampled using a miniature coring device. Exclusions are set out for coarse and non-cohesive soils.

The principal procedure adopts the use of methanol as a sample preservative. There are alternatives set out in BS10176, including the use of sodium hydrogen sulphate or water as preservatives, or the use of sealed cores.

It is imperative that the specific requirements of the chosen laboratory are known prior to the field work commencing as these requirements may vary from lab to lab.

2. Procedure

The steps below outline the procure to take when using 40ml methanol preservative sample vials. The alternative procedure for coarse soils is detailed in Section 3. Further detail on this option is provided in BS10176 Clause 6.6.

1. **Safety**. Methanol is a toxic and flammable liquid. Refer to the project-specific SHE Plan for further details. Note that these details should include the provision of appropriate PPE and access to washing and first aid facilities. Methanol containing vials should only be used in well ventilated areas. Additional care should be taken to avoid spillage/breakage of the methanol-containing vials. Surplus vials containing methanol should be returned with the samples to the originating laboratory in a safe and secure manner using the appropriate transportation packaging provided by the laboratory.
2. **Applicability**. Sampling using miniature corer-type device and 40ml vials should only be used if the maximum grain size is less than 3mm. For coarser materials, refer to the alternative method in section 3.
3. **Set out sampling station**. Establish a good working environment where the material to be sampled can be accessed, the sampling equipment can be laid out, the sampling equipment can be cleaned or decontaminated if necessary, the soil samples can be safely transferred to the required laboratory sample containers, the samples can be packaged for transportation, and all field notes and observations can be recorded. As a minimum this can be provided by a clean sheet of plastic laid on the ground next to the sampling location. Methanol has a high affinity for organic compounds so ensure that the sampling location and sampling station is not affected by external contamination sources such as vehicle exhaust emissions.
4. **Check sample vials**. Inspect the pre-weighed methanol-filled vials prior to use. Look for evidence of damage or obvious loss of methanol. Do not use any vials that appear damaged or appear to have lost some/all of the methanol. The vials should be pre-labelled with all the required sample identification information.
5. **Collect laboratory sample**. Using the required corer device supplied by the laboratory, extract the required core size/mass required by the laboratory. This could be 5-10g of soil – <u>check for lab-specific requirements</u>. The sample should be collected immediately after accessing the soil from the windowless sample core, hand auger core or from breaking open a bulk soil sample from an excavator bucket. The pre-filled vial should be opened only when the transfer of the sample core is ready to avoid methanol losses to atmosphere. The miniature corers are typically designed to take either 5g or 10g samples and should have markings to indicate when the required sample volume/mass has been collected. Take care to avoid splashing the methanol when transferring the soil to the vial. Clean the threads on the vial top and seal the vial with the septum cap as soon as possible. Do not add any additional labels or markings to the vial.

6. **Duplicate sample**. Duplicate samples are required for every sample. Not all of these need to be tested (refer to the project-specific sampling plan for details on the number of duplicates requiring testing). These duplicate samples should be collected as per the original sample.

7. **QA/QC samples**. In addition to duplicate samples, field and trip blanks are required. Refer to the project-specific sampling plan for further details.

8. **Sample storage**. Immediately after the sample has been taken the vial should be placed in the required chilled storage/transportation container. The target storage temperature according to the British Standard is 4+/-2^{o}C. It is recognised that this is impractical in most instances. The vials must remain upright during transit – this is best achieved using dedicated packaging inserts.

9. **Collect non-preserved sample for moisture content**. Collect a separate sample for soil moisture content using the sample container specified by the laboratory. No additional VOC-specific considerations are necessary. The sample can be obtained using the conventional method (i.e. a trowel).

10. **Decontaminate**. Decontaminate re-usable sampling equipment using de-ionised water and a plant-based detergent or Decon90.

11. **Field notes and chains of custody**. Complete all necessary field notes and chain of custody.

3. Alternative procedure for coarse soils

3.1 Fine and medium grained non-cohesive soils

For fine and medium grained non-cohesive soils for which the corer devices provide poor recovery, use a traditional sampling device (for example a small narrow width clean stainless-steel trowel) to collect the required soil size and transfer to the methanol-containing vial. Soil disturbance when collecting the sample should be kept to a minimum and transfer to the vial should be done as quickly as possible to minimise volatile losses to atmosphere. Use an electronic balance to determine when the required sample mass has been achieved. Laboratories are typically requiring 5g soil to 10ml of methanol (a ratio of 1:2 compared to the ratio of 1:1 required by the standard and reflects the fact that a 1:1 ratio (i.e. addition of 10g of soil) does not provide adequate coverage of methanol over the soil sample).

3.2 For coarse grained materials

For material with a grain size that does not fit into a 40ml glass vial, Annex C of BS10176 permits the use of unpreserved amber glass jars. In using this alternative approach, volatile losses to atmosphere should be minimised as far as reasonably practicable by:

- Sample the material as soon as reasonably practicable after extraction from the sampling point.
- Avoid incorporation of roots or stones as far as possible.
- Fill container as tightly as possible and compact to minimise headspace within the container.
- Keep samples at low temperatures and out of direct sunlight.
- Ship samples to the laboratory as soon as possible after sampling.

4. Equipment

a. 1 x core sampler

b. 1 x small clean stainless-steel (non-painted) trowel

c. 1 x electronic weighing scale

d. 2 x pre-filled methanol vials

e. 1 x 60g amber glass jar for the determination of moisture content

f. 1 x square of clean plastic sheeting

g. 1 x camera

h. 1 x electronic device for recording digital field notes and chain of custody

i. 1 x container of de-ionised water (and detergent if required)

j. 1 x disposable cleaning cloths

k. 1 x chilled sample storage container

5. Terms and Definitions

a.	Soil	Includes natural soils, made ground and fill material
b.	VOC	Volatile Organic Compound

6. References

a. AGS Guide to Environmental Sampling, Association of Geotechnical and Geoenvironmental Specialists, 2019

b. AGS Guidance on the Description of Anthropogenic Materials – A Practitioners' Guide, Association of Geotechnical and Geoenvironmental Specialists, 2018

c. BS5930:2015+A1:2020 Code of practice for ground investigations, British Standards Institution, 2020

d. BS 101075:2011+A2:2017 Investigation of potentially contaminated sites – Code of practice, British Standards Institution, 2017

e. BS 10176:2020 Taking soil samples for determination of volatile organic compounds (VOCs) – Specification, British Standards Institution, 2020

f. BS ISO 18400-102:2017 Soil quality – Sampling. Part 102: Selection and application of sampling techniques, British Standards Institution, 2017

g. BS ISO 18400-105:2017 Soil quality – Sampling. Part 105: Packaging, transport, storage and preservation of samples, British Standards Institution, 2017

h. BS ISO 18400-201:2017 Soil quality – Sampling. Part 201: Physical pretreatment in the field, British Standards Institution, 2017

i. BS ISO 18512:2007 Soil Quality – Guidance on long and short-term storage of soil samples, British Standards Institution, 2007

j. AECOM Soil Logging Guide version 2, 2019

k. AECOM Field Procedure FP03, Soil Sampling, Version 2.1m, December 2018

l. AECOM Field Procedure FP24 Soil Sample Volume Reduction and Sub-sampling by Cone and Quartering, Version 1.1, June 2019

7. Records

List of the official records that are generated and support this procedure. List using 'Alpha List' option from the AECOM Procedure List dropdown on the Home tab.

a. Laboratory Chain of Custody

b. Soil logging record

c. Photographic record

d. Daily field diary

8. Appendices

a. Attachment 1 – Examples of sampling corer devices and use.

9. Change Log

List the change history pertaining to this document including if it was identified differently throughout its life-cycle:

Rev #	Change Date	Description of Change	Location of Change

Attachment 1 (courtesy of ALS)

EasyDraw® Syringe Sampling Kit for Methanol Preservation

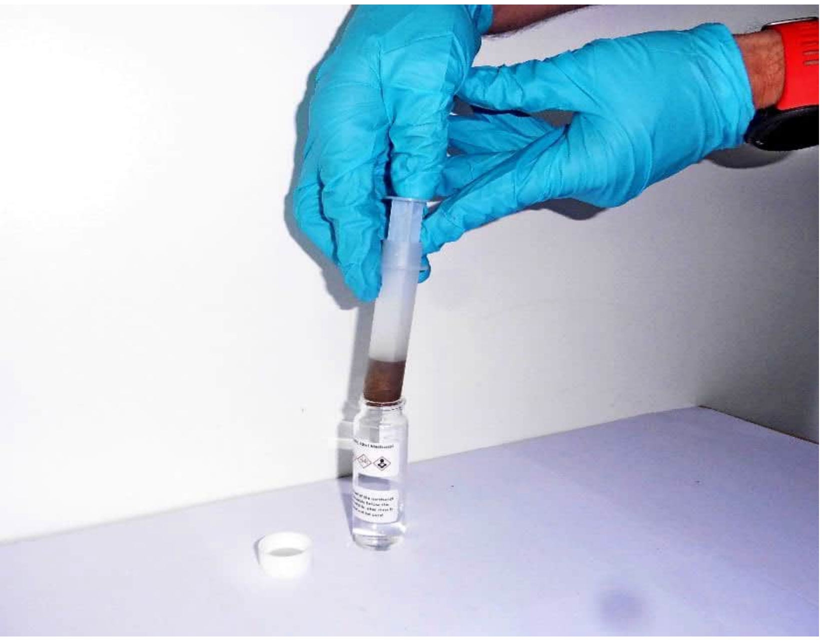
The EasyDraw Syringe (EDS) sampling kit allows 5 g of soil to be collected and immediately extruded into a pre-weighed, pre-preserved 40 ml VOC vials containing 10 ml of methanol.

EDS sample equipment and containers
1 x EDS sampler
2 x pre-filled methanol vials
1 x 60g jar for the determination of moisture content
Note – the blue PowerStop Handle is not supplied by the laboratory

Collecting a soil sample
Step 1
Insert the syringe into the 5 g position. Use the heavy position for dense clay, the light position for sandy soil and the medium position for all other soil types.

Step 2
Push the EDS into freshly exposed soil. Continue pushing until the soil inside the syringe has forced the plunger to the stopping point. Wipe all debris from the outside of the EDS. The intact core of soil should be flush with the mouth of the sampler. Remove any excess soil that extends beyond the mouth of the sampler.

Step 3
Remove the syringe from the PowerStop Handle. Insert the syringe into the open end of a pre-tared, pre-filled methanol vial. Extrude the sample into the vial by pushing the syringe plunger.



Step 4
Repeat the procedure above for the second vial.

Step 5
Place the vials in the foam inserts provided for storage and transportation.

Terra Core® Sampling Kit for Methanol Preservation

The Terra Core kit is provided and allows 5 g of soil to be collected and immediately extruded into a pre-weighed, pre-preserved 40 ml VOC vials containing 10 ml of methanol.

Terra Core sample equipment and containers
1 x Terra Core sampler
2 x pre-filled methanol vials
1 x 60g jar for the determination of moisture content

Collecting a soil sample
Step 1
With the plunger seated in the handle, push the Terra Core sampler into exposed soil until the sample chamber is filled. A filled chamber will deliver 5 grams of soil.

Step 2
Wipe all soil from the outside of the Terra Core sampler. The soil plug should be flush with the mouth of the sampler. Remove any excess soil that extends beyond the mouth of the sampler.

Step 3
Rotate the plunger that is seated in the handle top 90° until it is aligned with the slot in the body. Place the mouth of the sampler into the 40 ml vial and extrude the sample by pushing the plunger down again. Quickly place the cap on the 40 ml vial.

Step 4
Repeat the procedure above for the second vial.

Step 5
Place the vials in the foam inserts provided for storage and transportation.

CHAIN OF CUSTODY

CLIENT:	If Electronic File Required please select file format below		SAMPLER:
ADDRESS:			MOBILE:
	EQUIS		EMAIL REPORT TO:
PROJECT MANAGER (PM):	CROSSTAB		cc REPORT TO:
MOBILE:	CLIENT		INVOICE TO: (if different to report)
PROJECT ID:	AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)		QUOTE NUMBER: P.O No:
SITE:			ANALYSIS REQUIRED including SUITE names

element

Chain of Custody sheet page .... of ....

TURNAROUND - please tick						All waters - tick for samples to be tested shaken or settled	FOR LABORATORY USE ONLY
10 DAY		4 DAY		Other			AVERAGE COOL BOX TEMP.(if required):
5 DAY		3 DAY					SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Asbestos risk: Medium	Asbestos risk: Low															

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required. **WATERS -** we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

RELINQUISHED BY:		**RECIEVED BY:**		**METHOD of SHIPMENT**
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (eg suspected asbestos). Please let us know if samples are heavily contaminated, high PAHs expected, provide PID readings if available

Element Materials Technology

aecom.com

Appendix C Tables

C.1 Table C1 – Soil Sampling Locations

C.2 Table C2 – Duplicate Analysis

Table C1
Details of Soil Sampling Locations

Sample Location Area	Location ID	Final Depth (m)	Samples taken (m)	Scheduled Analysis	Duplicate	Ground Cover	Plot	Any Change from the Detailed Design
Treadgold House Stage 2 samples	GTCS2-S274	0.02	0-0.02	Stage 2 'Suite 1' (PAHs, lead, asbestos), lead bioaccessibility		Turf	Plot 10	Stage 2 investigation sample
	GTCS2-S275	0.02	0-0.02	Stage 2 'Suite 1' (PAHs, lead, asbestos)		Turf	Plot 8	Stage 2 investigation sample
	GTCS2-S279	0.02	0-0.02	Stage 2 'Suite 1' (PAHs, lead, asbestos), lead bioaccessibility		Turf	Plot 5	Stage 2 investigation sample
	GTCS2-S280	0.05	0-0.05	Stage 2 'Suite 1' (PAHs, lead, asbestos), lead bioaccessibility		Bare soil	Plot 4	Stage 2 investigation sample
	TH101	0.4	0-0.05	Asbestos and 9 metals (including lead)	DUP01 (lead & asbestos)	Partial turf	Plot 10	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH102	0.7	0-0.05	Asbestos and 13 metals (including lead)		Bare soil	Plot 10	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
			0.6-0.7	Lead				
	TH103	0.4	0-0.05	9 metals (including lead)		Partial turf	Plot 10	
			0.1-0.2	Lead and asbestos				
			0.3-0.4	Lead				
	TH104	1.2	0-0.05	Asbestos, 13 metals (including lead) and PAH-16		Partial turf	Plot 10	
			0.3-0.4	13 metals (including lead) and PAH-16				
			0.6-0.7	13 metals (including lead) and PAH-16	DUP02 (13 metals (including Lead) and PAH-16)			
			1.1-1.2	Asbestos, 13 metals (including lead) and PAH-16				
	TH105	0.2	0-0.05	Lead and asbestos		Turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH106	0.2	0-0.05	Lead and asbestos		Turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH107	0.2	0-0.05	Lead and asbestos		Turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH108	0.4	0-0.05	Lead and asbestos		Turf	Plot 9	
			0.1-0.2	13 metals (including lead)				
			0.3-0.4	Lead				
	TH109	0.4	0-0.05	Asbestos, 9 metals (including Lead), lead bioaccessibility		Bare soil	Plot 9	
			0.1-0.2	Lead and lead bioaccessibility				
			0.3-0.4	Lead				
	TH110	0.7	0-0.05	9 metals (including lead)		Partial turf	Plot 9	
			0.1-0.2	Lead and asbestos				
			0.3-0.4	Lead				
			0.6-0.7	Lead				
	TH111	0.2	0-0.05	Lead and asbestos		Partial turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH112	0.2	0-0.05	Lead and asbestos		Partial turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH113	0.2	0-0.05	Lead and asbestos		Partial turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH114	0.4	0-0.05	Asbestos and 13 metals (including lead)		Partial turf	Plot 8	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH115	0.4	0-0.05	Asbestos and 9 metals (including Lead)		Turf	Plot 8	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH116	0.7	0-0.05	Lead and asbestos		Turf	Plot 8	
			0.1-0.2	Lead	DUP03 (lead)			
			0.3-0.4	Lead				
			0.6-0.7	Lead				
	TH117	0.4	0-0.05	Lead and asbestos		Partial turf	Plot 7	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH118	0.7	0-0.05	Asbestos and 9 metals (including lead)		Bare soil	Plot 7	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
			0.6-0.7	Lead				
	TH119	0.4	0-0.05	Lead and asbestos		Turf	Plot 7	
			0.1-0.2	13 metals (including lead)				
			0.3-0.4	Lead				
	TH120	0.4	0-0.05	Lead and lead bioaccessibility		Bare soil	Plot 7	
			0.1-0.2	Lead				
			0.3-0.4	Lead and asbestos	DUP04 (lead & asbestos)			
	TH121	0.7	0-0.05	Asbestos and 9 metals (including lead)		Partial turf	Not included in averaging area	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
			0.6-0.7	Lead				
	TH122	0.4	0-0.05	Asbestos and 9 metals (including lead)	DUP05 (lead)	Partial turf	Plot 6	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH123	0.2	0-0.05	Lead and asbestos		Partial turf	Plot 6	
			0.1-0.2	Lead				

Table C1
Details of Soil Sampling Locations

Sample Location Area	Location ID	Final Depth (m)	Samples taken (m)	Scheduled Analysis	Duplicate	Ground Cover	Plot	Any Change from the Detailed Design
Treadgold House	TH124	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 6	
			0.1-0.2	Lead				
	TH125	0.4	0-0.05	Lead and asbestos		Turf	Plot 6	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH126	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 6	
			0.1-0.2	Lead				
	TH127	0.2	0-0.05	Lead and asbestos		Turf	Plot 6	
			0.1-0.2	Lead				
	TH128	0.2	0-0.05	Asbestos and 13 metals (including lead)		Bare soil	Plot 6	
			0.1-0.2	Lead				
	TH129	0.2	0-0.05	Lead and asbestos		Partial turf	Plot 6	
			0.1-0.2	Lead				
	TH130	0.7	0-0.05	9 metals (including lead)		Turf	Plot 6	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
			0.6-0.7	Lead and asbestos				
	TH131	0.2	0-0.05	Lead and asbestos		Turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH132	0.2	0-0.05	Lead and asbestos		Turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH133	0.2	0-0.05	Lead and asbestos		Turf	Plot 5	
			0.1-0.2	Lead				
	TH134	0.7	0-0.05	Lead and asbestos		Bare soil	Plot 5	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
			0.6-0.7	Lead				
	TH135	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 5	
			0.1-0.2	Lead				
	TH136	0.2	0-0.05	Lead and asbestos		Turf	Not included in plot averaging	
			0.1-0.2	Lead				
	TH137	0.2	0-0.05	Lead and asbestos		Turf	Plot 5	
			0.1-0.2	13 metals (including lead)				
	TH138	0.2	0-0.05	Lead and asbestos		Turf	Plot 5	
			0.1-0.2	Lead				
	TH139	0.2	0-0.05	Lead and asbestos		Turf	Plot 5	
			0.1-0.2	Lead	DUP06 (lead)			
	TH140	0.2	0-0.05	Lead and asbestos		Turf	Plot 5	
			0.1-0.2	Lead				
	TH141	0.2	0-0.05	Asbestos and 13 metals (including lead)		Bare soil	Plot 4	
			0.1-0.2	Lead				
	TH142	0.75	0-0.05	13 metals (including lead) and PAH-16		Turf	Plot 4	The scope intended for the excavation to reach 1.2m depth. A concrete obstruction was encountered at 0.75m and the excavation was terminated. In the SID, the window sample was originally proposed to be at location TH145, however this was moved due to on-site constraints (a service).
			0.3-0.4	Asbestos, 13 metals (including lead) and PAH-16				
			0.6-0.7	13 metals (including lead) and PAH-16				
	TH143	0.2	0-0.05	Lead and asbestos		Turf	Plot 4	
			0.1-0.2	Lead				
	TH144	0.2	0-0.05	Lead and asbestos		Turf	Plot 4	
			0.1-0.2	Lead				
	TH145	0.4	0-0.05	Asbestos and 9 metals (including lead)		Bare soil	Plot 4	NOTE ON MAP - Clear circle, red outline
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH146	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 4	
			0.1-0.2	Lead				
	TH147	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 4	
			0.1-0.2	Lead				
	TH148	0.2	0-0.05	Lead and asbestos		Bare soil	Not included in plot averaging	
			0.1-0.2	Lead				
	TH149	0.2	0-0.05	Lead and asbestos	DUP07 (lead & asbestos)	Bare soil	Not included in plot averaging	
			0.1-0.2	Lead				
	TH150	0.2	0-0.05	Lead and asbestos		Bare soil	Not included in plot averaging	
			0.1-0.2	Lead				
	TH151	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 3	
			0.1-0.2	Lead				
	TH152	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 3	
			0.1-0.2	Lead				
	TH153	0.2	0-0.05	Lead and asbestos		Turf	Plot 3	
			0.1-0.2	Lead				
	TH154	0.2	0-0.05	Lead and asbestos		Partial turf	Plot 3	
			0.1-0.2	Lead				
	TH155	0.2	0-0.05	Lead, asbestos and lead bioaccessibility		Turf	Plot 3	
			0.1-0.2	13 metals (including lead) and lead bioaccessibility				

Table C1
Details of Soil Sampling Locations

Sample Location Area	Location ID	Final Depth (m)	Samples taken (m)	Scheduled Analysis	Duplicate	Ground Cover	Plot	Any Change from the Detailed Design
	TH156	0.7	0-0.05	Lead		Bare soil	Plot 3	
			0.1-0.2	Lead and asbestos				
			0.3-0.4	Lead				
			0.6-0.7	Lead				
	TH157	0.2	0-0.05	Lead and asbestos		Partial turf	Plot 3	
			0.1-0.2	Lead				
	TH158	0.2	0-0.05	Lead and asbestos		Turf	Plot 2	
			0.1-0.2	Lead				
	TH159	0.2	0-0.05	Asbestos and 13 metals (including lead)		Partial turf	Plot 2	
			0.1-0.2	Lead				
	TH160	0.2	0-0.05	Lead and asbestos		Turf	Plot 2	
			0.1-0.2	Lead				
	TH161	0.9	0-0.05	Asbestos and 13 metals (including lead) and PAH-16		Turf	Plot 2	The scope intended for the excavation to reach 1.2m depth. A concrete obstruction was encountered at 0.75m and the excavation was terminated.
			0.3-0.4	13 metals (including lead) and PAH-16	DUP08 (lead)			
			0.6-0.7	13 metals (including lead) and PAH-16				
	TH162	0.4	0-0.05	Asbestos and 9 metals (including lead)		Bare soil	Plot 2	NOTE ON MAP - Clear circle, red outline
			0.1-0.2	Lead				
			0.3-0.4	Lead				
	TH163	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 2	
			0.1-0.2	Lead				
	TH164	0.2	0-0.05	Lead and asbestos		Bare soil	Plot 1	
			0.1-0.2	13 metals (including lead)				
	TH165	0.2	0-0.05	Lead and asbestos		Turf	Plot 1	
			0.1-0.2	Lead				
	TH166	0.2	0-0.05	Lead and asbestos		Turf	Plot 1	
			0.1-0.2	Lead				
	TH167	0.7	0-0.05	9 metals (including lead)		Turf	Plot 1	
			0.1-0.2	Lead				
			0.3-0.4	Lead				
			0.6-0.7	Lead and asbestos				
	TH168	0.2	0-0.05	Lead and asbestos	DUP09 (lead & asbestos)	Bare soil	Plot 1	
			0.1-0.2	Lead				
	TH169	0.4	0-0.05	9 metals (including lead) and lead bioaccessibility		Partial turf	Not included in averaging area	
			0.1-0.2	Lead				
			0.3-0.4	Lead and asbestos				
	TH170	1.07	0-0.05	Asbestos, 13 metals (including lead) and PAH-16		Bare soil	Not included in averaging area	The scope intended for the excavation to reach 1.2m depth. A concrete obstruction was encountered at 0.75m and the excavation was terminated.
			0.3-0.4	13 metals (including lead) and PAH-16				
			0.6-0.7	13 metals (including lead) and PAH-16				

Details of Soil Sampling Locations

Sample Location Area	Location ID	Final Depth (m)	Samples taken (m)	Scheduled Analysis	Duplicate	Ground Cover	Plot	Any Change from the Detailed Design
	TH171	0.05	0-0.05	Lead		Bare soil	Plot 7	An additional 20 samples were added to the scope because during sampling it became apparent that the western side of the garden is used more frequently by residents than previously thought.
	TH172	0.05	0-0.05	Lead		Partial turf	Plot 7	
	TH173	0.05	0-0.05	Lead		Turf	Plot 7	
	TH174	0.05	0-0.05	Lead		Partial turf	Plot 8	
	TH175	0.05	0-0.05	Lead		Turf	Plot 8	
	TH176	0.05	0-0.05	Lead		Partial turf	Plot 8	
	TH177	0.05	0-0.05	Lead		Turf	Plot 8	
	TH178	0.05	0-0.05	Lead		Partial turf	Plot 8	
	TH179	0.05	0-0.05	Lead		Turf	Plot 8	
	TH180	0.05	0-0.05	Lead		Partial turf	Plot 8	
	TH181	0.05	0-0.05	Lead		Partial turf	Plot 9	
	TH182	0.05	0-0.05	Lead		Partial turf	Plot 9	
	TH183	0.05	0-0.05	Lead		Partial turf	Plot 9	
	TH184	0.05	0-0.05	Lead		Partial turf	Plot 9	
	TH185	0.05	0-0.05	Lead		Partial turf	Plot 9	
	TH186	0.05	0-0.05	Lead		Partial turf	Plot 9	
	TH187	0.05	0-0.05	Lead		Partial turf	Plot 10	
	TH188	0.05	0-0.05	Lead		Turf	Plot 10	
	TH189	0.05	0-0.05	Lead		Turf	Plot 10	
	TH190	0.05	0-0.05	Lead		Bare soil	Plot 10	
APG Stage 1 samples	GTCS1-23	0.05	0-0.05	Metals (including lead), VOCs, SVOCs, PAH-16, PCBs, chlorinated & brominated dioxins and furans, organophosphorus and brominated flame retardants, PBBs, tetrabromobisphenol A, hexabromocyclododecane (1,2,5,6,9,10-), isocyanates, cyanides, asbestos, synthetic vitreous fibres (SVF) / man-made mineral fibres (MMMF), TOC		Bare soil	N/A	Stage 1 investigation sample
	GTCS1-24	0.05	0-0.05			Turf	N/A	Stage 1 investigation sample
Avondale Park Gardens	APG101	1	0-0.05	Lead		Turf	N/A	The scope did not indicate for a sample to be taken and scheduled at 0.9m. Samples were taken when onsite due to a change in the type of material in the inspection pit below 0.6mbgl.
			0.1-0.2	Lead				
			0.5-0.6	Asbestos, 13 metals (including lead) and PAH-16				
			0.9-1	Asbestos, 13 metals (including lead) and PAH-16				
	APG102	0.2	0-0.05	Asbestos, 13 metals (including lead) and PAH-16		Turf	N/A	
			0.1-0.2	Lead				
	APG103	0.2	0-0.05	Lead		Bare soil	N/A	
			0.1-0.2	Asbestos, 13 metals (including lead) and PAH-16	DUP10 (lead, asbestos, 13 metals & PAH-16)			
	APG104	0.2	0-0.05	Lead		Turf	N/A	
			0.1-0.2	Lead				
	APG105	0.2	0-0.05	Asbestos, 13 metals (including lead) and PAH-16		Bare soil	N/A	
			0.1-0.2	Lead				
	APG106	1	0-0.05	Lead		Bare soil	N/A	
			0.1-0.2	Lead				
			0.5-0.6	Asbestos, 13 metals (including lead) and PAH-16				
			0.9-1.0	Sample not scheduled for testing				
	APG107	0.2	0-0.05	Lead		Turf	N/A	
			0.1-0.2	Lead				
	APG108	0.2	0-0.05	Asbestos, 13 metals (including lead) and PAH-16		Bare soil	N/A	
			0.1-0.2	Lead				
	APG109	0.2	0-0.05	Lead		Bare soil	N/A	
			0.1-0.2	Asbestos, 13 metals (including lead) and PAH-16				
	APG110	0.2	0-0.05	Lead		Turf	N/A	
			0.1-0.2	Asbestos, 13 metals (including lead) and PAH-16				
	APG111	0.2	0-0.05	Lead		Turf	N/A	
			0.1-0.2	Lead				
	APG112	0.2	0-0.05	Asbestos, 13 metals (including lead) and PAH-16		Turf	N/A	
			0.1-0.2	Lead				
	APG113	1	0-0.05	Lead		Turf	N/A	
			0.1-0.2	Lead				
			0.5-0.6	Asbestos, 13 metals (including lead) and PAH-16				
			0.9-1.0	Sample not scheduled for testing				
	APG114	1	0-0.05	Lead	DUP11 (lead)	Turf	N/A	The scope did not indicate for a sample to be taken and scheduled at 0.9m. Samples were taken when onsite due to a change in the type of material in the inspection pit below 0.6mbgl.
			0.1-0.2	Lead				
			0.5-0.6	Asbestos, 13 metals (including lead) and PAH-16				
			0.9-1	Asbestos, 13 metals (including lead) and PAH-16				
	APG115	0.2	0-0.05	Lead		Turf	N/A	
			0.1-0.2	Lead				
	APG116	0.2	0-0.05	Lead		Turf	N/A	
			0.1-0.2	Asbestos, 13 metals (including lead) and PAH-16				

Notes:
N/A Individual plot subdivisions were not required for Avondale Park Gardens communal garden.

Table C2
Relative Percentage Difference Calculations for Duplicate Samples

Field Duplicates (soil)		Lab Report Number	21/17365/34	21/17365/12		21-18548-2-031221	21-18548-2-031221		21-18548-2-031221	21-18548-2-031221		21-18548-2-031221	21-18548-2-031221	
		Field ID	TH101	DUP01	**RPD**	TH104	DUP02	**RPD**	TH116	DUP03	**RPD**	TH120	DUP04	**RPD**
		Depth	0-0.05	0-0.05		0.6-0.7	0.6-0.7		0.1-0.2	0.1-0.2		0.3-0.4	0.3-0.4	
		Sampled Date/Time	02/11/2021	02/11/2021		01/11/2021	01/11/2021		02/11/2021	02/11/2021		01/11/2021	01/11/2021	
Parameter	**Units**	**Method Detection Limit**												
PAH														
Naphthalene	mg/kg	0.04	-	-	-	<0.04	<0.04	0	-	-	-	-	-	-
Acenaphthylene	mg/kg	0.03	-	-	-	<0.03	<0.03	0	-	-	-	-	-	-
Acenaphthene	mg/kg	0.05	-	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Fluorene	mg/kg	0.04	-	-	-	<0.04	<0.04	0	-	-	-	-	-	-
Phenanthrene	mg/kg	0.03	-	-	-	0.26	0.19	31	-	-	-	-	-	-
Anthracene	mg/kg	0.04	-	-	-	0.1	0.08	22	-	-	-	-	-	-
Fluoranthene	mg/kg	0.03	-	-	-	0.51	0.39	27	-	-	-	-	-	-
Pyrene	mg/kg	0.03	-	-	-	0.43	0.34	23	-	-	-	-	-	-
Benz(a)anthracene	mg/kg	0.06	-	-	-	0.26	0.21	21	-	-	-	-	-	-
Chrysene	mg/kg	0.02	-	-	-	0.26	0.2	26	-	-	-	-	-	-
Benzo(a) pyrene	mg/kg	0.04	-	-	-	0.2	0.15	29	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	-	-	-	0.15	0.11	31	-	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.04	-	-	-	<0.04	<0.04	0	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.04	-	-	-	0.14	0.1	33	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	-	-	-	0.27	0.2	30	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.02	-	-	-	0.1	0.08	22	-	-	-	-	-	-
Benzo(b)&(k)fluoranthene	mg/kg	0.07	-	-	-	0.37	0.28	28	-	-	-	-	-	-
PAH 16 Total	mg/kg	0.6	-	-	-	2.7	2.1	25	-	-	-	-	-	-
Metals														
Arsenic	mg/kg	0.5	-	-	-	14.2	12.5	13	-	-	-	-	-	-
Barium	mg/kg	1	-	-	-	125	110	13	-	-	-	-	-	-
Beryllium	mg/kg	0.5	-	-	-	2.3	2	14	-	-	-	-	-	-
Boron	mg/kg	0.5	-	-	-	2.7	2.9	7	-	-	-	-	-	-
Cadmium	mg/kg	0.1	-	-	-	0.1	<0.1	0	-	-	-	-	-	-
Chromium (III+VI)	mg/kg	0.5	-	-	-	63.4	66.1	4	-	-	-	-	-	-
Copper	mg/kg	1	-	-	-	45	36	22	-	-	-	-	-	-
Lead	mg/kg	5	441	597	30	150	67	**76**	1,473	1,383	6	1,204	3,152	**89**
Mercury	mg/kg	0.1	-	-	-	3.3	<0.1	**188**	-	-	-	-	-	-
Nickel	mg/kg	0.7	-	-	-	40.4	39.3	3	-	-	-	-	-	-
Selenium	mg/kg	1	-	-	-	1	<1	0	-	-	-	-	-	-
Vanadium	mg/kg	1	-	-	-	106	102	4	-	-	-	-	-	-
Zinc	mg/kg	5	-	-	-	187	104	**57**	-	-	-	-	-	-
Asbestos														
Asbestos Type	none		0	0	0	-	-	-	-	-	-	0	0	0
General Description (Bulk Analysis)	none		0	0	0	-	-	-	-	-	-	0	0	0
Asbestos Containing Material	none		0	0	0	-	-	-	-	-	-	0	0	0
Total Detailed Gravimetric Quantifica	mass %	0.001	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Gravimetric & PCOM Tota	mass %	0.001	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos PCOM Quantification (Fib	mass %	0.001	-	-	-	-	-	-	-	-	-	-	-	-
Total ACM Gravimetric Quantificatio	mass %	0.001	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Gravimetric Quantification	mass %	0.001	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos fibres			0	0	0	-	-	-	-	-	-	0	0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Field Duplicates (soil)		Lab Report Number	21-18548-3-021221	21-18548-3-021221		21-18548-3-021221	21-18548-3-021221		21-18548-3-021221	21-18548-3-021221		21-18548-2-031221	21-18548-2-031221	
		Field ID	TH122	DUP05	**RPD**	TH139	DUP06	**RPD**	TH149	DUP07	**RPD**	TH161	DUP08	**RPD**
		Depth	0.1-0.2	0.1-0.2		0.1-0.2	0.1-0.2		0-0.05	0-0.05		0.3-0.4	0.3-0.4	
		Sampled Date/Time	02/11/2021	02/11/2021		01/11/2021	01/11/2021		02/11/2021	02/11/2021		01/11/2021	01/11/2021	
Parameter	**Units**	**Method Detection Limit**												
PAH														
Naphthalene	mg/kg	0.04	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	0.03	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	0.04	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	0.03	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	0.04	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	0.03	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	0.03	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/kg	0.06	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.02	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a) pyrene	mg/kg	0.04	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.04	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.04	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.02	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)&(k)fluoranthene	mg/kg	0.07	-	-	-	-	-	-	-	-	-	-	-	-
PAH 16 Total	mg/kg	0.6	-	-	-	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	mg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (III+VI)	mg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5	1,346	1,463	8	1,135	1,344	17	1,327	1,294	3	1,189	865	**32**
Mercury	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	0.7	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos														
Asbestos Type	none		-	-	-	-	-	-	1	1	0	-	-	-
General Description (Bulk Analysis)	none		-	-	-	-	-	-	1	1	0	-	-	-
Asbestos Containing Material	none		-	-	-	-	-	-	0	0	0	-	-	-
Total Detailed Gravimetric Quantific	mass %	0.001	-	-	-	-	-	-	<0.001	0.003	**100**	-	-	-
Asbestos Gravimetric & PCOM Tota	mass %	0.001	-	-	-	-	-	-	<0.001	0.003	**100**	-	-	-
Asbestos PCOM Quantification (Fib	mass %	0.001	-	-	-	-	-	-	<0.001	<0.001	0	-	-	-
Total ACM Gravimetric Quantificatio	mass %	0.001	-	-	-	-	-	-	<0.001	<0.001	0	-	-	-
Asbestos Gravimetric Quantification	mass %	0.001	-	-	-	-	-	-	<0.001	0.003	**100**	-	-	-
Asbestos fibres			-	-	-	-	-	-	1	1	0	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tin
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are
***Interlab Duplicates are matched on a per compound basis as methods vary betw

Table C2
Relative Percentage Difference Calculations for Duplicate Samples

Sheet 3 of 3

Field Duplicates (soil)											
		Lab Report Number	21-18548-2-031221	21-18548-2-031221		21/17365/34	21-18548-5-211221		21-18548-5-211221	21-18548-5-211221	
		Field ID	TH168	DUP09	**RPD**	APG103	DUP10	**RPD**	APG114	DUP11	**RPD**
		Depth	0.3-0.4	0.3-0.4		0.1-0.2	0.1-0.2		0-0.05	0-0.05	
		Sampled Date/Time	01/11/2021	01/11/2021		06/12/2021	06/12/2021		06/12/2021	06/12/2021	
Parameter	**Units**	**Method Detection Limit**									
PAH											
Naphthalene	mg/kg	0.04	-	-	-	0.37	0.29	24	-	-	-
Acenaphthylene	mg/kg	0.03	-	-	-	1.59	1.26	23	-	-	-
Acenaphthene	mg/kg	0.05	-	-	-	0.39	0.23	52	-	-	-
Fluorene	mg/kg	0.04	-	-	-	0.4	0.2	67	-	-	-
Phenanthrene	mg/kg	0.03	-	-	-	7.39	3.18	**80**	-	-	-
Anthracene	mg/kg	0.04	-	-	-	2.4	1.37	**55**	-	-	-
Fluoranthene	mg/kg	0.03	-	-	-	15.49	10.11	**42**	-	-	-
Pyrene	mg/kg	0.03	-	-	-	13.47	9.07	**39**	-	-	-
Benz(a)anthracene	mg/kg	0.06	-	-	-	7.43	5.02	**39**	-	-	-
Chrysene	mg/kg	0.02	-	-	-	7.82	5.4	**37**	-	-	-
Benzo(a) pyrene	mg/kg	0.04	-	-	-	8.27	5.48	**41**	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	-	-	-	7.27	4.79	**41**	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.04	-	-	-	1.59	0.84	**62**	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.04	-	-	-	6.45	4.1	**45**	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	-	-	-	10.74	7.2	**39**	-	-	-
Benzo(k)fluoranthene	mg/kg	0.02	-	-	-	4.17	2.8	**39**	-	-	-
Benzo(b)&(k)fluoranthene	mg/kg	0.07	-	-	-	14.91	10	**39**	-	-	-
PAH 16 Total	mg/kg	0.6	-	-	-	95.2	61.3	**43**	-	-	-
Metals											
Arsenic	mg/kg	0.5	-	-	-	22.2	21.4	4	-	-	-
Barium	mg/kg	1	-	-	-	382	550	**36**	-	-	-
Beryllium	mg/kg	0.5	-	-	-	1.7	1.8	6	-	-	-
Boron	mg/kg	0.5	-	-	-	6.4	5.7	12	-	-	-
Cadmium	mg/kg	0.1	-	-	-	0.8	0.9	12	-	-	-
Chromium (III+VI)	mg/kg	0.5	-	-	-	75.2	76.7	2	-	-	-
Copper	mg/kg	1	-	-	-	95	87	9	-	-	-
Lead	mg/kg	5	233	140	**50**	912	1,644	**57**	715	912	24
Mercury	mg/kg	0.1	-	-	-	1.1	1	10	-	-	-
Nickel	mg/kg	0.7	-	-	-	27.5	30.1	9	-	-	-
Selenium	mg/kg	1	-	-	-	1	<1	0	-	-	-
Vanadium	mg/kg	1	-	-	-	61	69	12	-	-	-
Zinc	mg/kg	5	-	-	-	392	418	6	-	-	-
Asbestos											
Asbestos Type	none		0	0	0	0	0	0	-	-	-
General Description (Bulk Analysis)	none		0	0	0	0	0	0	-	-	-
Asbestos Containing Material	none		0	0	0	0	0	0	-	-	-
Total Detailed Gravimetric Quantifica	mass %	0.001	-	-	-	-	-	-	-	-	-
Asbestos Gravimetric & PCOM Tota	mass %	0.001	-	-	-	-	-	-	-	-	-
Asbestos PCOM Quantification (Fib	mass %	0.001	-	-	-	-	-	-	-	-	-
Total ACM Gravimetric Quantificatio	mass %	0.001	-	-	-	-	-	-	-	-	-
Asbestos Gravimetric Quantification	mass %	0.001	-	-	-	-	-	-	-	-	-
Asbestos fibres			0	0	0	0	0	0	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tin
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are
***Interlab Duplicates are matched on a per compound basis as methods vary betw

Appendix D Walkover Photolog and Sample Logs & Photos

Appendix E Treadgold House Laboratory Certificates

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781

W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	30th November, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 1
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	23rd November, 2021
Status :	Final Report
Issue :	1

Seven samples were received for analysis on 23rd November, 2021 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28				LOD/LOR	Units	Method No.
Sample ID	TH164	TH164	TH166	TH166	TH168	TH168	DUP09						
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021						
Sample Type	Loam	Loam	Loam	Loam	Sandy Loam	Loam	Sandy Loam						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021						
Arsenic #M	-	39.5	-	-	-	-	-				<0.5	mg/kg	TM30/PM15
Barium #M	-	676	-	-	-	-	-				<1	mg/kg	TM30/PM15
Beryllium	-	3.5	-	-	-	-	-				<0.5	mg/kg	TM30/PM15
Cadmium #M	-	0.9	-	-	-	-	-				<0.1	mg/kg	TM30/PM15
Chromium #M	-	69.5	-	-	-	-	-				<0.5	mg/kg	TM30/PM15
Copper #M	-	334AA	-	-	-	-	-				<1	mg/kg	TM30/PM15
Lead #M	925	1005	1311	1997	233	148	140				<5	mg/kg	TM30/PM15
Mercury #M	-	1.6	-	-	-	-	-				<0.1	mg/kg	TM30/PM15
Nickel #M	-	47.5	-	-	-	-	-				<0.7	mg/kg	TM30/PM15
Selenium #M	-	2	-	-	-	-	-				<1	mg/kg	TM30/PM15
Vanadium	-	70	-	-	-	-	-				<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	6.4	-	-	-	-	-				<0.1	mg/kg	TM74/PM32
Zinc #M	-	646	-	-	-	-	-				<5	mg/kg	TM30/PM15
Sample Type	Loam	Loam	Loam	Loam	Sandy Loam	Loam	Sandy Loam					None	PM13/PM0
Sample Colour	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown					None	PM13/PM0
Other Items	stones and vegetation	stones and vegetation	stones and vegetation	stones and vegetation	stones and vegetation	vegetation	stones and vegetation					None	PM13/PM0

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	1	TH164	0.00-0.05	4	25/11/2021	**General Description (Bulk Analysis)**	soil
					25/11/2021	**Asbestos Fibres**	NAD
					25/11/2021	**Asbestos ACM**	NAD
					25/11/2021	**Asbestos Type**	NAD
					25/11/2021	**Asbestos Level Screen**	NAD
21/18548	1	TH166	0.00-0.05	12	25/11/2021	**General Description (Bulk Analysis)**	soil
					25/11/2021	**Asbestos Fibres**	NAD
					25/11/2021	**Asbestos ACM**	NAD
					25/11/2021	**Asbestos Type**	NAD
					25/11/2021	**Asbestos Level Screen**	NAD
21/18548	1	TH168	0.00-0.05	20	25/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					25/11/2021	**Asbestos Fibres**	NAD
					25/11/2021	**Asbestos ACM**	NAD
					25/11/2021	**Asbestos Type**	NAD
					25/11/2021	**Asbestos Level Screen**	NAD
21/18548	1	DUP09	0.00-0.05	28	25/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					25/11/2021	**Asbestos Fibres**	NAD
					25/11/2021	**Asbestos ACM**	NAD
					25/11/2021	**Asbestos Type**	NAD
					25/11/2021	**Asbestos Level Screen**	NAD

Element Materials Technology

Notification of Deviating Samples

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

EMT Job No.: 21/18548

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	1st December, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 2
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	25th November, 2021
Status :	Final Report
Issue :	1

Sixty samples were received for analysis on 25th November, 2021 of which sixty were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Simon Gomery BSc
Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 3rd Floor Davidson Building, 5 Southampton Street, London WC2E 7HA
Company Registration No: 11371415

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	29-32	33-36	37-40	41-44	45-48	49-52	53-56	57-60	61-64	65-68	LOD/LOR	Units	Method No.
Sample ID	TH163	TH163	TH165	TH165	TH153	TH153	TH155	TH155	TH157	TH157			
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021			
Sample Type	Loam	Clayey Loam	Loam	Loam	Loam	Loam	Loam	Sandy Loam	Sandy Loam	Clayey Sand			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Arsenic #M	-	-	-	-	-	-	-	77.0	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	1500	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	7.4	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	-	-	-	1.7	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	-	-	-	95.4	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	-	-	-	751_{AA}	-	-	<1	mg/kg	TM30/PM15
Lead #M	1068	1329	1489	384900_{AB}	1693	3752_{AA}	1485	3623_{AA}	1271	995	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	-	-	-	3.2	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	-	-	-	88.3	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	-	-	-	1	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	105	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	4.8	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	-	-	-	1350	-	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	-	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	-	-	-	-	-	-	-	-	-	-	<0.05	mg/kg	TM4/PM8
Fluorene #M	-	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	-	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Anthracene #	-	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	-	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Pyrene #	-	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	-	-	-	-	-	-	-	-	-	<0.06	mg/kg	TM4/PM8
Chrysene #M	-	-	-	-	-	-	-	-	-	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	-	-	-	-	-	-	-	-	-	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	-	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	-	-	-	-	-	-	-	-	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	-	-	-	-	-	-	-	-	-	<0	%	TM4/PM8
Natural Moisture Content	-	-	-	-	-	-	-	-	-	-	<0.1	%	PM4/PM0
Sample Type	Loam	Clayey Loam	Loam	Loam	Loam	Loam	Loam	Sandy Loam	Sandy Loam	Clayey Sand		None	PM13/PM0
Sample Colour	Dark Brown	Medium Brown	Dark Brown	Medium Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones and vegertation	stones	stones and roots	stones and roots	stones and roots	stones and roots	stones and roots	stones and roots	stones and roots	stones, roots and laom		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	69-72	73-76	77-80	81-84	85-88	89-92	93-96	97-100	101-104	105-108	LOD/LOR	Units	Method No.
Sample ID	TH160	TH160	TH158	TH158	TH159	TH159	TH150	TH150	TH161	TH161			
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.30-0.40			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021			
Sample Type	Loam	Loam	Loam	Loam	Sandy Loam	Loam	Loam	Loam	Loam	Clay			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Arsenic #M	-	-	-	-	40.6	-	-	-	52.9	39.9	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	1215	-	-	-	1149	681	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	4.0	-	-	-	5.1	3.7	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	1.6	-	-	-	1.4	0.8	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	171.0	-	-	-	58.3	67.8	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	351$_{AA}$	-	-	-	471$_{AA}$	287$_{AA}$	<1	mg/kg	TM30/PM15
Lead #M	1580	3168$_{AA}$	1785	1738	1591	1700	1921	2434	1941	1189	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	1.9	-	-	-	2.4	1.4	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	57.3	-	-	-	67.1	53.8	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	2	-	-	-	<1	1	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	77	-	-	-	85	84	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	11.5	-	-	-	5.9	2.7	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	944	-	-	-	1141	777	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	-	-	-	-	-	-	-	-	0.16	0.05	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	-	-	-	-	-	-	-	0.27	0.29	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	-	-	-	-	-	-	-	-	<0.05	0.06	<0.05	mg/kg	TM4/PM8
Fluorene #M	-	-	-	-	-	-	-	-	<0.04	0.05	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	-	-	-	-	-	-	-	-	0.93	0.90	<0.03	mg/kg	TM4/PM8
Anthracene #	-	-	-	-	-	-	-	-	0.37	0.44	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	-	-	-	-	-	-	-	-	2.96	3.17	<0.03	mg/kg	TM4/PM8
Pyrene #	-	-	-	-	-	-	-	-	2.68	2.84	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	-	-	-	-	-	-	-	1.66	2.43	<0.06	mg/kg	TM4/PM8
Chrysene #M	-	-	-	-	-	-	-	-	1.74	2.42	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	-	-	-	-	-	-	-	-	3.64	4.62	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	-	-	-	-	-	-	-	1.92	2.32	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	-	-	-	-	-	-	-	-	1.89	2.19	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	-	-	-	-	-	-	-	0.30	0.48	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	-	-	-	-	-	-	-	1.54	1.68	<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	-	-	-	-	-	-	-	20.1	23.9	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	2.62	3.33	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	1.02	1.29	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	-	-	-	-	-	-	-	99	99	<0	%	TM4/PM8
Natural Moisture Content	-	-	-	-	-	-	-	-	41.1	22.1	<0.1	%	PM4/PM0
Sample Type	Loam	Loam	Loam	Loam	Sandy Loam	Loam	Loam	Loam	Loam	Clay		None	PM13/PM0
Sample Colour	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Dark Brown	Dark Brown	Dark Brown	Medium Brown		None	PM13/PM0
Other Items	stones and vegertation	sand and vegertation	sand and roots	stones and roots	stones and roots	stones and roots	stones and roots	stones	stones and roots	stones, sand and brick fragment		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	109-112	113-116	117-120	121-124	125-128	129-132	133-136	137-140	141-144	145-148			
Sample ID	TH161	TH154	TH154	DUP08	TH151	TH151	TH152	TH152	TH156	TH156			
Depth	0.60-0.70	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021			
Sample Type	Clay	Loam	Loam	Clay	Loam	Loam	Loam	Loam	Sandy Loam	Sandy Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Arsenic #M	31.3	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	452	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	2.9	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	0.5	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	45.4	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	196	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	715	1415	2119	865	1001	1239	926	3101AA	6029AA	2049	<5	mg/kg	TM30/PM15
Mercury #M	1.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	39.2	-	-	-	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	70	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	2.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	421	-	-	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	0.11	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.40	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	0.16	-	-	-	-	-	-	-	-	-	<0.05	mg/kg	TM4/PM8
Fluorene #M	0.21	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	3.02	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Anthracene #	0.93	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	5.10	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Pyrene #	4.19	-	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	2.47	-	-	-	-	-	-	-	-	-	<0.06	mg/kg	TM4/PM8
Chrysene #M	2.29	-	-	-	-	-	-	-	-	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	4.01	-	-	-	-	-	-	-	-	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	2.18	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	1.83	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.35	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.48	-	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	28.7	-	-	-	-	-	-	-	-	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	2.89	-	-	-	-	-	-	-	-	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.12	-	-	-	-	-	-	-	-	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	96	-	-	-	-	-	-	-	-	-	<0	%	TM4/PM8
Natural Moisture Content	21.2	-	-	-	-	-	-	-	-	-	<0.1	%	PM4/PM0
Sample Type	Clay	Loam	Loam	Clay	Loam	Loam	Loam	Loam	Sandy Loam	Sandy Loam		None	PM13/PM0
Sample Colour	Medium Brown	Dark Brown	Dark Brown	Medium Brown	Dark Brown	Medium Brown	Dark Brown	Dark Brown	Dark Brown	Medium Brown		None	PM13/PM0
Other Items	stones and brick fragment	stones, sand and roots	roots	stones and brick fragment	sand and vegertation	stones, sand and vegertation	stones and sand	stones and vegertation	stones	stone and roots		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	149-152	153-156	157-160	161-164	165-168	169-172	173-176	177-180	181-184	185-188			
Sample ID	TH149	TH149	TH142	TH142	TH142	TH148	TH148	TH104	TH104	TH104			
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.30-0.40	0.60-0.70	0.00-0.05	0.10-0.20	0.00-0.05	0.30-0.40	0.60-0.70			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021			
Sample Type	Loam	Loam	Loam	Clayey Sand	Clay	Loam	Loam	Clayey Loam	Clay	Clay			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Arsenic #M	-	-	89.8	32.9	30.0	-	-	33.2	30.7	14.2	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	1654	484	320	-	-	760	411	125	<1	mg/kg	TM30/PM15
Beryllium	-	-	8.2	2.4	2.3	-	-	2.9	2.3	2.3	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	2.0	0.4	0.6	-	-	1.1	0.4	0.1	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	135.0	64.7	40.6	-	-	104.9	61.1	63.4	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	934_{AA}	169	272_{AA}	-	-	230	167	45	<1	mg/kg	TM30/PM15
Lead #M	1327	1920	3996_{AA}	634	685	1678	2031	1071	630	150	<5	mg/kg	TM30/PM15
Mercury #M	-	-	5.1	0.7	0.9	-	-	1.8	1.2	3.3	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	99.6	39.9	30.5	-	-	44.1	31.5	40.4	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	2	2	<1	-	-	2	1	1	<1	mg/kg	TM30/PM15
Vanadium	-	-	112	65	64	-	-	82	82	106	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	5.9	2.4	2.4	-	-	4.5	2.5	2.7	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	1668	483	387	-	-	771	413	187	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	-	-	0.21	0.07	0.35	-	-	0.11	0.14	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	-	0.49	0.18	0.33	-	-	0.40	0.26	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	-	-	<0.05	0.20	0.62	-	-	0.16	0.10	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #M	-	-	0.07	0.14	0.46	-	-	0.14	0.11	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	-	-	1.29	2.25	4.84	-	-	2.47	2.46	0.26	<0.03	mg/kg	TM4/PM8
Anthracene #	-	-	0.62	0.69	1.39	-	-	0.83	0.41	0.10	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	-	-	3.05	4.37	7.06	-	-	6.75	3.57	0.51	<0.03	mg/kg	TM4/PM8
Pyrene #	-	-	2.59	3.48	5.60	-	-	5.80	2.85	0.43	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	-	1.66	1.99	3.18	-	-	3.26	1.16	0.26	<0.06	mg/kg	TM4/PM8
Chrysene #M	-	-	1.89	2.07	3.18	-	-	3.37	1.62	0.26	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	-	-	3.88	3.43	5.35	-	-	6.22	2.61	0.37	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	-	1.96	1.79	2.85	-	-	3.17	1.36	0.20	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	-	-	2.18	1.54	2.29	-	-	2.77	1.20	0.15	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	-	0.49	0.33	0.45	-	-	0.49	0.24	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	-	2.25	1.32	1.96	-	-	2.51	1.06	0.14	<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	-	22.6	23.9	39.9	-	-	38.5	19.2	2.7	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	-	2.79	2.47	3.85	-	-	4.48	1.88	0.27	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	-	1.09	0.96	1.50	-	-	1.74	0.73	0.10	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	-	94	92	92	-	-	93	92	93	<0	%	TM4/PM8
Natural Moisture Content	-	-	38.7	18.3	22.2	-	-	25.9	23.8	9.5	<0.1	%	PM4/PM0
Sample Type	Loam	Loam	Loam	Clayey Sand	Clay	Loam	Loam	Clayey Loam	Clay	Clay		None	PM13/PM0
Sample Colour	Dark Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Light Brown		None	PM13/PM0
Other Items	stones and vegertation	stones and roots	stones and roots	stones adn brick fragment	stones, sand and brick fragment	vegertation	stones	stones and roots	stones and sand	stones		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	189-192	193-196	197-200	201-204	205-208	209-212	213-216	217-220	221-224	225-228			
Sample ID	TH104	DUP02	TH110	TH110	TH110	TH110	TH102	TH102	TH102	TH102			
Depth	1.10-1.20	0.60-0.70	0.00-0.05	0.10-0.20	0.30-0.40	0.60-0.70	0.00-0.05	0.10-0.20	0.30-0.40	0.60-0.70			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021			
Sample Type	Clay	Clay	Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Arsenic #M	16.9	12.5	24.0	-	-	-	25.8	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	119	110	-	-	-	-	495	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	2.5	2.0	-	-	-	-	2.6	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	<0.1	0.6	-	-	-	0.7	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	75.6	66.1	87.4	-	-	-	75.9	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	38	36	139	-	-	-	158	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	507	67	670	1418	991	483	668	676	309	153	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	1.0	-	-	-	1.3	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	51.6	39.3	29.5	-	-	-	42.6	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	1	-	-	-	2	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	131	102	-	-	-	-	81	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	4.7	2.9	-	-	-	-	4.9	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	105	104	547	-	-	-	446	-	-	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	<0.04	<0.04	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	-	-	-	-	-	-	-	-	<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	<0.03	0.19	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.08	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	0.06	0.39	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Pyrene #	0.06	0.34	-	-	-	-	-	-	-	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.21	-	-	-	-	-	-	-	-	<0.06	mg/kg	TM4/PM8
Chrysene #M	0.04	0.20	-	-	-	-	-	-	-	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	<0.07	0.28	-	-	-	-	-	-	-	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.15	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	<0.04	0.11	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.10	-	-	-	-	-	-	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	2.1	-	-	-	-	-	-	-	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.20	-	-	-	-	-	-	-	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.08	-	-	-	-	-	-	-	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	90	86	-	-	-	-	-	-	-	-	<0	%	TM4/PM8
Natural Moisture Content	25.2	25.5	-	-	-	-	-	-	-	-	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Light Brown	Light Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Light Brown		None	PM13/PM0
Other Items	brick fragment	stones	stones, sand and vegertation	stones, loam and roots	loam and stones	brick and stones	clay, roots and stone	loam, brick fragment, stones and roots	brick fragment and roots	stones and brick fragment		None	PM13/PM0

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	229-232	233-236	237-240	241-244	245-248	249-252	253-256	257-260	261-264	265-268			
Sample ID	TH116	TH116	TH116	TH116	DUP03	TH170	TH170	TH170	TH156	TH156			
Depth	0.00-0.05	0.10-0.20	0.30-0.40	0.60-0.70	0.10-0.20	0.00-0.05	0.30-0.40	0.60-0.70	0.30-0.40	0.60-0.70			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021			
Sample Type	Sandy Loam	Sandy Loam	Clay	Clay	Sandy Loam	Sandy Loam	Clayey Sand	Clayey Sand	Clayey Sand	Clay			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Arsenic #M	-	-	-	-	-	44.6	35.2	21.0	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	803	490	442	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	3.5	2.6	4.8	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	-	1.0	1.2	0.3	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	-	58.9	58.1	51.3	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	-	318AA	187	60	-	-	<1	mg/kg	TM30/PM15
Lead #M	2103	1473	1407	1233	1383	1315	785	364	1095	903	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	-	2.7	1.2	0.9	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	-	53.3	39.5	14.8	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	-	1	<1	<1	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	71	72	111	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	3.0	1.7	2.4	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	-	821	471	230	-	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	-	-	-	-	-	0.12	0.09	0.26	-	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	-	-	-	-	0.24	0.19	0.90	-	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	-	-	-	-	-	<0.05	0.06	0.31	-	-	<0.05	mg/kg	TM4/PM8
Fluorene #M	-	-	-	-	-	<0.04	0.06	0.34	-	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	-	-	-	-	-	0.50	1.21	5.39	-	-	<0.03	mg/kg	TM4/PM8
Anthracene #	-	-	-	-	-	0.28	0.42	2.06	-	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	-	-	-	-	-	1.49	3.31	11.84	-	-	<0.03	mg/kg	TM4/PM8
Pyrene #	-	-	-	-	-	1.34	2.79	9.79	-	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	-	-	-	-	0.86	1.56	5.68	-	-	<0.06	mg/kg	TM4/PM8
Chrysene #M	-	-	-	-	-	1.04	1.67	5.53	-	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	-	-	-	-	-	2.12	2.83	9.62	-	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	-	-	-	-	1.06	1.51	5.00	-	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	-	-	-	-	-	1.16	1.29	4.37	-	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	-	-	-	-	0.19	0.25	0.88	-	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	-	-	-	-	1.08	1.14	4.01	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	-	-	-	-	11.5	18.4	66.0	-	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	-	-	-	-	1.53	2.04	6.93	-	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	-	-	-	-	0.59	0.79	2.69	-	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	-	-	-	-	92	92	91	-	-	<0	%	TM4/PM8
Natural Moisture Content	-	-	-	-	-	20.0	17.9	14.5	-	-	<0.1	%	PM4/PM0
Sample Type	Sandy Loam	Sandy Loam	Clay	Clay	Sandy Loam	Sandy Loam	Clayey Sand	Clayey Sand	Clayey Sand	Clay		None	PM13/PM0
Sample Colour	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, brick fragment and roots	stones and brick fragment	loam, roots and stones	stones and loam	stones and roots	stones and roots	stones and brick fragment	stones adn carbon	stones and brick fragment	stones, loam and sand brick fragment		None	PM13/PM0

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	2	TH163	0.00-0.05	32	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH165	0.00-0.05	40	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH153	0.00-0.05	48	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH155	0.00-0.05	56	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH157	0.00-0.05	64	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH160	0.00-0.05	72	29/11/2021	**General Description (Bulk Analysis)**	soil
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH158	0.00-0.05	80	29/11/2021	**General Description (Bulk Analysis)**	soil
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	2	TH158	0.00-0.05	80	29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH159	0.00-0.05	88	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH150	0.00-0.05	96	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH161	0.00-0.05	104	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH154	0.00-0.05	116	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH151	0.00-0.05	128	29/11/2021	**General Description (Bulk Analysis)**	soil
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH152	0.00-0.05	136	29/11/2021	**General Description (Bulk Analysis)**	soil
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH156	0.10-0.20	148	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH149	0.00-0.05	152	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					29/11/2021	**Asbestos Fibres**	Fibre Bundles
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	Chrysotile
					29/11/2021	**Asbestos Level Screen**	less than 0.1%
21/18548	2	TH142	0.30-0.40	164	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					29/11/2021	**Asbestos Fibres**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	2	TH142	0.30-0.40	164	29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH148	0.00-0.05	172	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH104	0.00-0.05	180	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH104	1.10-1.20	192	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH110	0.10-0.20	204	29/11/2021	**General Description (Bulk Analysis)**	soil
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH102	0.00-0.05	216	29/11/2021	**General Description (Bulk Analysis)**	soil
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH116	0.00-0.05	232	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					29/11/2021	**Asbestos Fibres**	NAD
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	NAD
					29/11/2021	**Asbestos Level Screen**	NAD
21/18548	2	TH170	0.00-0.05	252	29/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					29/11/2021	**Asbestos Fibres**	Fibre Bundles
					29/11/2021	**Asbestos ACM**	NAD
					29/11/2021	**Asbestos Type**	Chrysotile
					29/11/2021	**Asbestos Level Screen**	less than 0.1%

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

EMT Job No.: 21/18548

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

AB	x500 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	3rd December, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 2 Schedule C
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	25th November, 2021
Status :	Final Report
Issue :	1

Sixty samples were received for analysis on 25th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Baden

Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	2	TH149	0.00-0.05	152	02/12/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					02/12/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					02/12/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
21/18548	2	TH170	0.00-0.05	252	02/12/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					02/12/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					02/12/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

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SOILS

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It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM131	Quantification of Asbestos Fibres and ACM based on HSG248 First edition:2006, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	7th January, 2022
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 2 Schedule F
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	25th November, 2021
Status :	Final Report
Issue :	1

Sixty samples were received for analysis on 25th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Boden

Paul Boden BSc
Senior Project Manager

Element Materials Technology

Client Name:	AECOM	**Report :**	**Solid**
Reference:	60632092		
Location:	Treadgold House (Stage 2 Grenfell)	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	David Dyson		
EMT Job No:	21/18548		

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	53-56	57-60											
Sample ID	TH155	TH155											
Depth	0.00-0.05	0.10-0.20											
COC No / misc													
Containers	V J T	V J T											
Sample Date	22/11/2021	22/11/2021											
Sample Type	Loam	Sandy Loam											
Batch Number	2	2											
Date of Receipt	25/11/2021	25/11/2021									LOD/LOR	Units	Method No.
Bioaccessible Lead (Stomach)	1345	2081									<5	mg/kg	TM171/PM124
Bioaccessible Lead (Stomach And Intestine)	352	609									<5	mg/kg	TM171/PM124
Total Lead	1676	3482AA									<5	mg/kg	TM30/PM15
Bioaccessible Fraction (BAF) - Lead	80	60AA									<0	%	TM30/PM15/PM124

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

EMT Job No.: 21/18548

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.				Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15/PM124	please refer to PM15/PM124 for method details				Yes
TM171	Operation and analysis of metals by Thermo Fisher iCAPQc ICP-MS	PM124	UBM Unified BARGE bioaccessibility extraction of soil, in vitro method for simulating human digestive procedure using synthetic digestive fluids, carried out on the <250um fraction of the sample.				Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	20th December, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 2 Schedule D 21/18548 Batch 2 Schedule E
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	25th November, 2021
Status :	Final report
Issue :	1

Sixty samples were received for analysis on 25th November, 2021 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Boden

Paul Boden BSc
Senior Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 3rd Floor Davidson Building, 5 Southampton Street, London WC2E 7HA
Company Registration No: 11371415

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	41-44												
Sample ID	TH165												
Depth	0.10-0.20												
COC No / misc													
Containers	V J T												
Sample Date	22/11/2021												
Sample Type	Loam												
Batch Number	2												
Date of Receipt	25/11/2021										LOD/LOR	Units	Method No.
Lead #M (dried and crushed)	8536AB										<5	mg/kg	TM30/PM15
Lead #M (as received)	4740AA										<5	mg/kg	TM30/PM15

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18548

SOILS

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Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

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As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

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SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

AB	x10 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	2nd December, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 3 Schedule A 21/18548 Batch 3 Schedule B
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	26th November, 2021
Status :	Final Report
Issue :	1

Eighty six samples were received for analysis on 26th November, 2021 of which eighty six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

S. Gomery

Simon Gomery BSc
Project Manager

Please include all sections of this report if it is reproduced

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	269-272	273-276	277-280	281-284	285-288	289-292	293-296	297-300	301-304	305-308			
Sample ID	TH123	TH123	TH128	TH128	TH135	TH135	TH141	TH141	TH143	TH143			
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic #M	-	-	28.3	-	-	-	32.9	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	440	-	-	-	389	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	2.4	-	-	-	2.0	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	1.2	-	-	-	0.7	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	84.3	-	-	-	60.0	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	292 AA	-	-	-	198	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	999	1100	758	661	947	994	584	649	1357	1616	<5	mg/kg	TM30/PM15
Mercury #M	-	-	5.0	-	-	-	0.9	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	38.7	-	-	-	32.6	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	1	-	-	-	1	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	58	-	-	-	47	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	10.9	-	-	-	5.7	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	635	-	-	-	440	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation. loam	stones, tile, vegetation	stones, debris, glass, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	309-312	313-316	317-320	321-324	325-328	329-332	333-336	337-340	341-344	345-348			
Sample ID	TH146	TH146	TH133	TH133	TH138	TH138	DUP06	TH139	TH139	TH140			
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021			
Sample Type	Clayey Loam	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic #M	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	1358	1751	1736	1876	1834	5942 AA	1344	1353	1135	1398	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clayey Loam	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, brick	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation, loam		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	349-352	353-356	357-360	361-364	365-368	369-372	373-376	377-380	381-384	385-388			
Sample ID	TH140	TH131	TH131	TH136	TH136	TH137	TH137	TH132	TH132	TH147			
Depth	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic $^{\#M}$	-	-	-	-	-	-	109.8	-	-	-	<0.5	mg/kg	TM30/PM15
Barium $^{\#M}$	-	-	-	-	-	-	2009	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	9.8	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium $^{\#M}$	-	-	-	-	-	-	1.7	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium $^{\#M}$	-	-	-	-	-	-	94.3	-	-	-	<0.5	mg/kg	TM30/PM15
Copper $^{\#M}$	-	-	-	-	-	-	1061_{AA}	-	-	-	<1	mg/kg	TM30/PM15
Lead $^{\#M}$	3172_{AA}	1893	1831	1615	3644_{AA}	2766_{AA}	3774_{AA}	1692	4638_{AA}	1432	<5	mg/kg	TM30/PM15
Mercury $^{\#M}$	-	-	-	-	-	-	4.8	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel $^{\#M}$	-	-	-	-	-	-	120.4	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium $^{\#M}$	-	-	-	-	-	-	2	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	125	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron $^{\#M}$	-	-	-	-	-	-	5.6	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc $^{\#M}$	-	-	-	-	-	-	1648	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, loam	stones, vegetation, loam	stones, brick, vegetation	stones, vegetation	stones, brick, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation		None	PM13/PM0

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	389-392	393-396	397-400	401-404	405-408	409-412	413-416	417-420	421-424	425-428			
Sample ID	TH147	TH144	TH144	DUP07	TH167	TH167	TH167	TH167	TH162	TH162			
Depth	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.00-0.05	0.10-0.20	0.30-0.40	0.60-0.70	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	24/11/2021	24/11/2021	24/11/2021	24/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic #M	-	-	-	-	21.8	-	-	-	42.5	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	0.8	-	-	-	1.3	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	82.1	-	-	-	73.4	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	189	-	-	-	390AA	-	<1	mg/kg	TM30/PM15
Lead #M	2107	1059	596	1294	677	2229	451	469	1411	6245AA	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	0.6	-	-	-	1.6	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	47.5	-	-	-	58.9	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	<1	-	-	-	<1	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	630	-	-	-	840	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, chalk	stones, brick	stones, vegetation	stones, chalk, vegetation, loam		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name:	AECOM	**Report :**	**Solid**
Reference:	60632092		
Location:	Treadgold House (Stage 2 Grenfell)	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	David Dyson		
EMT Job No:	21/18548		

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	429-432	433-436	437-440	441-444	445-448	449-452	453-456	457-460	461-464	465-468			
Sample ID	TH162	TH119	TH119	TH119	TH130	TH130	TH130	TH130	TH145	TH145			
Depth	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40	0.60-0.70	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Sample Type	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Clayey Loam			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic #M	-	-	64.5	-	81.3	-	-	-	49.7	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	1361	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	4.9	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	1.6	-	1.5	-	-	-	1.3	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	120.7	-	93.9	-	-	-	74.5	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	594AA	-	594AA	-	-	-	484AA	-	<1	mg/kg	TM30/PM15
Lead #M	1090	1843	2174	2069	1774	2307	526	575	1476	1766	<5	mg/kg	TM30/PM15
Mercury #M	-	-	2.6	-	3.1	-	-	-	2.2	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	85.1	-	77.8	-	-	-	62.6	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	1	-	4	-	-	-	3	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	97	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	4.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	1163	-	1358	-	-	-	1177	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, loam	stones, vegetation, loam	stones, brick, vegetation	stones, brick, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation, sand	stones, chalk, vegetation	stones, vegetation	stones, vegetation		None	PM13/PM0

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All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	469-472	473-476	477-480	481-484	485-488	489-492	493-496	497-500	501-504	505-508			
Sample ID	TH145	TH134	TH134	TH134	TH134	TH125	TH125	TH125	TH118	TH118			
Depth	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40	0.60-0.70	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clay			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic #M	-	-	-	-	-	-	-	-	16.3	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	-	-	-	-	2.3	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	-	-	-	-	62.2	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	-	-	-	-	72	-	<1	mg/kg	TM30/PM15
Lead #M	2841 AA	717	1081	1649	541	6230 AA	1535	854	342	192	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	-	-	-	-	0.3	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	-	-	-	-	21.4	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	-	-	-	-	1	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	-	-	-	-	258	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, brick, vegetation	stones, vegetation	stones, vegetation	stones, brick, vegetation	stones, vegetation	stones		None	PM13/PM0

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	509-512	513-516	517-520	521-524	525-528	529-532	533-536	537-540	541-544	545-548			
Sample ID	TH118	TH118	TH117	TH117	TH117	TH121	TH121	TH121	TH121	TH120			
Depth	0.30-0.40	0.60-0.70	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40	0.60-0.70	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clayey Loam			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic #M	-	-	-	-	-	40.9	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	-	1.1	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	-	76.1	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	-	295AA	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	550	456	2148	3693AA	1253	1214	818	660	1027	1065	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	-	1.7	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	-	52.9	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	-	2	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	-	739	-	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, brick	stones, vegetation, loam	stones, loam, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, brick, vegetation, loam	stones, vegetation, brick	stones, vegetation		None	PM13/PM0

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All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	549-552	553-556	557-560	561-564	565-568	569-572	573-576	577-580	581-584	585-588			
Sample ID	TH120	TH120	TH114	TH114	TH114	DUP04	DUP05	TH115	TH115	TH115			
Depth	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40	0.30-0.40	0.00-0.05	0.00-0.05	0.10-0.20	0.30-0.40			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay			
Batch Number	3	3	3	3	3	3	3	3	3	3	LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021			
Arsenic #M	-	-	59.5	-	-	-	-	69.0	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	1005	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	5.1	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	1.5	-	-	-	-	1.5	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	88.3	-	-	-	-	84.7	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	368AA	-	-	-	-	533AA	-	-	<1	mg/kg	TM30/PM15
Lead #M	2763AA	1204	1556	1606	1612	3152AA	1463	1951	4102AA	1240	<5	mg/kg	TM30/PM15
Mercury #M	-	-	2.6	-	-	-	-	2.7	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	68.3	-	-	-	-	81.9	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	2	-	-	-	-	<1	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	95	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	3.8	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	1086	-	-	-	-	974	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, loam	stones, chalk, vegetation, loam	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation, loam, brick	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation	stones		None	PM13/PM0

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	589-592	593-596	597-600	601-604	605-608	609-612							
Sample ID	TH122	TH122	TH122	TH169	TH169	TH169							
Depth	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021							
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clayey Loam	Clay							
Batch Number	3	3	3	3	3	3					LOD/LOR	Units	Method No.
Date of Receipt	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021							
Arsenic #M	53.9	-	-	48.5	-	-					<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-					<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-					<0.5	mg/kg	TM30/PM15
Cadmium #M	1.2	-	-	1.5	-	-					<0.1	mg/kg	TM30/PM15
Chromium #M	79.1	-	-	85.2	-	-					<0.5	mg/kg	TM30/PM15
Copper #M	466AA	-	-	548AA	-	-					<1	mg/kg	TM30/PM15
Lead #M	1549	1346	638	3649AA	1643	1200					<5	mg/kg	TM30/PM15
Mercury #M	3.0	-	-	5.5	-	-					<0.1	mg/kg	TM30/PM15
Nickel #M	64.2	-	-	64.7	-	-					<0.7	mg/kg	TM30/PM15
Selenium #M	<1	-	-	2	-	-					<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-					<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-					<0.1	mg/kg	TM74/PM32
Zinc #M	880	-	-	1130	-	-					<5	mg/kg	TM30/PM15
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clayey Loam	Clay						None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown						None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, chalk, vegetation	stones, vegetation	stones, vegetation	stones						None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	3	TH123	0.00-0.05	272	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH128	0.00-0.05	280	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH135	0.00-0.05	288	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH141	0.00-0.05	296	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	Fibre Bundles
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	Amosite
					01/12/2021	**Asbestos Level Screen**	less than 0.1%
21/18548	3	TH143	0.00-0.05	304	01/12/2021	**General Description (Bulk Analysis)**	Soil/Stone
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH146	0.00-0.05	312	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH133	0.00-0.05	320	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	3	TH133	0.00-0.05	320	30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH138	0.00-0.05	328	30/11/2021	**General Description (Bulk Analysis)**	soil/stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH139	0.00-0.05	340	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH140	0.00-0.05	348	30/11/2021	**General Description (Bulk Analysis)**	soil/stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH131	0.00-0.05	356	30/11/2021	**General Description (Bulk Analysis)**	soil
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH136	0.00-0.05	364	30/11/2021	**General Description (Bulk Analysis)**	soil/stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH137	0.00-0.05	372	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH132	0.00-0.05	380	30/11/2021	**General Description (Bulk Analysis)**	soil
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH147	0.00-0.05	388	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH144	0.00-0.05	396	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	3	TH144	0.00-0.05	396	01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	3	DUP07	0.00-0.05	404	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	Fibre Bundles
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	Chrysotile
					01/12/2021	**Asbestos Level Screen**	less than 0.1%
21/18548	3	TH167	0.60-0.70	420	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH162	0.00-0.05	424	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					30/11/2021	**Asbestos Fibres**	Fibre Bundles
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	Chrysotile
					30/11/2021	**Asbestos Level Screen**	less than 0.1%
21/18548	3	TH119	0.00-0.05	436	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH130	0.60-0.70	460	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	Fibre Bundles
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	Chrysotile
					30/11/2021	**Asbestos Level Screen**	less than 0.1%
21/18548	3	TH145	0.00-0.05	464	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					30/11/2021	**Asbestos Fibres**	Fibre Bundles
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	Chrysotile
					30/11/2021	**Asbestos Level Screen**	less than 0.1%
21/18548	3	TH134	0.00-0.05	476	30/11/2021	**General Description (Bulk Analysis)**	soil
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH125	0.00-0.05	492	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	3	TH118	0.00-0.05	504	30/11/2021	**General Description (Bulk Analysis)**	soil
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH117	0.00-0.05	520	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH121	0.00-0.05	532	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH120	0.30-0.40	556	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH114	0.00-0.05	560	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	DUP04	0.30-0.40	572	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stone
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH115	0.00-0.05	580	30/11/2021	**General Description (Bulk Analysis)**	Soil/Stones
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH122	0.00-0.05	592	30/11/2021	**General Description (Bulk Analysis)**	soil
					30/11/2021	**Asbestos Fibres**	NAD
					30/11/2021	**Asbestos ACM**	NAD
					30/11/2021	**Asbestos Type**	NAD
					30/11/2021	**Asbestos Level Screen**	NAD
21/18548	3	TH169	0.30-0.40	612	01/12/2021	**General Description (Bulk Analysis)**	Soil/Stone
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

EMT Job No.: 21/18548

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	3rd December, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 3 Schedule C
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	26th November, 2021
Status :	Final Report
Issue :	1

Eighty six samples were received for analysis on 26th November, 2021 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	3	TH141	0.00-0.05	296	02/12/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					03/12/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					03/12/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
21/18548	3	DUP07	0.00-0.05	404	02/12/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Detailed Gravimetric Quantification (% Asb)	0.003 (mass %)
					02/12/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.003 (mass %)
					03/12/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					03/12/2021	Asbestos Gravimetric & PCOM Total	0.003 (mass %)
21/18548	3	TH162	0.00-0.05	424	02/12/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					03/12/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					03/12/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
21/18548	3	TH130	0.60-0.70	460	02/12/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					03/12/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					03/12/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
21/18548	3	TH145	0.00-0.05	464	02/12/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					02/12/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					03/12/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					03/12/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM131	Quantification of Asbestos Fibres and ACM based on HSG248 First edition:2006, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	7th January, 2022
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 3 Schedule D
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	26th November, 2021
Status :	Final Report
Issue :	1

Eighty six samples were received for analysis on 26th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	545-548	601-604											
Sample ID	TH120	TH169											
Depth	0.00-0.05	0.00-0.05											
COC No / misc													
Containers	V J T	V J T											
Sample Date	25/11/2021	25/11/2021											
Sample Type	Clayey Loam	Clay											
Batch Number	3	3											
Date of Receipt	26/11/2021	26/11/2021									LOD/LOR	Units	Method No.
Bioaccessible Lead (Stomach)	804	1516									<5	mg/kg	TM171/PM124
Bioaccessible Lead (Stomach And Intestine)	290	240									<5	mg/kg	TM171/PM124
Total Lead	1118	2243									<5	mg/kg	TM30/PM15
Bioaccessible Fraction (BAF) - Lead	72	68									<0	%	TM30/PM15/PM124

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology **Notification of Deviating Samples**

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
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EMT Job No.: 21/18548

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Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

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Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

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Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.				Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15/PM124	please refer to PM15/PM124 for method details				Yes
TM171	Operation and analysis of metals by Thermo Fisher iCAPQc ICP-MS	PM124	UBM Unified BARGE bioaccessibility extraction of soil, in vitro method for simulating human digestive procedure using synthetic digestive fluids, carried out on the <250um fraction of the sample.				Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	2nd December, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 4
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	27th November, 2021
Status :	Final Report
Issue :	1

Fifty three samples were received for analysis on 27th November, 2021 of which fifty three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

S. Gomery

Simon Gomery BSc
Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 3rd Floor Davidson Building, 5 Southampton Street, London WC2E 7HA
Company Registration No: 11371415

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	613-614	615-616	617-618	619-620	621-622	623-624	625-626	627-628	629-630	631-632			
Sample ID	TH171	TH172	TH173	TH174	TH175	TH176	TH177	TH178	TH179	TH180			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	J T	J T			
Sample Date	26/11/2021 08:40	26/11/2021 08:45	26/11/2021 09:04	26/11/2021 09:14	26/11/2021 09:29	26/11/2021 09:45	26/11/2021 09:58	26/11/2021 10:10	26/11/2021 10:24	26/11/2021 10:36			
Sample Type	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	4	4	4	4	4	4	4	4	4	4	LOD/LOR	Units	Method No.
Date of Receipt	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021			
Arsenic #M	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	1169	1260	1515	1422	1883	1525	1752	754	1394	1349	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, brick, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation, brick	stones, vegetation	stones, vegetation		None	PM13/PM0

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	633-634	635-636	637-638	639-640	641-642	643-644	645-646	647-648	649-650	651-652			
Sample ID	TH181	TH182	TH183	TH184	TH185	TH186	TH187	TH188	TH189	TH190			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	J T	J T			
Sample Date	26/11/2021 10:53	26/11/2021 11:07	26/11/2021 11:25	26/11/2021 11:37	26/11/2021 11:47	26/11/2021 11:58	26/11/2021 12:11	26/11/2021 12:20	26/11/2021 12:31	26/11/2021 12:40			
Sample Type	Clay	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clay			
Batch Number	4	4	4	4	4	4	4	4	4	4	LOD/LOR	Units	Method No.
Date of Receipt	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021			
Arsenic #M	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	426	481	460	1042	1099	1651	1283	1414	1556	340	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	-	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation, brick	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation, debris	stones, vegetation	stones, vegetation, loam		None	PM13/PM0

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	653-656	657-660	661-664	665-668	669-672	673-676	677-680	681-684	685-688	689-692			
Sample ID	TH108	TH108	TH108	TH109	TH109	TH109	TH129	TH129	TH127	TH127			
Depth	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	26/11/2021 09:40	26/11/2021 09:40	26/11/2021 09:40	26/11/2021 09:30	26/11/2021 09:30	26/11/2021 09:30	26/11/2021 14:09	26/11/2021 14:09	26/11/2021 14:05	26/11/2021 14:05			
Sample Type	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clay	Clay	Clayey Loam			
Batch Number	4	4	4	4	4	4	4	4	4	4	LOD/LOR	Units	Method No.
Date of Receipt	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021			
Arsenic #M	-	29.0	-	47.2	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	974	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	2.3	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	0.8	-	1.0	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	93.5	-	64.5	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	192	-	402 AA	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	2871 AA	18960 AB	20630 AB	1576	8259 AA	2870 AA	1557	4405 AA	1754	1212	<5	mg/kg	TM30/PM15
Mercury #M	-	1.5	-	2.3	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	38.0	-	55.4	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	<1	-	<1	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	70	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	2.3	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	783	-	804	-	-	-	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clay	Clay	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation, chalk	stones, vegetation, brick	stones, vegetation	stones, vegetation	stones, loam, vegetation	stones, vegetation, brick	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	693-696	697-700	701-704	705-708	709-712	713-716	717-720	721-724	725-728	729-732	LOD/LOR	Units	Method No.
Sample ID	TH124	TH124	TH126	TH126	TH113	TH113	TH107	TH107	TH106	TH106			
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	26/11/2021 13:25	26/11/2021 13:25	26/11/2021 13:50	26/11/2021 13:50	26/11/2021 12:15	26/11/2021 12:15	26/11/2021 11:00	26/11/2021 11:00	26/11/2021 10:50	26/11/2021 10:50			
Sample Type	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clayey Loam	Clayey Loam	Clay	Clay			
Batch Number	4	4	4	4	4	4	4	4	4	4			
Date of Receipt	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021			
Arsenic [#M]	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium [#M]	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium [#M]	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium [#M]	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper [#M]	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead [#M]	1399	1508	2136	1722	1270	3930_{AA}	1307	1122	1381	1488	<5	mg/kg	TM30/PM15
Mercury [#M]	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel [#M]	-	-	-	-	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium [#M]	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron [#M]	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc [#M]	-	-	-	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clayey Loam	Clayey Loam	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation, loam	stones, brick, vegetation	stones, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation, loam		None	PM13/PM0

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	733-736	737-740	741-744	745-748	749-752	753-756	757-760	761-764	765-768	769-772			
Sample ID	TH103	TH103	TH103	TH101	TH101	TH101	TH105	TH105	DUP01	TH111			
Depth	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.30-0.40	0.00-0.05	0.10-0.20	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	26/11/2021 09:15	26/11/2021 09:15	26/11/2021 09:15	26/11/2021 09:00	26/11/2021 09:00	26/11/2021 09:00	26/11/2021 10:35	26/11/2021 10:35	26/11/2021 10:35	26/11/2021 11:40			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clay	Clay			
Batch Number	4	4	4	4	4	4	4	4	4	4	LOD/LOR	Units	Method No.
Date of Receipt	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021	27/11/2021			
Arsenic #M	68.9	-	-	28.0	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	3.2	-	-	0.5	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	88.2	-	-	89.0	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	872_{AA}	-	-	128	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	2748_{AA}	609	453	650	441	559	1326	2412	597	1027	<5	mg/kg	TM30/PM15
Mercury #M	6.9	-	-	0.7	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	100.5	-	-	44.0	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	2	-	-	<1	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	2183	-	-	360	-	-	-	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, loam	stones, vegetation	stones, brick	stones, vegetation, brick	stones, chalk, brick	stones, chalk, brick	stones, vegetation, chalk	stones, vegetation	stones, vegetation	stones, vegetation		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	773-776	777-780	781-784	LOD/LOR	Units	Method No.
Sample ID	TH111	TH112	TH112			
Depth	0.10-0.20	0.00-0.05	0.10-0.20			
COC No / misc						
Containers	V J T	V J T	V J T			
Sample Date	26/11/2021 11:40	26/11/2021 11:57	26/11/2021 11:57			
Sample Type	Clayey Loam	Clay	Clay			
Batch Number	4	4	4			
Date of Receipt	27/11/2021	27/11/2021	27/11/2021			
Arsenic #M	-	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	1273	1009	935	<5	mg/kg	TM30/PM15
Mercury #M	-	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	-	<5	mg/kg	TM30/PM15
Sample Type	Clayey Loam	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, vegetation		None	PM13/PM0

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	4	TH108	0.00-0.05	656	01/12/2021	**General Description (Bulk Analysis)**	Soil/Stone
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH109	0.00-0.05	668	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH129	0.00-0.05	680	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH127	0.00-0.05	688	01/12/2021	**General Description (Bulk Analysis)**	Soil/Stones
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH124	0.00-0.05	696	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH126	0.00-0.05	704	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH113	0.00-0.05	712	01/12/2021	**General Description (Bulk Analysis)**	soil/stones
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	4	TH113	0.00-0.05	712	01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH107	0.00-0.05	720	01/12/2021	**General Description (Bulk Analysis)**	soil/stones
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH106	0.00-0.05	728	01/12/2021	**General Description (Bulk Analysis)**	Soil/Stones
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH103	0.10-0.20	740	01/12/2021	**General Description (Bulk Analysis)**	brick/soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH101	0.00-0.05	748	01/12/2021	**General Description (Bulk Analysis)**	soil/stone
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH105	0.00-0.05	760	01/12/2021	**General Description (Bulk Analysis)**	Soil/Stone
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	DUP01	0.00-0.05	768	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH111	0.00-0.05	772	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD
21/18548	4	TH112	0.00-0.05	780	01/12/2021	**General Description (Bulk Analysis)**	soil
					01/12/2021	**Asbestos Fibres**	NAD
					01/12/2021	**Asbestos ACM**	NAD
					01/12/2021	**Asbestos Type**	NAD
					01/12/2021	**Asbestos Level Screen**	NAD

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

AB	x10 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781

W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	7th January, 2022
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 4 Schedule C
Location :	Treadgold House (Stage 2 Grenfell)
Date samples received :	27th November, 2021
Status :	Final Report
Issue :	1

Fifty three samples were received for analysis on 27th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 3rd Floor Davidson Building, 5 Southampton Street, London WC2E 7HA
Company Registration No: 11371415

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	665-668	669-672											
Sample ID	TH109	TH109											
Depth	0.00-0.05	0.10-0.20											
COC No / misc													
Containers	V J T	V J T											
Sample Date	26/11/2021 09:30	26/11/2021 09:30											
Sample Type	Clayey Loam	Clayey Loam											
Batch Number	4	4									LOD/LOR	Units	Method No.
Date of Receipt	27/11/2021	27/11/2021											
Bioaccessible Lead (Stomach)	1787	3208									<5	mg/kg	TM171/PM124
Bioaccessible Lead (Stomach And Intestine)	711	1157									<5	mg/kg	TM171/PM124
Total Lead	2238	4321 AA									<5	mg/kg	TM30/PM15
Bioaccessible Fraction (BAF) - Lead	80	74 AA									<0	%	TM30/PM15/PM124

Client Name: AECOM
Reference: 60632092
Location: Treadgold House (Stage 2 Grenfell)
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

EMT Job No.: 21/18548

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.				Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15/PM124	please refer to PM15/PM124 for method details				Yes
TM171	Operation and analysis of metals by Thermo Fisher iCAPQc ICP-MS	PM124	UBM Unified BARGE bioaccessibility extraction of soil, in vitro method for simulating human digestive procedure using synthetic digestive fluids, carried out on the <250um fraction of the sample.				Yes

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	3rd December, 2020
Your reference :	60632092
Our reference :	Test Report 20/14697 Batch 11 Schedule A
Location :	Grenfell Stage 2
Date samples received :	6th November, 2020
Status :	Final report
Issue :	1

Seventy samples were received for analysis on 6th November, 2020 of which thirty five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson
EMT Job No: 20/14697

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	2296-2300	2306-2310	2316-2320	2326-2330	2336-2340	2346-2350	2356-2360	2366-2370	2376-2380	2386-2390	LOD/LOR	Units	Method No.
Sample ID	GTCS2-S385A	GTCS2-S385A	GTCS2-S385A	GTCS2-S316A	GTCS2-S312A	GTCS2-DUP12A	GTCS2-DUP12A	GTCS2-DUP12A	GTCS2-S271A	GTCS2-S272A			
Depth	0.00-0.02	0.00-0.20	0.50-0.60	0.00-0.02	0.00-0.02	0.00-0.05	0.00-0.20	0.50-0.60	0.00-0.02	0.00-0.02			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	04/11/2020	04/11/2020	04/11/2020	04/11/2020	04/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020			
Sample Type	Clayey Loam	Clayey Loam	Clayey Sand	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clay	Clayey Loam	Clayey Loam			
Batch Number	11	11	11	11	11	11	11	11	11	11			
Date of Receipt	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020			
Antimony	-	-	-	-	-	-	-	-	-	12	<1	mg/kg	TM30/PM15
Lead #M	32	50	172	26	61	158	422	NDP	744	454	<5	mg/kg	TM30/PM15
Antimony	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	-	-	-	-	-	-	457	-	-	<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #M	<0.04	<0.04	0.10	<0.04	<0.04	<0.04	<0.04	0.97	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.05	0.23	<0.03	<0.03	0.07	0.08	1.36	0.11	0.17	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	0.06	0.20	<0.05	<0.05	<0.05	<0.05	2.55	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	0.06	0.12	<0.04	<0.04	<0.04	<0.04	2.77	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.26	0.51	2.02	<0.03	0.07	0.37	0.45	29.84	0.90	1.06	<0.03	mg/kg	TM4/PM8
Anthracene #	0.07	0.15	0.75	<0.04	<0.04	0.13	0.13	7.73	0.23	0.31	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	0.47	0.98	6.15	<0.03	0.21	1.11	1.29	44.08	3.43	3.30	<0.03	mg/kg	TM4/PM8
Pyrene #	0.40	0.82	6.29	<0.03	0.19	0.94	1.12	33.91	2.99	2.83	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.28	0.51	4.29	<0.06	0.23	0.71	0.70	19.62	1.77	1.73	<0.06	mg/kg	TM4/PM8
Chrysene #M	0.27	0.51	4.57	<0.02	0.19	0.69	0.81	19.57	1.96	1.91	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	0.51	1.00	10.90	<0.07	0.44	1.30	1.59	35.56	4.00	3.80	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.30	0.58	6.57	<0.04	0.25	0.72	0.88	20.10	2.19	2.07	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.22	0.43	4.54	<0.04	0.21	0.54	0.68	13.95	1.73	1.50	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.10	0.99	<0.04	<0.04	0.12	0.13	2.74	0.29	0.26	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.22	0.42	4.37	<0.04	0.21	0.57	0.64	13.43	1.63	1.45	<0.04	mg/kg	TM4/PM8
PAH 16 Total	3.0	6.2	52.1	<0.6	2.0	7.3	8.5	248.2	21.2	20.4	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.37	0.72	7.85	<0.05	0.32	0.94	1.14	25.60	2.88	2.74	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.14	0.28	3.05	<0.02	0.12	0.36	0.45	9.96	1.12	1.06	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	86	84	86	83	83	87	84	86	88	83	<0	%	TM4/PM8
Natural Moisture Content	34.5	27.8	15.0	84.0	76.3	68.4	28.9	24.9	36.1	39.2	<0.1	%	PM4/PM0
Total Organic Carbon #	-	-	-	26.03	-	-	-	-	-	6.55	<0.02	%	TM21/PM24
Total Organic Carbon	-	-	-	-	-	-	-	-	-	-	<0.02	%	TM21/PM89
Sample Type	Clayey Loam	Clayey Loam	Clayey Sand	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clay	Clayey Loam	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, chalk, vegetation	stones, vegetation. wood	stones, vegetation	stones, vegetation	stones	stones, sand, brick	stones, vegetation	stones, vegetation		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson
EMT Job No: 20/14697

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	2396-2400	2406-2410	2416-2420	2426-2430	2436-2440	2446-2450	2456-2460	2466-2470	2476-2480	2486-2490			
Sample ID	GTCS2-S274A	GTCS2-S275A	GTCS2-S276A	GTCS2-S277A	GTCS2-S278A	GTCS2-S279A	GTCS2-S280A	GTCS2-S191A	GTCS2-S191A	GTCS2-S191A			
Depth	0.00-0.02	0.00-0.02	0.00-0.20	0.00-0.20	0.00-0.20	0.00-0.02	0.00-0.05	0.00-0.05	0.00-0.20	0.50-0.60			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020			
Sample Type	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clay			
Batch Number	11	11	11	11	11	11	11	11	11	11	LOD/LOR	Units	Method No.
Date of Receipt	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020			
Antimony	-	-	-	2	-	-	-	-	-	-	<1	mg/kg	TM30/PM15
Lead #M	1168	992	32	65	28	1385	NDP	448	610	NDP	<5	mg/kg	TM30/PM15
Antimony	-	-	-	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	-	-	-	-	-	2216	-	-	372	<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #M	0.12	0.10	<0.04	<0.04	<0.04	<0.04	0.17	<0.04	<0.04	0.19	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.24	0.18	<0.03	<0.03	<0.03	0.13	0.17	0.10	0.18	1.53	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.08	<0.05	mg/kg	TM4/PM8
Fluorene #M	0.12	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.71	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	2.12	0.97	<0.03	<0.03	<0.03	1.09	0.96	0.53	0.54	12.47	<0.03	mg/kg	TM4/PM8
Anthracene #	0.51	0.26	<0.04	<0.04	<0.04	0.30	0.28	0.17	0.26	4.68	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	4.95	3.04	<0.03	0.06	<0.03	3.82	2.74	1.38	1.86	21.29	<0.03	mg/kg	TM4/PM8
Pyrene #	4.19	2.70	<0.03	0.06	<0.03	3.18	2.35	1.20	1.62	17.63	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	2.31	1.62	<0.06	<0.06	<0.06	1.90	1.65	0.78	0.84	7.90	<0.06	mg/kg	TM4/PM8
Chrysene #M	2.68	1.87	<0.02	0.05	<0.02	2.23	1.73	0.82	1.01	8.21	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	5.29	3.68	0.13	0.13	<0.07	4.62	3.59	1.70	2.03	16.28	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	2.83	1.98	0.06	0.06	<0.04	2.38	1.87	0.98	1.10	9.52	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	2.17	1.59	0.06	0.06	<0.04	1.95	1.59	0.73	0.99	7.63	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.42	0.31	<0.04	<0.04	<0.04	0.40	0.29	0.15	0.20	1.88	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	2.26	1.52	0.06	0.07	<0.04	2.10	1.64	0.78	1.05	7.73	<0.04	mg/kg	TM4/PM8
PAH 16 Total	30.3	19.8	<0.6	<0.6	<0.6	24.1	19.0	9.3	11.7	118.7	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	3.81	2.65	0.09	0.09	<0.05	3.33	2.58	1.22	1.46	11.72	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.48	1.03	0.04	0.04	<0.02	1.29	1.01	0.48	0.57	4.56	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	86	86	88	85	86	86	86	80	110	105	<0	%	TM4/PM8
Natural Moisture Content	69.6	63.6	25.3	21.0	23.6	65.5	52.9	66.7	50.3	29.9	<0.1	%	PM4/PM0
Total Organic Carbon #	-	-	-	3.40	-	-	-	-	-	-	<0.02	%	TM21/PM24
Total Organic Carbon	-	-	-	-	-	-	-	-	-	-	<0.02	%	TM21/PM89
Sample Type	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam	Clay		None	PM13/PM0
Sample Colour	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, sand, vegetation	stones, vegetation	stones, sand, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, brick, chalk		None	PM13/PM0

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson
EMT Job No: 20/14697

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	2496-2500	2506-2510	2516-2520	2526-2530	2536-2540	2546-2550	2556-2560	2566-2570	2576-2580	2586-2590			
Sample ID	GTCS2-S192A	GTCS2-S193A	GTCS2-S193A	GTCS2-S193A	GTCS2-S194A	GTCS2-S195A	GTCS2-S195A	GTCS2-S195A	GTCS2-S196A	GTCS2-S197A			
Depth	0.00-0.02	0.00-0.05	0.00-0.20	0.50-0.60	0.00-0.20	0.00-0.02	0.00-0.20	0.50-0.60	0.00-0.02	0.00-0.02			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020			
Sample Type	Clay	Clayey Loam	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clay			
Batch Number	11	11	11	11	11	11	11	11	11	11	LOD/LOR	Units	Method No.
Date of Receipt	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020			
Antimony	-	-	-	-	-	3	NDP	4	-	-	<1	mg/kg	TM30/PM15
Lead #M	308	173	443	NDP	538	155	NDP	404	314	293	<5	mg/kg	TM30/PM15
Antimony	-	-	-	-	-	-	3	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	-	-	500	-	-	206	-	-	-	<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #M	<0.04	<0.04	<0.04	0.58	0.07	<0.04	<0.04	0.07	0.08	0.09	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.16	0.12	0.15	3.06	0.19	0.11	0.08	0.37	0.17	0.32	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	<0.05	1.00	0.09	<0.05	<0.05	0.10	<0.05	0.09	<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	<0.04	0.96	0.09	<0.04	<0.04	0.11	0.06	0.12	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.43	0.19	0.55	11.77	1.41	0.52	0.43	2.07	1.12	1.71	<0.03	mg/kg	TM4/PM8
Anthracene #	0.21	0.12	0.22	4.78	0.47	0.16	0.13	0.81	0.33	0.72	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	1.48	0.66	1.81	27.69	3.58	1.07	1.12	5.80	3.52	4.87	<0.03	mg/kg	TM4/PM8
Pyrene #	1.35	0.59	1.59	25.58	3.08	0.94	0.99	4.89	2.96	4.07	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.65	0.33	0.78	11.52	1.45	0.45	0.50	2.20	1.71	2.28	<0.06	mg/kg	TM4/PM8
Chrysene #M	0.84	0.38	0.92	12.41	1.72	0.55	0.56	2.40	2.06	2.64	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	1.85	0.89	1.77	26.57	3.11	1.07	1.09	4.75	4.17	5.42	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.98	0.49	0.96	15.93	1.66	0.57	0.59	2.65	2.30	2.90	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.93	0.47	0.84	12.89	1.39	0.53	0.53	2.24	1.82	2.40	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.18	0.12	0.21	2.98	0.34	0.14	0.11	0.51	0.28	0.46	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.04	0.52	0.88	12.82	1.41	0.53	0.48	2.20	1.71	2.62	<0.04	mg/kg	TM4/PM8
PAH 16 Total	10.1	4.9	10.7	170.5	20.1	6.6	6.6	31.2	22.3	30.7	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	1.33	0.64	1.27	19.13	2.24	0.77	0.78	3.42	3.00	3.90	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.52	0.25	0.50	7.44	0.87	0.30	0.31	1.33	1.17	1.52	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	106	111	104	104	101	118	104	108	86	92	<0	%	TM4/PM8
Natural Moisture Content	48.0	74.5	21.2	20.5	46.8	78.0	59.8	41.8	57.2	54.1	<0.1	%	PM4/PM0
Total Organic Carbon #	-	-	-	-	-	12.47	NDP	6.15	5.87	-	<0.02	%	TM21/PM24
Total Organic Carbon	-	-	-	-	-	-	9.07	-	-	-	<0.02	%	TM21/PM89
Sample Type	Clay	Clayey Loam	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, brick	stones, brick	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation		None	PM13/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name:	AECOM	**Report :**	**Solid**
Reference:	60632092		
Location:	Grenfell Stage 2	**Solids:**	V=60g VOC jar, J=250g glass jar, T=plastic tub
Contact:	David Dyson		
EMT Job No:	20/14697		

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	2596-2600	2606-2610	2616-2620	2626-2630	2636-2640			
Sample ID	GTCS2-S197A	GTCS2-S197A	GTCS2-S198A	GTCS2-S200A	GTCS2-S273A			
Depth	0.00-0.20	0.50-0.60	0.00-0.02	0.00-0.02	0.00-0.02			
COC No / misc								
Containers	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/11/2020	05/11/2020	05/11/2020	05/11/2020	05/11/2020			
Sample Type	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	11	11	11	11	11	LOD/LOR	Units	Method No.
Date of Receipt	06/11/2020	06/11/2020	06/11/2020	06/11/2020	06/11/2020			
Antimony	-	-	-	3	-	<1	mg/kg	TM30/PM15
Lead #M	NDP	443	194	110	997	<5	mg/kg	TM30/PM15
Antimony	-	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	428	-	-	-	-	<5	mg/kg	TM30/PM62
PAH MS								
Naphthalene #M	0.18	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.64	0.18	0.17	0.08	0.16	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	0.15	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #M	0.19	0.05	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	2.42	0.78	0.31	0.19	0.66	<0.03	mg/kg	TM4/PM8
Anthracene #	1.11	0.33	0.20	0.08	0.23	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	7.30	2.21	1.32	0.53	2.12	<0.03	mg/kg	TM4/PM8
Pyrene #	6.40	2.01	1.26	0.50	1.94	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	3.58	1.21	0.89	0.31	1.12	<0.06	mg/kg	TM4/PM8
Chrysene #M	4.43	1.23	0.93	0.33	1.12	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	8.96	2.55	2.04	0.67	2.47	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	4.71	1.42	1.15	0.39	1.30	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	4.34	1.20	0.93	0.31	1.20	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.88	0.24	0.20	0.06	0.23	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	4.62	1.23	1.02	0.34	1.27	<0.04	mg/kg	TM4/PM8
PAH 16 Total	49.9	14.6	10.4	3.8	13.8	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	6.45	1.84	1.47	0.48	1.78	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	2.51	0.71	0.57	0.19	0.69	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	98	92	97	100	110	<0	%	TM4/PM8
Natural Moisture Content	28.0	19.6	41.4	55.9	45.9	<0.1	%	PM4/PM0
Total Organic Carbon #	-	-	-	4.88	7.50	<0.02	%	TM21/PM24
Total Organic Carbon	-	-	-	-	-	<0.02	%	TM21/PM89
Sample Type	Clay	Clay	Clayey Loam	Clayey Loam	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, chalk, vegetation	stones, brick	stones, vegetation	stones, vegetation	stones, vegetation		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/14697	11	GTCS2-S385A	0.00-0.02	2300	17/11/2020	**General Description (Bulk Analysis)**	soil.stones
					17/11/2020	**Asbestos Fibres**	NAD
					17/11/2020	**Asbestos ACM**	NAD
					17/11/2020	**Asbestos Type**	NAD
					17/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S385A	0.00-0.20	2310	17/11/2020	**General Description (Bulk Analysis)**	soil.stones
					17/11/2020	**Asbestos Fibres**	NAD
					17/11/2020	**Asbestos ACM**	NAD
					17/11/2020	**Asbestos Type**	NAD
					17/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S385A	0.50-0.60	2320	17/11/2020	**General Description (Bulk Analysis)**	soil.stones
					17/11/2020	**Asbestos Fibres**	NAD
					17/11/2020	**Asbestos ACM**	NAD
					17/11/2020	**Asbestos Type**	NAD
					17/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S316A	0.00-0.02	2330	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S312A	0.00-0.02	2340	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-DUP12A	0.00-0.05	2350	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-DUP12A	0.00-0.20	2360	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/14697	11	GTCS2-DUP12A	0.00-0.20	2360	16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-DUP12A	0.50-0.60	2370	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	Fibre Bundles
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	Chrysotile
					16/11/2020	**Asbestos Level Screen**	less than 0.1%
20/14697	11	GTCS2-S271A	0.00-0.02	2380	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S272A	0.00-0.02	2390	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S274A	0.00-0.02	2400	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S275A	0.00-0.02	2410	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S276A	0.00-0.20	2420	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S277A	0.00-0.20	2430	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S278A	0.00-0.20	2440	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S279A	0.00-0.02	2450	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	NAD

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/14697	11	GTCS2-S279A	0.00-0.02	2450	16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S280A	0.00-0.05	2460	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	Fibre Bundles
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	Chrysotile
					16/11/2020	**Asbestos Level Screen**	less than 0.1%
20/14697	11	GTCS2-S191A	0.00-0.05	2470	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S191A	0.00-0.20	2480	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S191A	0.50-0.60	2490	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	Fibre Bundles
					16/11/2020	**Asbestos Fibres (2)**	Fibre Bundles
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos ACM (2)**	NAD
					16/11/2020	**Asbestos Type**	Chrysotile
					16/11/2020	**Asbestos Type (2)**	Crocidolite
					16/11/2020	**Asbestos Level Screen**	less than 0.1%
20/14697	11	GTCS2-S192A	0.00-0.02	2500	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S193A	0.00-0.05	2510	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S193A	0.00-0.20	2520	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S193A	0.50-0.60	2530	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	Fibre Bundles
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	Amosite

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/14697	11	GTCS2-S193A	0.50-0.60	2530	16/11/2020	**Asbestos Level Screen**	less than 0.1%
20/14697	11	GTCS2-S194A	0.00-0.20	2540	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S195A	0.00-0.02	2550	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S195A	0.00-0.20	2560	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	Fibre Bundles
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	Chrysotile
					16/11/2020	**Asbestos Level Screen**	less than 0.1%
20/14697	11	GTCS2-S195A	0.50-0.60	2570	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S196A	0.00-0.02	2580	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S197A	0.00-0.02	2590	16/11/2020	**General Description (Bulk Analysis)**	soil.stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S197A	0.00-0.20	2600	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	Fibre Bundles
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	Amosite
					16/11/2020	**Asbestos Level Screen**	less than 0.1%
20/14697	11	GTCS2-S197A	0.50-0.60	2610	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stone
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S198A	0.00-0.02	2620	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/14697	11	GTCS2-S198A	0.00-0.02	2620	16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S200A	0.00-0.02	2630	16/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					16/11/2020	**Asbestos Fibres**	NAD
					16/11/2020	**Asbestos ACM**	NAD
					16/11/2020	**Asbestos Type**	NAD
					16/11/2020	**Asbestos Level Screen**	NAD
20/14697	11	GTCS2-S273A	0.00-0.02	2640	17/11/2020	**General Description (Bulk Analysis)**	Soil/Stones
					17/11/2020	**Asbestos Fibres**	NAD
					17/11/2020	**Asbestos ACM**	NAD
					17/11/2020	**Asbestos Type**	NAD
					17/11/2020	**Asbestos Level Screen**	NAD

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Method No.	NDP Reason
20/14697	11	GTCS2-DUP12A	0.50-0.60	2366-2370	TM30/PM15	Asbestos detected in sample
20/14697	11	GTCS2-S280A	0.00-0.05	2456-2460	TM30/PM15	Asbestos detected in sample
20/14697	11	GTCS2-S191A	0.50-0.60	2486-2490	TM30/PM15	Asbestos detected in sample
20/14697	11	GTCS2-S193A	0.50-0.60	2526-2530	TM30/PM15	Asbestos detected in sample
20/14697	11	GTCS2-S195A	0.00-0.20	2556-2560	TM30/PM15	Asbestos detected in sample
20/14697	11	GTCS2-S195A	0.00-0.20	2556-2560	TM21/PM24	Asbestos detected in sample
20/14697	11	GTCS2-S197A	0.00-0.20	2596-2600	TM30/PM15	Asbestos detected in sample

Client Name: AECOM
Reference: 60632092
Location: Grenfell Stage 2
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 20/14697						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/14697

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 20/14697

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM89	Preparation of positive asbestos samples for Eltra analysis			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes

EMT Job No: 20/14697

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

Judd, Emma

From:	Paul Boden <paul.boden@element.com>
Sent:	07 January 2022 11:40
To:	Judd, Emma; Dyson, David
Subject:	[EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hi Emma,

Re the two samples queried on Batch 4: TH108 at 0.1-0.2m depth (18,960mg/kg) and TH108 at 0.3-0.4m depth (20,630 mg/kg). Please see below details of our investigation:

Both samples were prepared by Matt Hewitt on 30/11/21 and were analysed the same day by DH on Alan (ST21 211130-7 A Results).
Both samples required dilutions for their Pb conc. fall within instrument calibration range and were diluted and analysed by DH on 1/12/21 (ST21 211201-1 A Results).
Excellent agreement is seen between neat and dilution data confirming no dilution errors.
All quality control checks are within acceptable limits for the testing - AQC/Ind Cal/Low Cal checks within defined criteria, Process Blank <LOD, Cal R2 > 0.999, peaks on wavelength with no observed inter-element spectral interference.
Nothing to indicate any issues with the testing.
Happy with reported data for these two samples.

Kind regards
Paul

From: Judd, Emma <Emma.Toms@aecom.com>
Sent: 04 January 2022 15:17
To: Paul Boden <paul.boden@element.com>; Dyson, David <david.dyson@aecom.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,

Happy New Year! I hope you are well. Just wondering if you know if the inorganics manager managed to look into the below before Christmas?

Also, Simon scheduled some additional testing I requested on the 21st December (after I received an out of office from yourself – see attached email) – would it be possible to also get an estimated delivery date for those results? It was lead bioaccessibility testing on a few selected samples.

Thanks,
Emma

From: Paul Boden <paul.boden@element.com>
Sent: 21 December 2021 08:42
To: Toms, Emma <Emma.Toms@aecom.com>; Dyson, David <david.dyson@aecom.com>

Subject: [EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Emma,

I will pass this over to our inorganics manager to look into.

Kind regards
Paul

From: Toms, Emma <Emma.Toms@aecom.com>
Sent: 20 December 2021 17:28
To: Paul Boden <paul.boden@element.com>; Dyson, David <david.dyson@aecom.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,

Thank you for this.

These results are significantly different to the initial one! Do you have any thoughts for the reason for this difference? Are your team confident about the internal QA/QC that was initially completed on this sample?

There are two further samples which are outside of the typical range of the results: TH108 at 0.1-0.2m depth (18,960mg/kg) and TH108 at 0.3-0.4m depth (20,630 mg/kg) from 21/18548 Batch 4 – given the above retest results, just wanted to check if you are confident that these samples have met the internal QA/QC procedures, as they appear to be outliers considering the dataset as a whole?

Thanks,
Emma

From: Paul Boden <paul.boden@element.com>
Sent: 20 December 2021 10:37
To: Dyson, David <david.dyson@aecom.com>; Toms, Emma <Emma.Toms@aecom.com>
Subject: [EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi David,

Please find attached the report now with the repeated Lead from both “as received” and dried and crushed.

Kind regards

From: Dyson, David <david.dyson@aecom.com>
Sent: 16 December 2021 10:58
To: Paul Boden <paul.boden@element.com>; Toms, Emma <Emma.Toms@aecom.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,
For the repeat analysis are you able to re-do the analysis on the already prepared portion of the sample (if any remains) but also do a full new sample prep from a separate container?

Happy to pay for an extra metals analysis if necessary.

Thanks

David Dyson, CGeol
Associate, Remediation Services
D +44-(0)20-3043-9672
M +44 (0)7799-647-173
david.dyson@aecom.com

Click here to connect with me on LinkedIn

AECOM
Sunley House
4 Bedford Park
Croydon, CR0 2AP, UK
T +44 (0)20-8639-3500
aecom.com

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From: Paul Boden <paul.boden@element.com>
Sent: 16 December 2021 10:47
To: Toms, Emma <Emma.Toms@aecom.com>; Dyson, David <david.dyson@aecom.com>
Subject: [EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Emma,

I'm good thank you.

I estimate tomorrow for this report and I apologise for our current delays.

I will have sample TH165 0.1-0.2 repeated for lead.

Kind Regards
Paul

From: Toms, Emma <Emma.Toms@aecom.com>
Sent: 16 December 2021 10:43
To: Paul Boden <paul.boden@element.com>; Dyson, David <david.dyson@aecom.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,

Hope you are well.

Just wondering if you have an updated ETA on the samples for the below interim report?

Also, we have noticed a lead concentration in certificate 21/18548 which is significantly higher than the rest of the samples – would it be possible to reanalyse this one to check that the result is correct? It is sample TH165 at depth 0.1-0.2m – currently reporting a concentration of 384,900mg/kg.

Thanks,
Emma

From: Paul Boden <paul.boden@element.com>
Sent: 13 December 2021 13:11
To: Dyson, David <david.dyson@aecom.com>
Cc: Toms, Emma <Emma.Toms@aecom.com>
Subject: [EXTERNAL] EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Dear David,

Please find attached the interim report for samples recently received from Treadgold House (Stage 2 Grenfell), our reference 21/18548.

We currently have a 1-2 day delay in some organic areas. We will endeavour to have the report completed as quickly as possible.

I apologise for the inconvenience this may cause.

If I can be of any further assistance please don't hesitate to contact me.

Kind regards

To avoid deviation of samples due to temperature please provide a representative sample temperature on your chain of custody.

Note: Where Asbestos analysis is required we require a separate sample (preferably 1kg) in an additional plastic tub or A5 double bag. Where this is not provided turnaround times and/or accreditation status may be affected.

Paul Boden
Senior Project Manager
Element Materials Technology
Unit 3 Deeside Point
Zone 3 Deeside Industrial Park
Deeside
CH5 2UA
UK

P: +44 (0)1244 833780
F: +44 (0)1244 833781

paul.boden@element.com
www.element.com

Judd, Emma

From:	Paul Boden <paul.boden@element.com>
Sent:	06 January 2022 11:47
To:	Judd, Emma
Cc:	Dyson, David
Subject:	[EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]
Attachments:	EMT-21-18548-Batch-2-Schedule-ABC-Crosstab-202201061143.xlsx; EMT-21-18548-Batch-2-Schedule-ABC-Report-202201061143.pdf; EMT-21-18548-Batch-2-Schedule-ABC-Report-202201061143.xlsx; EMT-21-18548-Batch-2-Sched-ABC.202201061143.Chemistry2e.csv; EMT-21-18548-Batch-2-Sched-ABC.202201061143.Header.xml; EMT-21-18548-Batch-2-Sched-ABC.202201061143.Sample2e.csv
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hi Emma,

We have now looked into your query re the Pb data: **TH165 0.1-0.2m.** Please see our Inorganics Managers comments below:

I've had a look over the data and a dilution error appears to be the cause for the initial v. high reported Pb result…a correction factor x10 higher than prepared has been applied to the software for 21/18548-42 Pb.

Reported: 384900 mg/kg Pb
Actual result: 38490 mg/kg Pb.

This corrected Pb result is still higher than repeat data sets but now much closer.

All quality checks are within defined criteria for all testing – AQC, Ind. Cal./Low Cal. checks within acceptable limits, Process Blank <LOD, R2>0.999, and peaks are on wavelength with no observed interelement interference. Nothing to indicate any issues with the analysis.
All other analytes measured in Soil Trace suite shows comparable data across all repeats (with exception of Sb which varies as per Pb) confirming no sample mix-up, suggesting therefore initial elevated Pb is possibly the result of a hotspot/sample heterogeneity.

I have attached an amended report and apologise for this error.

Kind regards
Paul

From: Judd, Emma <Emma.Toms@aecom.com>
Sent: 04 January 2022 16:04
To: Paul Boden <paul.boden@element.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Thank you!

From: Paul Boden <paul.boden@element.com>
Sent: 04 January 2022 15:32
To: Judd, Emma <Emma.Toms@aecom.com>; Dyson, David <david.dyson@aecom.com>
Subject: [EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Emma,

Happy New Year.

I will chase this up for you.

The extra Bio-accessibility testing is due end of this week.

Kind regards

From: Judd, Emma <Emma.Toms@aecom.com>
Sent: 04 January 2022 15:17
To: Paul Boden <paul.boden@element.com>; Dyson, David <david.dyson@aecom.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,

Happy New Year! I hope you are well. Just wondering if you know if the inorganics manager managed to look into the below before Christmas?

Also, Simon scheduled some additional testing I requested on the 21st December (after I received an out of office from yourself – see attached email) – would it be possible to also get an estimated delivery date for those results? It was lead bioaccessibility testing on a few selected samples.

Thanks,
Emma

From: Paul Boden <paul.boden@element.com>
Sent: 21 December 2021 08:42
To: Toms, Emma <Emma.Toms@aecom.com>; Dyson, David <david.dyson@aecom.com>
Subject: [EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Emma,

I will pass this over to our inorganics manager to look into.

Kind regards
Paul

From: Toms, Emma <Emma.Toms@aecom.com>
Sent: 20 December 2021 17:28
To: Paul Boden <paul.boden@element.com>; Dyson, David <david.dyson@aecom.com>

Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,

Thank you for this.

These results are significantly different to the initial one! Do you have any thoughts for the reason for this difference? Are your team confident about the internal QA/QC that was initially completed on this sample?

There are two further samples which are outside of the typical range of the results: TH108 at 0.1-0.2m depth (18,960mg/kg) and TH108 at 0.3-0.4m depth (20,630 mg/kg) from 21/18548 Batch 4 – given the above retest results, just wanted to check if you are confident that these samples have met the internal QA/QC procedures, as they appear to be outliers considering the dataset as a whole?

Thanks,
Emma

From: Paul Boden <paul.boden@element.com>
Sent: 20 December 2021 10:37
To: Dyson, David <david.dyson@aecom.com>; Toms, Emma <Emma.Toms@aecom.com>
Subject: [EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi David,

Please find attached the report now with the repeated Lead from both "as received" and dried and crushed.

Kind regards

From: Dyson, David <david.dyson@aecom.com>
Sent: 16 December 2021 10:58
To: Paul Boden <paul.boden@element.com>; Toms, Emma <Emma.Toms@aecom.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,
For the repeat analysis are you able to re-do the analysis on the already prepared portion of the sample (if any remains) but also do a full new sample prep from a separate container?

Happy to pay for an extra metals analysis if necessary.

Thanks

David Dyson, CGeol
Associate, Remediation Services
D +44-(0)20-3043-9672
M +44 (0)7799-647-173
david.dyson@aecom.com

Click here to connect with me on LinkedIn

AECOM
Sunley House
4 Bedford Park
Croydon, CR0 2AP, UK
T +44 (0)20-8639-3500

aecom.com

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From: Paul Boden <paul.boden@element.com>
Sent: 16 December 2021 10:47
To: Toms, Emma <Emma.Toms@aecom.com>; Dyson, David <david.dyson@aecom.com>
Subject: [EXTERNAL] RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Emma,

I'm good thank you.

I estimate tomorrow for this report and I apologise for our current delays.

I will have sample TH165 0.1-0.2 repeated for lead.

Kind Regards
Paul

From: Toms, Emma <Emma.Toms@aecom.com>
Sent: 16 December 2021 10:43
To: Paul Boden <paul.boden@element.com>; Dyson, David <david.dyson@aecom.com>
Subject: RE: EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Hi Paul,

Hope you are well.

Just wondering if you have an updated ETA on the samples for the below interim report?

Also, we have noticed a lead concentration in certificate 21/18548 which is significantly higher than the rest of the samples – would it be possible to reanalyse this one to check that the result is correct? It is sample TH165 at depth 0.1-0.2m – currently reporting a concentration of 384,900mg/kg.

Thanks,
Emma

From: Paul Boden <paul.boden@element.com>
Sent: 13 December 2021 13:11
To: Dyson, David <david.dyson@aecom.com>
Cc: Toms, Emma <Emma.Toms@aecom.com>
Subject: [EXTERNAL] EMT Job reference 21/18548 Batch 5 - Treadgold House (Stage 2 Grenfell) 60632092 (Interim Report) **Please supply a PO before the due date** [Scanned]

Dear David,

Please find attached the interim report for samples recently received from Treadgold House (Stage 2 Grenfell), our reference 21/18548.

We currently have a 1-2 day delay in some organic areas. We will endeavour to have the report completed as quickly as possible.

I apologise for the inconvenience this may cause.

If I can be of any further assistance please don't hesitate to contact me.

Kind regards

To avoid deviation of samples due to temperature please provide a representative sample temperature on your chain of custody.

Note: Where Asbestos analysis is required we require a separate sample (preferably 1kg) in an additional plastic tub or A5 double bag. Where this is not provided turnaround times and/or accreditation status may be affected.

Paul Boden
Senior Project Manager
Element Materials Technology
Unit 3 Deeside Point
Zone 3 Deeside Industrial Park
Deeside
CH5 2UA
UK

P: +44 (0)1244 833780
F: +44 (0)1244 833781

paul.boden@element.com
www.element.com

Appendix F Avondale Park Gardens Laboratory Certificates

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781

W: www.element.com

AECOM
9th Floor Reception
Sunley House
4 Bedford Park
Croydon
CR0 2AP

Attention :	David Dyson
Date :	21st December, 2021
Your reference :	60632092
Our reference :	Test Report 21/18548 Batch 5
Location :	Avondale Park Gardens
Date samples received :	7th December, 2021
Status :	Final Report
Issue :	2

Forty two samples were received for analysis on 7th December, 2021 of which forty were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

S. Gomery

Simon Gomery BSc
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Avondale Park Gardens
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	785-788	789-792	793-796	797-800	801-804	805-808	809-812	813-816	817-820	821-824	LOD/LOR	Units	Method No.
Sample ID	APG101	APG101	APG101	APG101	APG102	APG102	APG103	APG103	APG104	APG104			
Depth	0.00-0.05	0.10-0.20	0.50-0.60	0.90-1.00	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	06/12/2021 09:55	06/12/2021 09:55	06/12/2021 09:55	06/12/2021 09:55	06/12/2021 08:58	06/12/2021 08:58	06/12/2021 09:17	06/12/2021 09:17	06/12/2021 09:45	06/12/2021 09:45			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clay			
Batch Number	5	5	5	5	5	5	5	5	5	5			
Date of Receipt	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021			
Arsenic #M	-	-	13.5	16.2	22.3	-	-	22.2	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	142	157	304	-	-	382	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	1.1	1.2	1.8	-	-	1.7	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	<0.1	0.1	0.6	-	-	0.8	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	90.8	72.8	81.0	-	-	75.2	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	46	42	81	-	-	95	-	-	<1	mg/kg	TM30/PM15
Lead #M	761	668	381	394	1014	624	1052	912	1000	771	<5	mg/kg	TM30/PM15
Mercury #M	-	-	1.1	0.8	1.4	-	-	1.1	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	18.7	21.6	28.4	-	-	27.5	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	<1	<1	<1	-	-	1	-	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	59	58	71	-	-	61	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	1.5	1.0	3.9	-	-	6.4	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	113	113	360	-	-	392	-	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	-	-	0.11	0.06	0.23	-	-	0.37	-	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	-	0.24	0.12	1.08	-	-	1.59	-	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	-	-	0.07	<0.05	0.23	-	-	0.39	-	-	<0.05	mg/kg	TM4/PM8
Fluorene #M	-	-	0.07	<0.04	0.21	-	-	0.40	-	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	-	-	1.32	0.38	3.87	-	-	7.39	-	-	<0.03	mg/kg	TM4/PM8
Anthracene #	-	-	0.41	0.14	1.00	-	-	2.40	-	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	-	-	3.09	1.07	10.34	-	-	15.49	-	-	<0.03	mg/kg	TM4/PM8
Pyrene #	-	-	2.78	0.87	8.58	-	-	13.47	-	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	-	1.56	0.61	5.34	-	-	7.43	-	-	<0.06	mg/kg	TM4/PM8
Chrysene #M	-	-	1.71	0.66	5.73	-	-	7.82	-	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	-	-	3.42	1.26	10.66	-	-	14.91	-	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	-	1.85	0.70	5.73	-	-	8.27	-	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	-	-	1.65	0.57	4.84	-	-	7.27	-	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	-	0.36	0.13	0.91	-	-	1.59	-	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	-	1.48	0.54	4.00	-	-	6.45	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	-	20.1	7.1	62.8	-	-	95.2	-	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	-	2.46	0.91	7.68	-	-	10.74	-	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	-	0.96	0.35	2.98	-	-	4.17	-	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	-	95	87	92	-	-	92	-	-	<0	%	TM4/PM8
Natural Moisture Content	-	-	18.5	16.4	46.6	28.6	-	20.8	-	-	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation, loam	stones, vegetation	stones, chalk, vegetation	stones, chalk, vegetation	stones, vegetation, loam	stones, vegetation, glass	stones, vegetation, wood	stones, vegetation, brick	stones, vegetation	stones, vegetation, loam		None	PM13/PM0

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Avondale Park Gardens
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	825-828	829-832	833-836	837-840	841-844	849-852	853-856	857-860	861-864	865-868	LOD/LOR	Units	Method No.
Sample ID	APG105	APG105	APG106	APG106	APG106	APG107	APG107	APG108	APG108	APG109			
Depth	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.50-0.60	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	06/12/2021 09:35	06/12/2021 09:35	06/12/2021 10:30	06/12/2021 10:30	06/12/2021 10:30	06/12/2021 14:00	06/12/2021 14:00	06/12/2021 13:37	06/12/2021 13:37	06/12/2021 13:50			
Sample Type	Clay	Clayey Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam			
Batch Number	5	5	5	5	5	5	5	5	5	5			
Date of Receipt	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021			
Arsenic #M	25.2	-	-	-	16.0	-	-	18.6	-	-	<0.5	mg/kg	TM30/PM15
Barium #M	271	-	-	-	177	-	-	322	-	-	<1	mg/kg	TM30/PM15
Beryllium	1.8	-	-	-	1.1	-	-	1.5	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	1.1	-	-	-	0.1	-	-	0.7	-	-	<0.1	mg/kg	TM30/PM15
Chromium #M	78.1	-	-	-	84.1	-	-	74.4	-	-	<0.5	mg/kg	TM30/PM15
Copper #M	89	-	-	-	45	-	-	70	-	-	<1	mg/kg	TM30/PM15
Lead #M	763	638	519	543	941	765	698	851	670	1923	<5	mg/kg	TM30/PM15
Mercury #M	1.9	-	-	-	1.2	-	-	0.9	-	-	<0.1	mg/kg	TM30/PM15
Nickel #M	28.3	-	-	-	17.7	-	-	29.1	-	-	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	-	-	-	<1	-	-	<1	-	-	<1	mg/kg	TM30/PM15
Vanadium	69	-	-	-	60	-	-	57	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	4.3	-	-	-	1.6	-	-	4.3	-	-	<0.1	mg/kg	TM74/PM32
Zinc #M	301	-	-	-	91	-	-	363	-	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	0.43	-	-	-	<0.04	-	-	0.27	-	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	1.39	-	-	-	0.08	-	-	1.06	-	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	0.31	-	-	-	<0.05	-	-	0.19	-	-	<0.05	mg/kg	TM4/PM8
Fluorene #M	0.33	-	-	-	<0.04	-	-	0.19	-	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	5.00	-	-	-	0.33	-	-	2.99	-	-	<0.03	mg/kg	TM4/PM8
Anthracene #	1.94	-	-	-	0.09	-	-	1.33	-	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	11.87	-	-	-	0.69	-	-	8.46	-	-	<0.03	mg/kg	TM4/PM8
Pyrene #	10.52	-	-	-	0.61	-	-	7.21	-	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	6.40	-	-	-	0.41	-	-	4.15	-	-	<0.06	mg/kg	TM4/PM8
Chrysene #M	6.47	-	-	-	0.47	-	-	4.49	-	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	13.18	-	-	-	0.86	-	-	7.50	-	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	7.51	-	-	-	0.48	-	-	3.98	-	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	6.59	-	-	-	0.42	-	-	3.65	-	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	1.25	-	-	-	0.09	-	-	0.55	-	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	5.83	-	-	-	0.38	-	-	3.10	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	79.0	-	-	-	4.9	-	-	49.1	-	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	9.49	-	-	-	0.62	-	-	5.40	-	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	3.69	-	-	-	0.24	-	-	2.10	-	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	92	-	-	-	92	-	-	94	-	-	<0	%	TM4/PM8
Natural Moisture Content	48.4	-	-	-	16.5	-	-	27.6	-	-	<0.1	%	PM4/PM0
Sample Type	Clay	Clayey Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation, chalk. brick	stones, vegetation	stones, vegetation	stones, vegetation	stones, brick, vegetation, loam	stones, vegetation		None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Avondale Park Gardens
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	869-872	873-876	877-880	881-884	885-888	889-892	893-896	897-900	901-904	905-908			
Sample ID	APG109	APG110	APG110	APG111	APG111	APG112	APG112	APG113	APG113	APG113			
Depth	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.50-0.60			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	06/12/2021 13:50	06/12/2021 13:00	06/12/2021 13:00	06/12/2021 13:25	06/12/2021 13:25	06/12/2021 12:50	06/12/2021 12:50	06/12/2021 10:55	06/12/2021 10:55	06/12/2021 10:55			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay	Clay			
Batch Number	5	5	5	5	5	5	5	5	5	5	LOD/LOR	Units	Method No.
Date of Receipt	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021			
Arsenic #M	23.5	-	22.9	-	-	20.6	-	-	-	15.9	<0.5	mg/kg	TM30/PM15
Barium #M	669	-	497	-	-	234	-	-	-	176	<1	mg/kg	TM30/PM15
Beryllium	1.8	-	1.7	-	-	1.2	-	-	-	1.3	<0.5	mg/kg	TM30/PM15
Cadmium #M	0.5	-	0.5	-	-	0.5	-	-	-	0.2	<0.1	mg/kg	TM30/PM15
Chromium #M	87.2	-	63.0	-	-	78.4	-	-	-	84.1	<0.5	mg/kg	TM30/PM15
Copper #M	82	-	78	-	-	73	-	-	-	46	<1	mg/kg	TM30/PM15
Lead #M	2223	1016	1027	849	901	546	506	782	611	468	<5	mg/kg	TM30/PM15
Mercury #M	1.1	-	0.8	-	-	0.7	-	-	-	0.9	<0.1	mg/kg	TM30/PM15
Nickel #M	27.8	-	31.2	-	-	22.8	-	-	-	20.6	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	-	<1	-	-	<1	-	-	-	<1	<1	mg/kg	TM30/PM15
Vanadium	64	-	79	-	-	58	-	-	-	60	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	2.4	-	2.6	-	-	3.9	-	-	-	1.6	<0.1	mg/kg	TM74/PM32
Zinc #M	474	-	514	-	-	267	-	-	-	151	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	0.65	-	0.34	-	-	0.22	-	-	-	0.15	<0.04	mg/kg	TM4/PM8
Acenaphthylene	3.14	-	2.03	-	-	1.14	-	-	-	0.53	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	0.30	-	0.26	-	-	0.12	-	-	-	0.07	<0.05	mg/kg	TM4/PM8
Fluorene #M	0.37	-	0.31	-	-	0.12	-	-	-	0.08	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	4.73	-	4.51	-	-	1.81	-	-	-	1.29	<0.03	mg/kg	TM4/PM8
Anthracene #	3.17	-	2.64	-	-	1.04	-	-	-	0.66	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	13.71	-	14.10	-	-	5.99	-	-	-	3.03	<0.03	mg/kg	TM4/PM8
Pyrene #	12.00	-	12.34	-	-	4.76	-	-	-	2.72	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	7.96	-	8.10	-	-	3.50	-	-	-	1.60	<0.06	mg/kg	TM4/PM8
Chrysene #M	8.20	-	8.23	-	-	4.07	-	-	-	1.92	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	17.20	-	15.22	-	-	7.88	-	-	-	3.78	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	9.42	-	8.53	-	-	4.37	-	-	-	2.06	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	9.17	-	7.22	-	-	3.59	-	-	-	1.88	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	1.61	-	1.24	-	-	0.56	-	-	-	0.26	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	8.17	-	5.95	-	-	3.48	-	-	-	1.77	<0.04	mg/kg	TM4/PM8
PAH 16 Total	99.8	-	91.0	-	-	42.7	-	-	-	21.8	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	12.38	-	10.96	-	-	5.67	-	-	-	2.72	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	4.82	-	4.26	-	-	2.21	-	-	-	1.06	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	87	-	86	-	-	93	-	-	-	94	<0	%	TM4/PM8
Natural Moisture Content	19.5	-	18.9	-	-	28.1	-	-	-	14.2	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation, loam	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation, loam	stones, vegetation, loam, tile	stones, brick, chalk, vegetation		None	PM13/PM0

Element Materials Technology

Client Name: AECOM
Reference: 60632092
Location: Avondale Park Gardens
Contact: David Dyson
EMT Job No: 21/18548

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	913-916	917-920	921-924	925-928	929-932	933-936	937-940	941-944	945-948	949-952			
Sample ID	APG114	APG114	APG114	APG114	APG115	APG115	APG116	APG116	DUP10	DUP11			
Depth	0.00-0.05	0.10-0.20	0.50-0.60	0.90-1.00	0.00-0.05	0.10-0.20	0.00-0.05	0.10-0.20	0.10-0.20	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	06/12/2021 11:25	06/12/2021 11:25	06/12/2021 11:25	06/12/2021 11:25	06/12/2021 12:35	06/12/2021 12:35	06/12/2021 11:50	06/12/2021 11:50	06/12/2021 09:17	06/12/2021 11:25			
Sample Type	Clayey Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam			
Batch Number	5	5	5	5	5	5	5	5	5	5	LOD/LOR	Units	Method No.
Date of Receipt	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021	07/12/2021			
Arsenic #M	-	-	11.8	13.9	-	-	-	19.4	21.4	-	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	163	86	-	-	-	213	550	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	1.0	0.6	-	-	-	1.4	1.8	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	0.2	0.2	-	-	-	0.3	0.9	-	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	68.7	52.9	-	-	-	82.3	76.7	-	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	55	27	-	-	-	68	87	-	<1	mg/kg	TM30/PM15
Lead #M	715	599	1038	600	589	673	545	572	1644	912	<5	mg/kg	TM30/PM15
Mercury #M	-	-	0.4	3.5	-	-	-	0.9	1.0	-	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	21.0	11.3	-	-	-	24.5	30.1	-	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	<1	<1	-	-	-	<1	<1	-	<1	mg/kg	TM30/PM15
Vanadium	-	-	135	32	-	-	-	96	69	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	1.1	1.0	-	-	-	1.7	5.7	-	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	111	52	-	-	-	187	418	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	-	-	0.21	0.06	-	-	-	0.41	0.29	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	-	0.69	0.23	-	-	-	2.58	1.26	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	-	-	0.12	<0.05	-	-	-	0.15	0.23	-	<0.05	mg/kg	TM4/PM8
Fluorene #M	-	-	0.16	<0.04	-	-	-	0.22	0.20	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	-	-	2.65	0.46	-	-	-	3.47	3.18	-	<0.03	mg/kg	TM4/PM8
Anthracene #	-	-	1.49	0.25	-	-	-	2.26	1.37	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	-	-	6.98	1.29	-	-	-	13.54	10.11	-	<0.03	mg/kg	TM4/PM8
Pyrene #	-	-	6.06	1.19	-	-	-	12.45	9.07	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	-	3.39	0.78	-	-	-	8.24	5.02	-	<0.06	mg/kg	TM4/PM8
Chrysene #M	-	-	4.04	0.92	-	-	-	8.44	5.40	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	-	-	6.15	1.59	-	-	-	17.12	10.00	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	-	3.45	0.88	-	-	-	9.70	5.48	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	-	-	3.25	0.77	-	-	-	8.45	4.79	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	-	0.48	0.16	-	-	-	1.73	0.84	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	-	2.92	0.70	-	-	-	7.61	4.10	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	-	42.0	9.3	-	-	-	96.4	61.3	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	-	4.43	1.14	-	-	-	12.33	7.20	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	-	1.72	0.45	-	-	-	4.79	2.80	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	-	95	93	-	-	-	91	91	-	<0	%	TM4/PM8
Natural Moisture Content	-	-	7.4	20.5	-	-	-	16.4	2.8	-	<0.1	%	PM4/PM0
Sample Type	Clayey Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clayey Loam	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation, loam	stones, brick	stones, chalk, vegetation	stones, vegetation, glass	stones, vegetation	stones, vegetation, peat	stones, vegetation, loam, tile, brick	stones, chalk, vegetation	stones, vegetation		None	PM13/PM0

Client Name: AECOM
Reference: 60632092
Location: Avondale Park Gardens
Contact: David Dyson

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	5	APG101	0.50-0.60	796	09/12/2021	**General Description (Bulk Analysis)**	soil/stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG101	0.90-1.00	800	09/12/2021	**General Description (Bulk Analysis)**	soil/stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG102	0.00-0.05	804	09/12/2021	**General Description (Bulk Analysis)**	soil/stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG103	0.10-0.20	816	09/12/2021	**General Description (Bulk Analysis)**	soil
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG105	0.00-0.05	828	09/12/2021	**General Description (Bulk Analysis)**	soil
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG106	0.50-0.60	844	09/12/2021	**General Description (Bulk Analysis)**	soil/stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG108	0.00-0.05	860	09/12/2021	**General Description (Bulk Analysis)**	soil
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD

Client Name: AECOM
Reference: 60632092
Location: Avondale Park Gardens
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18548	5	APG108	0.00-0.05	860	09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG109	0.10-0.20	872	09/12/2021	**General Description (Bulk Analysis)**	soil
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG110	0.10-0.20	880	09/12/2021	**General Description (Bulk Analysis)**	soil
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG112	0.00-0.05	892	08/12/2021	**General Description (Bulk Analysis)**	soil/stones
					08/12/2021	**Asbestos Fibres**	NAD
					08/12/2021	**Asbestos ACM**	NAD
					08/12/2021	**Asbestos Type**	NAD
					08/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG113	0.50-0.60	908	09/12/2021	**General Description (Bulk Analysis)**	soil
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG114	0.50-0.60	924	09/12/2021	**General Description (Bulk Analysis)**	Soil/Stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG114	0.90-1.00	928	09/12/2021	**General Description (Bulk Analysis)**	soil/stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	APG116	0.10-0.20	944	09/12/2021	**General Description (Bulk Analysis)**	Soil/Stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD
21/18548	5	DUP10	0.10-0.20	948	09/12/2021	**General Description (Bulk Analysis)**	Soil/Stones
					09/12/2021	**Asbestos Fibres**	NAD
					09/12/2021	**Asbestos ACM**	NAD
					09/12/2021	**Asbestos Type**	NAD
					09/12/2021	**Asbestos Level Screen**	NAD

Client Name: AECOM
Reference: 60632092
Location: Avondale Park Gardens
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/18548						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

EMT Job No.: 21/18548

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18548

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes

Element Materials Technology

Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson
EMT Job No: 19/9004

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	470-477	478-485	486-493	502-509	510-517	518-525	526-533	542-549	558-565	574-581			
Sample ID	GTCS 1-18 FIELD DUPLICATE	GTCS 1-18 LAB FIELD DUPLICATE	GTCS 1-23 PRIMARY SAMPLE	GTCS 1-23 LAB DUPLICATE	GTCS 1-23 FIELD DUPLICATE	GTCS 1-23 LAB FIELD DUPLICATE	GTCS 1-24A	GTCS 1-19A	GTCS 1-20A	GTCS 1-21A			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/06/2019 11:10	05/06/2019 11:10	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 09:50	05/06/2019 14:45	05/06/2019 15:20	05/06/2019 12:30			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019			
Aluminium	-	-	12090	11560	-	-	13720	8970	10260	10030	<50	mg/kg	TM30/PM15
Arsenic #M	-	-	18.4	19.1	-	-	23.1	16.7	19.2	13.9	<0.5	mg/kg	TM30/PM15
Barium #M	-	-	540	564	-	-	269	171	249	186	<1	mg/kg	TM30/PM15
Beryllium	-	-	1.3	1.3	-	-	1.6	1.1	1.4	1.1	<0.5	mg/kg	TM30/PM15
Cadmium #M	-	-	0.9	0.8	-	-	1.0	1.1	0.8	1.1	<0.1	mg/kg	TM30/PM15
Chromium #M	-	-	71.5	71.1	-	-	68.2	69.3	117.8	66.9	<0.5	mg/kg	TM30/PM15
Copper #M	-	-	93	88	-	-	76	68	90	81	<1	mg/kg	TM30/PM15
Lead #M	-	-	2099	2151	-	-	659	290	434	1200	<5	mg/kg	TM30/PM15
Mercury #M	-	-	0.8	1.8	-	-	1.8	0.8	0.6	0.9	<0.1	mg/kg	TM30/PM15
Nickel #M	-	-	24.9	24.9	-	-	27.4	25.6	28.3	23.3	<0.7	mg/kg	TM30/PM15
Selenium #M	-	-	1	1	-	-	2	1	2	<1	<1	mg/kg	TM30/PM15
Vanadium	-	-	53	53	-	-	62	53	58	44	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	-	-	6.4	6.1	-	-	2.7	2.0	3.5	4.5	<0.1	mg/kg	TM74/PM32
Zinc #M	-	-	499	444	-	-	285	229	292	299	<5	mg/kg	TM30/PM15
Aluminium	17423	19023	-	-	12510	11124	-	-	-	-	<50	mg/kg	TM30/PM62
Arsenic	58.6	61.5	-	-	20.2	19.3	-	-	-	-	<0.5	mg/kg	TM30/PM62
Barium	866	944	-	-	613	560	-	-	-	-	<1	mg/kg	TM30/PM62
Beryllium	4.1	4.0	-	-	1.3	1.2	-	-	-	-	<0.5	mg/kg	TM30/PM62
Cadmium	7.0	2.1	-	-	0.8	0.8	-	-	-	-	<0.1	mg/kg	TM30/PM62
Chromium	57.8	63.4	-	-	30.6	30.1	-	-	-	-	<0.5	mg/kg	TM30/PM62
Copper	470$_{AB}$	504$_{AB}$	-	-	86	92	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	1459	1519	-	-	2621	2539	-	-	-	-	<5	mg/kg	TM30/PM62
Mercury	3.5	3.3	-	-	0.9	0.8	-	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	73.1	85.3	-	-	23.9	23.1	-	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	2	2	-	-	<1	1	-	-	-	-	<1	mg/kg	TM30/PM62
Vanadium	90	92	-	-	59	59	-	-	-	-	<1	mg/kg	TM30/PM62
Water Soluble Boron	3.8	3.7	-	-	7.4	6.5	-	-	-	-	<0.1	mg/kg	TM74/PM61
Zinc	5153$_{AB}$	1184	-	-	451	444	-	-	-	-	<5	mg/kg	TM30/PM62
Aluminium	18250	16400	-	-	9670	11210	-	-	-	-	<50	mg/kg	TM30/PM42
Arsenic	50.7	46.6	-	-	17.2	16.3	-	-	-	-	<0.5	mg/kg	TM30/PM42
Barium	945	883	-	-	486	517	-	-	-	-	<1	mg/kg	TM30/PM42
Beryllium	3.9	3.7	-	-	1.1	1.2	-	-	-	-	<0.5	mg/kg	TM30/PM42
Cadmium	1.9	1.9	-	-	0.6	0.6	-	-	-	-	<0.1	mg/kg	TM30/PM42
Chromium	57.4	54.1	-	-	28.3	31.0	-	-	-	-	<0.5	mg/kg	TM30/PM42
Copper	501$_{AB}$	539$_{AB}$	-	-	79	79	-	-	-	-	<1	mg/kg	TM30/PM42
Lead	1780	1472	-	-	2092	2371	-	-	-	-	<5	mg/kg	TM30/PM42
Mercury	3.1	2.6	-	-	0.5	0.4	-	-	-	-	<0.1	mg/kg	TM30/PM42
Nickel	62.1	55.4	-	-	21.1	21.9	-	-	-	-	<0.7	mg/kg	TM30/PM42
Selenium	2	2	-	-	<1	<1	-	-	-	-	<1	mg/kg	TM30/PM42
Vanadium	92	79	-	-	51	53	-	-	-	-	<1	mg/kg	TM30/PM42
Water Soluble Boron	3.5	3.5	-	-	4.2	4.9	-	-	-	-	<0.1	mg/kg	TM30/PM42
Zinc	1058	1000	-	-	369	382	-	-	-	-	<5	mg/kg	TM30/PM42

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson
EMT Job No: 19/9004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	470-477	478-485	486-493	502-509	510-517	518-525	526-533	542-549	558-565	574-581	LOD/LOR	Units	Method No.
Sample ID	GTCS 1-18 FIELD DUPLICATE	GTCS 1-18 LAB FIELD DUPLICATE	GTCS 1-23 PRIMARY SAMPLE	GTCS 1-23 LAB DUPLICATE	GTCS 1-23 FIELD DUPLICATE	GTCS 1-23 LAB FIELD DUPLICATE	GTCS 1-24A	GTCS 1-19A	GTCS 1-20A	GTCS 1-21A			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/06/2019 11:10	05/06/2019 11:10	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 09:50	05/06/2019 14:45	05/06/2019 15:20	05/06/2019 12:30			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019			
PAH MS													
Naphthalene #M	0.07	0.07	0.29	0.38	0.39	0.32	0.28	0.15	0.08	0.05	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.23	0.21	1.69	1.76	1.74	1.54	1.04	1.40	0.27	0.17	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	0.16	0.19	0.12	0.15	0.16	0.07	0.13	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	0.20	0.21	0.19	0.19	0.16	0.10	0.11	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.43	0.43	2.85	3.07	3.00	3.15	2.56	1.65	1.65	0.46	<0.03	mg/kg	TM4/PM8
Anthracene #	0.26	0.24	1.74	1.77	1.72	1.72	1.24	1.12	0.50	0.19	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	1.20	1.19	9.69	10.15	10.10	9.67	8.11	7.09	3.68	1.37	<0.03	mg/kg	TM4/PM8
Pyrene #	1.22	1.21	8.80	9.15	9.11	8.90	7.19	6.20	3.13	1.19	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.79	0.79	5.55	5.92	6.03	5.66	4.40	4.03	1.71	0.72	<0.06	mg/kg	TM4/PM8
Chrysene #M	0.91	0.93	5.77	6.12	6.19	6.08	4.53	3.75	1.82	0.80	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	2.26	2.24	12.85	13.77	13.97	12.57	9.96	8.23	3.61	1.68	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	1.06	1.09	7.43	7.68	7.82	7.05	5.75	4.52	2.04	0.90	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	1.01	1.01	5.22	5.84	5.84	5.06	4.20	3.20	1.35	0.67	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.19	0.24	1.01	1.25	1.49	1.31	1.06	0.67	0.32	0.18	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.14	1.12	5.46	6.15	5.95	5.13	4.34	3.26	1.40	0.68	<0.04	mg/kg	TM4/PM8
Coronene	0.24	0.27	1.23	1.13	1.43	0.91	1.04	0.76	0.25	0.18	<0.04	mg/kg	TM4/PM8
PAH 16 Total	10.8	10.8	68.7	73.4	73.7	68.5	55.0	45.4	21.8	9.1	<0.6	mg/kg	TM4/PM8
PAH 17 Total	11.01	11.04	69.94	74.54	75.09	69.41	56.02	46.20	22.05	9.24	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	1.63	1.61	9.25	9.91	10.06	9.05	7.17	5.93	2.60	1.21	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.63	0.63	3.60	3.86	3.91	3.52	2.79	2.30	1.01	0.47	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	98	96	100	99	101	92	96	98	101	99	<0	%	TM4/PM8
VOC TICs	ND	ND	ND	ND	ND	ND	See Attached	ND	ND	ND		None	TM15/PM10
SVOC TICs	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached		None	TM16/PM8
7,12-Dimethyl benzo(a)anthracene	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	21.5	18.3	15.0	12.5	11.1	12.6	15.2	13.2	21.4	13.8	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	-	-	71.5	71.1	-	-	68.2	69.3	117.8	66.9	<0.5	mg/kg	NONE/NONE
Chromium III	57.8	63.4	-	-	30.6	30.1	-	-	-	-	<0.5	mg/kg	NONE/NONE
Chromium III	57.4	54.1	-	-	28.3	31.0	-	-	-	-	<0.5	mg/kg	NONE/NONE
Free Cyanide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Total Cyanide #M	1.5AA	1.8AA	0.8	0.7	<0.5	0.6	0.6	<0.5	<0.5	0.7	<0.5	mg/kg	TM89/PM45

Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson
EMT Job No: 19/9004

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	470-477	478-485	486-493	502-509	510-517	518-525	526-533	542-549	558-565	574-581	LOD/LOR	Units	Method No.
Sample ID	GTCS 1-18 FIELD DUPLICATE	GTCS 1-18 LAB FIELD DUPLICATE	GTCS 1-23 PRIMARY SAMPLE	GTCS 1-23 LAB DUPLICATE	GTCS 1-23 FIELD DUPLICATE	GTCS 1-23 LAB FIELD DUPLICATE	GTCS 1-24A	GTCS 1-19A	GTCS 1-20A	GTCS 1-21A			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/06/2019 11:10	05/06/2019 11:10	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 09:50	05/06/2019 14:45	05/06/2019 15:20	05/06/2019 12:30			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019			
Total Organic Carbon #	-	-	6.14	5.81	-	-	5.84	5.57	4.88	4.09	<0.02	%	TM21/PM24
Total Organic Carbon	8.57	9.51	-	-	7.08	5.75	-	-	-	-	<0.02	%	TM21/PM89
Thiocyanate	1.2	1.3	1.7	1.5	1.4	1.5	1.8	1.6	0.8	0.8	<0.6	mg/kg	TM107/PM119
Furans (Chlorinated)													
2378-TCDF*	28.1	19.2	7.74	9.95	10.4	9.98	12.8	5.7	6.52	6.49		ng/kg	Subcontracted
12378-PCDF*	26.7	16.6	5.51	5.79	2.02	7.71	9.94	5.06	4.84	4.43		ng/kg	Subcontracted
23478-PCDF*	57.6	27.8	8.98	4.06	7.61	9.49	8.96	6.95	6.15	7.29		ng/kg	Subcontracted
123478-HxCDF*	37.5	21.4	8.85	6.71	5.23	8.58	10.9	6.86	6.81	6.17		ng/kg	Subcontracted
123678-HxCDF*	35	16.8	6.54	7.42	7.3	7.66	9.62	5.63	4.38	4.09		ng/kg	Subcontracted
234678-HxCDF*	56.7	21.4	7.47	7.59	6.44	7.46	9.24	6.1	5.39	4.05		ng/kg	Subcontracted
123789-HxCDF*	2.25	0.939	<0.333	0.88	<0.608	0.877	0.943	0.799	<0.505	0.547		ng/kg	Subcontracted
1234678-HpCDF*	232	155	50.1	45	46.7	57.8	54.7	55	60.2	46		ng/kg	Subcontracted
1234789-HpCDF*	5.65	3.25	2.8	1.67	2.6	1.3	2.64	2.6	2.48	2.17		ng/kg	Subcontracted
OCDF*	88.9	87.6	33.1	31.8	36.8	74.4	40.1	37.4	43.2	42.3		ng/kg	Subcontracted
Dioxins (Chlorinated)													
2378-TCDD*	4.61	3.16	<0.377	<0.334	<0.230	<0.225	<0.235	<0.226	<0.218	<0.218		ng/kg	Subcontracted
12378-PCDD*	12.5	12.2	2.05	0.918	1.84	2.2	2.68	0.643	1.51	1.07		ng/kg	Subcontracted
123478-HxCDD*	12	7.8	2.07	1.85	2.01	1.66	2.71	1.36	0.917	1.82		ng/kg	Subcontracted
123678-HxCDD*	20	11.6	3.63	4.91	4.29	5.29	6.17	4.12	3.56	3.09		ng/kg	Subcontracted
123789-HxCDD*	13.9	10	2.13	2.69	3.36	3.68	5.17	2.67	2	2.27		ng/kg	Subcontracted
1234678-HpCDD*	132	86.6	53.2	56.6	57.4	65.5	55.8	58.7	62.3	67.5		ng/kg	Subcontracted
OCDD*	524	489	327	350	354	385	270	381	319	450		ng/kg	Subcontracted
TEQ(1) (NATO)*	65.9	37.9	11.5	8.73	10.5	12.7	13.8	9.18	8.91	9.12		ng/kg	Subcontracted
TEQ(2) (NATO)*	65.9	37.9	11.1	8.39	10.2	12.5	13.5	8.95	8.64	8.9		ng/kg	Subcontracted
Furans (Brominated)													
2378-TBDF*	6.99	4.8	1.98	1.55	1.7	1.58	3.08	2.65	1.97	2.87		ng/kg	Subcontracted
12378-PBDF*	6.14	4.87	1.54	1.17	1.28	1.25	1.66	1.7	1.41	1.75		ng/kg	Subcontracted
23478-PBDF*	2.24	2.59	0.83	0.76	0.88	0.76	1.19	0.98	0.77	0.89		ng/kg	Subcontracted
123478-HxBDF*	3.06	3.81	0.62	1.38	1.6	1.75	1.9	2	2.3	2.1		ng/kg	Subcontracted
123678-HxBDF*	2.29	2	0.79	1.72	2.19	2.6	2.27	2.53	2.21	1.85		ng/kg	Subcontracted
234678-HxBDF*	1.82	2.13	<0.780	<0.800	<0.800	<0.830	<0.880	<0.810	<0.770	<0.750		ng/kg	Subcontracted
123789-HxBDF*	1.48	1.19	<0.820	<0.840	<0.800	<0.820	<0.820	<0.790	<0.800	<0.810		ng/kg	Subcontracted
1234678-HpBDF*	<0.790	<0.770	<0.740	<0.770	<0.790	<0.770	<0.790	<0.840	<0.780	<0.770		ng/kg	Subcontracted
1234789-HpBDF*	<0.810	<0.810	<0.800	<0.800	<0.820	<0.800	<0.830	<0.800	<0.810	<0.790		ng/kg	Subcontracted
OBDF*	<0.780	<0.820	<0.840	<0.790	<0.810	<0.840	<0.850	<0.820	<0.840	<0.850		ng/kg	Subcontracted

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Element Materials Technology

Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson
EMT Job No: 19/9004

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	470-477	478-485	486-493	502-509	510-517	518-525	526-533	542-549	558-565	574-581	LOD/LOR	Units	Method No.
Sample ID	GTCS 1-18 FIELD DUPLICATE	GTCS 1-18 LAB FIELD DUPLICATE	GTCS 1-23 PRIMARY SAMPLE	GTCS 1-23 LAB DUPLICATE	GTCS 1-23 FIELD DUPLICATE	GTCS 1-23 LAB FIELD DUPLICATE	GTCS 1-24A	GTCS 1-19A	GTCS 1-20A	GTCS 1-21A			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/06/2019 11:10	05/06/2019 11:10	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 09:50	05/06/2019 14:45	05/06/2019 15:20	05/06/2019 12:30			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019			
Dioxins (Brominated)													
2378-TBDD*	<0.770	<0.760	<0.780	<0.790	<0.770	<0.790	<0.800	<0.800	<0.780	<0.800		ng/kg	Subcontracted
12378-PBDD*	<0.800	<0.820	<0.810	<0.840	<0.800	<0.800	<0.810	<0.780	<0.800	<0.780		ng/kg	Subcontracted
123478-HxBDD*	<0.710	<0.760	<0.790	<0.790	<0.770	<0.790	<0.770	<0.760	<0.750	<0.770		ng/kg	Subcontracted
123678-HxBDD*	<0.730	<0.730	<0.760	<0.770	<0.740	<0.780	<0.790	<0.800	<0.780	<0.780		ng/kg	Subcontracted
123789-HxBDD*	<0.690	<0.660	<0.690	<0.750	<0.800	<0.730	<0.730	<0.770	<0.770	<0.710		ng/kg	Subcontracted
1234678-HpBDD*	1.22	0.99	<0.800	<0.800	<0.830	<0.800	<0.780	<0.840	<0.830	<0.800		ng/kg	Subcontracted
OBDD*	<0.780	<0.800	<0.820	<0.840	<0.800	<0.820	<0.820	<0.820	<0.800	<0.820		ng/kg	Subcontracted
PCB-81*	18.3	9.94	2.06	1.84	0.73	0.941	2.66	2.81	4.43	0.997		ng/kg	Subcontracted
PCB-77*	211	73	33.1	36.2	34.1	34.5	33.9	73.1	92.7	57.6		ng/kg	Subcontracted
PCB-123*	63.6	29.8	12.7	15.4	15.1	14.1	17.2	40.2	40	14.9		ng/kg	Subcontracted
PCB-118*	1880	851	512	581	471	480	507	1040	1090	554		ng/kg	Subcontracted
PCB-114*	43.5	12.6	5.77	6.39	5.17	5.49	4.66	9.05	10.6	8.14		ng/kg	Subcontracted
PCB-105*	1060	498	248	281	226	231	228	431	545	269		ng/kg	Subcontracted
PCB-126*	63.3	37.7	6.46	7.59	6.36	11	11.9	19.2	13.3	8.08		ng/kg	Subcontracted
PCB-167*	154	114	60.3	57.4	51.4	52.9	48.1	122	93.1	51.1		ng/kg	Subcontracted
PCB-156*	398	280	128	133	104	111	104	245	214	101		ng/kg	Subcontracted
PCB-157*	92.5	66.5	34.7	39.5	33.2	33.8	30.1	71.4	59.2	34.2		ng/kg	Subcontracted
PCB-169*	18.1	7.36	1.52	1.17	2.68	2.15	2.11	1.87	1.53	0.795		ng/kg	Subcontracted
PCB-189*	43.5	33.2	19.2	16.6	14.9	15.6	14.4	28.1	18.9	18.3		ng/kg	Subcontracted
Isocyanic Acid-d	78	80	71	60	69	70	67	77	79	81	<0	%	TM192/PM0
Methyl Isocyanate-d	97	99	86	76	86	87	79	96	77	99	<0	%	TM192/PM0
Ethyl Isocyanate-d	92	94	83	74	84	82	74	89	77	92	<0	%	TM192/PM0
Propyl Isocyanate-d	104	107	88	75	84	90	86	96	94	101	<0	%	TM192/PM0
Phenyl Isocyanate-d	76	77	60	46	55	50	53	65	73	83	<0	%	TM192/PM0
Hexamethylene Diisocyanate-d	82	83	69	57	64	66	65	77	81	85	<0	%	TM192/PM0
2,4-Toluene Diisocyanate-d	126	119	66	43	59	76	75	100	117	135	<0	%	TM192/PM0
2,6-Toluene Diisocyanate-d	79	84	61	45	57	58	59	74	78	87	<0	%	TM192/PM0
Isophorone Diisocyanate-d	84	86	84	73	78	81	81	87	87	88	<0	%	TM192/PM0
4,4-Methylene-bis(phenyl-isocyanate)-d	87	89	58	44	57	56	65	76	82	96	<0	%	TM192/PM0
Isocyanic Acid	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
Methyl Isocyanate	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
Ethyl Isocyanate	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
Propyl Isocyanate	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
Phenyl Isocyanate	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
Hexamethylene Diisocyanate	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
2,4-Toluene Diisocyanate	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
2,6-Toluene Diisocyanate	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
Isophorone Diisocyanate	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	ug/kg	TM192/PM0
4,4-Methylene-bis(phenyl-isocyanate)	<250	<250	<250	<250	<250	373	<250	<250	<250	<250	<250	ug/kg	TM192/PM0
pH #M	7.73	7.82	7.60	7.59	7.57	7.59	7.27	7.13	8.06	7.73	<0.01	pH units	TM73/PM11

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Element Materials Technology

Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson
EMT Job No: 19/9004

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	470-477	478-485	486-493	502-509	510-517	518-525	526-533	542-549	558-565	574-581			
Sample ID	GTCS 1-18 FIELD DUPLICATE	GTCS 1-18 LAB FIELD DUPLICATE	GTCS 1-23 PRIMARY SAMPLE	GTCS 1-23 LAB DUPLICATE	GTCS 1-23 FIELD DUPLICATE	GTCS 1-23 LAB FIELD DUPLICATE	GTCS 1-24A	GTCS 1-19A	GTCS 1-20A	GTCS 1-21A			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/06/2019 11:10	05/06/2019 11:10	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 09:50	05/06/2019 14:45	05/06/2019 15:20	05/06/2019 12:30			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation	stones, wood	stones, vegetation	stones, vegetation	stones, vegetation	stones, vegetation		None	PM13/PM0
hexabromobiphenyl (2,2',4,4',5,5'-) (PBB 153)*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		mg/kg	Subcontracted
4,4'-dibromobiphenyl (PBB 15)*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		mg/kg	Subcontracted
2,2',5-tribromobiphenyl (PBB 18)*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		mg/kg	Subcontracted
2,2'-dibromobiphenyl (PBB 4)*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		mg/kg	Subcontracted
tetrabromobiphenyl (3,3',5,5'-) (PBB 80)*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		mg/kg	Subcontracted
2,2',4,4',6-pentabromodiphenyl ether (BDE-100)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',3,4,4',5'-hexabromodiphenyl ether (BDE-138)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',4,4',5,6'-hexabromodiphenyl ether (BDE-154)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',4-tribromodiphenyl ether (BDE-17)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',3,4,4',5',6-heptabromodiphenyl ether (BDE-183)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,4,4'-tribromodiphenyl ether (BDE-28)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',4,4'-tetrabromodiphenyl ether (BDE-47)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,3',4,4'-tetrabromodiphenyl ether (BDE-66)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',3,4,4'-pentabromodiphenyl ether (BDE-85)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
2,2',4,4',5-pentabromodiphenyl ether (BDE-99)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
hexabromocyclododecane (1,2,5,6,9,10-)*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
tetrabromobisphenol A*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		mg/kg	Subcontracted
triphenylphosphate*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted
tris(1-chloro-2-propyl)phosphate TCPP*	<0.15	<0.15	<0.15	<0.15	<0.15	<0.20	<0.15	<0.50	<0.15	<0.15		mg/kg	Subcontracted
tris(2-ethylhexyl) phosphate*	0.23	0.22	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		mg/kg	Subcontracted

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Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson
EMT Job No: 19/9004

SVOC Report : **Solid**

EMT Sample No.	470-477	478-485	486-493	502-509	510-517	518-525	526-533	542-549	558-565	574-581			
Sample ID	GTCS 1-18 FIELD DUPLICATE	GTCS 1-18 LAB FIELD DUPLICATE	GTCS 1-23 PRIMARY SAMPLE	GTCS 1-23 LAB DUPLICATE	GTCS 1-23 FIELD DUPLICATE	GTCS 1-23 LAB FIELD DUPLICATE	GTCS 1-24A	GTCS 1-19A	GTCS 1-20A	GTCS 1-21A			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/06/2019 11:10	05/06/2019 11:10	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 09:50	05/06/2019 14:45	05/06/2019 15:20	05/06/2019 12:30			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019			
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	72	195	162	141	126	116	131	87	98	43	<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	634	731	399	394	307	337	384	418	287	571	<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	453	119	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Carbazole	58	54	329	451	226	291	238	250	296	61	<10	ug/kg	TM16/PM8
Dibenzofuran #M	36	60	139	164	136	132	107	89	142	28	<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	83	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	105	105	112	110	119	118	112	107	101	107	<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	113	115	127	124	125	130	130	122	114	120	<0	%	TM16/PM8

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Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson
EMT Job No: 19/9004

VOC Report : **Solid**

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	470-477	478-485	486-493	502-509	510-517	518-525	526-533	542-549	558-565	574-581			
Sample ID	GTCS 1-18 FIELD DUPLICATE	GTCS 1-18 LAB FIELD DUPLICATE	GTCS 1-23 PRIMARY SAMPLE	GTCS 1-23 LAB DUPLICATE	GTCS 1-23 FIELD DUPLICATE	GTCS 1-23 LAB FIELD DUPLICATE	GTCS 1-24A	GTCS 1-19A	GTCS 1-20A	GTCS 1-21A			
Depth	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05	0.00-0.05			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	05/06/2019 11:10	05/06/2019 11:10	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 08:50	05/06/2019 09:50	05/06/2019 14:45	05/06/2019 15:20	05/06/2019 12:30			
Sample Type	Clayey Loam	Clayey Loam	Clay	Clay	Clay	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clayey Loam			
Batch Number	2	2	2	2	2	2	2	2	2	2	LOD/LOR	Units	Method No.
Date of Receipt	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019	06/06/2019			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Chloromethane #	11	19	16	18	11	34	7	12	21	7	<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/kg	TM15/PM10
Chloroethane #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Trichlorofluoromethane #M	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethane #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromochloromethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Chloroform #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,1,1-Trichloroethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Carbon tetrachloride #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichloroethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
Benzene #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
Trichloroethene (TCE) #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2-Dichloropropane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Dibromomethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromodichloromethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Toluene #M	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3-Dichloropropane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Dibromochloromethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chlorobenzene #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
Ethylbenzene #M	<3	<3	3	3	<3	3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
o-Xylene #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15_A/PM10
Bromoform	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #M	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	68	75	70	70	78	71	85	82	73	88	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	52	55	52	53	58	53	64	61	50	68	<0	%	TM15/PM10

Element Materials Technology

Job number:	19/9004	**Method:**	**SVOC**
Sample number:	491	**Matrix:**	**Solid**
Sample identity:	GTCS 1-23 PRIMARY SAMPLE		
Sample depth:	0.00-0.05		
Sample Type:	Clay		
Units:	ug/kg		

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
95-13-6	Indene	5.465	80	1027
83-33-0	1H-Inden-1-one, 2,3-dihydro-	7.311	90	368
832-69-9	Phenanthrene, 1-methyl-	10.831	95	849
2531-84-2	Phenanthrene, 2-methyl-	10.850	98	1313
84-65-1	9,10-Anthracenedione	11.077	92	389
612-94-2	Naphthalene, 2-phenyl-	11.124	89	729
5737-13-3	Cyclopenta(def)phenanthrenone	11.436	93	1456
2789-88-0	di-p-Tolylacetylene	11.483	89	576
116196-83-9	4,4'-Bis(tetrahydrothiopyran)	11.644	96	2508
243-42-5	Benzo[b]naphtho[2,3-d]furan	11.937	91	1417
33543-31-6	Fluoranthene, 2-methyl-	12.183	96	4555
2381-21-7	Pyrene, 1-methyl-	12.306	96	1978
64401-21-4	Pyrene, 1,3-dimethyl-	12.845	93	1021
239-35-0	Benzo[b]naphtho[2,1-d]thiophene	12.940	96	2312
217-59-4	Triphenylene	13.299	98	9889
25732-74-5	Cyclopenta(cd)pyrene, 3,4-dihydro-	13.432	91	3954
3351-28-8	Chrysene, 1-methyl-	13.856	97	2567
126848-01-9	3,5,6-Trimethyl-p-quinone, 2-(2,5-dioxotetrahydrofuran-3-yl)thio-	14.784	89	7888
192-97-2	Benzo[e]pyrene	14.954	97	10148
629-94-7	Heneicosane	15.174	95	6918
593-45-3	Octadecane	15.958	92	8766
191-26-4	Dibenzo[def,mno]chrysene	16.775	92	2785

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All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Job number: 19/9004 **Method:** **SVOC**
Sample number: 507 **Matrix:** **Solid**
Sample identity: GTCS 1-23 LAB DUPLICATE
Sample depth: 0.00-0.05
Sample Type: Clay
Units: ug/kg

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
132-65-0	Dibenzothiophene	10.151	94	312
832-69-9	Phenanthrene, 1-methyl-	10.850	97	600
203-64-5	4H-Cyclopenta[def]phenanthrene	10.926	87	1061
2531-84-2	Phenanthrene, 2-methyl-	10.954	98	519
84-65-1	9,10-Anthracenedione	11.077	91	289
5737-13-3	Cyclopenta(def)phenanthrenone	11.436	93	492
116196-83-9	4,4'-Bis(tetrahydrothiopyran)	11.644	96	756
243-42-5	Benzo[b]naphtho[2,3-d]furan	11.937	95	659
2381-21-7	Pyrene, 1-methyl-	12.079	95	860
33543-31-6	Fluoranthene, 2-methyl-	12.183	96	1960
243-17-4	11H-Benzo[b]fluorene	12.259	95	718
64401-21-4	Pyrene, 1,3-dimethyl-	12.722	89	668
479-79-8	11H-Benzo[a]fluoren-11-one	12.779	96	540
239-35-0	Benzo[b]naphtho[2,1-d]thiophene	12.940	96	1024
239-01-0	11H-Benzo[a]carbazole	13.224	93	515
25732-74-5	Cyclopenta(cd)pyrene, 3,4-dihydro-	13.432	92	1582
2498-77-3	Benz[a]anthracene, 1-methyl-	13.856	96	1040
3351-28-8	Chrysene, 1-methyl-	13.896	96	685
198-55-0	Perylene	14.954	96	3387
646-31-1	Tetracosane	15.174	91	1911

Element Materials Technology

Job number: 19/9004 **Method:** **SVOC**
Sample number: 515 **Matrix:** **Solid**
Sample identity: GTCS 1-23 FIELD DUPLICATE
Sample depth: 0.00-0.05
Sample Type: Clay
Units: ug/kg

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
2245-38-7	Naphthalene, 1,6,7-trimethyl-	9.392	86	136
613-12-7	Anthracene, 2-methyl-	10.880	95	544
2531-84-2	Phenanthrene, 2-methyl-	10.902	97	499
610-48-0	Anthracene, 1-methyl-	10.957	96	296
84-65-1	9,10-Anthracenedione	11.133	87	419
34373-96-1	9,10-Bis(bromomethyl)anthracene	11.177	83	451
781-43-1	9,10-Dimethylanthracene	11.364	94	232
2789-88-0	di-p-Tolylacetylene	11.416	95	477
5737-13-3	Cyclopenta(def)phenanthrenone	11.492	83	1002
484-11-7	Neocuproine	11.754	81	739
200-23-7	Benzo[kl]xanthene	11.931	93	598
1210-12-4	9-Anthracenecarbonitrile	11.973	91	191
243-42-5	Benzo[b]naphtho[2,3-d]furan	11.998	96	757
33543-31-6	Fluoranthene, 2-methyl-	12.141	97	858
2381-21-7	Pyrene, 1-methyl-	12.243	94	2218
243-17-4	11H-Benzo[b]fluorene	12.327	96	872
479-79-8	11H-Benzo[a]fluoren-11-one	12.841	95	1038
64401-21-4	Pyrene, 1,3-dimethyl-	12.917	83	680
227-86-1	Anthra(1,2-b)thiophene	13.010	98	923
239-35-0	Benzo[b]naphtho[2,1-d]thiophene	13.223	95	1041
34777-33-8	Benzo(c)carbazole	13.296	92	765
6418-47-9	Heneicosane, 3-methyl-	13.558	83	643
1705-84-6	Triphenylene, 2-methyl-	13.936	95	2050
3351-28-8	Chrysene, 1-methyl-	13.968	96	1163
50861-05-7	9H-Cyclopenta[a]pyrene	14.093	93	1942
192-97-2	Benzo[e]pyrene	15.032	96	5869
112-95-8	Eicosane	15.238	95	3426
215-58-7	Benzo[b]triphenylene	16.526	93	1301

Element Materials Technology

Job number: 19/9004 **Method:** SVOC
Sample number: 523 **Matrix:** Solid
Sample identity: GTCS 1-23 LAB FIELD DUPLIC
Sample depth: 0.00-0.05
Sample Type: Clayey Loam
Units: ug/kg

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
2531-84-2	Phenanthrene, 2-methyl-	10.812	95	386
832-69-9	Phenanthrene, 1-methyl-	10.831	97	692
610-48-0	Anthracene, 1-methyl-	10.878	97	473
203-64-5	4H-Cyclopenta[def]phenanthrene	10.906	93	1286
84-65-1	9,10-Anthracenedione	11.058	89	298
137235-51-9	1,2,4,8-Tetramethylbicyclo[6.3.0]undeca-2,4-diene	11.105	86	574
5737-13-3	Cyclopenta(def)phenanthrenone	11.407	83	696
2789-88-0	di-p-Tolylacetylene	11.464	89	258
77581-11-4	2,9-Dimethyl-2,3,4,5,6,7-hexahydro-1H-2-benzazonine	11.568	90	425
116196-83-9	4,4'-Bis(tetrahydrothiopyran)	11.615	95	1225
2435-53-2	Tetrachloro-o-benzoquinone	11.852	90	595
243-42-5	Benzo[b]naphtho[2,3-d]furan	11.918	90	933
33543-31-6	Fluoranthene, 2-methyl-	12.155	97	2325
243-17-4	11H-Benzo[b]fluorene	12.230	93	821
2381-21-7	Pyrene, 1-methyl-	12.277	96	678
64401-21-4	Pyrene, 1,3-dimethyl-	12.817	91	438
227-86-1	Anthra(1,2-b)thiophene	12.911	96	1213
479-79-8	11H-Benzo[a]fluoren-11-one	13.006	86	900
82979-72-4	8,9-Dihydro-7H-cyclopenta[a]pyrene	13.826	95	1728
198-55-0	Perylene	14.764	90	3330
192-97-2	Benzo[e]pyrene	14.933	98	15183

Job number: 19/9004 **Method:** VOC
Sample number: 526 **Matrix:** Solid
Sample identity: GTCS 1-24A
Sample depth: 0.00-0.05
Sample Type: Loam
Units: ug/kg

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
1120-21-4	Undecane	7.242	96	386

Element Materials Technology

Job number:	19/9004	**Method:**	**SVOC**
Sample number:	531	**Matrix:**	**Solid**
Sample identity:	GTCS 1-24A		
Sample depth:	0.00-0.05		
Sample Type:	Loam		
Units:	ug/kg		

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
832-69-9	Phenanthrene, 1-methyl-	10.831	92	200
2531-84-2	Phenanthrene, 2-methyl-	10.850	97	308
203-64-5	4H-Cyclopenta[def]phenanthrene	10.926	81	558
84-65-1	9,10-Anthracenedione	11.077	86	217
5737-13-3	Cyclopenta(def)phenanthrenone	11.436	80	303
116196-83-9	4,4'-Bis(tetrahydrothiopyran)	11.644	96	336
243-42-5	Benzo[b]naphtho[2,3-d]furan	11.937	93	412
33543-31-6	Fluoranthene, 2-methyl-	12.183	93	764
243-17-4	11H-Benzo[b]fluorene	12.259	93	316
2381-21-7	Pyrene, 1-methyl-	12.306	96	396
479-79-8	11H-Benzo[a]fluoren-11-one	12.770	95	296
227-86-1	Anthra(1,2-b)thiophene	12.940	96	620
34777-33-8	Benzo(c)carbazole	13.224	86	387
25732-74-5	Cyclopenta(cd)pyrene, 3,4-dihydro-	13.432	90	998
2541-69-7	Benz[a]anthracene, 7-methyl-	13.856	95	804
3351-32-4	2-Methylchrysene	13.896	94	503
191-30-0	1,2,9,10-Dibenzopyrene	14.445	92	1190
203-11-2	Indeno[1,2,3-fg]naphthacene	14.475	92	718
126848-01-9	3,5,6-Trimethyl-p-quinone, 2-(2,5-dioxotetrahydrofuran-3-yl)thio-	14.784	96	1963
198-55-0	Perylene	14.954	95	2798

Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/9004	2	GTCS 1-18 LAB DUPLICATE	0.00-0.05	469	07/06/2019	**Asbestos Fibres (2)**	Fibre Bundles
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos ACM (2)**	NAD
					07/06/2019	**Asbestos Type**	Chrysotile
					07/06/2019	**Asbestos Type (2)**	Amosite
					07/06/2019	**Asbestos Level Screen**	less than 0.1%
					25/06/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/06/2019	**Potentially Respirable Fibres per gram**	0
					26/06/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/06/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
19/9004	2	GTCS 1-18 FIELD DUPLICATE	0.00-0.05	477	07/06/2019	**General Description (Bulk Analysis)**	soil.stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	Fibre Bundles
					07/06/2019	**Asbestos Fibres (2)**	Fibre Bundles
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos ACM (2)**	NAD
					07/06/2019	**Asbestos Type**	Chrysotile
					07/06/2019	**Asbestos Type (2)**	Crocidolite
					07/06/2019	**Asbestos Level Screen**	less than 0.1%
					25/06/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/06/2019	**Potentially Respirable Fibres per gram**	86822
					26/06/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/06/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
19/9004	2	GTCS 1-18 LAB FIELD DUPLICATE	0.00-0.05	485	07/06/2019	**General Description (Bulk Analysis)**	soil-stones
					07/06/2019	**Synthetic/MMMF**	Present
					07/06/2019	**Asbestos Fibres**	Fibre Bundles
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos Type**	Chrysotile
					07/06/2019	**Asbestos Level Screen**	less than 0.1%
					25/06/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/06/2019	**Potentially Respirable Fibres per gram**	0
					26/06/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/06/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
19/9004	2	GTCS 1-23 PRIMARY SAMPLE	0.00-0.05	493	07/06/2019	**General Description (Bulk Analysis)**	soil-stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	NAD
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos Type**	NAD
					07/06/2019	**Asbestos Level Screen**	NAD
19/9004	2	GTCS 1-23 LAB DUPLICATE	0.00-0.05	509	07/06/2019	**General Description (Bulk Analysis)**	soil-stones
					07/06/2019	**Synthetic/MMMF**	Present
					07/06/2019	**Asbestos Fibres**	NAD
					07/06/2019	**Asbestos ACM**	NAD

Client Name: AECOM
Reference: 60595731
Location: Grenfell
Contact: David Dyson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/9004	2	GTCS 1-23 LAB DUPLICATE	0.00-0.05	509	07/06/2019	**Asbestos Type**	NAD
					07/06/2019	**Asbestos Level Screen**	NAD
19/9004	2	GTCS 1-23 FIELD DUPLICATE	0.00-0.05	517	07/06/2019	**General Description (Bulk Analysis)**	soil-stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	Fibre Bundles
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos Type**	Chrysotile
					07/06/2019	**Asbestos Level Screen**	less than 0.1%
					25/06/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/06/2019	**Potentially Respirable Fibres per gram**	0
					26/06/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/06/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
19/9004	2	GTCS 1-23 LAB FIELD DUPLICATE	0.00-0.05	525	07/06/2019	**General Description (Bulk Analysis)**	soil-stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	Fibre Bundles
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos Type**	Chrysotile
					07/06/2019	**Asbestos Level Screen**	less than 0.1%
					25/06/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					25/06/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/06/2019	**Potentially Respirable Fibres per gram**	0
					26/06/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/06/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
19/9004	2	GTCS 1-24A	0.00-0.05	533	07/06/2019	**General Description (Bulk Analysis)**	soil-stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	NAD
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos Type**	NAD
					07/06/2019	**Asbestos Level Screen**	NAD
19/9004	2	GTCS 1-19A	0.00-0.05	549	07/06/2019	**General Description (Bulk Analysis)**	soil-stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	NAD
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos Type**	NAD
					07/06/2019	**Asbestos Level Screen**	NAD
19/9004	2	GTCS 1-20A	0.00-0.05	565	07/06/2019	**General Description (Bulk Analysis)**	soil.stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	NAD
					07/06/2019	**Asbestos ACM**	NAD
					07/06/2019	**Asbestos Type**	NAD
					07/06/2019	**Asbestos Level Screen**	NAD
19/9004	2	GTCS 1-21A	0.00-0.05	581	07/06/2019	**General Description (Bulk Analysis)**	soil.stones
					07/06/2019	**Synthetic/MMMF**	Absent
					07/06/2019	**Asbestos Fibres**	NAD

Appendix G Generic Quantitative Risk Assessment Data Tables

							Location Code	GTCS2-S274A	GTCS2-S275A	GTCS2-S279A	GTCS2-S280A	TH101	TH101	TH101	TH102	TH102	TH102	TH102	TH103	TH103	TH103
							Depth Range	0-0.02	0-0.02	0-0.02	0-0.05	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4
							Date	05/11/2020	05/11/2020	05/11/2020	05/11/2020	26/11/2021	26/11/2021	26/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	26/11/2021	26/11/2021	26/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	turf	turf	turf	bare soil - disturbed	Partial turf	Partial turf	Partial turf	Bare soil	Bare soil	Bare soil	Bare soil	Partial turf	Partial turf	Partial turf
Chem_Group	**ChemName**	**output unit**	**EQL**	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900[#2]	**13[#2]**			0.12	0.1	<0.04	0.17	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	**6000[#2]**			0.24	0.18	0.13	0.17	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	**6000[#2]**			0.12	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	**4500[#2]**			0.12	<0.04	<0.04	<0.04	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	**1500[#2]**			2.12	0.97	1.09	0.96	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	**37000[#2]**			0.51	0.26	0.3	0.28	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	**1600[#2]**			4.95	3.04	3.82	2.74	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	**3800[#2]**			4.19	2.7	3.18	2.35	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	**15[#2]**			2.31	1.62	1.9	1.65	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	**32[#2]**			2.68	1.87	2.23	1.73	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	**3.2[#2]**			2.83	1.98	2.38	1.87	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	**46[#2]**			2.17	1.59	1.95	1.59	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	**0.32[#2]**			**0.42**	0.31	**0.4**	0.29	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	**360[#2]**			2.26	1.52	2.1	1.64	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	**4[#2]**			3.81	2.65	3.33	2.58	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	**110[#2]**			1.48	1.03	1.29	1.01	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					5.29	3.68	4.62	3.59	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					30.3	19.8	24.1	19	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	2.83	1.98	2.38	1.87	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	**40[#2]**			-	-	-	-	28	-	-	25.8	-	-	-	**68.9**	-	-
	Barium	mg/kg	1		**1300[#3]**			-	-	-	-	-	-	-	495	-	-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	**1.7[#2]**			-	-	-	-	-	-	-	**2.6**	-	-	-	-	-	-
	Boron	mg/kg	0.1	21000[#2]	**11000[#2]**			-	-	-	-	-	-	-	4.9	-	-	-	-	-	-
	Cadmium	mg/kg	0.1	120[#2]	**85[#2]**			-	-	-	-	0.5	-	-	0.7	-	-	-	3.2	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	-	-	-	89	-	-	75.9	-	-	-	88.2	-	-
	Copper	mg/kg	1	12000[#2]	**7100[#2]**			-	-	-	-	128	-	-	158	-	-	-	872	-	-
	Lead	mg/kg	5		**310[#5]**	630	310	**1168**	**992**	**1385**	**2216**	**650**	**441**	**559**	**668**	**676**	309	153	**2748**	**609**	**453**
	Mercury	mg/kg	0.1	120[#2]	**23156[#2]**			-	-	-	-	0.7	-	-	1.3	-	-	-	6.9	-	-
	Nickel	mg/kg	0.7	230[#2]	**180[#2]**			-	-	-	-	44	-	-	42.6	-	-	-	100.5	-	-
	Selenium	mg/kg	1	1100[#2]	**430[#2]**			-	-	-	-	<1	-	-	2	-	-	-	2	-	-
	Vanadium	mg/kg	1	2000[#2]	**1200[#2]**			-	-	-	-	-	-	-	81	-	-	-	-	-	-
	Zinc	mg/kg	5	81000[#2]	**40000[#2]**			-	-	-	-	360	-	-	446	-	-	-	2183	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					62	-	57	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					808	-	925	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					276	-	330	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					1296	-	1626	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-	-	No Asbestos Detected	-
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						Soil/Stone	Soil/Stone	Soil/Stone	soil/stones	soil/stone	-	-	soil	-	-	-	-	brick/soil	-
	Asbestos Containing Material	None						No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-	-	No Asbestos Detected	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Fibre bundles	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-	-	No Asbestos Detected	-

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH104	TH104	TH104	TH104	TH105	TH105	TH106	TH106	TH107	TH107	TH108	TH108	TH108	TH109
							Depth Range	0-0.05	0.3-0.4	0.6-0.7	1.1-1.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0-0.05
							Date	23/11/2021	23/11/2021	23/11/2021	23/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil
Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900[#2]	**13[#2]**			0.11	0.14	<0.04	<0.04	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	**6000[#2]**			0.4	0.26	<0.03	<0.03	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	**6000[#2]**			0.16	0.1	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	**4500[#2]**			0.14	0.11	<0.04	<0.04	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	**1500[#2]**			2.47	2.46	0.26	<0.03	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	**37000[#2]**			0.83	0.41	0.1	<0.04	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	**1600[#2]**			6.75	3.57	0.51	0.06	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	**3800[#2]**			5.8	2.85	0.43	0.06	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	**15[#2]**			3.26	1.16	0.26	<0.06	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	**32[#2]**			3.37	1.62	0.26	0.04	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	**3.2[#2]**			3.17	1.36	0.2	<0.04	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	**46[#2]**			2.77	1.2	0.15	<0.04	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	**0.32[#2]**			**0.49**	0.24	<0.04	<0.04	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	**360[#2]**			2.51	1.06	0.14	<0.04	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	**4[#2]**			**4.48**	1.88	0.27	<0.05	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	**110[#2]**			1.74	0.73	0.1	<0.02	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					6.22	2.61	0.37	<0.07	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					38.5	19.2	2.7	<0.6	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	**40[#2]**			33.2	30.7	14.2	16.9	-	-	-	-	-	-	-	29	-	**47.2**
	Barium	mg/kg	1		**1300[#3]**			760	411	125	119	-	-	-	-	-	-	-	974	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	**1.7[#2]**			**2.9**	**2.3**	**2.3**	**2.5**	-	-	-	-	-	-	-	**2.3**	-	-
	Boron	mg/kg	0.1	21000[#2]	**11000[#2]**			4.5	2.5	2.7	4.7	-	-	-	-	-	-	-	2.3	-	-
	Cadmium	mg/kg	0.1	120[#2]	**85[#2]**			1.1	0.4	0.1	<0.1	-	-	-	-	-	-	-	0.8	-	1
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			104.9	61.1	63.4	75.6	-	-	-	-	-	-	-	93.5	-	64.5
	Copper	mg/kg	1	12000[#2]	**7100[#2]**			230	167	45	38	-	-	-	-	-	-	-	192	-	402
	Lead	mg/kg	5		**310[#5]**	630	310	**1071**	**630**	150	**507**	**1326**	**2412**	**1381**	**1488**	**1307**	**1122**	**2871**	**18,960**	**20,630**	**1576**
	Mercury	mg/kg	0.1	120[#2]	**23156[#2]**			1.8	1.2	3.3	<0.1	-	-	-	-	-	-	-	1.5	-	2.3
	Nickel	mg/kg	0.7	230[#2]	**180[#2]**			44.1	31.5	40.4	51.6	-	-	-	-	-	-	-	38	-	55.4
	Selenium	mg/kg	1	1100[#2]	**430[#2]**			2	1	1	<1	-	-	-	-	-	-	-	<1	-	<1
	Vanadium	mg/kg	1	2000[#2]	**1200[#2]**			82	82	106	131	-	-	-	-	-	-	-	70	-	-
	Zinc	mg/kg	5	81000[#2]	**40000[#2]**			771	413	187	105	-	-	-	-	-	-	-	783	-	804
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	80
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						No Asbestos Detected	-	-	No Asbestos Detected	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						Soil/Stones	-	-	Soil/Stones	Soil/Stone	-	Soil/Stones	-	soil/stones	-	Soil/Stone	-	-	soil
	Asbestos Containing Material	None						No Asbestos Detected	-	-	No Asbestos Detected	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						No Asbestos Detected	-	-	No Asbestos Detected	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH109	TH109	TH110	TH110	TH110	TH110	TH111	TH111	TH112	TH112	TH113	TH113	TH114	TH114
							Depth Range	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2
							Date	26/11/2021	26/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	25/11/2021	25/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Bare soil	Bare soil	Partial turf	Partial turf	Partial turf	Partial turf	Turf	Turf	Turf	Turf	Turf	Turf	Partial turf	Partial turf
Chem_Group	**ChemName**	**output unit**	**EQL**	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900[#2]	**13[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	**6000[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	**6000[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	**4500[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	**1500[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	**37000[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	**1600[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	**3800[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	**15[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	**32[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	**3.2[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	**46[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	**0.32[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	**360[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	**4[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	**110[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	**40[#2]**			-	-	24	-	-	-	-	-	-	-	-	-	**59.5**	-
	Barium	mg/kg	1		**1300[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	1005	-
	Beryllium	mg/kg	0.5	2.2[#2]	**1.7[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	**5.1**	-
	Boron	mg/kg	0.1	21000[#2]	**11000[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	3.8	-
	Cadmium	mg/kg	0.1	120[#2]	**85[#2]**			-	-	0.6	-	-	-	-	-	-	-	-	-	1.5	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	-	87.4	-	-	-	-	-	-	-	-	-	88.3	-
	Copper	mg/kg	1	12000[#2]	**7100[#2]**			-	-	139	-	-	-	-	-	-	-	-	-	368	-
	Lead	mg/kg	5		**310[#5]**	630	310	**8259**	**2870**	**670**	**1418**	**991**	**483**	**1027**	**1273**	**1009**	**935**	**1270**	**3930**	**1556**	**1606**
	Mercury	mg/kg	0.1	120[#2]	**23156[#2]**			-	-	1	-	-	-	-	-	-	-	-	-	2.6	-
	Nickel	mg/kg	0.7	230[#2]	**180[#2]**			-	-	29.5	-	-	-	-	-	-	-	-	-	68.3	-
	Selenium	mg/kg	1	1100[#2]	**430[#2]**			-	-	1	-	-	-	-	-	-	-	-	-	2	-
	Vanadium	mg/kg	1	2000[#2]	**1200[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	95	-
	Zinc	mg/kg	5	81000[#2]	**40000[#2]**			-	-	547	-	-	-	-	-	-	-	-	-	1086	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					74	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	-	-	soil	-	-	soil	-	soil	-	soil/stones	-	Soil/Stone	-
	Asbestos Containing Material	None						-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
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Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH114	TH115	TH115	TH115	TH116	TH116	TH116	TH116	TH117	TH117	TH117	TH118	TH118	TH118
							Depth Range	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4
							Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Partial turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Partial turf	Partial turf	Partial turf	Bare soil	Bare soil	Bare soil
Chem_Group	**ChemName**	**output unit**	**EQL**	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900#2	**13#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000#2	**6000#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000#2	**6000#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900#2	**4500#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100#2	**1500#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000#2	**37000#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100#2	**1600#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400#2	**3800#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29#2	**15#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57#2	**32#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7#2	**3.2#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82#2	**46#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58#2	**0.32#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640#2	**360#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2#2	**4#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190#2	**110#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79#2	**40#2**			-	**69**	-	-	-	-	-	-	-	-	-	16.3	-	-
	Barium	mg/kg	1		**1300#3**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2#2	**1.7#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Boron	mg/kg	0.1	21000#2	**11000#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.1	120#2	**85#2**			-	1.5	-	-	-	-	-	-	-	-	-	2.3	-	-
	Chromium (III+VI)	mg/kg	0.5	910#2	910#2			-	84.7	-	-	-	-	-	-	-	-	-	62.2	-	-
	Copper	mg/kg	1	12000#2	**7100#2**			-	533	-	-	-	-	-	-	-	-	-	72	-	-
	Lead	mg/kg	5		**310#5**	630	310	**1612**	**1951**	**4102**	**1240**	**2103**	**1473**	**1407**	**1233**	**2148**	**3693**	**1253**	**342**	192	**550**
	Mercury	mg/kg	0.1	120#2	**23156#2**			-	2.7	-	-	-	-	-	-	-	-	-	0.3	-	-
	Nickel	mg/kg	0.7	230#2	**180#2**			-	81.9	-	-	-	-	-	-	-	-	-	21.4	-	-
	Selenium	mg/kg	1	1100#2	**430#2**			-	<1	-	-	-	-	-	-	-	-	-	1	-	-
	Vanadium	mg/kg	1	2000#2	**1200#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	81000#2	**40000#2**			-	974	-	-	-	-	-	-	-	-	-	258	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	Soil/Stones	-	-	Soil/Stone	-	-	-	Soil/Stones	-	-	soil	-	-
	Asbestos Containing Material	None						-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH118	TH119	TH119	TH119	TH120	TH120	TH120	TH121	TH121	TH121	TH121	TH122	TH122	TH122
							Depth Range	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4
							Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Partial turf	Partial turf	Partial turf	Partial turf	Partial turf	Partial turf	Partial turf
Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900#2	13#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000#2	6000#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000#2	6000#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900#2	4500#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100#2	1500#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000#2	37000#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100#2	1600#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400#2	3800#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29#2	15#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57#2	32#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7#2	3.2#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82#2	46#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58#2	0.32#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640#2	360#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2#2	4#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190#2	110#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79#2	40#2			-	-	**64.5**	-	-	-	-	**40.9**	-	-	-	**53.9**	-	-
	Barium	mg/kg	1		1300#3			-	-	**1361**	-	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2#2	1.7#2			-	-	**4.9**	-	-	-	-	-	-	-	-	-	-	-
	Boron	mg/kg	0.1	21000#2	11000#2			-	-	4.1	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.1	120#2	85#2			-	-	1.6	-	-	-	-	1.1	-	-	-	1.2	-	-
	Chromium (III+VI)	mg/kg	0.5	910#2	910#2			-	-	120.7	-	-	-	-	76.1	-	-	-	79.1	-	-
	Copper	mg/kg	1	12000#2	7100#2			-	-	594	-	-	-	-	295	-	-	-	466	-	-
	Lead	mg/kg	5		310#5	630	310	**456**	**1843**	**2174**	**2069**	**1065**	**2763**	**1204**	**1214**	**818**	**660**	**1027**	**1549**	**1346**	**638**
	Mercury	mg/kg	0.1	120#2	23156#2			-	-	2.6	-	-	-	-	1.7	-	-	-	3	-	-
	Nickel	mg/kg	0.7	230#2	180#2			-	-	85.1	-	-	-	-	52.9	-	-	-	64.2	-	-
	Selenium	mg/kg	1	1100#2	430#2			-	-	1	-	-	-	-	2	-	-	-	<1	-	-
	Vanadium	mg/kg	1	2000#2	1200#2			-	-	97	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	81000#2	40000#2			-	-	1163	-	-	-	-	739	-	-	-	880	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	72	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	No Asbestos Detected	-	-	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	-	-
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	Soil/Stone	-	-	-	-	Soil/Stones	Soil/Stones	-	-	-	soil	-	-
	Asbestos Containing Material	None						-	No Asbestos Detected	-	-	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	No Asbestos Detected	-	-	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	-	-

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
-: Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH123	TH123	TH124	TH124	TH125	TH125	TH125	TH126	TH126	TH127	TH127	TH128	TH128	TH129
							Depth Range	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05
							Date	24/11/2021	24/11/2021	26/11/2021	26/11/2021	25/11/2021	25/11/2021	25/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	24/11/2021	24/11/2021	26/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Partial turf	Partial turf	Bare soil	Bare soil	Turf	Turf	Turf	Bare soil	Bare soil	Turf	Turf	Bare soil	Bare soil	Partial turf
Chem_Group	**ChemName**	**output unit**	**EQL**	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900[#2]	**13[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	**6000[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	**6000[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	**4500[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	**1500[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	**37000[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	**1600[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	**3800[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	**15[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	**32[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	**3.2[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	**46[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	**0.32[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	**360[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	**4[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	**110[#2]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	**40[#2]**			-	-	-	-	-	-	-	-	-	-	-	28.3	-	-
	Barium	mg/kg	1		**1300[#3]**			-	-	-	-	-	-	-	-	-	-	-	440	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	**1.7[#2]**			-	-	-	-	-	-	-	-	-	-	-	**2.4**	-	-
	Boron	mg/kg	0.1	21000[#2]	**11000[#2]**			-	-	-	-	-	-	-	-	-	-	-	10.9	-	-
	Cadmium	mg/kg	0.1	120[#2]	**85[#2]**			-	-	-	-	-	-	-	-	-	-	-	1.2	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	-	-	-	-	-	-	-	-	-	-	84.3	-	-
	Copper	mg/kg	1	12000[#2]	**7100[#2]**			-	-	-	-	-	-	-	-	-	-	-	292	-	-
	Lead	mg/kg	5		**310[#5]**	630	310	**999**	**1100**	**1399**	**1508**	**6230**	**1535**	**854**	**2136**	**1722**	**1754**	**1212**	**758**	**661**	**1557**
	Mercury	mg/kg	0.1	120[#2]	**23156[#2]**			-	-	-	-	-	-	-	-	-	-	-	5	-	-
	Nickel	mg/kg	0.7	230[#2]	**180[#2]**			-	-	-	-	-	-	-	-	-	-	-	38.7	-	-
	Selenium	mg/kg	1	1100[#2]	**430[#2]**			-	-	-	-	-	-	-	-	-	-	-	1	-	-
	Vanadium	mg/kg	1	2000[#2]	**1200[#2]**			-	-	-	-	-	-	-	-	-	-	-	58	-	-
	Zinc	mg/kg	5	81000[#2]	**40000[#2]**			-	-	-	-	-	-	-	-	-	-	-	635	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						soil	-	soil	-	Soil/Stones	-	-	soil	-	Soil/Stones	-	soil	-	soil
	Asbestos Containing Material	None						No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead	TH129	TH130	TH130	TH130	TH130	TH131	TH131	TH132	TH132	TH133	TH133	TH134	TH134	TH134
							Depth Range	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4
							Date	26/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	25/11/2021	25/11/2021	25/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Partial turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil
PAH	Naphthalene	mg/kg	0.03	4900#2	13#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000#2	6000#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000#2	6000#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900#2	4500#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100#2	1500#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000#2	37000#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100#2	1600#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400#2	3800#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29#2	15#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57#2	32#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7#2	3.2#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82#2	46#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58#2	0.32#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640#2	360#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2#2	4#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190#2	110#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79#2	40#2			-	**81.3**	-	-	-	-	-	-	-	-	-	-	-	-
	Barium	mg/kg	1		1300#3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2#2	1.7#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Boron	mg/kg	0.1	21000#2	11000#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.1	120#2	85#2			-	1.5	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (III+VI)	mg/kg	0.5	910#2	910#2			-	93.9	-	-	-	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	1	12000#2	7100#2			-	594	-	-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	5		310#5	630	310	**4405**	**1774**	**2307**	**526**	**575**	**1893**	**1831**	**1692**	**4638**	**1736**	**1876**	**717**	**1081**	**1649**
	Mercury	mg/kg	0.1	120#2	23156#2			-	3.1	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	0.7	230#2	180#2			-	77.8	-	-	-	-	-	-	-	-	-	-	-	-
	Selenium	mg/kg	1	1100#2	430#2			-	4	-	-	-	-	-	-	-	-	-	-	-	-
	Vanadium	mg/kg	1	2000#2	1200#2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	81000#2	40000#2			-	1358	-	-	-	-	-	-	-	-	-	-	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	-	-	-	Chrysotile	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	-	-	-	Soil/Stones	soil	-	soil	-	Soil/Stones	-	soil	-	-
	Asbestos Containing Material	None						-	-	-	-	No Asbestos Detected	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	-	-	-	Fibre Bundles	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH134	TH135	TH135	TH136	TH136	TH137	TH137	TH138	TH138	TH139	TH139	TH140	TH140	TH141
							Depth Range	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05
							Date	25/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Bare soil	Bare soil	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil
Chem_Group	**ChemName**	**output unit**	**EQL**	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900#2	**13#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000#2	**6000#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000#2	**6000#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900#2	**4500#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100#2	**1500#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000#2	**37000#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100#2	**1600#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400#2	**3800#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29#2	**15#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57#2	**32#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7#2	**3.2#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82#2	**46#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58#2	**0.32#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640#2	**360#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2#2	**4#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190#2	**110#2**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79#2	**40#2**			-	-	-	-	-	-	**109.8**	-	-	-	-	-	-	32.9
	Barium	mg/kg	1		**1300#3**			-	-	-	-	-	-	**2009**	-	-	-	-	-	-	389
	Beryllium	mg/kg	0.5	2.2#2	**1.7#2**			-	-	-	-	-	-	**9.8**	-	-	-	-	-	-	**2**
	Boron	mg/kg	0.1	21000#2	**11000#2**			-	-	-	-	-	-	5.6	-	-	-	-	-	-	5.7
	Cadmium	mg/kg	0.1	120#2	**85#2**			-	-	-	-	-	-	1.7	-	-	-	-	-	-	0.7
	Chromium (III+VI)	mg/kg	0.5	910#2	910#2			-	-	-	-	-	-	94.3	-	-	-	-	-	-	60
	Copper	mg/kg	1	12000#2	**7100#2**			-	-	-	-	-	-	1061	-	-	-	-	-	-	198
	Lead	mg/kg	5		**310#5**	630	310	**541**	**947**	**994**	**1615**	**3644**	**2766**	**3774**	**1834**	**5942**	**1353**	**1135**	**1398**	**3172**	**584**
	Mercury	mg/kg	0.1	120#2	**23156#2**			-	-	-	-	-	-	4.8	-	-	-	-	-	-	0.9
	Nickel	mg/kg	0.7	230#2	**180#2**			-	-	-	-	-	-	120.4	-	-	-	-	-	-	32.6
	Selenium	mg/kg	1	1100#2	**430#2**			-	-	-	-	-	-	2	-	-	-	-	-	-	1
	Vanadium	mg/kg	1	2000#2	**1200#2**			-	-	-	-	-	-	125	-	-	-	-	-	-	47
	Zinc	mg/kg	5	81000#2	**40000#2**			-	-	-	-	-	-	1648	-	-	-	-	-	-	440
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	Amosite
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	soil	-	soil/stones	-	Soil/Stone	-	soil/stones	-	Soil/Stones	-	soil/stones	-	soil
	Asbestos Containing Material	None						-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001
	Asbestos fibres	-						-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	Fibre Bundles

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH141	TH142	TH142	TH142	TH143	TH143	TH144	TH144	TH145	TH145	TH145	TH146	TH146	TH147
							Depth Range	0.1-0.2	0-0.05	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0-0.05
							Date	24/11/2021	23/11/2021	23/11/2021	23/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	25/11/2021	25/11/2021	25/11/2021	24/11/2021	24/11/2021	24/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil
				GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
Chem_Group	**ChemName**	**output unit**	**EQL**																		
PAH	Naphthalene	mg/kg	0.03	4900#2	13#2			-	0.21	0.07	0.35	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000#2	6000#2			-	0.49	0.18	0.33	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000#2	6000#2			-	<0.05	0.2	0.62	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900#2	4500#2			-	0.07	0.14	0.46	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100#2	1500#2			-	1.29	2.25	4.84	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000#2	37000#2			-	0.62	0.69	1.39	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100#2	1600#2			-	3.05	4.37	7.06	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400#2	3800#2			-	2.59	3.48	5.6	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29#2	15#2			-	1.66	1.99	3.18	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57#2	32#2			-	1.89	2.07	3.18	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7#2	3.2#2			-	1.96	1.79	2.85	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82#2	46#2			-	2.18	1.54	2.29	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58#2	0.32#2			-	**0.49**	**0.33**	**0.45**	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640#2	360#2			-	2.25	1.32	1.96	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2#2	4#2			-	2.79	2.47	3.85	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190#2	110#2			-	1.09	0.96	1.5	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	3.88	3.43	5.35	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	22.6	23.9	39.9	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79#2	40#2			-	**89.8**	32.9	30	-	-	-	-	**49.7**	-	-	-	-	-
	Barium	mg/kg	1		1300#3			-	**1654**	484	320	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2#2	1.7#2			-	**8.2**	**2.4**	**2.3**	-	-	-	-	-	-	-	-	-	-
	Boron	mg/kg	0.1	21000#2	11000#2			-	5.9	2.4	2.4	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.1	120#2	85#2			-	2	0.4	0.6	-	-	-	-	1.3	-	-	-	-	-
	Chromium (III+VI)	mg/kg	0.5	910#2	910#2			-	135	64.7	40.6	-	-	-	-	74.5	-	-	-	-	-
	Copper	mg/kg	1	12000#2	7100#2			-	934	169	272	-	-	-	-	484	-	-	-	-	-
	Lead	mg/kg	5		310#5	630	310	**649**	**3996**	**634**	**685**	**1357**	**1616**	**1059**	**596**	**1476**	**1766**	**2841**	**1358**	**1751**	**1432**
	Mercury	mg/kg	0.1	120#2	23156#2			-	5.1	0.7	0.9	-	-	-	-	2.2	-	-	-	-	-
	Nickel	mg/kg	0.7	230#2	180#2			-	99.6	39.9	30.5	-	-	-	-	62.6	-	-	-	-	-
	Selenium	mg/kg	1	1100#2	430#2			-	2	2	<1	-	-	-	-	3	-	-	-	-	-
	Vanadium	mg/kg	1	2000#2	1200#2			-	112	65	64	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	81000#2	40000#2			-	1668	483	387	-	-	-	-	1177	-	-	-	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	Chrysotile	-	-	No Asbestos Detected	-	No Asbestos Detected
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	-	Soil/Stone	-	Soil/Stone	-	soil	-	Soil/Stone	-	-	soil	-	Soil/Stones
	Asbestos Containing Material	None						-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
	Asbestos fibres	-						-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	Fibre Bundles	-	-	No Asbestos Detected	-	No Asbestos Detected

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead	TH147	TH148	TH148	TH149	TH149	TH150	TH150	TH151	TH151	TH152	TH152	TH153	TH153	TH154
							Depth Range	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05
							Date	24/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	22/11/2021	22/11/2021	23/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf	Turf
PAH	Naphthalene	mg/kg	0.03	4900[#2]	13[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	6000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	6000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	4500[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	1500[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	37000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	1600[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	3800[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	15[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	32[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	3.2[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	46[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	0.32[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	360[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	4[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	110[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	40[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Barium	mg/kg	1		1300[#3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	1.7[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Boron	mg/kg	0.1	21000[#2]	11000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.1	120[#2]	85[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	1	12000[#2]	7100[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	5		310[#5]	630	310	2107	1678	2031	1327	1920	1921	2434	1001	1239	926	3101	1693	3752	1415
	Mercury	mg/kg	0.1	120[#2]	23156[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	0.7	230[#2]	180[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Selenium	mg/kg	1	1100[#2]	430[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vanadium	mg/kg	1	2000[#2]	1200[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	81000[#2]	40000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	No Asbestos Detected	-	Chrysotile	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	Soil/Stones	-	Soil/Stone	-	Soil/Stones	-	soil	-	soil	-	Soil/Stones	-	Soil/Stones
	Asbestos Containing Material	None						-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	No Asbestos Detected	-	Fibre Bundles	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH154	TH155	TH155	TH156	TH156	TH156	TH156	TH157	TH157	TH158	TH158	TH159	TH159	TH160
							Depth Range	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05
							Date	23/11/2021	22/11/2021	22/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf	Turf	Turf	Partial turf	Partial turf	Turf
Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900[#2]	13[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	6000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	6000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	4500[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	1500[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	37000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	1600[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	3800[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	15[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	32[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	3.2[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	46[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	0.32[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	360[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	4[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	110[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	40[#2]			-	-	**77**	-	-	-	-	-	-	-	-	**40.6**	-	-
	Barium	mg/kg	1		1300[#3]			-	-	**1500**	-	-	-	-	-	-	-	-	1215	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	1.7[#2]			-	-	**7.4**	-	-	-	-	-	-	-	-	**4**	-	-
	Boron	mg/kg	0.1	21000[#2]	11000[#2]			-	-	4.8	-	-	-	-	-	-	-	-	11.5	-	-
	Cadmium	mg/kg	0.1	120[#2]	85[#2]			-	-	1.7	-	-	-	-	-	-	-	-	1.6	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	-	95.4	-	-	-	-	-	-	-	-	171	-	-
	Copper	mg/kg	1	12000[#2]	7100[#2]			-	-	751	-	-	-	-	-	-	-	-	351	-	-
	Lead	mg/kg	5		310[#5]	630	310	2119	1485	3623	6029	2049	1095	903	1271	995	1785	1738	1591	1700	1580
	Mercury	mg/kg	0.1	120[#2]	23156[#2]			-	-	3.2	-	-	-	-	-	-	-	-	1.9	-	-
	Nickel	mg/kg	0.7	230[#2]	180[#2]			-	-	88.3	-	-	-	-	-	-	-	-	57.3	-	-
	Selenium	mg/kg	1	1100[#2]	430[#2]			-	-	1	-	-	-	-	-	-	-	-	2	-	-
	Vanadium	mg/kg	1	2000[#2]	1200[#2]			-	-	105	-	-	-	-	-	-	-	-	77	-	-
	Zinc	mg/kg	5	81000[#2]	40000[#2]			-	-	1350	-	-	-	-	-	-	-	-	944	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	80	60	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	Soil/Stones	-	-	Soil/Stone	-	-	Soil/Stones	-	soil	-	Soil/Stones	-	soil
	Asbestos Containing Material	None						-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH160	TH161	TH161	TH161	TH162	TH162	TH162	TH163	TH163	TH164	TH164	TH165	TH165	TH166
							Depth Range	0.1-0.2	0-0.05	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05
							Date	22/11/2021	23/11/2021	23/11/2021	23/11/2021	25/11/2021	25/11/2021	25/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf	Turf
Chem_Group	**ChemName**	**output unit**	**EQL**	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900[#2]	**13[#2]**			-	0.16	0.05	0.11	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	**6000[#2]**			-	0.27	0.29	0.4	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	**6000[#2]**			-	<0.05	0.06	0.16	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	**4500[#2]**			-	<0.04	0.05	0.21	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	**1500[#2]**			-	0.93	0.9	3.02	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	**37000[#2]**			-	0.37	0.44	0.93	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	**1600[#2]**			-	2.96	3.17	5.1	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	**3800[#2]**			-	2.68	2.84	4.19	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	**15[#2]**			-	1.66	2.43	2.47	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	**32[#2]**			-	1.74	2.42	2.29	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	**3.2[#2]**			-	1.92	2.32	2.18	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	**46[#2]**			-	1.89	2.19	1.83	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	**0.32[#2]**			-	0.3	**0.48**	**0.35**	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	**360[#2]**			-	1.54	1.68	1.48	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	**4[#2]**			-	2.62	3.33	2.89	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	**110[#2]**			-	1.02	1.29	1.12	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	3.64	4.62	4.01	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	20.1	23.9	28.7	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	**40[#2]**			-	**52.9**	39.9	31.3	**42.5**	-	-	-	-	-	39.5	-	-	-
	Barium	mg/kg	1		**1300[#3]**			-	1149	681	452	-	-	-	-	-	-	676	-	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	**1.7[#2]**			-	**5.1**	**3.7**	**2.9**	-	-	-	-	-	-	**3.5**	-	-	-
	Boron	mg/kg	0.1	21000[#2]	**11000[#2]**			-	5.9	2.7	2.1	-	-	-	-	-	-	6.4	-	-	-
	Cadmium	mg/kg	0.1	120[#2]	**85[#2]**			-	1.4	0.8	0.5	1.3	-	-	-	-	-	0.9	-	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	58.3	67.8	45.4	73.4	-	-	-	-	-	69.5	-	-	-
	Copper	mg/kg	1	12000[#2]	**7100[#2]**			-	471	287	196	390	-	-	-	-	-	334	-	-	-
	Lead	mg/kg	5		**310[#5]**	630	310	**3168**	**1941**	**1189**	**715**	**1411**	**6245**	**1090**	**1068**	**1329**	**925**	**1005**	**1489**	**38,490**	**1311**
	Mercury	mg/kg	0.1	120[#2]	**23156[#2]**			-	2.4	1.4	1.1	1.6	-	-	-	-	-	1.6	-	-	-
	Nickel	mg/kg	0.7	230[#2]	**180[#2]**			-	67.1	53.8	39.2	58.9	-	-	-	-	-	47.5	-	-	-
	Selenium	mg/kg	1	1100[#2]	**430[#2]**			-	<1	1	<1	<1	-	-	-	-	-	2	-	-	-
	Vanadium	mg/kg	1	2000[#2]	**1200[#2]**			-	85	84	70	-	-	-	-	-	-	70	-	-	-
	Zinc	mg/kg	5	81000[#2]	**40000[#2]**			-	1141	777	421	840	-	-	-	-	-	646	-	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	No Asbestos Detected	-	-	Chrysotile	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	Soil/Stones	-	-	Soil/Stones	-	-	Soil/Stones	-	soil	-	Soil/Stones	-	soil
	Asbestos Containing Material	None						-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	No Asbestos Detected	-	-	Fibre Bundles	-	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH166	TH167	TH167	TH167	TH167	TH168	TH168	TH169	TH169	TH169	TH170	TH170	TH170	TH171
							Depth Range	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.3-0.4	0.6-0.7	0-0.05
							Date	22/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	22/11/2021	22/11/2021	25/11/2021	25/11/2021	25/11/2021	23/11/2021	23/11/2021	23/11/2021	26/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Partial turf	Partial turf	Partial turf	Bare soil	Bare soil	Bare soil	Turf
				GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
Chem_Group	**ChemName**	**output unit**	**EQL**																		
PAH	Naphthalene	mg/kg	0.03	4900[#2]	**13[#2]**			-	-	-	-	-	-	-	-	-	-	0.12	0.09	0.26	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	**6000[#2]**			-	-	-	-	-	-	-	-	-	-	0.24	0.19	0.9	-
	Acenaphthene	mg/kg	0.05	15000[#2]	**6000[#2]**			-	-	-	-	-	-	-	-	-	-	<0.05	0.06	0.31	-
	Fluorene	mg/kg	0.04	9900[#2]	**4500[#2]**			-	-	-	-	-	-	-	-	-	-	<0.04	0.06	0.34	-
	Phenanthrene	mg/kg	0.03	3100[#2]	**1500[#2]**			-	-	-	-	-	-	-	-	-	-	0.5	1.21	5.39	-
	Anthracene	mg/kg	0.04	74000[#2]	**37000[#2]**			-	-	-	-	-	-	-	-	-	-	0.28	0.42	2.06	-
	Fluoranthene	mg/kg	0.03	3100[#2]	**1600[#2]**			-	-	-	-	-	-	-	-	-	-	1.49	3.31	11.84	-
	Pyrene	mg/kg	0.03	7400[#2]	**3800[#2]**			-	-	-	-	-	-	-	-	-	-	1.34	2.79	9.79	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	**15[#2]**			-	-	-	-	-	-	-	-	-	-	0.86	1.56	5.68	-
	Chrysene	mg/kg	0.02	57[#2]	**32[#2]**			-	-	-	-	-	-	-	-	-	-	1.04	1.67	5.53	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	**3.2[#2]**			-	-	-	-	-	-	-	-	-	-	1.06	1.51	**5**	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	**46[#2]**			-	-	-	-	-	-	-	-	-	-	1.16	1.29	4.37	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	**0.32[#2]**			-	-	-	-	-	-	-	-	-	-	0.19	0.25	**0.88**	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	**360[#2]**			-	-	-	-	-	-	-	-	-	-	1.08	1.14	4.01	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	**4[#2]**			-	-	-	-	-	-	-	-	-	-	1.53	2.04	**6.93**	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	**110[#2]**			-	-	-	-	-	-	-	-	-	-	0.59	0.79	2.69	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	2.12	2.83	9.62	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	11.5	18.4	66	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	**40[#2]**			-	21.8	-	-	-	-	-	**48.5**	-	-	**44.6**	35.2	21	-
	Barium	mg/kg	1		**1300[#3]**			-	-	-	-	-	-	-	-	-	-	803	490	442	-
	Beryllium	mg/kg	0.5	2.2[#2]	**1.7[#2]**			-	-	-	-	-	-	-	-	-	-	**3.5**	**2.6**	**4.8**	-
	Boron	mg/kg	0.1	21000[#2]	**11000[#2]**			-	-	-	-	-	-	-	-	-	-	3	1.7	2.4	-
	Cadmium	mg/kg	0.1	120[#2]	**85[#2]**			-	0.8	-	-	-	-	-	1.5	-	-	1	1.2	0.3	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	82.1	-	-	-	-	-	85.2	-	-	58.9	58.1	51.3	-
	Copper	mg/kg	1	12000[#2]	**7100[#2]**			-	189	-	-	-	-	-	548	-	-	318	187	60	-
	Lead	mg/kg	5		**310[#5]**	630	310	**1997**	**677**	**2229**	**451**	**469**	233	148	**3649**	**1643**	**1200**	**1315**	**785**	**364**	**1169**
	Mercury	mg/kg	0.1	120[#2]	**23156[#2]**			-	0.6	-	-	-	-	-	5.5	-	-	2.7	1.2	0.9	-
	Nickel	mg/kg	0.7	230[#2]	**180[#2]**			-	47.5	-	-	-	-	-	64.7	-	-	53.3	39.5	14.8	-
	Selenium	mg/kg	1	1100[#2]	**430[#2]**			-	<1	-	-	-	-	-	2	-	-	1	<1	<1	-
	Vanadium	mg/kg	1	2000[#2]	**1200[#2]**			-	-	-	-	-	-	-	-	-	-	71	72	111	-
	Zinc	mg/kg	5	81000[#2]	**40000[#2]**			-	630	-	-	-	-	-	1130	-	-	821	471	230	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	68	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	-	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	Chrysotile	-	-	-
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	-	-	-	Soil/Stone	Soil/Stones	-	-	-	Soil/Stone	Soil/Stone	-	-	-
	Asbestos Containing Material	None						-	-	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-
	Asbestos fibres	-						-	-	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	Fibre Bundles	-	-	-

Comments
GAC: Generic Assessment Criteria
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate
HH: Human Health

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

							Location Code	TH172	TH173	TH174	TH175	TH176	TH177	TH178	TH179	TH180	TH181	TH182	TH183	TH184	TH185
							Depth Range	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
							Date	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Turf	Turf	Partial turf	Turf	Partial turf	Turf	Turf	Turf	Turf	Partial turf	Partial turf	Partial turf	Partial turf	Partial turf
Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead														
PAH	Naphthalene	mg/kg	0.03	4900[#2]	13[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	6000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	6000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	4500[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	1500[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	37000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	1600[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	3800[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	15[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	32[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	3.2[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	46[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	0.32[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	360[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	4[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	110[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	40[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Barium	mg/kg	1		1300[#3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	1.7[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Boron	mg/kg	0.1	21000[#2]	11000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.1	120[#2]	85[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	1	12000[#2]	7100[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	5		310[#5]	630	310	1260	1515	1422	1883	1525	1752	754	1394	1349	426	481	460	1042	1099
	Mercury	mg/kg	0.1	120[#2]	23156[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	mg/kg	0.7	230[#2]	180[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Selenium	mg/kg	1	1100[#2]	430[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vanadium	mg/kg	1	2000[#2]	1200[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	81000[#2]	40000[#2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Level	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Containing Material	None						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-						-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments
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 - : Not analysed
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Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE
#5:Defra C4SL 12/2014

Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead					
							Location Code	TH186	TH187	TH188	TH189	TH190
							Depth Range	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
							Date	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
							Monitoring Zone	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House	28. Treadgold House
							Soil Cover	Partial turf	Partial turf	Turf	Turf	Turf
PAH	Naphthalene	mg/kg	0.03	4900[#2]	**13[#2]**			-	-	-	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]	**6000[#2]**			-	-	-	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]	**6000[#2]**			-	-	-	-	-
	Fluorene	mg/kg	0.04	9900[#2]	**4500[#2]**			-	-	-	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]	**1500[#2]**			-	-	-	-	-
	Anthracene	mg/kg	0.04	74000[#2]	**37000[#2]**			-	-	-	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]	**1600[#2]**			-	-	-	-	-
	Pyrene	mg/kg	0.03	7400[#2]	**3800[#2]**			-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]	**15[#2]**			-	-	-	-	-
	Chrysene	mg/kg	0.02	57[#2]	**32[#2]**			-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	**3.2[#2]**			-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	**46[#2]**			-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	**0.32[#2]**			-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	**360[#2]**			-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	**4[#2]**			-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	**110[#2]**			-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					-	-	-	-	-
	PAH 16 Total	mg/kg	0.6					-	-	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	-	-	-	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]	**40[#2]**			-	-	-	-	-
	Barium	mg/kg	1		**1300[#3]**			-	-	-	-	-
	Beryllium	mg/kg	0.5	2.2[#2]	**1.7[#2]**			-	-	-	-	-
	Boron	mg/kg	0.1	21000[#2]	**11000[#2]**			-	-	-	-	-
	Cadmium	mg/kg	0.1	120[#2]	**85[#2]**			-	-	-	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			-	-	-	-	-
	Copper	mg/kg	1	12000[#2]	**7100[#2]**			-	-	-	-	-
	Lead	mg/kg	5		**310[#5]**	630	310	**1651**	**1283**	**1414**	**1556**	**340**
	Mercury	mg/kg	0.1	120[#2]	**23156[#2]**			-	-	-	-	-
	Nickel	mg/kg	0.7	230[#2]	**180[#2]**			-	-	-	-	-
	Selenium	mg/kg	1	1100[#2]	**430[#2]**			-	-	-	-	-
	Vanadium	mg/kg	1	2000[#2]	**1200[#2]**			-	-	-	-	-
	Zinc	mg/kg	5	81000[#2]	**40000[#2]**			-	-	-	-	-
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					-	-	-	-	-
	Bioaccessible Lead – stomach	mg/kg	5					-	-	-	-	-
	Bioaccessible Lead – stomach and intestine	mg/kg	5					-	-	-	-	-
	Lead – total (BARGE method)	mg/kg	5					-	-	-	-	-
Asbestos	Asbestos Type	None						-	-	-	-	-
	Asbestos Level	None						-	-	-	-	-
	General Description (Bulk Analysis)	None						-	-	-	-	-
	Asbestos Containing Material	None						-	-	-	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0					-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0					-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					-	-	-	-	-
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					-	-	-	-	-
	Asbestos fibres	-						-	-	-	-	-

Comments
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							Location Code						
							Depth Range						
							Date						
							Monitoring Zone						
							Soil Cover						
				GAC_HH_POS_RES_SLOAM_>3.48%TOC	GAC_HH_RES-PL_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_TH_POSresi_lead	EN_AECOM_RBKCGrenfell_GSC_TH_Resi-HP_lead						
Chem_Group	**ChemName**	**output unit**	**EQL**					Minimum	Minimum	Maximum	Maximum	Average	Median
PAH	Naphthalene	mg/kg	0.03	4900[#2]	13[#2]			<0.04	0.05	0.35	0.35	0.12	0.11
	Acenaphthylene	mg/kg	0.03	15000[#2]	6000[#2]			<0.03	0.13	0.9	0.9	0.28	0.24
	Acenaphthene	mg/kg	0.05	15000[#2]	6000[#2]			<0.05	0.06	0.62	0.62	0.12	0.06
	Fluorene	mg/kg	0.04	9900[#2]	4500[#2]			<0.04	0.05	0.46	0.46	0.11	0.06
	Phenanthrene	mg/kg	0.03	3100[#2]	1500[#2]			<0.03	0.26	5.39	5.39	1.8	1.21
	Anthracene	mg/kg	0.04	74000[#2]	37000[#2]			<0.04	0.1	2.06	2.06	0.58	0.42
	Fluoranthene	mg/kg	0.03	3100[#2]	1600[#2]			0.06	0.06	11.84	11.84	4	3.31
	Pyrene	mg/kg	0.03	7400[#2]	3800[#2]			0.06	0.06	9.79	9.79	3.3	2.84
	Benz(a)anthracene	mg/kg	0.06	29[#2]	15[#2]			<0.06	0.26	5.68	5.68	2	1.66
	Chrysene	mg/kg	0.02	57[#2]	32[#2]			0.04	0.04	5.53	5.53	2.1	1.89
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]	3.2[#2]			<0.04	0.2	5	5	2	1.96
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]	46[#2]			<0.04	0.15	4.37	4.37	1.8	1.83
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]	0.32[#2]			<0.04	0.19	0.88	0.88	0.35	0.33
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]	360[#2]			<0.04	0.14	4.01	4.01	1.6	1.54
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]	4[#2]			<0.05	0.27	6.93	6.93	2.8	2.65
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]	110[#2]			<0.02	0.1	2.69	2.69	1.1	1.03
	Benzo(b)&(k)fluoranthene	mg/kg	0.07					<0.07	0.37	9.62	9.62	3.9	3.68
	PAH 16 Total	mg/kg	0.6					<0.6	2.7	66	66	24	22.6
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg				10	5.6	1.87	1.87	2.83	2.83	2.3	2.18
Metals	Arsenic	mg/kg	0.5	79[#2]	40[#2]			14.2	14.2	109.8	109.8	44	39.7
	Barium	mg/kg	1		1300[#3]			119	119	2009	2009	781	676
	Beryllium	mg/kg	0.5	2.2[#2]	1.7[#2]			2	2	9.8	9.8	3.9	2.9
	Boron	mg/kg	0.1	21000[#2]	11000[#2]			1.7	1.7	11.5	11.5	4.5	4.1
	Cadmium	mg/kg	0.1	120[#2]	85[#2]			<0.1	0.1	3.2	3.2	1.1	1.1
	Chromium (III+VI)	mg/kg	0.5	910[#2]	910[#2]			40.6	40.6	171	171	80	76
	Copper	mg/kg	1	12000[#2]	7100[#2]			38	38	1061	1061	355	293.5
	Lead	mg/kg	5		310[#5]	630	310	148	148	38490	38490	1959	1381
	Mercury	mg/kg	0.1	120[#2]	23156[#2]			<0.1	0.3	6.9	6.9	2.2	1.75
	Nickel	mg/kg	0.7	230[#2]	180[#2]			14.8	14.8	120.4	120.4	55	52.25
	Selenium	mg/kg	1	1100[#2]	430[#2]			<1	1	4	4	1.3	1
	Vanadium	mg/kg	1	2000[#2]	1200[#2]			47	47	131	131	85	82
	Zinc	mg/kg	5	81000[#2]	40000[#2]			105	105	2183	2183	803	774
Bioaccessible Metals	Bioaccessible Fraction (BAF) - Lead	percent	0					57	57	80	80	69	70
	Bioaccessible Lead – stomach	mg/kg	5					808	808	925	925		866.5
	Bioaccessible Lead – stomach and intestine	mg/kg	5					276	276	330	330		303
	Lead – total (BARGE method)	mg/kg	5					1296	1296	1626	1626		1461
Asbestos	Asbestos Type	None						99999	ND	0	ND		
	Asbestos Level	None						99999	ND	0	ND		
	General Description (Bulk Analysis)	None						99999	ND	0	ND		
	Asbestos Containing Material	None						99999	ND	0	ND		
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0					<0.001	ND	<0.001	ND	0.0005	0.0005
	Asbestos Gravimetric & PCOM Total	mass %	0					<0.001	ND	<0.001	ND	0.0005	0.0005
	Asbestos PCOM Quantification (Fibres)	mass %	0					<0.001	ND	<0.001	ND	0.0005	0.0005
	Total ACM Gravimetric Quantification (% Asb)	mass %	0					<0.001	ND	<0.001	ND	0.0005	0.0005
	Asbestos Gravimetric Quantification (ACMs)	mass %	0					<0.001	ND	<0.001	ND	0.0005	0.0005
	Asbestos fibres	-						99999	ND	0	ND		

Comments
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Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_APG_Lead										
					Location Code	APG101	APG101	APG101	APG101	APG102	APG102	APG103	APG103	APG104	APG104
					Depth Range	0-0.05	0.1-0.2	0.5-0.6	0.9-1	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2
					Date	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021
					Monitoring Zone	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens
					Soil cover	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Turf	Turf
	Natural Moisture Content	%	0.1			-	-	18.5	16.4	46.6	28.6	-	20.8	-	-
PAH	Naphthalene	mg/kg	0.03	4900[#2]		-	-	0.11	0.06	0.23	-	-	0.37	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]		-	-	0.24	0.12	1.08	-	-	1.59	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]		-	-	0.07	<0.05	0.23	-	-	0.39	-	-
	Fluorene	mg/kg	0.04	9900[#2]		-	-	0.07	<0.04	0.21	-	-	0.4	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]		-	-	1.32	0.38	3.87	-	-	7.39	-	-
	Anthracene	mg/kg	0.04	74000[#2]		-	-	0.41	0.14	1	-	-	2.4	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]		-	-	3.09	1.07	10.34	-	-	15.49	-	-
	Pyrene	mg/kg	0.03	7400[#2]		-	-	2.78	0.87	8.58	-	-	13.47	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]		-	-	1.56	0.61	5.34	-	-	7.43	-	-
	Chrysene	mg/kg	0.02	57[#2]		-	-	1.71	0.66	5.73	-	-	7.82	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]		-	-	1.85	0.7	5.73	-	-	8.27	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]		-	-	1.65	0.57	4.84	-	-	7.27	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]		-	-	0.36	0.13	0.91	-	-	1.59	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]		-	-	1.48	0.54	4	-	-	6.45	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]		-	-	2.46	0.91	7.68	-	-	10.74	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]		-	-	0.96	0.35	2.98	-	-	4.17	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07			-	-	3.42	1.26	10.66	-	-	14.91	-	-
	PAH 16 Total	mg/kg	0.6			-	-	20.1	7.1	62.8	-	-	95.2	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg		10	**10**	-	-	1.85	0.7	5.73	-	-	8.27	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]		-	-	13.5	16.2	22.3	-	-	22.2	-	-
	Barium	mg/kg	1	1300[#3]		-	-	142	157	304	-	-	382	-	-
	Beryllium	mg/kg	0.5	2.2[#2]		-	-	1.1	1.2	1.8	-	-	1.7	-	-
	Boron	mg/kg	0.1	21000[#2]		-	-	1.5	1	3.9	-	-	6.4	-	-
	Cadmium	mg/kg	0.1	120[#2]		-	-	<0.1	0.1	0.6	-	-	0.8	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]		-	-	90.8	72.8	81	-	-	75.2	-	-
	Copper	mg/kg	1	12000[#2]		-	-	46	42	81	-	-	95	-	-
	Lead	mg/kg	5		**630**	**761**	**668**	381	394	**1014**	624	**1052**	**912**	**1000**	**771**
	Mercury	mg/kg	0.1	120[#2]		-	-	1.1	0.8	1.4	-	-	1.1	-	-
	Nickel	mg/kg	0.7	230[#2]		-	-	18.7	21.6	28.4	-	-	27.5	-	-
	Selenium	mg/kg	1	1100[#2]		-	-	<1	<1	<1	-	-	1	-	-
	Vanadium	mg/kg	1	2000[#2]		-	-	59	58	71	-	-	61	-	-
	Zinc	mg/kg	5	81000[#2]		-	-	113	113	360	-	-	392	-	-
Organics	TOC	%	0.02			-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None				-	-	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	-	-	No Asbestos Detected	-	-
	Asbestos Level	None				-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None				-	-	soil/stones	soil/stones	soil/stones	-	-	soil	-	-
	Asbestos Containing Material	None				-	-	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	-	-	No Asbestos Detected	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-				-	-	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	-	-	No Asbestos Detected	-	-

Comments
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE

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					Location Code	APG105	APG105	APG106	APG106	APG106	APG107	APG107	APG108	APG108	APG109
					Depth Range	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.5-0.6	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05
					Date	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021
					Monitoring Zone	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens
					Soil cover	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf	Bare soil	Bare soil	Bare soil
Chem_Group	**ChemName**	**output unit**	**EQL**	GAC_HH_POS_RES_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_APG_Lead										
	Natural Moisture Content	%	0.1			48.4	-	-	-	16.5	-	-	27.6	-	-
PAH	Naphthalene	mg/kg	0.03	4900[#2]		0.43	-	-	-	<0.04	-	-	0.27	-	-
	Acenaphthylene	mg/kg	0.03	15000[#2]		1.39	-	-	-	0.08	-	-	1.06	-	-
	Acenaphthene	mg/kg	0.05	15000[#2]		0.31	-	-	-	<0.05	-	-	0.19	-	-
	Fluorene	mg/kg	0.04	9900[#2]		0.33	-	-	-	<0.04	-	-	0.19	-	-
	Phenanthrene	mg/kg	0.03	3100[#2]		5	-	-	-	0.33	-	-	2.99	-	-
	Anthracene	mg/kg	0.04	74000[#2]		1.94	-	-	-	0.09	-	-	1.33	-	-
	Fluoranthene	mg/kg	0.03	3100[#2]		11.87	-	-	-	0.69	-	-	8.46	-	-
	Pyrene	mg/kg	0.03	7400[#2]		10.52	-	-	-	0.61	-	-	7.21	-	-
	Benz(a)anthracene	mg/kg	0.06	29[#2]		6.4	-	-	-	0.41	-	-	4.15	-	-
	Chrysene	mg/kg	0.02	57[#2]		6.47	-	-	-	0.47	-	-	4.49	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]		7.51	-	-	-	0.48	-	-	3.98	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]		6.59	-	-	-	0.42	-	-	3.65	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]		1.25	-	-	-	0.09	-	-	0.55	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]		5.83	-	-	-	0.38	-	-	3.1	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]		9.49	-	-	-	0.62	-	-	5.4	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]		3.69	-	-	-	0.24	-	-	2.1	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07			13.18	-	-	-	0.86	-	-	7.5	-	-
	PAH 16 Total	mg/kg	0.6			79	-	-	-	4.9	-	-	49.1	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg		10	**10**	7.51	-	-	-	0.48	-	-	3.98	-	-
Metals	Arsenic	mg/kg	0.5	79[#2]		25.2	-	-	-	16	-	-	18.6	-	-
	Barium	mg/kg	1	1300[#3]		271	-	-	-	177	-	-	322	-	-
	Beryllium	mg/kg	0.5	2.2[#2]		1.8	-	-	-	1.1	-	-	1.5	-	-
	Boron	mg/kg	0.1	21000[#2]		4.3	-	-	-	1.6	-	-	4.3	-	-
	Cadmium	mg/kg	0.1	120[#2]		1.1	-	-	-	0.1	-	-	0.7	-	-
	Chromium (III+VI)	mg/kg	0.5	910[#2]		78.1	-	-	-	84.1	-	-	74.4	-	-
	Copper	mg/kg	1	12000[#2]		89	-	-	-	45	-	-	70	-	-
	Lead	mg/kg	5		**630**	**763**	**638**	519	543	**941**	**765**	**698**	**851**	**670**	**1923**
	Mercury	mg/kg	0.1	120[#2]		1.9	-	-	-	1.2	-	-	0.9	-	-
	Nickel	mg/kg	0.7	230[#2]		28.3	-	-	-	17.7	-	-	29.1	-	-
	Selenium	mg/kg	1	1100[#2]		<1	-	-	-	<1	-	-	<1	-	-
	Vanadium	mg/kg	1	2000[#2]		69	-	-	-	60	-	-	57	-	-
	Zinc	mg/kg	5	81000[#2]		301	-	-	-	91	-	-	363	-	-
Organics	TOC	%	0.02			-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None				No Asbestos Detected	-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-
	Asbestos Level	None				-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None				soil	-	-	-	soil/stones	-	-	soil	-	-
	Asbestos Containing Material	None				No Asbestos Detected	-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-				No Asbestos Detected	-	-	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-

Comments
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
Field_D: Field Duplicate

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE

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					Location Code	APG109	APG110	APG110	APG111	APG111	APG112	APG112	APG113	APG113
					Depth Range	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2
					Date	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021
					Monitoring Zone	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens
					Soil cover	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf
Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_APG_Lead									
	Natural Moisture Content	%	0.1			19.5	-	18.9	-	-	28.1	-	-	-
PAH	Naphthalene	mg/kg	0.03	4900#2		0.65	-	0.34	-	-	0.22	-	-	-
	Acenaphthylene	mg/kg	0.03	15000#2		3.14	-	2.03	-	-	1.14	-	-	-
	Acenaphthene	mg/kg	0.05	15000#2		0.3	-	0.26	-	-	0.12	-	-	-
	Fluorene	mg/kg	0.04	9900#2		0.37	-	0.31	-	-	0.12	-	-	-
	Phenanthrene	mg/kg	0.03	3100#2		4.73	-	4.51	-	-	1.81	-	-	-
	Anthracene	mg/kg	0.04	74000#2		3.17	-	2.64	-	-	1.04	-	-	-
	Fluoranthene	mg/kg	0.03	3100#2		13.71	-	14.1	-	-	5.99	-	-	-
	Pyrene	mg/kg	0.03	7400#2		12	-	12.34	-	-	4.76	-	-	-
	Benz(a)anthracene	mg/kg	0.06	29#2		7.96	-	8.1	-	-	3.5	-	-	-
	Chrysene	mg/kg	0.02	57#2		8.2	-	8.23	-	-	4.07	-	-	-
	Benzo(a) pyrene	mg/kg	0.04	5.7#2		9.42	-	8.53	-	-	4.37	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82#2		9.17	-	7.22	-	-	3.59	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58#2		1.61	-	1.24	-	-	0.56	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.04	640#2		8.17	-	5.95	-	-	3.48	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.05	7.2#2		12.38	-	10.96	-	-	5.67	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.02	190#2		4.82	-	4.26	-	-	2.21	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.07			17.2	-	15.22	-	-	7.88	-	-	-
	PAH 16 Total	mg/kg	0.6			99.8	-	91	-	-	42.7	-	-	-
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg		10	**10**	9.42	-	8.53	-	-	4.37	-	-	-
Metals	Arsenic	mg/kg	0.5	79#2		23.5	-	22.9	-	-	20.6	-	-	-
	Barium	mg/kg	1	1300#3		669	-	497	-	-	234	-	-	-
	Beryllium	mg/kg	0.5	2.2#2		1.8	-	1.7	-	-	1.2	-	-	-
	Boron	mg/kg	0.1	21000#2		2.4	-	2.6	-	-	3.9	-	-	-
	Cadmium	mg/kg	0.1	120#2		0.5	-	0.5	-	-	0.5	-	-	-
	Chromium (III+VI)	mg/kg	0.5	910#2		87.2	-	63	-	-	78.4	-	-	-
	Copper	mg/kg	1	12000#2		82	-	78	-	-	73	-	-	-
	Lead	mg/kg	5		**630**	**2223**	**1016**	**1027**	**849**	**901**	546	506	**782**	611
	Mercury	mg/kg	0.1	120#2		1.1	-	0.8	-	-	0.7	-	-	-
	Nickel	mg/kg	0.7	230#2		27.8	-	31.2	-	-	22.8	-	-	-
	Selenium	mg/kg	1	1100#2		<1	-	<1	-	-	<1	-	-	-
	Vanadium	mg/kg	1	2000#2		64	-	79	-	-	58	-	-	-
	Zinc	mg/kg	5	81000#2		474	-	514	-	-	267	-	-	-
Organics	TOC	%	0.02			-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Type	None				No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-
	Asbestos Level	None				-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None				soil	-	soil	-	-	soil/stones	-	-	-
	Asbestos Containing Material	None				No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0			-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0			-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-
	Asbestos fibres	-				No Asbestos Detected	-	No Asbestos Detected	-	-	No Asbestos Detected	-	-	-

Comments
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE

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Chem_Group	ChemName	output unit	EQL	GAC_HH_POS_RES_SLOAM_>3.48%TOC	EN_AECOM_RBKCGrenfell_GSC_APG_Lead										
					Location Code	APG113	APG114	APG114	APG114	APG114	APG115	APG115	APG116	APG116	GTCS 1-24
					Depth Range	0.5-0.6	0-0.05	0.1-0.2	0.5-0.6	0.9-1	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05
					Date	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	06/12/2021	05/06/2019
					Monitoring Zone	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens	43. Avondale Park Gardens
					Soil cover	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	turf
	Natural Moisture Content	%	0.1			14.2	-	-	7.4	20.5	-	-	-	16.4	15.2
PAH	Naphthalene	mg/kg	0.03	4900[#2]		0.15	-	-	0.21	0.06	-	-	-	0.41	<0.027 - 0.28
	Acenaphthylene	mg/kg	0.03	15000[#2]		0.53	-	-	0.69	0.23	-	-	-	2.58	1.04
	Acenaphthene	mg/kg	0.05	15000[#2]		0.07	-	-	0.12	<0.05	-	-	-	0.15	0.16
	Fluorene	mg/kg	0.04	9900[#2]		0.08	-	-	0.16	<0.04	-	-	-	0.22	0.16
	Phenanthrene	mg/kg	0.03	3100[#2]		1.29	-	-	2.65	0.46	-	-	-	3.47	2.56
	Anthracene	mg/kg	0.04	74000[#2]		0.66	-	-	1.49	0.25	-	-	-	2.26	1.24
	Fluoranthene	mg/kg	0.03	3100[#2]		3.03	-	-	6.98	1.29	-	-	-	13.54	8.11
	Pyrene	mg/kg	0.03	7400[#2]		2.72	-	-	6.06	1.19	-	-	-	12.45	7.19
	Benz(a)anthracene	mg/kg	0.06	29[#2]		1.6	-	-	3.39	0.78	-	-	-	8.24	4.4
	Chrysene	mg/kg	0.02	57[#2]		1.92	-	-	4.04	0.92	-	-	-	8.44	4.53
	Benzo(a) pyrene	mg/kg	0.04	5.7[#2]		2.06	-	-	3.45	0.88	-	-	-	9.7	5.75
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	82[#2]		1.88	-	-	3.25	0.77	-	-	-	8.45	4.2
	Dibenz(a,h)anthracene	mg/kg	0.04	0.58[#2]		0.26	-	-	0.48	0.16	-	-	-	1.73	1.06
	Benzo(g,h,i)perylene	mg/kg	0.04	640[#2]		1.77	-	-	2.92	0.7	-	-	-	7.61	4.34
	Benzo(b)fluoranthene	mg/kg	0.05	7.2[#2]		2.72	-	-	4.43	1.14	-	-	-	12.33	7.17
	Benzo(k)fluoranthene	mg/kg	0.02	190[#2]		1.06	-	-	1.72	0.45	-	-	-	4.79	2.79
	Benzo(b)&(k)fluoranthene	mg/kg	0.07			3.78	-	-	6.15	1.59	-	-	-	17.12	9.96
	PAH 16 Total	mg/kg	0.6			21.8	-	-	42	9.3	-	-	-	96.4	55
	Benzo(a)pyrene (surrogate marker for PAH mixture)	mg/kg		10	**10**	2.06	-	-	3.45	0.88	-	-	-	9.7	5.75
Metals	Arsenic	mg/kg	0.5	79[#2]		15.9	-	-	11.8	13.9	-	-	-	19.4	23.1
	Barium	mg/kg	1	1300[#3]		176	-	-	163	86	-	-	-	213	269
	Beryllium	mg/kg	0.5	2.2[#2]		1.3	-	-	1	0.6	-	-	-	1.4	1.6
	Boron	mg/kg	0.1	21000[#2]		1.6	-	-	1.1	1	-	-	-	1.7	2.7
	Cadmium	mg/kg	0.1	120[#2]		0.2	-	-	0.2	0.2	-	-	-	0.3	1
	Chromium (III+VI)	mg/kg	0.5	910[#2]		84.1	-	-	68.7	52.9	-	-	-	82.3	68.2
	Copper	mg/kg	1	12000[#2]		46	-	-	55	27	-	-	-	68	76
	Lead	mg/kg	5		**630**	468	**715**	599	**1038**	600	589	**673**	545	572	**659**
	Mercury	mg/kg	0.1	120[#2]		0.9	-	-	0.4	3.5	-	-	-	0.9	1.8
	Nickel	mg/kg	0.7	230[#2]		20.6	-	-	21	11.3	-	-	-	24.5	27.4
	Selenium	mg/kg	1	1100[#2]		<1	-	-	<1	<1	-	-	-	<1	2
	Vanadium	mg/kg	1	2000[#2]		60	-	-	135	32	-	-	-	96	62
	Zinc	mg/kg	5	81000[#2]		151	-	-	111	52	-	-	-	187	285
Organics	TOC	%	0.02			-	-	-	-	-	-	-	-	-	5.84
Asbestos	Asbestos Type	None				No Asbestos Detected	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	No Asbestos Detected
	Asbestos Level	None				-	-	-	-	-	-	-	-	-	-
	General Description (Bulk Analysis)	None				soil	-	-	Soil/Stones	soil/stones	-	-	-	Soil/Stones	soil-stones
	Asbestos Containing Material	None				No Asbestos Detected	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	No Asbestos Detected
	Total Detailed Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos Gravimetric & PCOM Total	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos PCOM Quantification (Fibres)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Total ACM Gravimetric Quantification (% Asb)	mass %	0			-	-	-	-	-	-	-	-	-	-
	Asbestos fibres	-				No Asbestos Detected	-	-	No Asbestos Detected	No Asbestos Detected	-	-	-	No Asbestos Detected	No Asbestos Detected

Comments
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
Field_D: Field Duplicate

Env Stds Comments
#2:LQM/CIEH S4ULs 2015
#3:EIC/AGS/CL:AIRE

Appendix H Detailed Quantitative Risk Assessment Data Tables

						Location Code	TH164	TH164	TH165	TH165	TH166	TH166	TH167	TH167	TH167	TH167	TH168	TH168
						Depth Range	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2
						Date	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	22/11/2021	22/11/2021
						Monitoring Zone	28. Treadgold House - Plot 1											
						Soil Cover	Bare soil	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil
Chem_Group	**ChemName**	**output unit**	**EQL**	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2												
Metals	Lead	mg/kg	5	1.060	**2.150**	4.530	925	1005	1489	**8.563**	1311	1997	677	**2229**	451	469	233	148

Statistical Summary

Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
12	12	148	148	8563	8563	1625	965	2284

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

						Location Code	TH158	TH158	TH159	TH159	TH160	TH160	TH161	TH161	TH161	TH162	TH162	TH162	TH163	TH163
						Depth Range	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2
						Date	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	22/11/2021	23/11/2021	23/11/2021	23/11/2021	25/11/2021	25/11/2021	25/11/2021	22/11/2021	22/11/2021
						Monitoring Zone	28. Treadgold House - Plot 2													
						Soil Cover	Turf	Turf	Partial turf	Partial turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil
Chem_Group	**ChemName**	**output unit**	**EQL**	EN_AECOM_RBKCGR ENFELL_SSAC_CHILD _RECEPTOR_STEP 1	EN_AECOM_RBKCGR ENFELL_SSAC_ADULT _RECEPTOR_STEP 1	EN_AECOM_RBKCGR ENFELL_SSAC_CHILD _RECEPTOR_STEP 2														
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530	1785	1738	1591	1700	1580	**3168**	1941	1189	715	1411	**6245**	1090	1068	1329

Statistical Summary

Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
14	14	715	715	6245	6245	1896	1585.5	1375

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

						Location Code	TH151	TH151	TH152	TH152	TH153	TH153	TH154	TH154	TH155	TH155	TH156	TH156	TH156	TH156	TH157	TH157
						Depth Range	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2
						Date	23/11/2021	23/11/2021	23/11/2021	23/11/2021	22/11/2021	22/11/2021	23/11/2021	23/11/2021	22/11/2021	22/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	22/11/2021	22/11/2021
						Monitoring Zone	28. Treadgold House - Plot 3															
						Soil Cover	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf
Chem_Group	**ChemName**	**output unit**	**EQL**	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2																
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530	1001	1239	926	**3101**	1693	**3752**	1415	2119	1485	**3623**	**6029**	2049	1095	903	1271	995

Statistical Summary

Chem_Group	**ChemName**	**output unit**	**EQL**	Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
Metals	Lead	mg/kg	5	16	16	903	903	6029	6029	2044	1450	1417

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

Chem_Group	ChemName	output unit	EQL	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530

Location Code	GTCS2-S280A	TH141	TH141	TH142	TH142	TH142	TH143	TH143	TH144	TH144	TH145	TH145	TH145	TH146	TH146	TH147	TH147	TH148	TH148	TH149	TH149	TH150	TH150
Depth Range	0-0.05	0-0.05	0.1-0.2	0-0.05	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2
Date	05/11/2020	24/11/2021	24/11/2021	23/11/2021	23/11/2021	23/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	25/11/2021	25/11/2021	25/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021
Monitoring Zone	28. Treadgold House - Plot 4																						
Soil Cover	bare soil - disturbed	Bare soil	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil
Lead (mg/kg)	**2216**	584	649	**3996**	634	685	1357	1616	1059	596	1476	1766	**2841**	1358	1751	1432	2107	1678	2031	1327	1920	1921	**2434**

Statistical Summary

ChemName	Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
Lead	23	23	584	584	3996	3996	1628	1616	806

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

						Location Code	GTCS2-S279A	TH131	TH131	TH132	TH132	TH133	TH133	TH134	TH134	TH134	TH134	TH135	TH135	TH136	TH136	TH137	TH137	TH138	TH138	TH139	TH139	TH140	TH140
						Depth Range	0-0.02	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2
						Date	05/11/2020	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021	24/11/2021
						Monitoring Zone	28. Treadgold House - Plot 5																						
						Soil Cover	turf	Turf	Turf	Turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf
				EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2																							
Chem_Group	ChemName	output unit	EQL																										
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530	1385	1893	1831	1692	**4638**	1736	1876	717	1081	1649	541	947	994	1615	**3644**	**2766**	**3774**	1834	**5942**	1353	1135	1398	**3172**

Statistical Summary

Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
23	23	541	541	5942	5942	2070	1692	1338

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

						Location Code	TH122	TH122	TH122	TH123	TH123	TH124	TH124	TH125	TH125	TH125	TH126
						Depth Range	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0-0.05
						Date	25/11/2021	25/11/2021	25/11/2021	24/11/2021	24/11/2021	26/11/2021	26/11/2021	25/11/2021	25/11/2021	25/11/2021	26/11/2021
						Monitoring Zone	28. Treadgold House - Plot 6										
						Soil Cover	Partial turf	Partial turf	Partial turf	Partial turf	Partial turf	Bare soil	Bare soil	Turf	Turf	Turf	Bare soil
				EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2											
Chem_Group	**ChemName**	**output unit**	**EQL**														
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530	1549	1346	638	999	1100	1399	1508	**6230**	1535	854	2136

Location Code	TH126	TH127	TH127	TH128	TH128	TH129	TH129	TH130	TH130	TH130	TH130
Depth Range	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7
Date	26/11/2021	26/11/2021	26/11/2021	24/11/2021	24/11/2021	26/11/2021	26/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
Soil Cover	Bare soil	Turf	Turf	Bare soil	Bare soil	Partial turf	Partial turf	Turf	Turf	Turf	Turf
Lead (mg/kg)	1722	1754	1212	758	661	1557	**4405**	1774	**2307**	526	575

Statistical Summary

ChemName	Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
Lead	22	22	526	526	6230	6230	1661	1453.5	1314

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

						Location Code	TH117	TH117	TH117	TH118	TH118	TH118	TH118	TH119	TH119	TH119	TH120	TH120	TH120	TH171	TH172	TH173
						Depth Range	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0-0.05	0-0.05
						Date	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	26/11/2021	26/11/2021	26/11/2021
						Monitoring Zone	28. Treadgold House - Plot 7															
						Soil Cover	Partial turf	Partial turf	Partial turf	Bare soil	Bare soil	Bare soil	Bare soil	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf
Chem_Group	**ChemName**	**output unit**	**EQL**	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2																
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530	2148	**3693**	1253	342	192	550	456	1843	**2174**	2069	1065	**2763**	1204	1169	1260	1515

Statistical Summary

Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
16	16	192	192	3693	3693	1481	1256.5	940

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

Chem_Group	ChemName	output unit	EQL	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530

Location Code	GTCS2-S275A	TH111	TH111	TH112	TH112	TH113	TH113	TH114	TH114	TH114	TH115	TH115
Depth Range	0-0.02	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2
Date	05/11/2020	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
Monitoring Zone	28. Treadgold House - Plot 8											
Soil Cover	turf	Turf	Turf	Turf	Turf	Turf	Turf	Partial turf	Partial turf	Partial turf	Turf	Turf
Lead (mg/kg)	992	1027	1273	1009	935	1270	**3930**	1556	1606	1612	1951	**4102**

Location Code	TH115	TH116	TH116	TH116	TH116	TH174	TH175	TH176	TH177	TH178	TH179	TH180
Depth Range	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
Date	25/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
Monitoring Zone												
Soil Cover	Turf	Turf	Turf	Turf	Turf	Partial turf	Turf	Partial turf	Turf	Turf	Turf	Turf
Lead (mg/kg)	1240	2103	1473	1407	1233	1422	1883	1525	1752	754	1394	1349

Statistical Summary

Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
24	24	754	754	4102	4102	1617	1414.5	809

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

						Location Code	GTCS2-S275A	GTCS2-S279A	TH108	TH108	TH108	TH109	TH109	TH109	TH110	TH110	TH110	TH110	TH111	TH111	TH112	TH112	TH113	TH113	TH181	TH182	TH183	TH184	TH185	TH186
						Depth Range	0-0.02	0-0.02	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
						Date	05/11/2020	05/11/2020	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
						Monitoring Zone	28. Treadgold House - Plot 9																							
						Soil Cover	turf	turf	Turf	Turf	Turf	Bare soil	Bare soil	Bare soil	Partial turf	Partial turf	Partial turf	Partial turf	Turf	Turf	Turf	Turf	Turf	Turf	Partial turf	Partial turf	Partial turf	Partial turf	Partial turf	Partial turf
				EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2																								
Chem_Group	**ChemName**	**output unit**	**EQL**																											
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530	992	1385	**2871**	**18,960**	**20,630**	1576	**8259**	**2870**	670	1418	991	483	1027	1273	1009	935	1270	**3930**	426	481	460	1042	1099	1651

Statistical Summary

Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
24	24	426	426	20630	20630	3155	1184.5	5386

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

Chem_Group	ChemName	output unit	EQL	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_ADULT_RECEPTOR_STEP 1	EN_AECOM_RBKCGRENFELL_SSAC_CHILD_RECEPTOR_STEP 2
Metals	Lead	mg/kg	5	1,060	**2,150**	4,530

Location Code	GTCS2-S274A	TH101	TH101	TH101	TH102	TH102	TH102	TH102	TH103	TH103	TH103	TH104	TH104
Depth Range	0-0.02	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.1-0.2	0.3-0.4	0.6-0.7	0-0.05	0.1-0.2	0.3-0.4	0-0.05	0.3-0.4
Date	05/11/2020	26/11/2021	26/11/2021	26/11/2021	23/11/2021	23/11/2021	23/11/2021	23/11/2021	26/11/2021	26/11/2021	26/11/2021	23/11/2021	23/11/2021
Monitoring Zone	28. Treadgold House - Plot 10												
Soil Cover	turf	Partial turf	Partial turf	Partial turf	Bare soil	Bare soil	Bare soil	Bare soil	Partial turf	Partial turf	Partial turf	Turf	Turf
Lead	1168	650	441	559	668	676	309	153	**2748**	609	453	1071	630

Location Code	TH104	TH104	TH105	TH105	TH106	TH106	TH107	TH107	TH187	TH188	TH189	TH190
Depth Range	0.6-0.7	1.1-1.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0.1-0.2	0-0.05	0-0.05	0-0.05	0-0.05
Date	23/11/2021	23/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021	26/11/2021
Monitoring Zone	28. Treadgold House - Plot 10											
Soil Cover	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Turf	Partial turf	Turf	Turf	Turf
Lead	150	507	1326	**2412**	1381	1488	1307	1122	1283	1414	1556	340

Statistical Summary

Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation
25	25	150	150	2748	2748	977	676	654

Comments
SSAC: Site Specific Assessment Criteria
(blank): No assessment criteria available
 - : Not analysed
Field_D: Field Duplicate

Appendix I Letter to Residents – Treadgold House

LANCASTER WEST
NEIGHBOURHOOD TEAM
W11
part of Kensington and Chelsea Council

Unit 7 Baseline Studios
Whitchurch Road
W11 4AT

07 April 2022

Dear resident,

In July 2021, we wrote to you to let you know that further soil sampling would be undertaken, following the completion of the environmental checks that were carried out in the areas surrounding Grenfell Tower, to identify any significant soil contamination from the Grenfell Tower tragedy.

At Treadgold House, the checks concluded that:

- Public open space to the north of the building and the raised planters to the south and west found normal soil composition and require no further action.
- Higher levels of lead than expected were found in four ground-level samples, two to the south and two to the west of the building (as requested at our block meeting on 23rd September 2021, a summary of these results is provided at the end of this letter).
- The source of lead in the four samples is more likely to be from historic contamination rather than from the Grenfell tragedy and could be linked to removing lead paint from windows or railings, or the past use of the land as a brickworks.

Specialists from AECOM, the consultants carrying out the additional work, will visit and walk around the garden area to finalise sampling positions on Tuesday November 9. The soil sampling work is then scheduled to commence on Monday November 22 and will be completed by Tuesday 30 November at the latest. No works are expected to be undertaken during the weekends.

During that time, AECOM will be:

- Digging 66 shallow holes in the communal garden to the west and south of Treadgold House to depths of between 20cm and 70cm
- Potentially drilling holes at 4 locations using a window sampling drilling rig to depths of up to 3m below ground level
- Taking about 200 soil samples and testing for substances such as lead, asbestos, hydrocarbon compounds and other metals

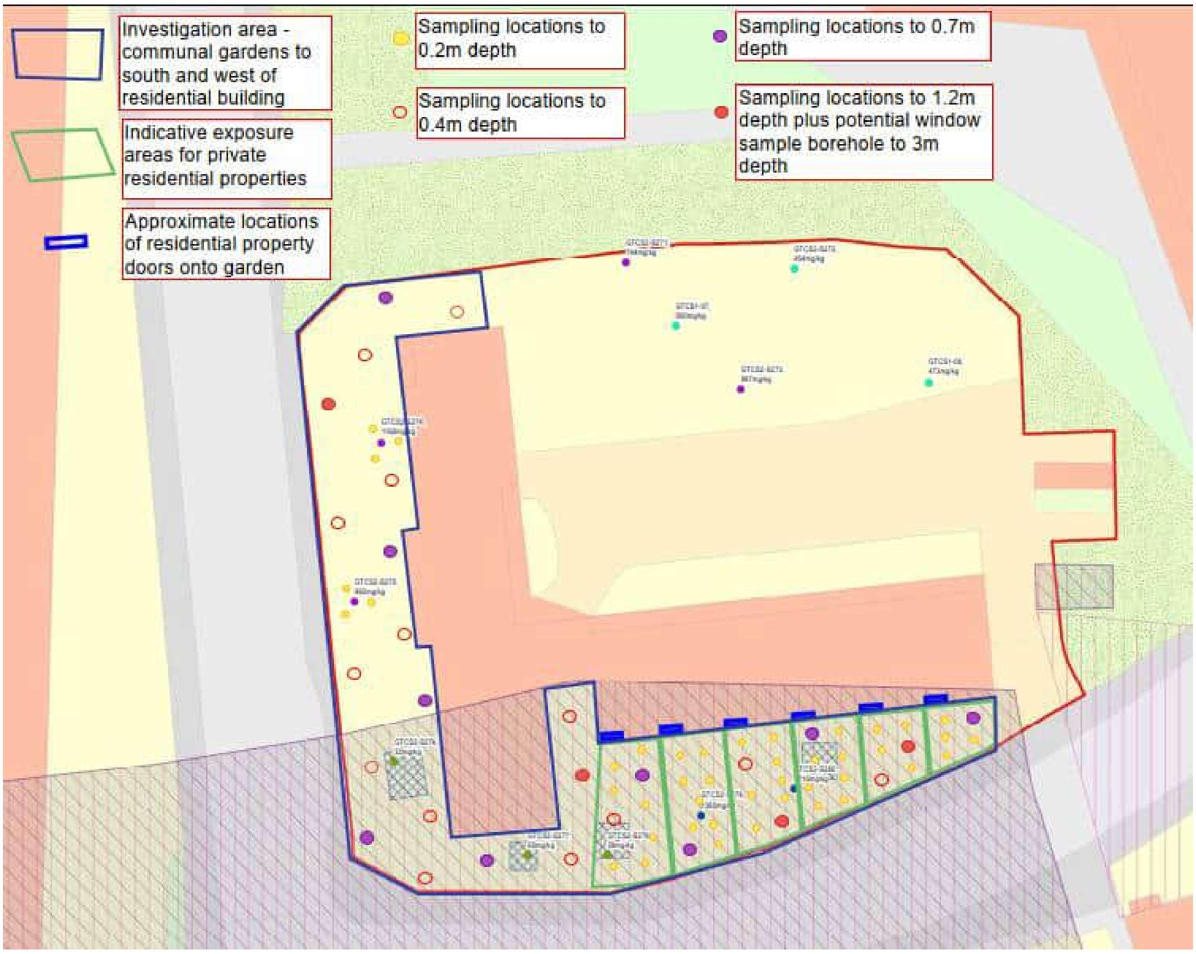
A plan of the proposed investigation is included on the next page. The shallow hole and window sample locations may vary slightly from the attached plan to avoid features such as areas of paving or water supply pipes.

For those residents who saw the soil sampling undertaken during the two stages of investigation connected with the Grenfell Tower, the area of the ground to be sampled at each location will be smaller and typically no larger than 20cm by 20cm.

Where holes are dug in grassed areas, AECOM will try hard to minimise damage to the turf by removing it prior to digging and then replacing it once the hole is finished. Once complete, marks where the turf was cut are likely to be visible, potentially for several months. Every effort will be made to clean up after work has finished, however, the grass may also be left slightly muddy around each hole and in the general area investigated, but this should wash away when it rains.

Generally, the sampling work shouldn't result in noise that will be a nuisance, however, the window sampling rig (if it is required) uses a drop hammer, which makes a regular hammering sound, which can be noisy. For example, you will probably be able to hear the hammering noise within your home with the windows closed. If the rig is needed, it will only be used on one day, Friday 26 November, and only during normal working hours between 9am and 5pm, in accordance with the Council's Code of Construction. Please note, it will not be possible to use the garden area on this day and access will be restricted.

Proposed sampling locations at Treadgold House



We apologise for any disturbance caused by the sampling works. AECOM will try its best to minimise the impact of the work and the Council will ensure that any damage is fixed.

As part of these works, we also want to find out about how you use the land – do you sit out, do you mainly use the area outside your back door or the whole area, do your children play ball games on it, do you grow plants or vegetables? We are particularly keen to hear from residents whose doors lead out on to the southern garden area where the soil sampling is to take place. This is to make sure we can take this into account when looking at the results of the sampling. You can contact us by calling us on 0800 389 2005 or email lancasterwestoffice@rbkc.gov.uk.

On completion of the sampling work, it will take a few months for the soil samples to be tested and for AECOM to prepare a report with their recommendations. We will provide you with an update early in the new year and by the end of February at the latest.

The Council will carry out additional works if further action is recommended by AECOM. Even if no action is needed, we will discuss the results with you.

Given understandable concerns, and to provide maximum assurance, we have committed to replace the turf and beds of all areas to the south and west of Treadgold House that may have higher levels of trace elements than expected – even if it is deemed safe to leave them as they are.

If you have any queries about these works, either before or while they take place, please contact us using the details at the bottom of this page.

There will also be an opportunity to ask questions at a block meeting, which will take place once we have the results back – we will confirm dates to you as soon as possible.

Kind regards,

James Caspell

Neighbourhood Director

Attachment 1: Summary of soil sampling data for Treadgold House

As part of the Stage 2 Environmental Checks undertaken in the areas surrounding Grenfell Tower, AECOM produced the following site specific assessment criteria (SSAC) to assess lead levels found in ground level soil within the communal garden to the south and west of Treadgold House:

- Residential use without home grown produce – 737mg/kg
- Public open space near to a residential use – 1420mg/kg

These SSAC identify how much lead in the soil may be safely swallowed and digested by a child using the communal garden. This includes both soil that is directly eaten while using the garden or tracked into homes and then breathed in and swallowed with other household dust. As the SSAC are based on very conservative assumptions, exceeding them does not necessarily mean that a person will be harmed.

Previously, four samples of surface soil were taken from the communal garden including two samples to the west (1168mg/kg and 992mg/kg) and two samples to the south (2216mg/kg and 1385mg/kg) of Treadgold House.

All four lead results exceeded the 'residential use without home grown produce' SSAC and one of the soil samples, from the communal garden to the south of Treadgold House, also exceeded the 'public open space near to residential use' SSAC. Elevated lead levels in urban soils are common and meaningful conclusions cannot be drawn from four samples taken from such a large area, so it is important to wait until we have the results of the planned soil sampling exercise before deciding whether an unacceptable risk exists from lead in soil.

AECOM believes that the SSAC for 'public open space near to a residential use' probably applies to the whole communal garden and that the 'residential use without home grown produce' criteria may apply in the southern part of the communal garden, near to residents' back doors. AECOM would like to refine the SSAC to better reflect how the communal garden is used and we would appreciate it if Treadgold House residents could tell us whether they:

- Sit out and, if so, how often and for how long?
- Mainly use the area outside back doors or the whole area?
- Play ball games and if so, where?
- Grow plants or vegetables?

The planned soil sampling work and input from residents will provide the level of information that AECOM needs to update the SSAC and identify the level of risk to residents using the communal garden. If lead is found to pose unacceptable risks, AECOM will use the results to design a plan to clean-up lead contamination. Normally clean-up will include replacing contaminated soils with clean soil, which would be designed in consultation with residents.

As mentioned in July, these results do not change existing advice from Public Health England, now known as the UK Health Security Agency, which applies to anyone handling soil in an urban environment. This is to follow general good practice such as washing your hands after gardening, working or playing in soil and washing and peeling homegrown fruit and vegetables.

To read more about the results from the Stage 2 Environmental Checks Programme visit www.gov.uk/guidance/soil-and-environmental-checks.

Appendix J Data Validation Summary Report

	Field Procedure No. FP26 **FIELD SAMPLING AND LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES**			Version 2: May 2018 Page 1 of 1
	DATA VALIDATION SUMMARY REPORT			
Site name:	Grenfell Tower Stage 2 Follow on	**Samples collected by:**	**Emma Judd, Holly Fenwick, David Dyson, Ben Disney**	
Project number:	60632092			
Project Manager:	David Dyson			
Matrix type:	Soil	**Analytical data checked by:**	**Emma Judd, David Dyson**	
Primary samples:	235 soil samples	Date		
Laboratories used:	Element	Signed		
Lab batch reference (s):	Main batch references: 21-18548 B1; 21-18548 B2; 21-18548 B3; 21-18548 B4; 21-18548 B5	**Project Manager:**	**David Dyson**	
		Date		
		Signed		

General Issues	**Task Name**	**Errors (Y/N)**	**Comments**	**Completed by**
1	Deliverables checked against chain of custody	N	Checked.	David Dyson/ Emma Judd
2	Sample IDs reviewed	N	Sample IDs checked. Errors noted on photo board for locations: - TH104 at depth 0.6-0.7m - no duplicate taken here - TH104 at depth 1.1-1.2m - incorrect location ID - TH131 - all photoboards state TH171 but TH131 is correct These errors are noted and updated within the sample logs.	David Dyson/ Emma Judd
3	Sample temperature on receipt checked	N	No deviating samples recorded in laboratory certificates	David Dyson/ Emma Judd
4	Holding times acceptable	N	Holding times acceptable - a check of the laboratory certificates has been completed.	David Dyson/ Emma Judd
5	Unit consistency reviewed	N	Reporting units correct and consistent.	Holly Fenwick
6	Check LOD / MDL are as expected.	N	A check of the laboratory certificates has been completed.	Holly Fenwick
7	Are the results accredited?	N	Results are accredited. a check of the laboratory certificates has been completed.	David Dyson/ Emma Judd
8	Do the results fit with previous concentration trends?	N	Limited previous data is available, however the results of the follow-on sampling exercise are consistent with the previous Stage 1 and Stage 2 Environmental Checks results for Treadgold House and Avondale Park Gardens.	David Dyson/ Emma Judd
9	Comparison of data to visual/ olfactory evidence	N	No visual / olfactory observations which correspond to high concentrations of lead in samples TH165 0.1-0.2m (38,490mg/kg), TH108 0.1-0.2m (18,960mg/kg) or TH108 0.3-0.4m (20,630mg/kg) Visual evidence of contamination often not relevant for metals - therefore absence of visual or olfactory evidence is not inconsistent with high metals concentrations.	Emma Judd

	Field Procedure No. FP26	Version 2: May 2018
	FIELD SAMPLING AND LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES	Page 1 of 1

DATA VALIDATION SUMMARY REPORT

Specific Issues	Task Name	Errors (Y/N)	Comments	Completed by
# # # #	Duplicate samples identified	N	11 no. duplicate samples. RPDs calculated and discussed in report.	David Dyson/ Emma Judd
# # # #	Duplicate frequency appropriate (1 in 20 samples)	N	Acceptable.	David Dyson/ Emma Judd
# # # # #	RPD assessment acceptable	N	Acceptable. High RPDs are discussed within the report.	Holly Fenwick
# # # #	Trip blanks results acceptable	N	N/A	Holly Fenwick
# #	Field & Equipment/Rinsate blank results acceptable	N	N/A	Holly Fenwick
# #	Laboratory blank acceptable	N	N/A	Holly Fenwick
# # # # # # #	Surrogate laboratory data acceptable	N	No surrogate recovery issues identified on the laboratory certificates.	Emma Judd
# # #	AQC data acceptable	N	No AQC failures noted in the laboratory certificates	Emma Judd
# # # #	Matrix spike (and Matrix Spike duplicate) data acceptable (optional)	N/A	N/A	Emma Judd
# # # #	Relevant data added to table footnotes & any deviation issues identified	N	Complete. No deviations identified.	Holly Fenwick

Specific Issues	Task Name	Errors (Y/N)	Comments	Completed by
# # # #	10% minimum check of tabulated laboratory data against lab certificates	N	Complete.	Holly Fenwick
# # # #	Tabulated field data (e.g. water quality parameters) checked for input errors	N	Complete.	Emma Judd
# # # # #	Lab dilution error	Y	A lab dilution error was identified for sample TH165, following a re-test of the sample. Reasoning for the re-test of the sample is discussed further in section 4.7.3. of the Investigation Report.	David Dyson/ Emma Judd

Other Observations

No records of deviating samples. There was a holding time error with sample APG114 (0.9-1m), though this is unlikely to have affected the results gained as there were no tests conducted for volatile compounds.

Approvals	Date	Name	Signature
~~The data set is not considered appropriate for reporting~~			
The data set is considered appropriate for reporting with the identified issue The data review has identified minor isolated quality issues, as described above, and within the main report. Overall the data are considered suitable for reporting	05/04/2022	David Dyson	DDyson

Appendix K CLEA Model Inputs and Results

CLEA Software Version 1.071		Page 1 of 11
Report generated	04-Feb-22	
Report title	Treadgold House Part 2A Assessment	
Created by	ET at AECOM	

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?			Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal	Top Two applied?	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Lead (C4SL adult)	2.15E+03	NR	NR	1.00	NR	NR	NR	No	No	Yes	Yes	No	Yes	No	No	No
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Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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CLEA Software Version 1.071 | Report generated 4-Feb-22 |

Environment Agency

		Soil Distribution				Media Concentrations														
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	$mg\ kg^{-1}$	$mg\ m^{-3}$	$mg\ kg^{-1}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ kg^{-1}$ FW	$mg\ kg^{-1}$ FW	$mg\ kg^{-1}$ FW	$mg\ kg^{-1}$ FW	$mg\ kg^{-1}$ FW	$mg\ kg^{-1}$ FW
1	Lead (C4SL adult)	100.0	0.0	0.0	100.0	2.15E+03	NR	1.07E+03	9.15E-07	1.16E-07	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
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Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Lead (C4SL adult)	6.25E-04	0.00E+00	0.00E+00	5.10E-06	0.00E+00	0.00E+00	0.00E+00	99.19	0.00	0.00	0.81	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Lead (C4SL adult)	ID	0.63	NR	0	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	**0.68**	0.64
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Environment Agency

	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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Environment Agency

		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Lead (C4SL adult)	1.00E+03	NR	2.96E+05	0.00419 fw	0.00402 fw	0.00731 fw	0.00074 fw	0.00020 fw	0.00022 fw
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Environment Agency

	Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
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CLEA Software Version 1.071

Report generated	04/02/2022
Report title	Treadgold House Part 2A Assessment
Created by	ET at AECOM

BASIC SETTINGS

Land Use	Residential (lifetime exposure C4SL)							
Building	Small terraced house							
Receptor	Female (res C4SL)	Start age class	17	End age class	18	Exposure Duration	59	years
Soil	Sandy loam							

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✗	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✗			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

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Land Use Residential (lifetime exposure C4SL) **Receptor** Female (res C4SL)

Environment Agency

Age Class	Exposure Frequencies (days yr^{-1}) Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Occupation Periods (hr day^{-1}) Indoors	Outdoors	Soil to skin adherence factors (mg cm^2) Indoor	Outdoor	Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Max exposed skin factor Indoor (m^2 m^{-2})	Outdoor (m^2 m^{-2})	Total skin area (m^2)
1	180	180	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	365	365	365	170	365	365	15.0	1.0	0.06	0.30	0.05	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	365	365	365	170	365	365	15.0	1.0	0.06	0.30	0.05	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	365	365	365	170	365	365	15.0	1.0	0.06	0.30	0.05	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	365	365	365	170	365	365	15.0	1.0	0.06	0.30	0.05	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	365	365	365	170	365	365	16.0	1.0	0.06	0.30	**0.03**	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	365	365	365	170	365	365	16.0	1.0	0.06	0.30	**0.03**	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	90TH PERCENTILE RATES Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

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Building Small terraced house

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Soil Sandy loam

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	6.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	3.48E-02
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

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Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	59
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	19000.00
Fraction of site cover ($m^2\ m^{-2}$)	0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	$g\ DW\ g^{-1}\ FW$	dimensionless		$g\ g^{-1}\ DW$	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average

CLEA Software Version 1.071

Report generated	05-Apr-22
Report title	Treadgold House Part 2A Assessment
Created by	ET at AECOM

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Lead (C4SL child)	1.06E+03	NR	NR	1.00	NR	NR	NR	No	No	Yes	Yes	No	Yes	No	No	No
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CONDITIONAL FORMAT CHECK FOR SATURATION LIMITS

		Saturation limit exceeded for oral AC 0 = No result 1= Amber 2= Red, 3 = Green	Saturation limit exceeded for inhal AC	Saturation limit exceeded for combined AC
1	Lead (C4SL child)	3		
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Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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	Saturation limit exceeded for oral AC	Saturation limit exceeded for inhal AC	Saturation limit exceeded for combined AC
	0 = No result 1= Amber 2= Red, 3 = Green		
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Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Lead (C4SL child)	100.0	0.0	0.0	100.0	1.06E+03	NR	5.29E+02	4.33E-06	1.08E-06	NA	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
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CONDITIONAL FORMAT CHECK FOR USER ENTERED SITE DATA

Soil Distribution				Media Concentrations													

		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
2	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
3	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
4	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
5	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
6	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
7	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
8	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
9	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
10	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
11	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
12	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
13	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
14	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
15	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
16	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
17	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
18	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
19	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
20	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0

Environment Agency

	Soil Distribution				Media Concentrations															
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Soil Distribution	Media Concentrations

		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
21	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
22	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
23	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
24	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
25	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
26	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
27	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
28	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
29	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0
30	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0	0	0	0	0	0	0	0	0

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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Lead (C4SL child)	1.39E-03	0.00E+00	0.00E+00	8.79E-06	0.00E+00	0.00E+00	0.00E+00	99.37	0.00	0.00	0.63	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg-1 bw day-1)							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Lead (C4SL child)	ID	1.4	NR	0	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	**0.68**	0.64
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CONDITIONAL FORMAT CHECK FOR CHEMICAL DATA

^{1} BW day^{-1})	µg kg^{-1} BW day^{-1})		day^{-1})	($_{aw}$) (cm^3 cm^{-3})	s^{-1})	(m^2 s^{-1})			ensionless)	g^{-1} DW)	orrection factor	ingestion	inhalation

			Oral Health Criteria Value (µg kg		Inhalation Health Criteria Value (	Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg	Air-water partition coefficient (k	Coefficient of Diffusion in Air (m	Coefficient of Diffusion in Water	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dim	Soil-to-dust transport factor (g	Sub-surface soil to indoor air c (dimensionless)	Relative bioavailability via soil (unitless)	Relative bioavailability via dust (unitless)
1	Lead (C4SL child)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})	Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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CONDITIONAL FORMAT CHECK FOR CHEMICAL DATA

		BW day^{-1})		µg kg^{-1} BW day^{-1})		day^{-1})	(K_{aw}) (cm^3 cm^{-3})	s^{-1})	(m^2 s^{-1})			ensionless)	g^{-1} DW)	orrection factor	ingestion	inhalation

	Oral Health Criteria Value (µg kg		Inhalation Health Criteria Value (		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg	Air-water partition coefficient (K	Coefficient of Diffusion in Air (m^2	Coefficient of Diffusion in Water	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dim	Soil-to-dust transport factor (g	Sub-surface soil to indoor air c (dimensionless)	Relative bioavailability via soil (unitless)	Relative bioavailability via dust (unitless)
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Environment Agency

		Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg\ g^{-1}$ plant DW or FW basis over $mg\ g^{-1}$ DW soil)
1	Lead (C4SL child)	1.00E+03	NR	2.96E+05	0.00419 fw	0.00402 fw	0.00731 fw	0.00074 fw	0.00020 fw	0.00022 fw
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CONDITIONAL FORMAT CHECK FOR CHEMICAL DATA

	nt ($cm^3\ g^{-1}$)			(Green vegetables)	(Root vegetables)	(Tuber vegetables)	(Herbaceous fruit)	(Shrub fruit)	(Tree fruit)

		Soil-to-water partition coefficier	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor
1	Lead (C4SL child)	0	0	0	0	0	0	0	0	0
2										
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Environment Agency

	Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)
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CONDITIONAL FORMAT CHECK FOR CHEMICAL DATA

	nt ($cm^3 g^{-1}$)			(Green vegetables)	(Root vegetables)	(Tuber vegetables)	(Herbaceous fruit)	(Shrub fruit)	(Tree fruit)

		Soil-to-water partition coefficier	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor	Soil-to-plant concentration factor
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CLEA Software Version 1.071

Report generated	05/04/2022
Report title	Treadgold House Part 2A Assessment
Created by	ET at AECOM

BASIC SETTINGS

Land Use	Public Open Space (res C4SL)						
Building	Small terraced house						
Receptor	Female (res C4SL)	Start age class	4	End age class	9	Exposure Duration	6 years
Soil	Sandy loam						

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✗	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✗			Inhalation of indoor vapour	✗
				Inhalation of outdoor vapour	✓

Environment Agency

Land Use Public Open Space (res C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^2)						Max exposed skin factor		
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor	Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Indoor (m^2 m^{-2})	Outdoor (m^2 m^{-2})	Total skin area (m^2)
1	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	0	365	**111**	365	**111**	23.0	1.0	0.06	0.10	**0.04**	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.04**	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.04**	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.04**	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.04**	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.04**	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Environment Agency

Consumption Rates

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	90TH PERCENTILE RATES Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Soil Sandy loam

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	6.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	3.48E-02
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Environment Agency

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)	5.00
Air dispersion factor at height of 0.8m *	500.00
Air dispersion factor at height of 1.6m *	2000.00
Fraction of site cover ($m^2\ m^{-2}$)	0.5

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	$g\ DW\ g^{-1}\ FW$	dimensionless		$g\ g^{-1}\ DW$	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

CLEA Software Version 1.071

Report generated	17-Mar-22
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Created by	DJD at AECOM

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Lead (C4SL child)	4.53E+03	NR	NR	1.00	NR	NR	NR	No	No	Yes	Yes	No	Yes	No	No	No
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Environment Agency

	Assessment Criterion (mg kg-1)			Ratio of ADE to HCV			Saturation Limit (mg kg-1)	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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Environment Agency

		Soil Distribution				Media Concentrations														
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Lead (C4SL child)	100.0	0.0	0.0	100.0	4.53E+03	NR	2.27E+03	1.85E-05	4.63E-06	NA	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
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Environment Agency

	Soil Distribution				Media Concentrations															
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Lead (C4SL child)	2.06E-03	0.00E+00	0.00E+00	3.77E-05	0.00E+00	0.00E+00	0.00E+00	98.21	0.00	0.00	1.79	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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Environment Agency

		Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Lead (C4SL child)	ID	**2.1**	NR	0	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	**0.68**	0.64
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Environment Agency

	Oral Health Criteria Value ($\mu g\ kg^{-1}$ BW day^{-1})		Inhalation Health Criteria Value ($\mu g\ kg^{-1}$ BW day^{-1})		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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Environment Agency

		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)
1	Lead (C4SL child)	1.00E+03	NR	2.96E+05	0.00419 fw	0.00402 fw	0.00731 fw	0.00074 fw	0.00020 fw	0.00022 fw
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Environment Agency

	Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for root vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for tuber vegetables ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for herbaceous fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for shrub fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)	Soil-to-plant concentration factor for tree fruit ($mg g^{-1}$ plant DW or FW basis over $mg g^{-1}$ DW soil)
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Report generated	17/03/2022
Report title	Grenfell Investigation into Potential Land Contamination Impacts
Created by	DJD at AECOM

Environment Agency

BASIC SETTINGS

Land Use	Public Open Space (res C4SL)						
Building	Small terraced house						
Receptor	Female (res C4SL)	Start age class	4	End age class	9	Exposure Duration	6 years
Soil	Sandy loam						

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✗	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✗			Inhalation of indoor vapour	✗
				Inhalation of outdoor vapour	✓

Environment Agency

Land Use Public Open Space (res C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1}): Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Occupation Periods (hr day^{-1}): Indoors	Outdoors	Soil to skin adherence factors (mg cm^2): Indoor	Outdoor	Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Max exposed skin factor: Indoor (m^2 m^{-2})	Outdoor (m^2 m^{-2})	Total skin area (m^2)
1	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	0	365	**111**	365	**111**	23.0	1.0	0.06	0.10	**0.01**	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.01**	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.01**	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.01**	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.01**	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	365	0	365	**111**	365	**111**	19.0	1.0	0.06	0.10	**0.01**	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Soil Sandy loam

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	6.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	3.48E-02
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Environment Agency

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate (cm^3 s^{-1})	2.50E+01
Building ventilation rate (cm^3 s^{-1})	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.8m *	500.00
Air dispersion factor at height of 1.6m *	2000.00
Fraction of site cover (m^2 m^{-2})	0.5

* Air dispersion factor in g m^{-2} s^{-1} per kg m^{-3}

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

Appendix L Laboratory Chains of Custody

CHAIN OF COUSTODY

CLIENT: AECOM	If electronic file required please select file format below	REPRESENTATIVE SAMPLE TEMPERATURE (°C):	element
ADDRESS: SUNLEY HOUSE 4 BEDFORD PARK CROYDON	EQUIS	SAMPLER: EMMA TOMS/HOLLY FENWICK	
PROJECT MANAGER: DAVID DYSON	CROSSTAB	MOBILE:	
MOBILE:	CLIENT ESDAT ✓	EMAIL REPORT TO: emmatoms@aecom.com	
PROJECT ID:	AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	cc REPORT TO: david.dyson@aecom.com	
SITE: TREADGOLD HOUSE (STAGE 2 GRENFELL)		INVOICE TO: (if different to report)	
		QUOTE NUMBER: / P.O No:	Chain of Custody sheet page 1 of 2

TURNAROUND - please tick	(SURCHARGES MAY APPLY)		All waters - tick for samples to be tested shaken or settled	FOR LABORATORY USE ONLY
10 DAY	4 DAY	Other		AVERAGE COOL BOX TEMP.(if required):
5 DAY ✓	3 DAY			SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Medium	Low	LEAD	ASBESTOS	METALS (13)
TH163					S	22/11/21		0-0.05					✓	✓	
TH163								0.1-0.2					✓		
TH165								0-0.05					✓	✓	
TH165								0.1-0.2					✓		
TH153								0-0.05					✓	✓	
TH153								0.1-0.2					✓		
TH155								0-0.05					✓	✓	
TH155								0.1-0.2					✓		✓
TH157								0-0.05					✓	✓	
TH157								0.1-0.2					✓		
TH160								0-0.05					✓	✓	
TH160								0.1-0.2					✓		
TH158								0-0.05					✓	✓	
TH158								0.1-0.2					✓		
TH159								0-0.05					✓	✓	✓
TH159								0.1-0.2					✓		

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name: EMMA TOMS	Date:	Name:	Date:	Consignment note No:
Of: AECOM	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 220261

CHAIN OF COUSTODY

CLIENT: AECOM	If electronic file required please select file format below	REPRESENTATIVE SAMPLE TEMPERATURE (°C):	
ADDRESS: SUNLEY HOUSE, 4 BEDFORD PARK CROYDON		SAMPLER: EMMA TOMS	
	EQUIS	MOBILE: 07741653315	
PROJECT MANAGER: DAVID DYSON	CROSSTAB	EMAIL REPORT TO: emma.toms@aecom.com	
MOBILE:	CLIENT ESDAT ✓	cc REPORT TO: david.dyson@aecom.com	
PROJECT ID:	AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	INVOICE TO: (if different to report)	
SITE: TREADGOLD HOUSE (GRENFELL STAGE 2 FOLLOW ...)		QUOTE NUMBER:	P.O No:

Chain of Custody sheet page 2 of 2

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY ✓ 4 DAY Other

5 DAY 3 DAY

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY

AVERAGE COOL BOX TEMP.(if required):

SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Medium	Low	LEAD	ASBESTOS	Metals (13)	PAH 16
TH150					S	23/11/21		0-0.05					✓	✓		
TH150								0.1-0.2					✓			
TH161								0-0.05					✓	✓	✓	✓
TH161								0.3-0.4					✓		✓	✓
TH161								0.6-0.7					✓		✓	✓
TH154								0-0.05					✓	✓		
TH154								0.1-0.2					✓			
DUP08								0.3-0.4					✓			
TH151								0-0.05					✓	✓		
TH151								0.1-0.2					✓			
TH152								0-0.05					✓	✓		
TH152								0.1-0.2					✓			
TH156								0-0.05					✓			
~~TH156~~								0.1-0.2					~~DUV HOLD~~			
TH156								0.1-0.2					✓	✓		

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required. WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 220262

CHAIN OF CUSTODY

element

CLIENT:	AECOM
ADDRESS:	SUNLEY HOUSE, 4 BEDFORD PARK, CROYDON
PROJECT MANAGER:	DAVID DYSON
MOBILE:	
PROJECT ID:	
SITE:	TREADGOLD HOUSE

If electronic file required please select file format below

EQUIS	
CROSSTAB	
CLIENT ESDAT	✓
AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	

REPRESENTATIVE SAMPLE TEMPERATURE (°C):	
SAMPLER:	EMMA TOMS / HOLLY FENWICK
MOBILE:	
EMAIL REPORT TO:	emma.toms@aecom.com
cc REPORT TO:	david.dyson@aecom.com
INVOICE TO: (if different to report)	
QUOTE NUMBER:	P.O No:

Chain of Custody sheet page 1 of 1

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY		4 DAY	
5 DAY	✓	3 DAY	
Other			

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW/L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Asbestos risk Medium	Asbestos risk Low	Lead	Asbestos	Metals (13)
TH164					S	22/11/21		0-0.05					✓	✓	
TH164					S	↓		0.1-0.2					✓		✓
TH166					S			0-0.05					✓	✓	
TH166					S			0.1-0.2					✓		
TH168					S			0-0.05					✓	✓	
TH168					S			0.1-0.2					✓		
DUP09					S	↓		0-0.05					✓	✓	

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 220260

CHAIN OF CUSTODY

CLIENT:	AECOM
ADDRESS:	SUNLEY HOUSE, 4 BEDFORD PARK, CROYDON
PROJECT MANAGER:	DAVID DYSON
MOBILE:	
PROJECT ID:	
SITE:	TREADGOLD HOUSE (GRENFELL follow on)

If electronic file required please select file format below

EQUIS	
CROSSTAB	
CLIENT	CSV ✓
AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	

REPRESENTATIVE SAMPLE TEMPERATURE (°C):

SAMPLER:	EMMA TOMS
MOBILE:	07741 653315
EMAIL REPORT TO:	emma.toms@aecom.com
cc REPORT TO:	david.dyson@aecom.com
INVOICE TO: (if different to report)	
QUOTE NUMBER:	P.O No:

element

Chain of Custody sheet page 3 of 4

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY		4 DAY		Other
5 DAY	✓	3 DAY		

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required. WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW/L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Medium	Low	LEAD	ASBESTOS	Metals (13)	PAH 16	Metals (9)	
TH149					S			0-0.05					✓	✓				
TH149						23/11/2		0.1-0.2					✓					
TH142								0-0.05					✓		✓	✓		
TH142								0.3-0.4					✓	✓	✓	✓		
TH142								0.6-0.7					✓		✓	✓		
TH148								0-0.05					✓	✓				
TH148								0.1-0.2					✓					No asbestos
TH104								0-0.05					✓	✓	✓	✓		
TH104								0.3-0.4					✓		✓	✓		
TH104								0.6-0.7					✓		✓	✓		
TH104								1.1-1.2					✓	✓	✓	✓		
DUP07								0.6-0.7					✓		✓	✓		
TH110								0-0.05					✓				✓	
TH110								0.1-0.2					✓	✓				
TH110								0.3-0.4					✓					
TH110								0.6-0.7					✓					
TH102								0-0.05					✓	✓	✓			
TH102								0.1-0.2					✓					
TH102								0.3-0.4					✓					
TH103								0.6-0.7					✓					

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

CHAIN OF CUSTODY

CLIENT:	AECOM
ADDRESS:	CROYDON
PROJECT MANAGER:	DAVID DYSON
MOBILE:	
PROJECT ID:	~~LEAD GOLD HOUSE (GRENFELL FOLLOW ON)~~
SITE:	

If electronic file required please select file format below: EQUIS | CROSSTAB ESDAT ✓ | CLIENT | AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)

REPRESENTATIVE SAMPLE TEMPERATURE (°C):	
SAMPLER:	EMMA TOMS
MOBILE:	07741 653315
EMAIL REPORT TO:	emma.toms@aecom.com
cc REPORT TO:	david.dyson@aecom.com
INVOICE TO: (if different to report)	
QUOTE NUMBER:	P.O No:

element

Chain of Custody sheet page 4 of 4

TURNAROUND - please tick (SURCHARGES MAY APPLY): 10 DAY ✓ | 5 DAY | 4 DAY | 3 DAY | Other

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Medium	Low	LEAD	ASBESTOS	METALS (13)	PAH 16	METALS (9)
TH116					S	23/11/21		0-0.05					✓	✓			
TH116								0.1-0.2					✓				
TH116								0.3-0.4					✓				
TH116								0.6-0.7					✓				
DUP03								0.1-0.2					✓				
TH170								0-0.05					✓	✓	✓	✓	
TH170								0.3-0.4					✓		✓	✓	
TH170								0.6-0.7					✓		✓	✓	
TH156								0.3-0.4					✓				
TH156								0.6-0.7					✓				

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 220264

CHAIN OF CUSTODY

CLIENT: Accom

ADDRESS: Sunley HOUSE, 4 BEDFORD PARK, CROYDON

PROJECT MANAGER: DAVID DYSON

MOBILE:

PROJECT ID:

SITE: TREAD GOLD HOUSE

If electronic file required please select file format below

EQUIS

CROSSTAB

CLIENT ESDAT ✓

AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)

REPRESENTATIVE SAMPLE TEMPERATURE (°C):

SAMPLER: EMMA TOMS / HOLLY FENWICK

MOBILE:

EMAIL REPORT TO: emma.toms@accom.com

cc REPORT TO: david.dyson@accom.com

INVOICE TO: (if different to report)

QUOTE NUMBER:

P.O No:

element

Chain of Custody sheet page ..1.. of 2

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY ✓ | 4 DAY | Other
5 DAY | 3 DAY

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY

AVERAGE COOL BOX TEMP.(if required):

SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required. WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Medium	Low	lead	asbestos	metals (13)
TH123					S	24/11/21		0-0.05					✓	✓	
TH123					S	24/11/21		0.1-0.2					✓		
TH128					S	24/11/21		0-0.05					✓	✓	✓
TH128					S	24/11/21		0.1-0.2					✓		
TH135					S	24/11/21		0-0.05					✓	✓	
TH135					S	24/11/21		0.1-0.2					✓		
TH141					S			0-0.05					✓	✓	✓
TH141					S			0.1-0.2					✓		
TH143					S			0-0.05					✓	✓	
TH143					S			0.1-0.2					✓		
TH146					S			0-0.05					✓	✓	
TH146					S			0.1-0.2					✓		
TH133					S			0-0.05					✓	✓	
TH133					S			0.1-0.2					✓		
TH138					S			0-0.05					✓	✓	
TH138					S			0.1-0.2					✓		
DUP06					S			0.1-0.2					✓		
TH139					S			0-0.05					✓	✓	
TH139					S			0.1-0.2					✓		
TH140					S			0-0.05					✓	✓	

RELINQUISHED BY:

Name: Date:

Of: Time:

RECIEVED BY:

Name: Date:

Of: Time:

METHOD of SHIPMENT

Consignment note No:

Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 220266

CHAIN OF CUSTODY

CLIENT: Accom
ADDRESS: SUNLEY HOUSE, 4 BEDFORD

PROJECT MANAGER: DAVID DYSON
MOBILE:
PROJECT ID:
SITE: TREADGOLD HOUSE

If electronic file required please select file format below
EQUIS
CROSSTAB
CLIENT ESDAT ✓
AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)

REPRESENTATIVE SAMPLE TEMPERATURE (°C):
SAMPLER: EMMA TOMS / HOLLY FENWICK
MOBILE:
EMAIL REPORT TO: emma.toms@accom.com
cc REPORT TO: david.dyson@accom
INVOICE TO: (if different to report)
QUOTE NUMBER:
P.O No:

element

Chain of Custody sheet page 2 of 2

TURNAROUND - please tick (SURCHARGES MAY APPLY)
10 DAY
5 DAY ✓
4 DAY
3 DAY
Other

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Asbestos risk Medium	Asbestos risk Low	lead	asbestos	metals (13)
TH140					S	24/11/21		0.1-0.2					✓		
TH171					S			0-0.05					✓	✓	
TH171					S			0.1-0.2					✓		
TH136					S			0-0.05					✓	✓	
TH136					S			0.1-0.2					✓		
TH137					S			0-0.05					✓	✓	
TH137					S			0.1-0.2					✓		✓
TH132					S			0-0.05					✓	✓	
TH132					S			0.1-0.2					✓		
TH147					S			0-0.05					✓	✓	
TH147					S			0.1-0.2					✓		
TH144					S			0-0.05					✓	✓	
TH144					S			0.1-0.2					✓		
DUP07					S			0-0.05					✓	✓	

RELINQUISHED BY:
Name: Date:
Of: Time:

RECIEVED BY:
Name: Date:
Of: Time:

METHOD of SHIPMENT
Consignment note No:
Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

CHAIN OF CUSTODY

CLIENT: AECOM		If electronic file required please select file format below	
ADDRESS: SUNLEY HOUSE, 4 BEDFORD PARK, CROYDON		EQUIS	
PROJECT MANAGER: DAVID DYSON		CROSSTAB	
MOBILE:		CLIENT ESDAT	✓
PROJECT ID:		AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	
SITE: TREADGOLD HOUSE (GRENFELL STAGE 2 FOLLOW ON)			

REPRESENTATIVE SAMPLE TEMPERATURE (°C):

SAMPLER: EMMA TOMS

MOBILE:

EMAIL REPORT TO: emma.toms@aecom.com

cc REPORT TO: david.dyson@aecom.com

INVOICE TO: (if different to report)

QUOTE NUMBER: P.O No:

element

Chain of Custody sheet page 3 of 5

TURNAROUND - please tick (SURCHARGES MAY APPLY): 10 DAY ☐ 4 DAY ☐ Other ☐ 5 DAY ✓ 3 DAY ☐

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY

AVERAGE COOL BOX TEMP.(if required):

SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required. **WATERS -** we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Asbestos risk Medium	Asbestos risk Low	LEAD	ASBESTOS	METALS (3)	METALS (9)
TH167					S	25/11/21		0-0.05					✓			✓
TH167								0.1-0.2					✓			
TH167								0.3-0.4					✓			
TH167								0.6-0.7					✓	✓		
TH162								0-0.05					✓	✓		✓
TH162								0.1-0.2					✓			
TH162								0.3-0.4					✓			
TH119								0-0.05					✓	✓		
TH119								0.1-0.7					✓		✓	
TH119								0.3-0.4					✓			
~~TH130~~								[illegible]								
TH130								0-0.05					✓			✓
TH130								0.1-0.2					✓			
TH130								0.3-0.4					✓			
TH130								0.6-0.7					✓	✓		
TH145								0-0.05					✓	✓		✓
TH145								0.1-0.2					✓			
TH145								0.3-0.4					✓			
TH134								0-0.05					✓	✓		
TH134								0.1-0.7					✓			

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

CHAIN OF CUSTODY

CLIENT: AECOM	If electronic file required please select file format below
ADDRESS: SUNLEY HOUSE, 4 BEDFORD PARK, CROYDON	EQUIS
PROJECT MANAGER: DAVID DYSON	CROSSTAB
MOBILE:	CLIENT CSDAT ✓
PROJECT ID:	AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)
SITE: TREADGOLD HOUSE (GRENFELL STAGE 2 FOLLOW ON)	

REPRESENTATIVE SAMPLE TEMPERATURE (°C):	
SAMPLER: EMMA TOMS	
MOBILE: 07741 653315	
EMAIL REPORT TO: emma.toms@aecom.com	
cc REPORT TO: david.dyson@aecom.com	
INVOICE TO: (if different to report)	
QUOTE NUMBER:	P.O No:

element

Chain of Custody sheet page ~~3~~4 of 5

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY		4 DAY	
5 DAY	✓	3 DAY	
Other			

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECEIPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Asbestos risk Medium	Asbestos risk Low	LEAD	ASBESTOS	METALS (13)	METALS (9)
TH134					S	25/11/21		0.3-0.4					✓			
TH134								0.6-0.7					✓			
TH125								0-0.05					✓	✓		
TH125								0.1-0.2					✓			
TH125								0.3-0.4					✓			
TH118								0-0.05					✓	✓		✓
TH118								0.1-0.2					✓			
TH118								0.3-0.4					✓			
TH118								0.6-0.7					✓			
TH117								0-0.05					✓	✓		
TH117								0.1-0.2					✓			
TH117								0.3-0.4					✓			
TH121								0-0.05					✓	✓		✓
TH121								0.1-0.2					✓			
TH121								0.3-0.4					✓			
TH121								0.6-0.7					✓			
TH120								0-0.05					✓			
TH120								0.1-0.2					✓			
TH120								0.3-0.4					✓	✓		
TH114								0-0.05					✓	✓	✓	

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

CHAIN OF COUSTODY

CLIENT:	AECOM
ADDRESS:	SUNLEY HOUSE, 4 BEDFORD PARK, CROYDON
PROJECT MANAGER:	DAVID DYSON
MOBILE:	
PROJECT ID:	
SITE:	TREADGOLD HOUSE (GRENFELL STAGE 2 FOLLOW ON)

If electronic file required please select file format below

EQUIS	
CROSSTAB	
CLIENT EDAT	✓
AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	

REPRESENTATIVE SAMPLE TEMPERATURE (°C):

SAMPLER:	EMMA TOMS
MOBILE:	07741 653315
EMAIL REPORT TO:	emma.toms@aecom.com
cc REPORT TO:	david.dyson@aecom.com
INVOICE TO: (if different to report)	
QUOTE NUMBER:	P.O No:

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Chain of Custody sheet page 5 of 5

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY		4 DAY		Other	
5 DAY	✓	3 DAY			

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Asbestos risk Medium	Asbestos risk Low	LEAD	ASBESTOS	METALS (15)	METALS (9)
TH114					S	25/11/21		0.1-0.2					✓			
TH114								0.3-0.4					✓			
DUP04								0.3-0.4					✓	✓		
DUP05								0-0.05					✓			
TH115								0-0.05					✓	✓		✓
TH115								0.1-0.2					✓			
TH115								0.3-0.4					✓			
TH122								0-0.05					✓	✓		✓
TH122								0.1-0.2					✓			
TH122								0.3-0.4					✓			
TH169								0-0.05					✓			✓
TH169								0.1-0.2					✓			
TH169								0.3-0.4					✓	✓		

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 220470

CHAIN OF CUSTODY

CLIENT: AECOM
ADDRESS: CROYDON

PROJECT MANAGER: DAVID DYSON
MOBILE: 07798 647173
PROJECT ID: 60632092
SITE: TREADGOLD HOUSE (GRENFELL STAGE 2 FOLLOW ON)

If electronic file required please select file format below
- EQUIS
- CROSSTAB
- CLIENT ✓
- AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)

REPRESENTATIVE SAMPLE TEMPERATURE (°C):

SAMPLER: D. DYSON & BEN. D
MOBILE: 07799 647173
EMAIL REPORT TO: david.dyson@aecom.com
cc REPORT TO:
INVOICE TO: (if different to report)
QUOTE NUMBER: | P.O No:

Chain of Custody sheet page 1 of 3

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY		4 DAY		Other	
5 DAY	✓	3 DAY			

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Asbestos risk: Medium	Asbestos risk: Low	Lead
TH171					S	26/11/21	08:40	0-0.05m	N			✓	✓
TH172					S	"	08:45	0-0.05m	"			✓	✓
TH173					S	"	09:04	"	"			✓	✓
TH174					S	"	09:14	"	"			✓	✓
TH175					S	"	09:29	"	"			✓	✓
TH176					S	"	09:45	"	"			✓	✓
TH177					S	"	09:58	"	"			✓	✓
TH178					S	"	10:10	"	"			✓	✓
TH179					S	"	10:24	"	"			✓	✓
TH180					S	"	10:36	"	"			✓	✓
TH181					S	"	10:53	"	"			✓	✓
TH182					S	"	11:07	"	"			✓	✓
TH183					S	"	11:25	"	"			✓	✓
TH184					S	"	11:37	"	"			✓	✓
TH185					S	"	11:47	"	"			✓	✓
TH186					S	"	11:58	"	"			✓	✓
TH187					S	"	12:11	"	"			✓	✓
TH188					S	"	12:26	"	"			✓	✓
TH189					S	"	12:31	"	"			✓	✓
TH190					S	"	12:40	"	"			✓	✓

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

RELINQUISHED BY:
Name: DAVID DYSON | Date: 26/11/21
Of: AECOM | Time: 16:00

RECIEVED BY:
Name: | Date:
Of: | Time:

METHOD of SHIPMENT
Consignment note No:
Courier Company: APC

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 222044

CHAIN OF COUSTODY

CLIENT:	AECOM
ADDRESS:	2 SUNLEY HOUSE 4 BEDFORD PARK
PROJECT MANAGER:	DAVID DYSON
MOBILE:	
PROJECT ID:	
SITE:	TREADGOLD HOUSE (GRENFELL STAGE 2 FOLLOW ON)

If electronic file required please select file format below

EQUIS	
CROSSTAB	
CLIENT	
AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	

REPRESENTATIVE SAMPLE TEMPERATURE (°C):

SAMPLER:	EMMA TOMS
MOBILE:	07741653315
EMAIL REPORT TO:	emma.toms@aecom.com
cc REPORT TO:	david.dyson@aecom.com
INVOICE TO: (if different to report)	
QUOTE NUMBER:	P.O No:

element

Chain of Custody sheet page 2 of 3

TURNAROUND - please tick (SURCHARGES MAY APPLY)

10 DAY		4 DAY	
5 DAY	✓	3 DAY	
Other			

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY

AVERAGE COOL BOX TEMP.(if required):

SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Medium	Low	LEAD	ASBESTOS	METALS (13)	METALS (9)
TH108					S	26/11/21	09:40	0-0.05					✓	✓		
TH108					↓	↓	↓	0.1-0.2					✓		✓	
TH108					↓	↓	↓	0.3-0.4					✓			
TH109					↓	↓	09:30	0-0.05					✓	✓		✓
TH109					↓	↓	↓	0.1-0.2					✓			
TH109					↓	↓	↓	0.3-0.4					✓			
TH129					↓	↓	4.09	0-0.05					✓	✓		
TH129					↓	↓	↓	0.1-0.2					✓			
TH127					↓	↓	16:05	0-0.05					✓	✓		
TH127					↓	↓	↓	0.1-0.2					✓			
TH124					↓	↓	3:25	0-0.05					✓	✓		
TH124					↓	↓	↓	0.1-0.2					✓			
TH126					↓	↓	3:50	0-0.05					✓	✓		
TH126					↓	↓	↓	0.1-0.2					✓			
TH113					↓	↓	12:15	0-0.05					✓	✓		
TH113					↓	↓	↓	0.1-0.2					✓			
TH107					↓	↓	11:00	0-0.05					✓			
TH107					↓	↓	↓	0.1-0.2					✓			
TH106					↓	↓	10:50	0-0.05					✓	✓		
TH106					↓	↓	↓	0.1-0.2					✓			

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required. **WATERS** - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

CHAIN OF CUSTODY

CLIENT: A-ECOM	If electronic file required please select file format below	REPRESENTATIVE SAMPLE TEMPERATURE (°C):	element
ADDRESS: SUNLEY HOUSE 4 BEDFORD PARK, CROYDON	EQUIS	SAMPLER: EMMA TOMS	
PROJECT MANAGER: DAVID DYSON	CROSSTAB	MOBILE: 07741 653315	
MOBILE:	CLIENT ESDAT ✓	EMAIL REPORT TO: emma.toms@aecom.com	
PROJECT ID:	AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	cc REPORT TO: david.dyson@aecom.com	
SITE: TREADGOLD HOUSE		INVOICE TO: (if different to report)	
		QUOTE NUMBER: / P.O No	Chain of Custody sheet page 3 of 3

TURNAROUND - please tick (SURCHARGES MAY APPLY): 10 DAY [ ] 4 DAY [ ] Other [ ] 5 DAY [ ] 3 DAY [✓]

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required. **WATERS** - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Medium	Low	LEAD	ASBESTOS	METALS (13)	METALS (7)
TH103					S	26/11/21	07.15	0-0.05					✓			✓
TH103								0.1-0.2					✓	✓		
TH103								0.3-0.4					✓			
TH101							09.[illegible]	0-0.05					✓	✓		✓
TH101								0.1-0.2					✓			
TH101								0.3-0.4					✓			
TH105							10.35	0-0.05					✓	✓		
TH105								0.1-0.2					✓			
DUP01								0-0.05					✓	✓		
TH111							11.40	0-0.05					✓	✓		
TH111								0.1-0.2					✓			
TH112							11.57	0-0.05					✓	✓		
TH112								0.1-0.2					✓			

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

EMT 222043

CHAIN OF CUSTODY

CLIENT: Accom
ADDRESS: Sandy House, 4 Bedford Park, Croydon CRO 2AP
PROJECT MANAGER: David Dyson
MOBILE: +44 7799 647 173
PROJECT ID: Grenfell Stage 2 follow on
SITE: Avondale Park Gardens

If electronic file required please select file format below
- EQUIS
- CROSSTAB
- CLIENT: Excel
- AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)

REPRESENTATIVE SAMPLE TEMPERATURE (°C):
SAMPLER:
MOBILE:
EMAIL REPORT TO:
cc REPORT TO:
INVOICE TO: (if different to report)
QUOTE NUMBER: P.O No:

element

Chain of Custody sheet page ...1... of 3

TURNAROUND - please tick (SURCHARGES MAY APPLY): 10 DAY ☐ 4 DAY ☐ Other ☐ 5 DAY ☑ 3 DAY ☐

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW/L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Medium	Low	Lead	Asbestos	M.1-18(13)	PAH-16
APG101					S	06/12/21	9:55	0-0.05					✓			
APG101					S		9:55	0.1-0.2					✓			
APG101					S		9:55	0.5-0.6					✓	✓	✓	✓
APG101					S		9:55	0.9-1					ON HOLD			
APG102					S		8:58	0-0.05					✓	✓	✓	✓
APG102					S		8:58	0.1-0.2					✓			
APG103					S		9:17	0-0.05					✓			
APG103					S		9:17	0.1-0.2					✓	✓	✓	✓
APG104					S		9:45	0-0.05					✓			
APG104					S		9:45	0.1-0.2					✓			
APG105					S		9:35	0-0.05					✓	✓	✓	✓
APG105					S		9:35	0.1-0.2					✓			
APG106					S		10:30	0-0.05					✓			
APG106					S		10:30	0.1-0.2					✓			
APG106					S		10:30	0.5-0.6					✓	✓	✓	✓
APG106					S		10:30	0.9-1					ON HOLD			
APG107					S		16:05	0-0.05					✓			
APG107					S		16:05	0.1-0.2					✓			
APG108					S		13:37	0-0.05					✓	✓	✓	✓
APG108					S		13:37	0.1-0.2					✓			

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WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

RELINQUISHED BY:
Name: Date:
Of: Time:

RECIEVED BY:
Name: Date:
Of: Time:

METHOD of SHIPMENT
Consignment note No:
Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

QF-PM-1.1a v 4.1

EMT 222036

CHAIN OF CUSTODY

CLIENT: Arcam	If electronic file required please select file format below	REPRESENTATIVE SAMPLE TEMPERATURE (°C):	
ADDRESS: Surety House, 4 Balford Park, Croydon CR0 2AP		SAMPLER:	
	EQUIS	MOBILE:	
PROJECT MANAGER: David Dyson	CROSSTAB	EMAIL REPORT TO:	
MOBILE: +44 7799 667173	CLIENT	cc REPORT TO:	
PROJECT ID: Grenfell Stage 2 follow on	AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	INVOICE TO: (if different to report)	
SITE: Avondale Park Gardens		QUOTE NUMBER:	P.O No:

element

Chain of Custody sheet page 2 of 3

TURNAROUND - please tick	(SURCHARGES MAY APPLY)	All waters - tick for samples to be tested shaken or settled	FOR LABORATORY USE ONLY
10 DAY	4 DAY	Other	AVERAGE COOL BOX TEMP.(if required):
5 DAY ✓	3 DAY		SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk High	Asbestos risk Medium	Asbestos risk Low	Lead	Asbestos	Metals (13)	Metals (9)	PAH - 16
APG109					S	06/12/21	13:50	0-0.05					✓				
APG109					S		13:50	0.1-0.2					✓	✓	✓		✓
APG110					S		13:00	0-0.05					✓				
APG110					S		13:00	0.1-0.2					✓	✓	✓		✓
APG111					S		13:25	0-0.05					✓				
APG111					S		13:25	0.1-0.2					✓				
APG112					S		12:50	0-0.05					✓	✓	✓		✓
APG112					S		12:50	0.1-0.2					✓				
APG113					S		10:55	0-0.05					✓				
APG113					S		10:55	0.1-0.2					✓				
APG113					S		10:55	0.5-0.6					✓	✓	✓		✓
APG113					S		10:55	0.9-1					ON HOLD				
APG114					S		11:35	0-0.05					✓				
APG114					S		11:25	0.1-0.2					✓				
APG114					S		11:25	0.5-0.6					✓	✓	✓		✓
APG114					S		11:25	0.9-1					ON HOLD				
APG115					S		12:35	0-0.05					✓				
APG115					S		12:50	0.1-0.2					✓				
APG116					S		11:15	0-0.05					✓				
APG116					S		11:15	0.1-0.2					✓	✓	✓		✓

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RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name:	Date:	Name:	Date:	Consignment note No:
Of:	Time:	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.

Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

CHAIN OF COUSTODY

CLIENT: Accom
ADDRESS: Scully House, 4 Bedford Park, Croydon CR0 2AP
PROJECT MANAGER: David Dyson
MOBILE: +44 7799 647 173
PROJECT ID: Grenfell Stage 2, follow on
SITE: Avondale Park Gardens

If electronic file required please select file format below: EQUIS / CROSSTAB / CLIENT / AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)

REPRESENTATIVE SAMPLE TEMPERATURE (°C):
SAMPLER:
MOBILE:
EMAIL REPORT TO:
cc REPORT TO:
INVOICE TO: (if different to report)
QUOTE NUMBER: | P.O No:

element

Chain of Custody sheet page 3 of 3

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.
WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken samples

TURNAROUND - please tick (SURCHARGES MAY APPLY)
10 DAY [ ] 4 DAY [ ] Other [ ]
5 DAY [✓] 3 DAY [ ]

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY
AVERAGE COOL BOX TEMP.(if required):
SAMPLE RECIEPT CONDITION:

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

ANALYSIS REQUIRED including SUITE names

Sample ID	AGS SAMP TYPE	AGS SAMP REF	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Medium	Low	Lead	Metals (13)	PAH-16	Asbestos
DUP10					S	06/12/21	11:15	0.1-0.2					✓	✓	✓	✓
DUP11					S	↓	11:25	0-0.05					✓			

ON HOLD

ON HOLD

RELINQUISHED BY:
Name: | Date:
Of: | Time:

RECIEVED BY:
Name: | Date:
Of: | Time:

METHOD of SHIPMENT
Consignment note No:
Courier Company:

Health & Safety instructions including known hazards (e.g. suspected asbestos). Please let us know if samples are heavily contaminated e.g. high PAHs expected, provide PID readings if available.
Representative Sample Temperature: this should represent the in-ground sample temperature of soil/groundwater at time of sampling, and not the ambient air.

Element
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780
Reg Office: Element Materials Technology Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN Company Reg No: 11371415

QF-PM-1.1a v 4.1

EMT 222038

Appendix M Historical Ordnance Survey Maps

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads — Fenced / Un-Fenced
Minor Roads — Fenced / Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. — County Borough Boundary (England)
Co. Burgh Bdy. — County Burgh Boundary (Scotland)
RD. Bdy. — Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Sloping Masonry
Pylon
Pole
Electricity Transmission Line
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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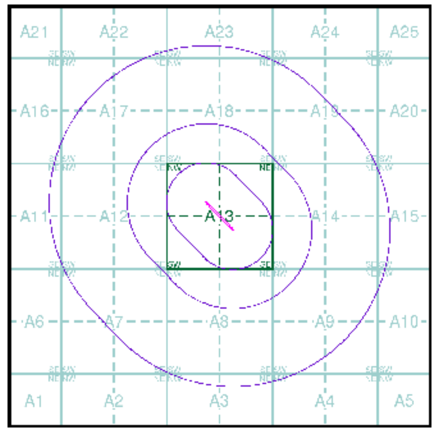
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:10,560	1874	3
Surrey	1:10,560	1874	4
London	1:10,560	1896	5
London	1:10,560	1920	6
Ordnance Survey Plan	1:10,000	1951	7
Ordnance Survey Plan	1:10,000	1957	8
Ordnance Survey Plan	1:10,000	1967	9
Ordnance Survey Plan	1:10,000	1975	10
Ordnance Survey Plan	1:10,000	1984	11
London	1:25,000	1985	12
Ordnance Survey Plan	1:10,000	1996	13
10K Raster Mapping	1:10,000	1999	14
10K Raster Mapping	1:10,000	2006	15
VectorMap Local	1:10,000	2020	16

Historical Map - Slice A



Order Details

Order Number: 244506740_1_1
Customer Ref: 60632092
National Grid Reference: 523500, 181360
Slice: A
Site Area (Ha): 0.25
Search Buffer (m): 1000

Site Details

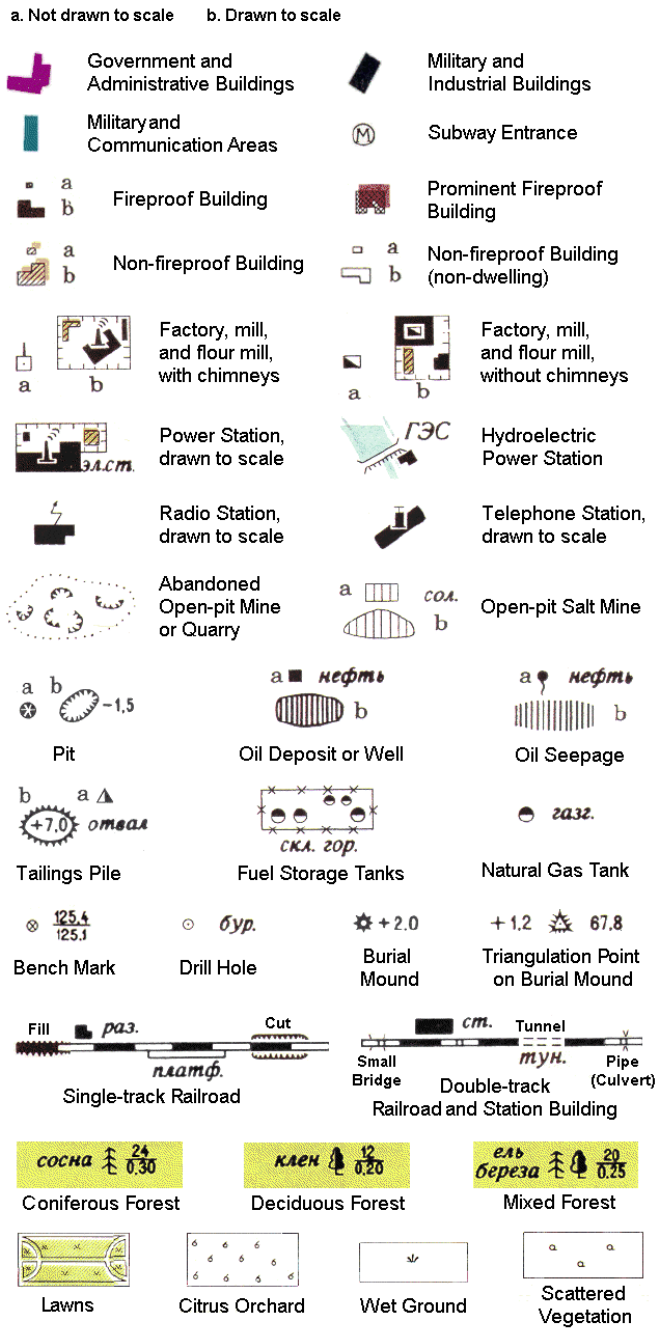
Kensington, LONDON

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping



243,8 Values for prominent elevations

186,0 Numbers for spot elevations, depth soundings, contour lines, etc.

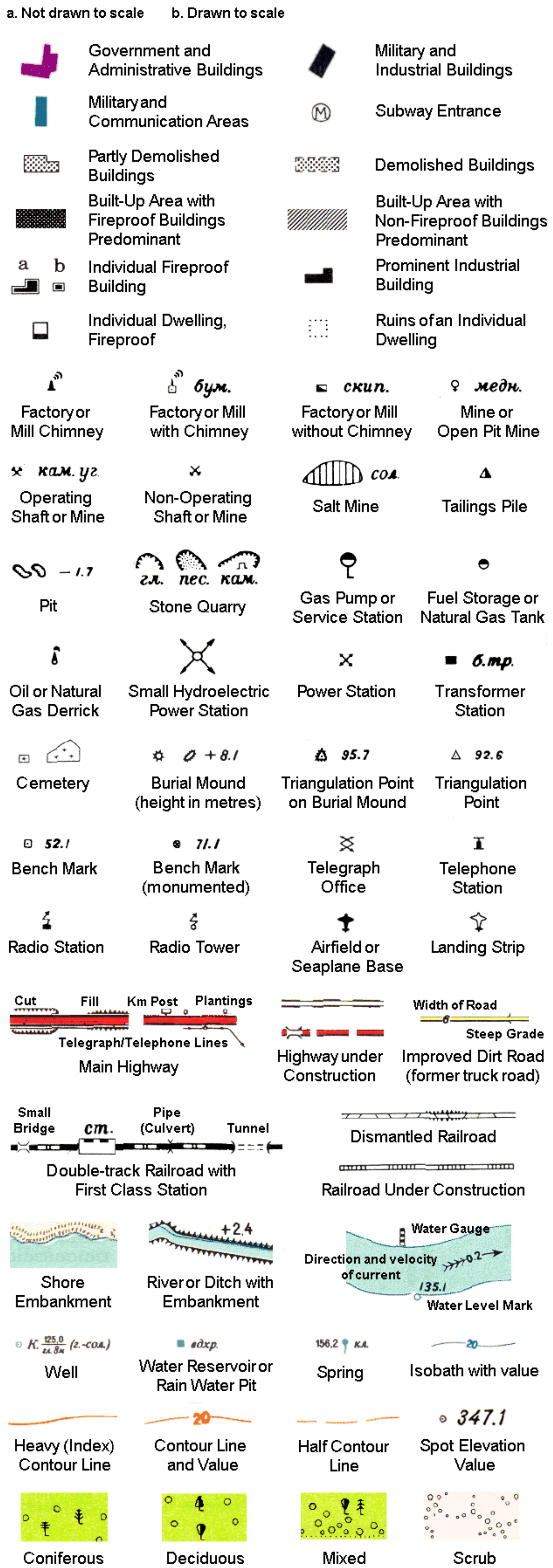
0,2 Velocity of the current, width of river bed, depth of river

180/12 Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (-)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping



Key to Numbers on Mapping

TQ28_London

No.	Description
83	Factory (Gas)
347	Television Centre

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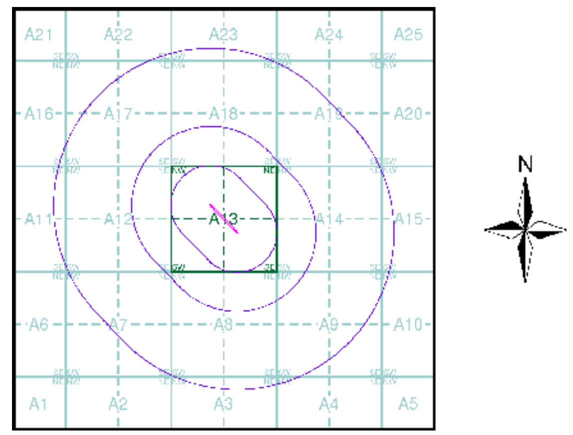
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:10,560	1874	3
Surrey	1:10,560	1874	4
London	1:10,560	1896	5
London	1:10,560	1920	6
Ordnance Survey Plan	1:10,000	1951	7
Ordnance Survey Plan	1:10,000	1957	8
Ordnance Survey Plan	1:10,000	1967	9
Ordnance Survey Plan	1:10,000	1975	10
Ordnance Survey Plan	1:10,000	1984	11
London	1:25,000	1985	12
Ordnance Survey Plan	1:10,000	1996	13
10K Raster Mapping	1:10,000	1999	14
10K Raster Mapping	1:10,000	2006	15
VectorMap Local	1:10,000	2020	16

Russian Map - Slice A



Order Details

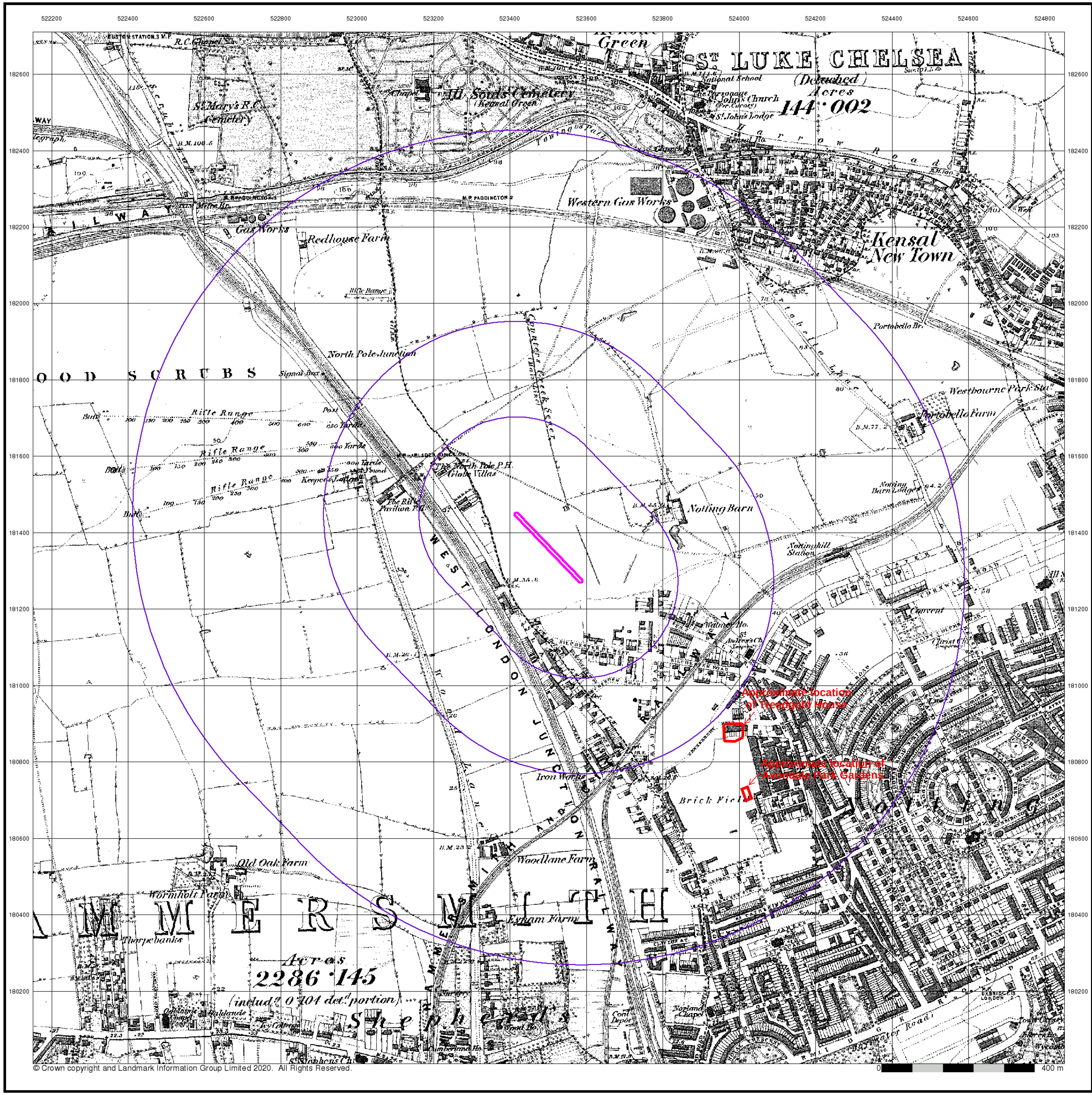
Order Number:	244506740_1_1
Customer Ref:	60632092
National Grid Reference:	523500, 181360
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	1000

Site Details

Kensington, LONDON

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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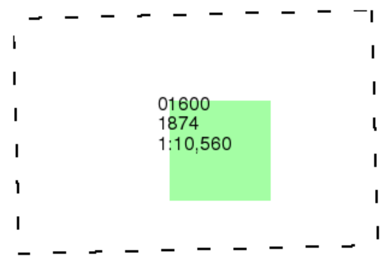
Middlesex

Published 1874

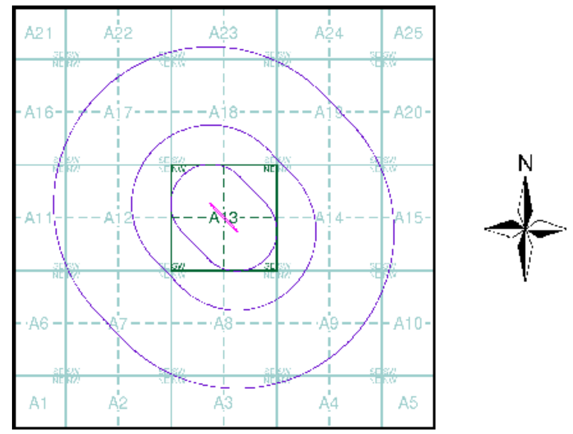
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 244506740_1_1
Customer Ref: 60632092
National Grid Reference: 523500, 181360
Slice: A
Site Area (Ha): 0.25
Search Buffer (m): 1000

Site Details

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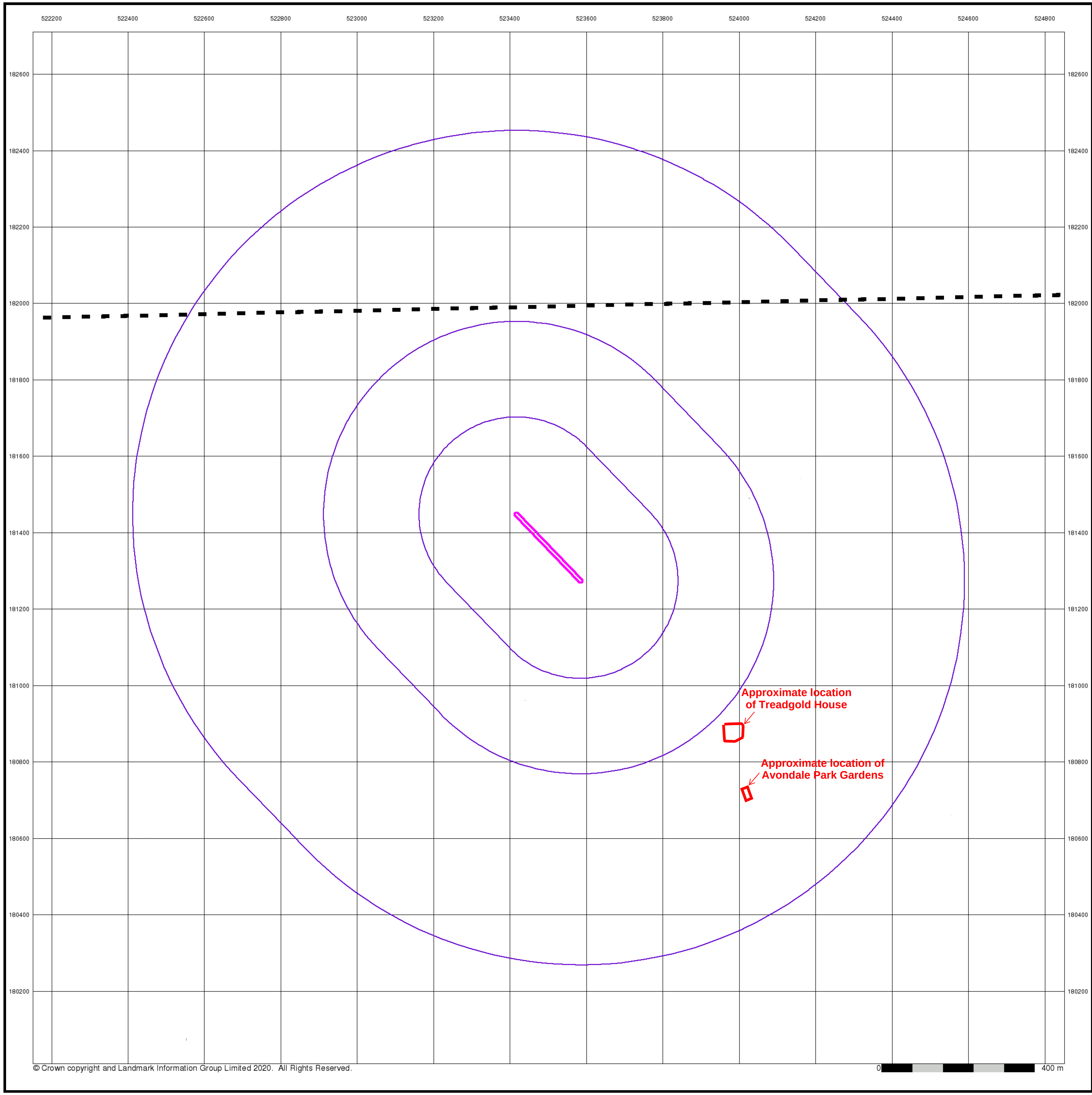

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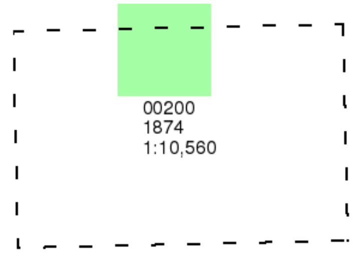
Surrey

Published 1874

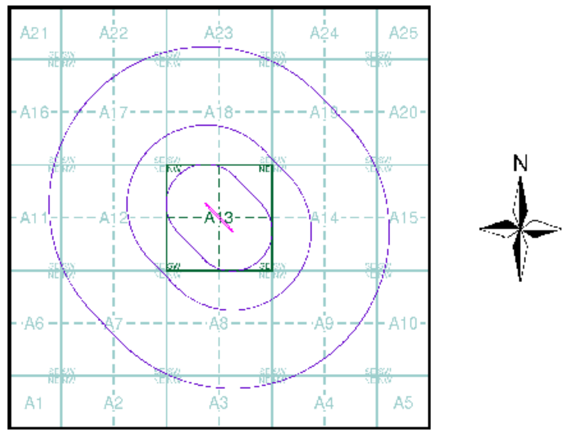
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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Customer Ref: 60632092
National Grid Reference: 523500, 181360
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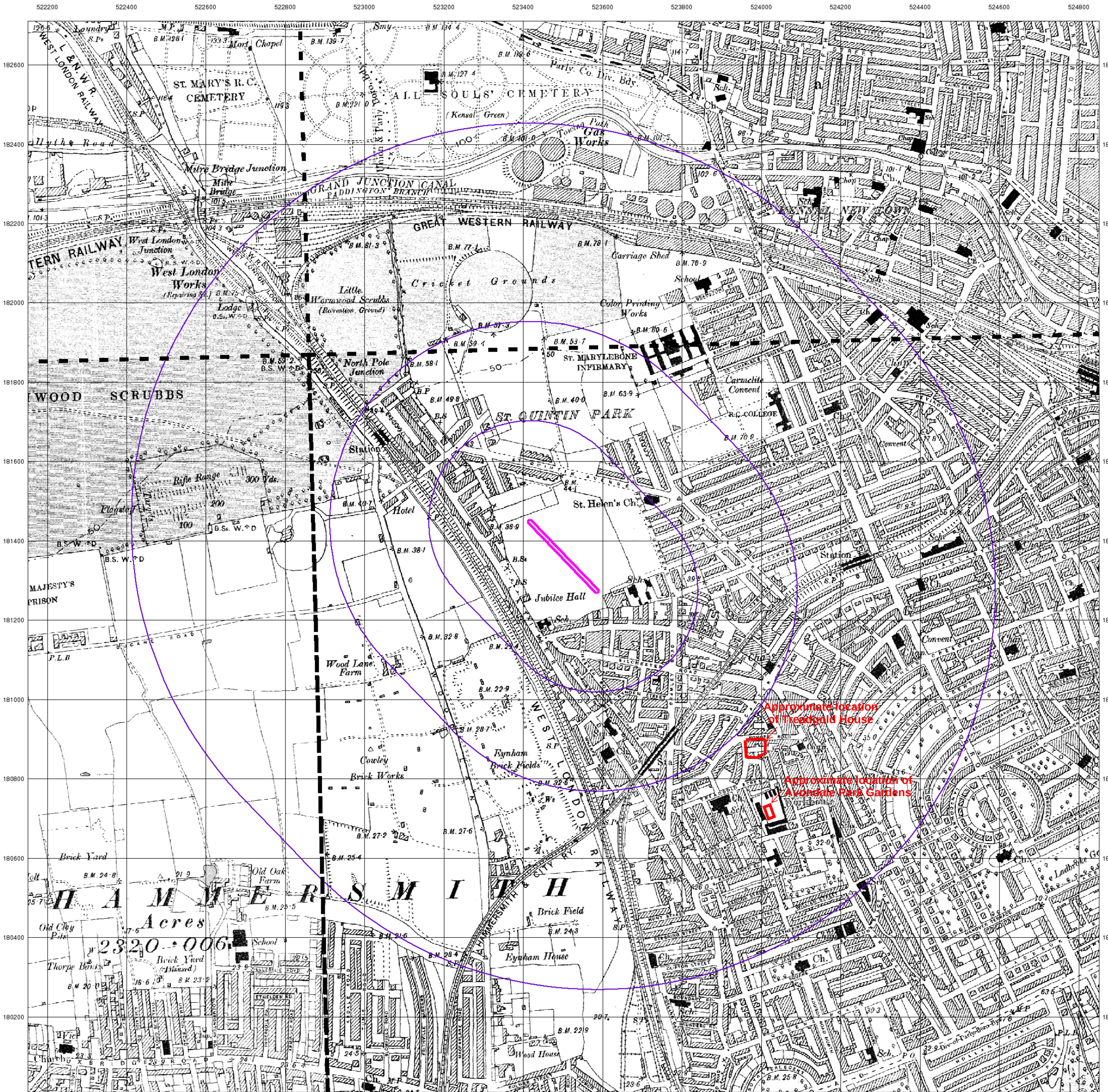

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0 400 m

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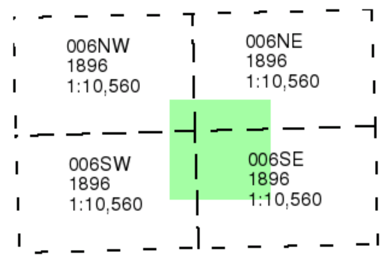
London

Published 1896

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



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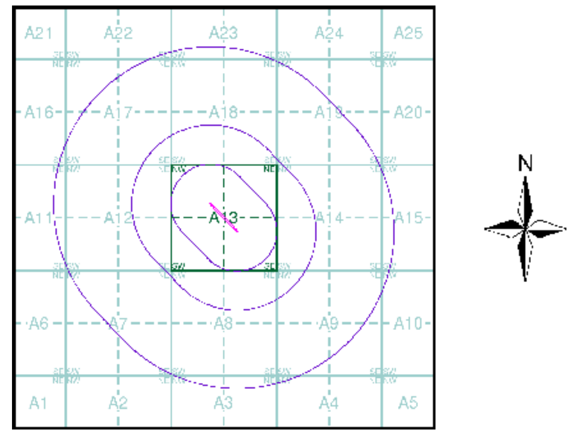

Order Details

Order Number: 244506740_1_1
Customer Ref: 60632092
National Grid Reference: 523500, 181360
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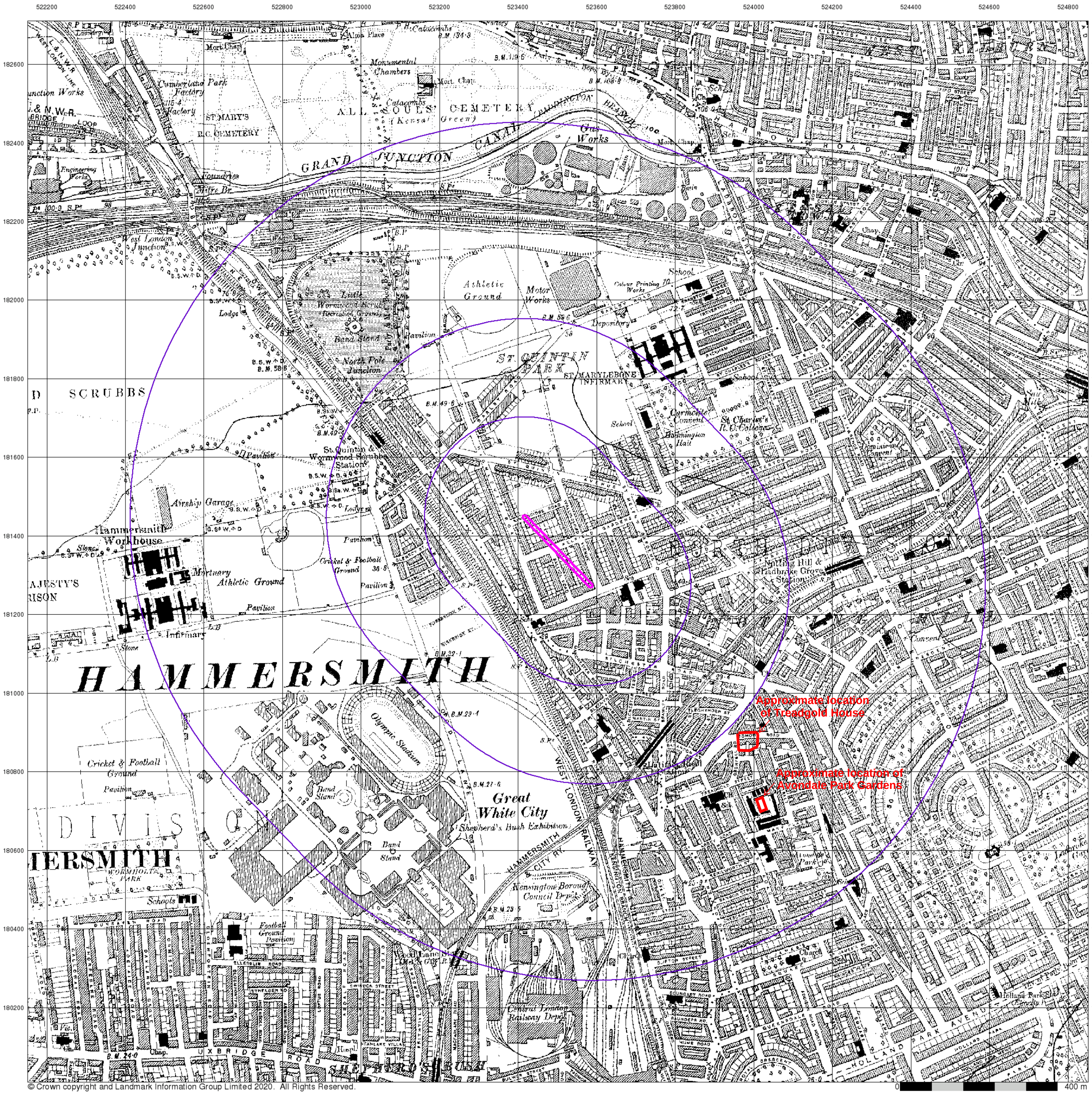

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London

Published 1920

Source map scale - 1:10,560

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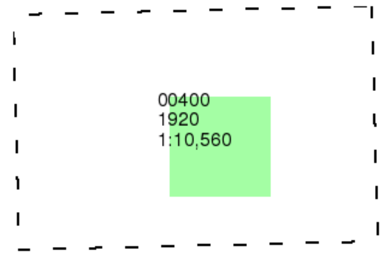
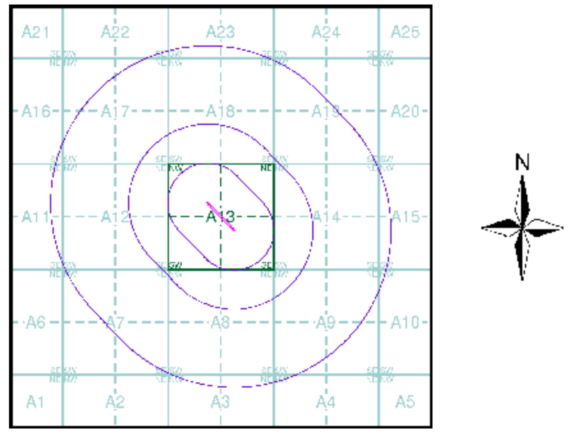
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 244506740_1_1
Customer Ref: 60632092
National Grid Reference: 523500, 181360
Slice: A
Site Area (Ha): 0.25
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Site Details

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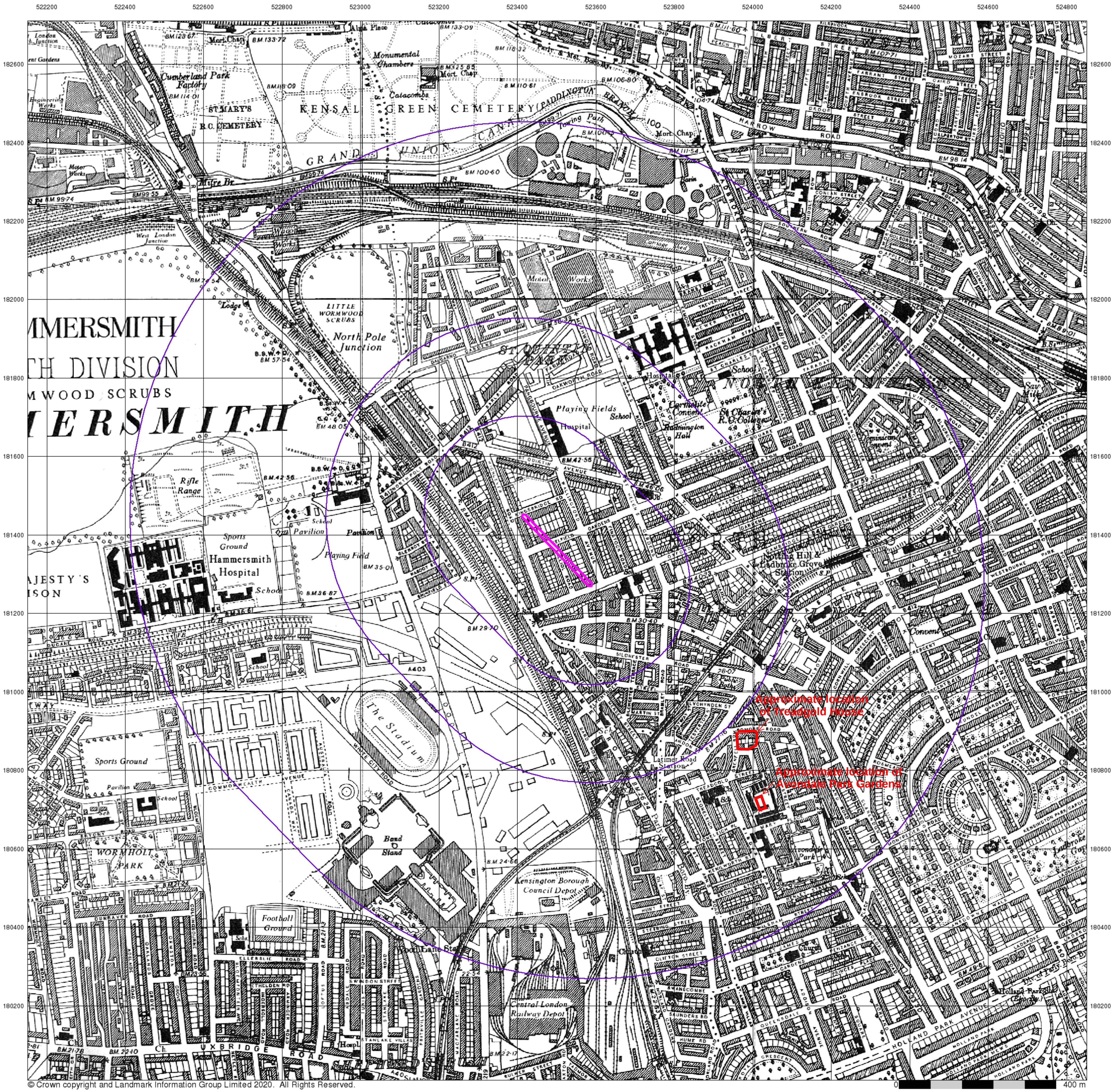

0 400 m

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Ordnance Survey Plan

Published 1951

Source map scale - 1:10,000

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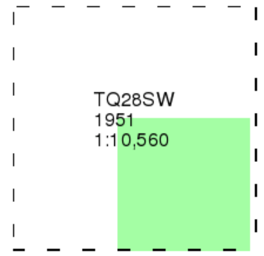
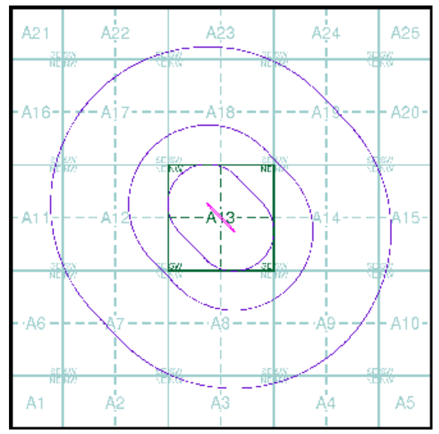
Map Name(s) and Date(s)



Historical Map - Slice A



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Order Details

Order Number:	244506740_1_1
Customer Ref:	60632092
National Grid Reference:	523500, 181360
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	1000

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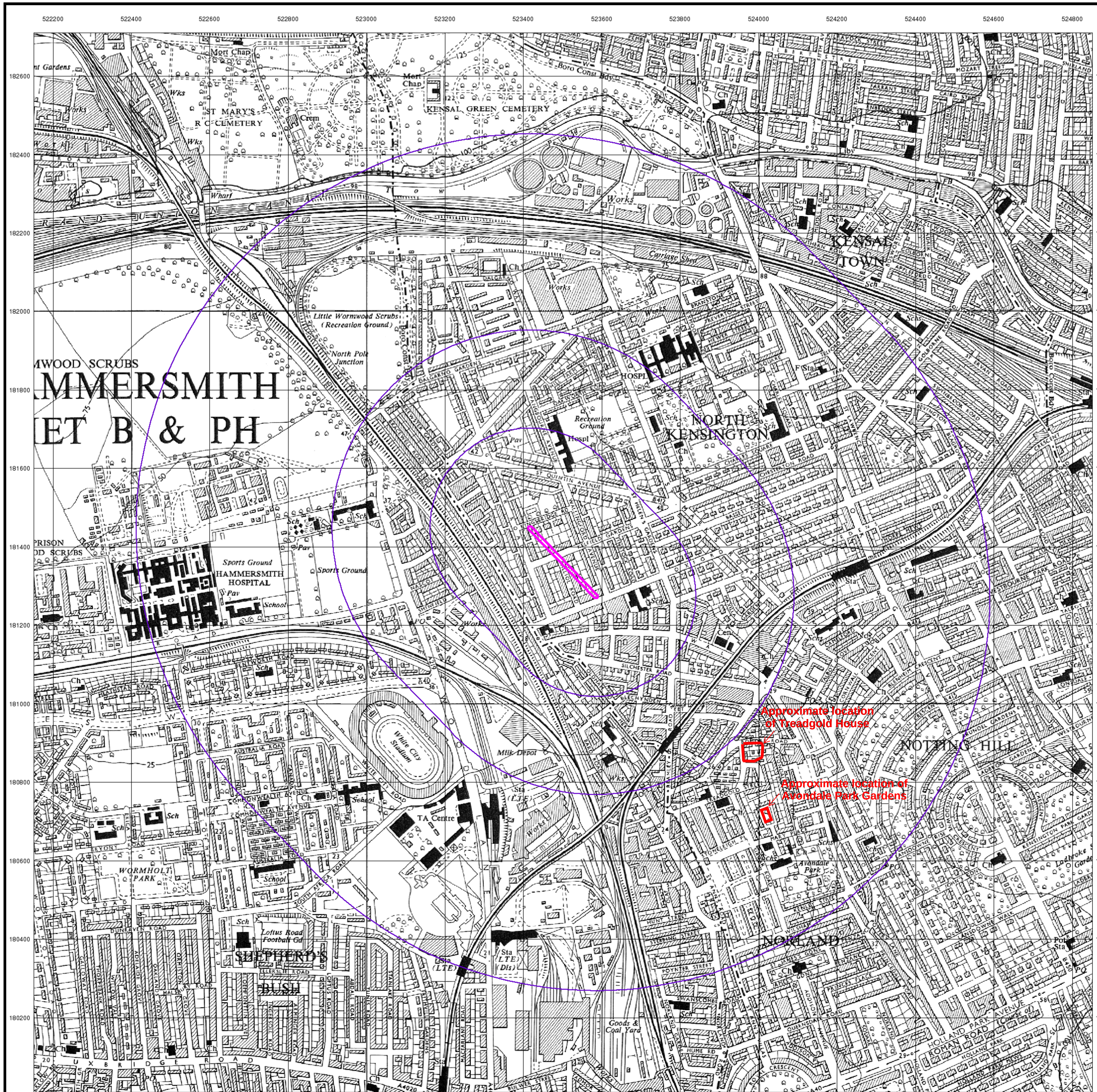

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Ordnance Survey Plan

Published 1957

Source map scale - 1:10,000

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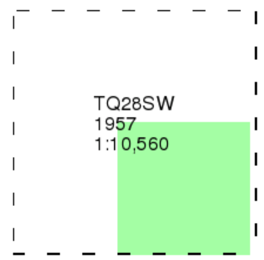
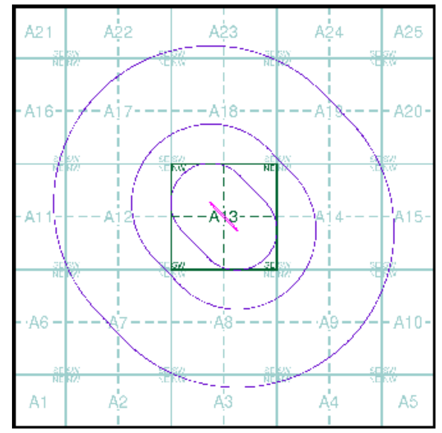


Historical Map - Slice A



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National Grid Reference:	523500, 181360
Slice:	A
Site Area (Ha):	0.25
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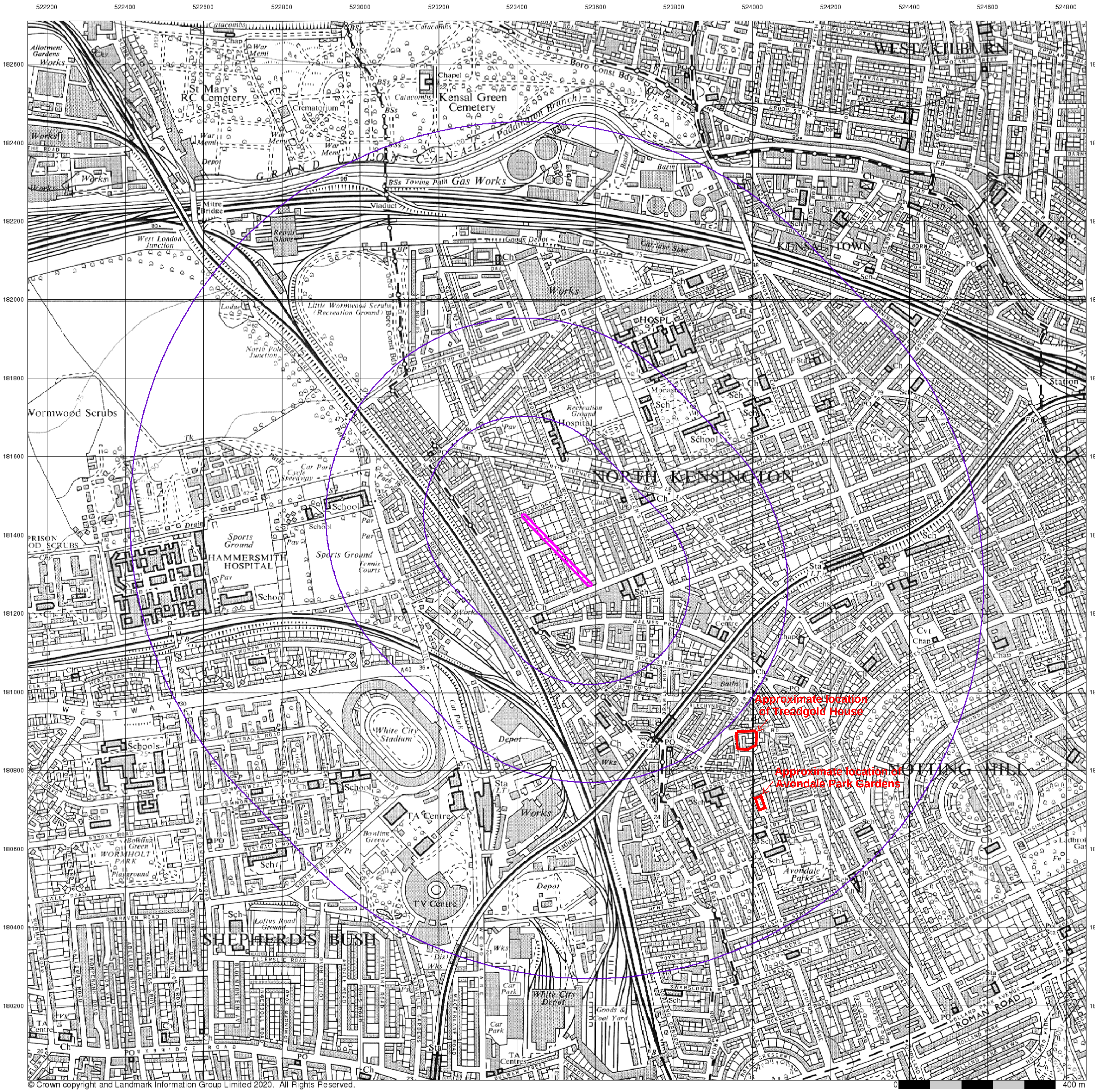

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Ordnance Survey Plan

Published 1967

Source map scale - 1:10,000

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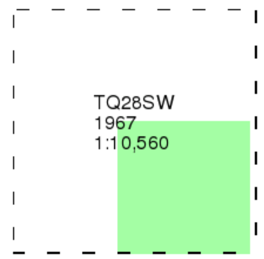
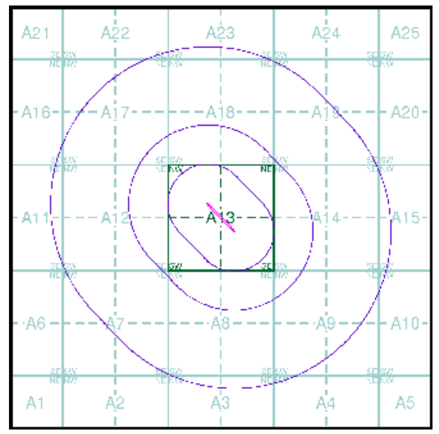
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	244506740_1_1
Customer Ref:	60632092
National Grid Reference:	523500, 181360
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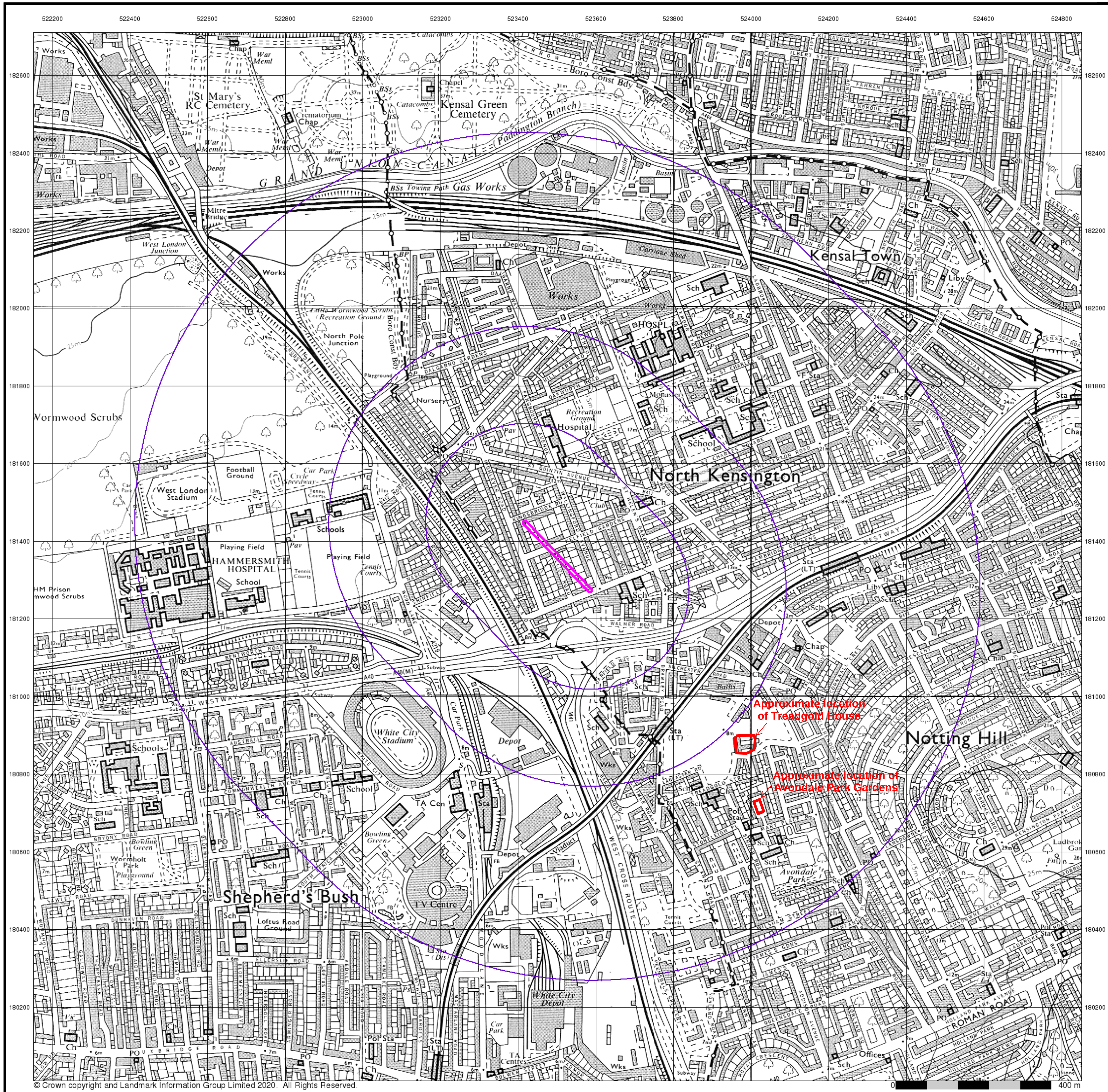

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Ordnance Survey Plan

Published 1975

Source map scale - 1:10,000

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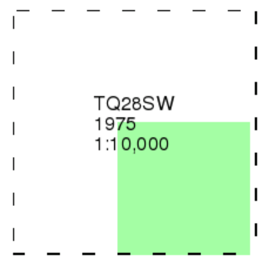
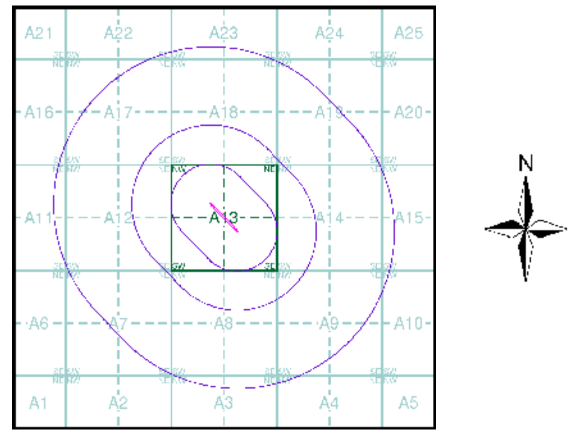
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	244506740_1_1
Customer Ref:	60632092
National Grid Reference:	523500, 181360
Slice:	A
Site Area (Ha):	0.25
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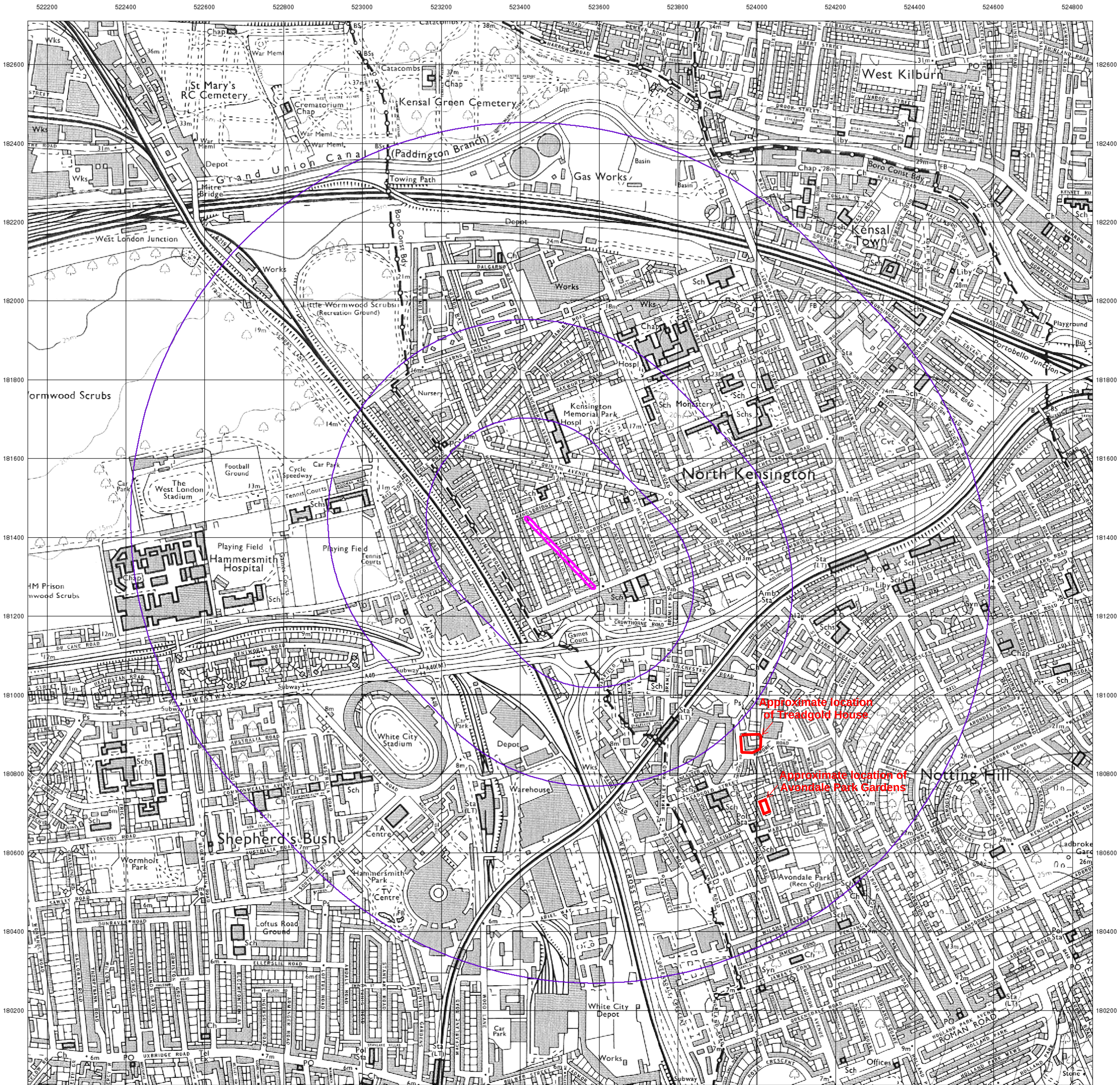

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Ordnance Survey Plan

Published 1984

Source map scale - 1:10,000

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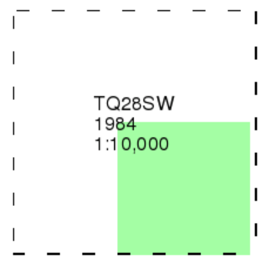
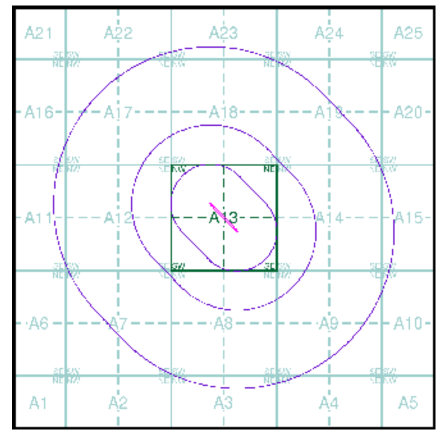
Map Name(s) and Date(s)



Historical Map - Slice A



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Order Details

Order Number:	244506740_1_1
Customer Ref:	60632092
National Grid Reference:	523500, 181360
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	1000

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London

Published 1985

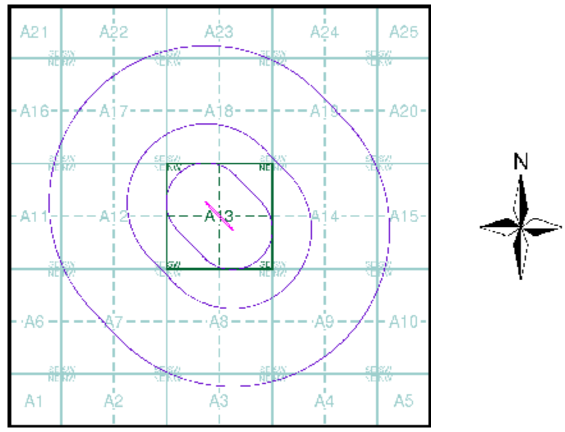
Source map scale - 1:25,000

These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.
They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)

TQ28
1985
1:25,000

Russian Map - Slice A



Order Details

Order Number: 244506740_1_1
Customer Ref: 60632092
National Grid Reference: 523500, 181360
Slice: A
Site Area (Ha): 0.25
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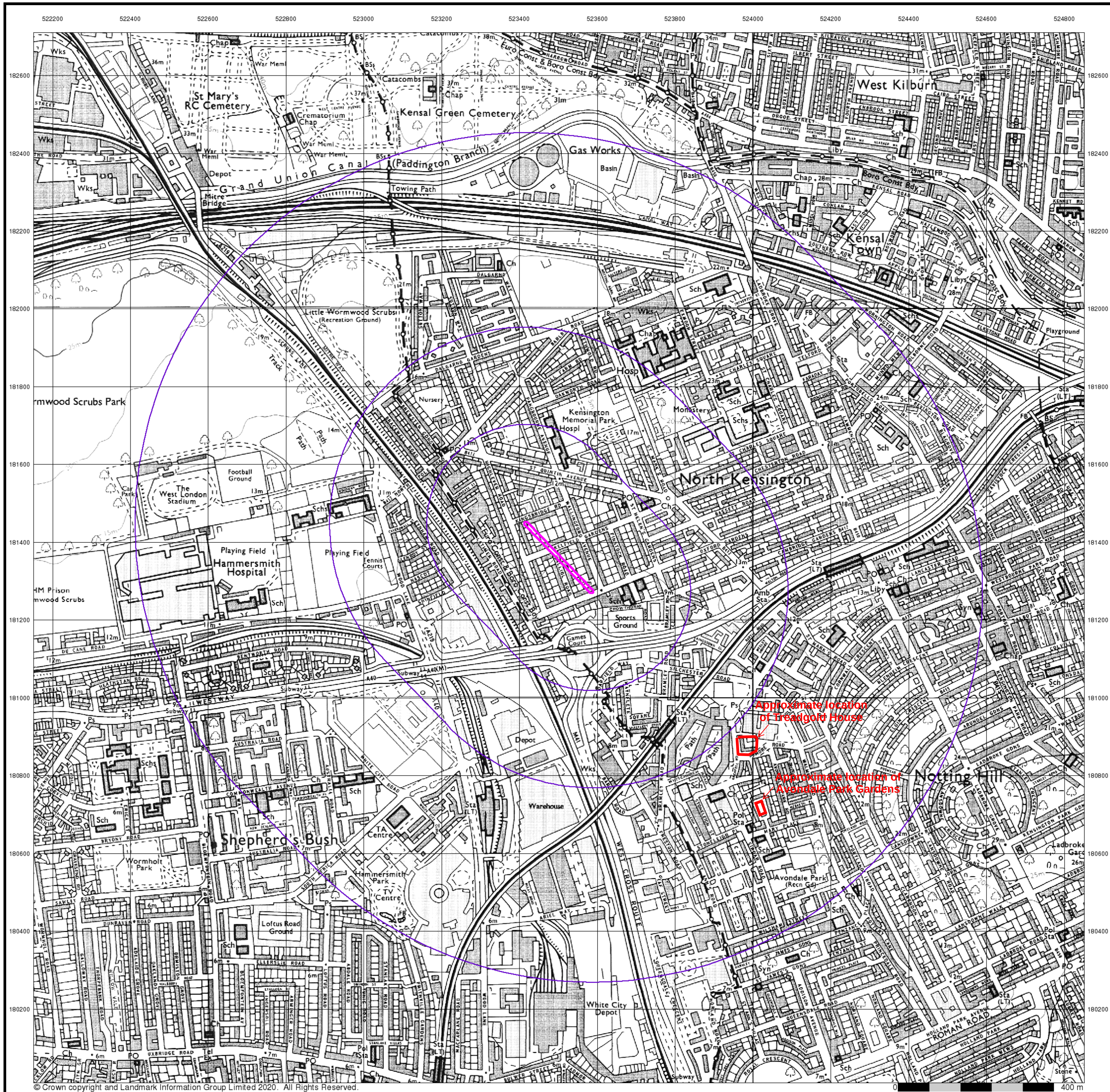

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Ordnance Survey Plan

Published 1996

Source map scale - 1:10,000

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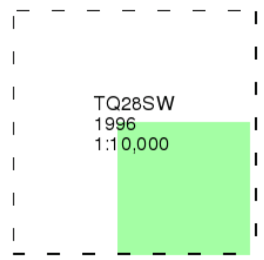
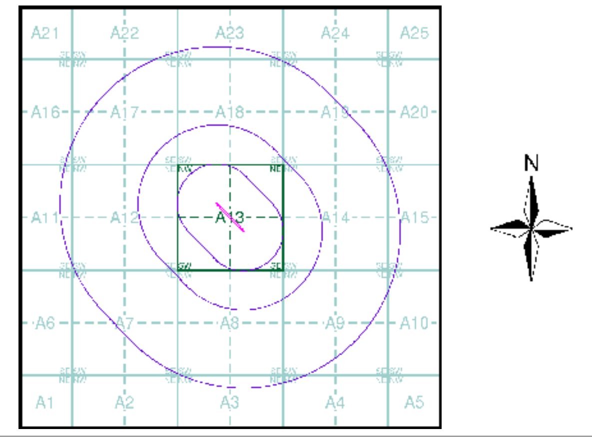


Historical Map - Slice A



Order Details

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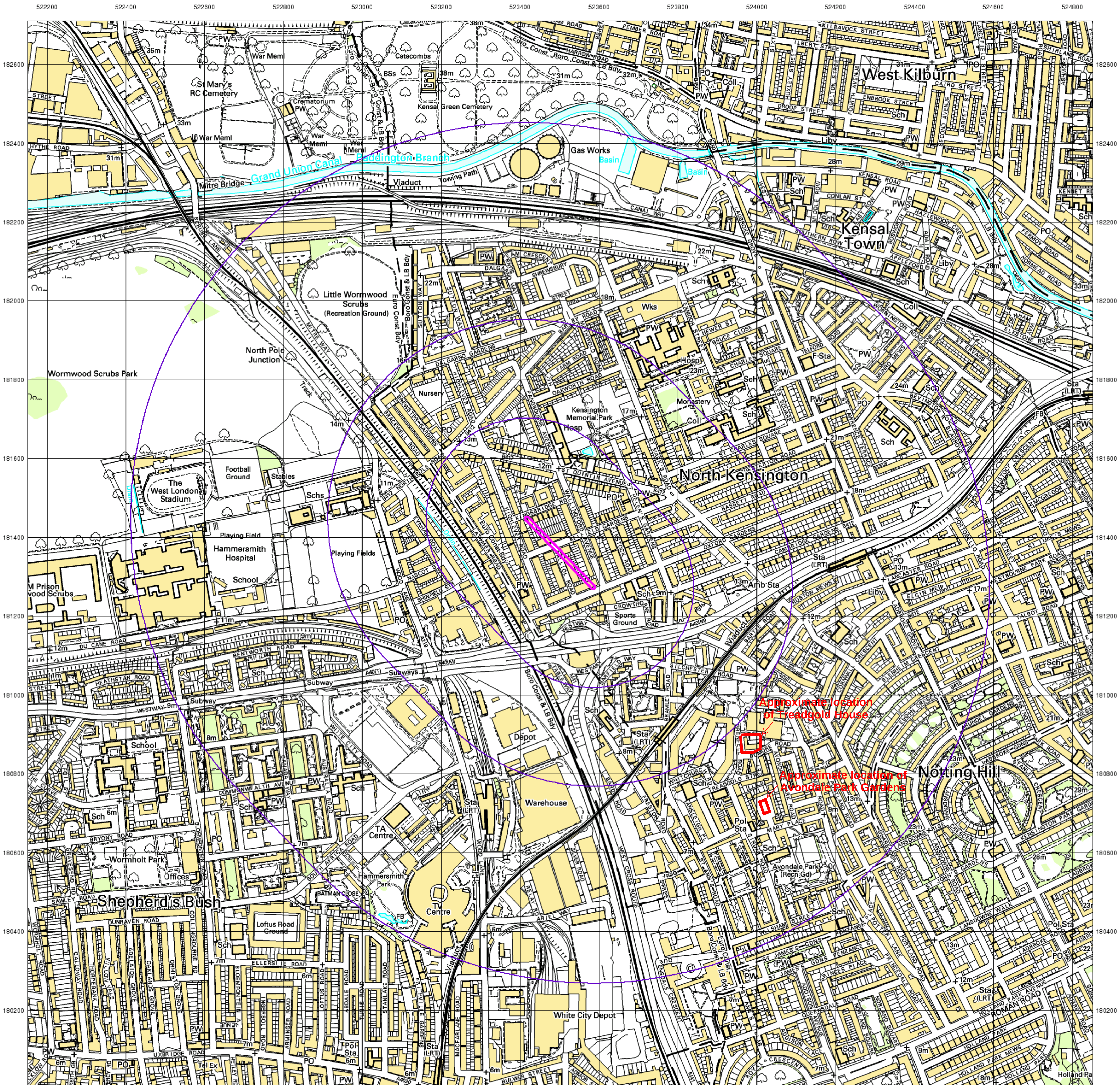

0 400 m

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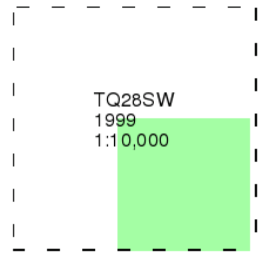
10k Raster Mapping

Published 1999

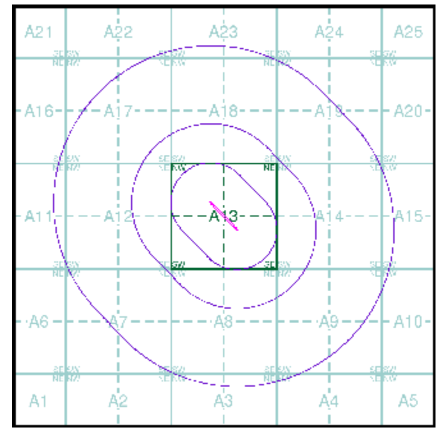
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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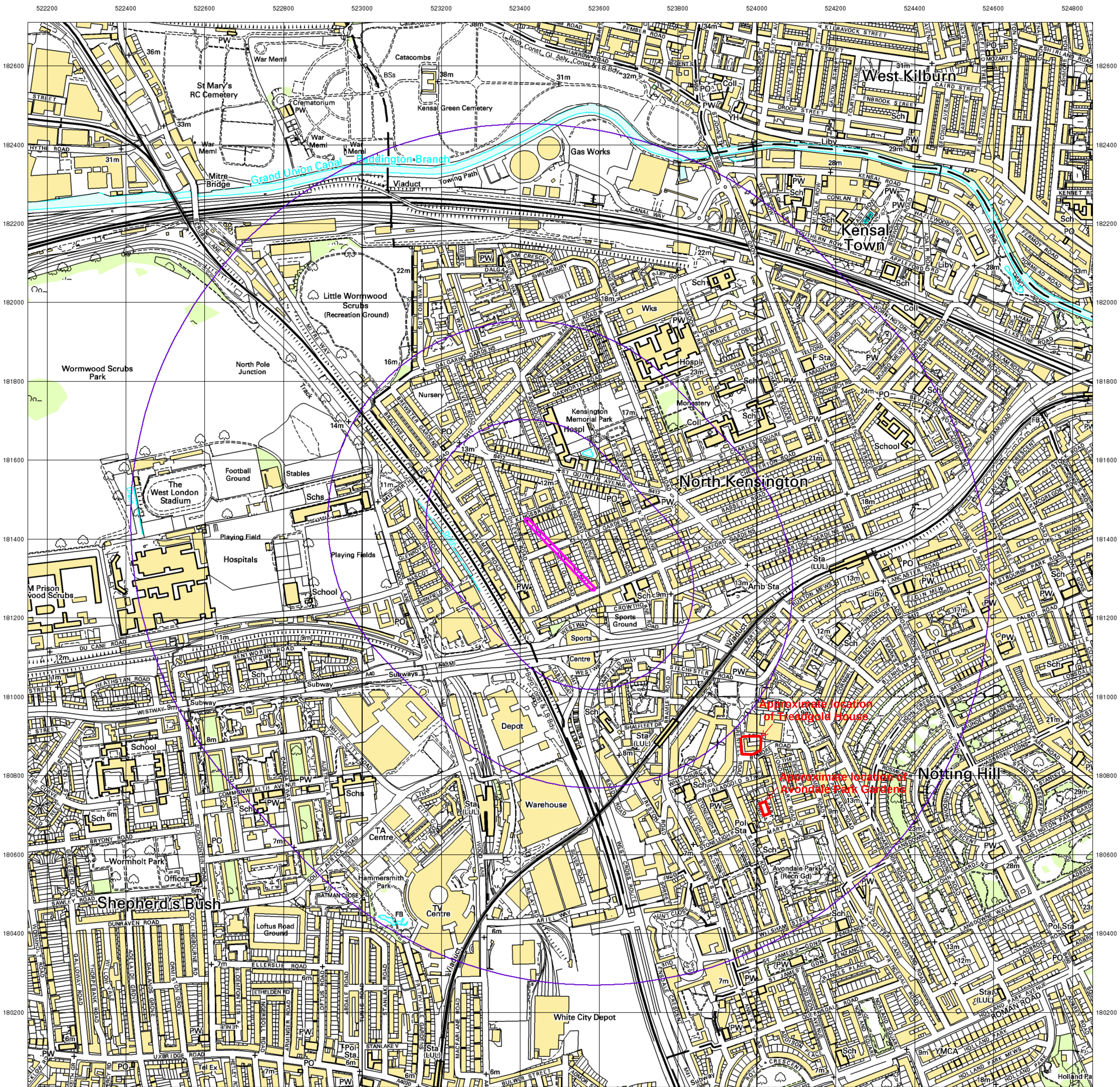

0 400 m

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10k Raster Mapping

Published 2006

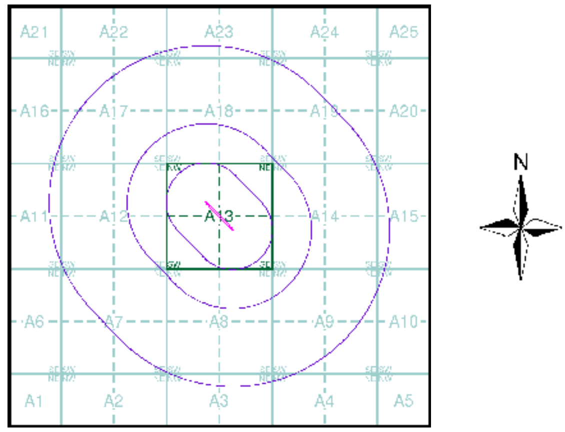
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TQ28SW
2006
1:10,000

Historical Map - Slice A



Order Details

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Site Details

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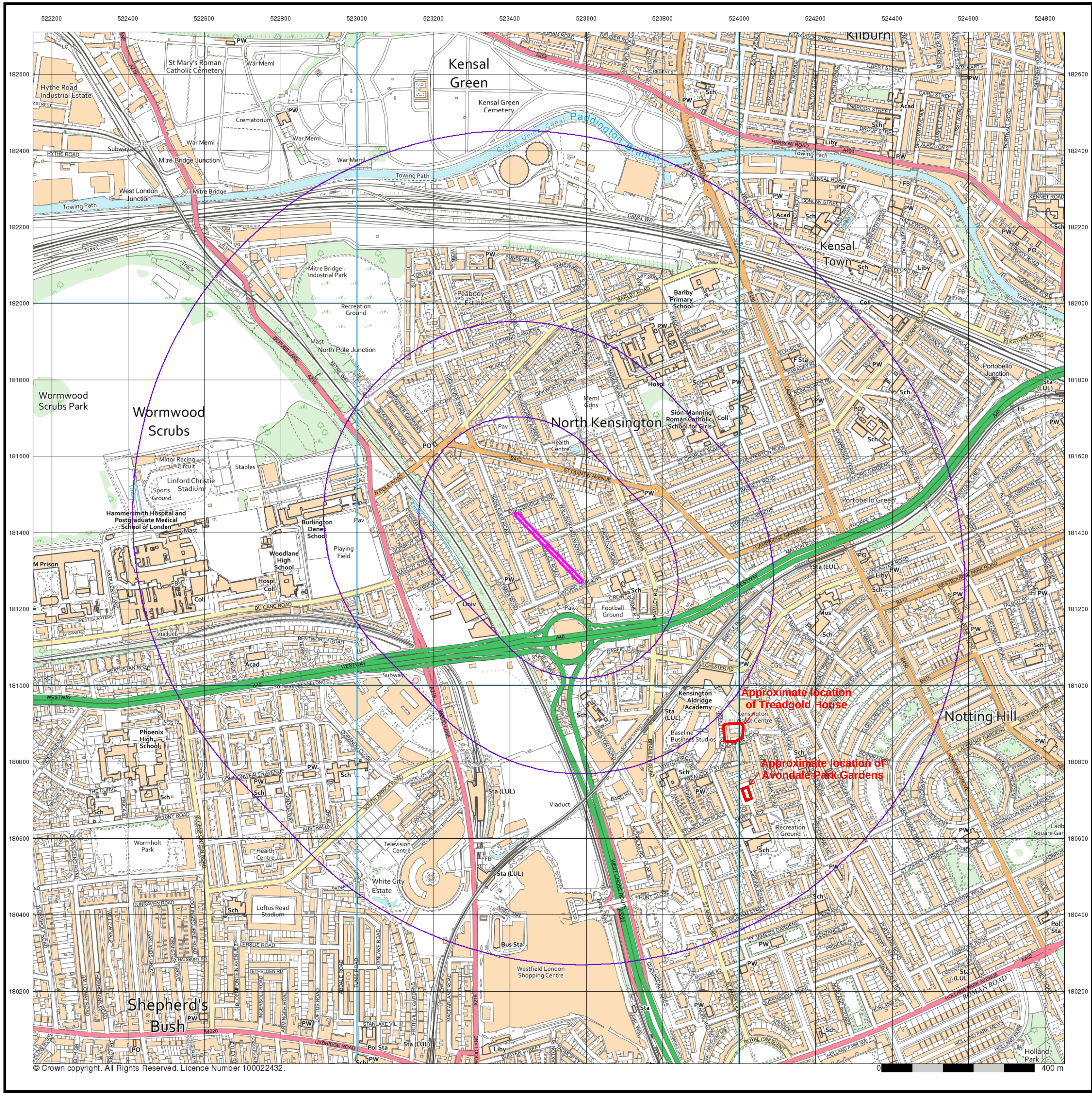
Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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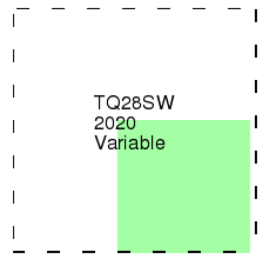
VectorMap Local

Published 2020

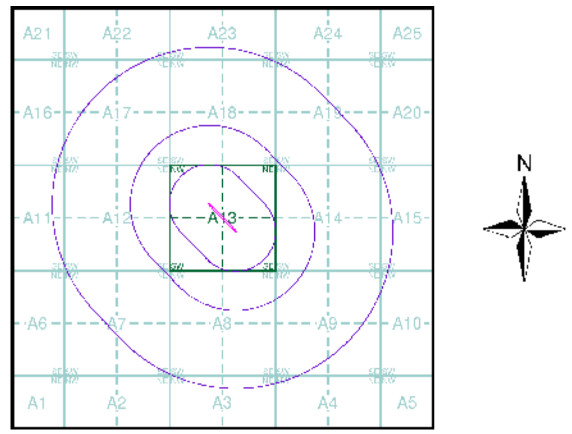
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	244506740_1_1
Customer Ref:	60632092
National Grid Reference:	523500, 181360
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	1000

Site Details

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Appendix N Site Investigation Data from Avondale Park

		WS1 (0.25m)	WS1 (1.5m)	WS2 (2.0m)	WS2 (3.0m)	WS3 (0.5m)	WS3 (1.0m)	WS4 (0.5m)	WS4 (1.0m)	WS4 (1.5m)	WS4 (3.0m)	WS5 (1.0m)	WS5 (2.0m)
Date		Jan-13	Jan-13	Jan-13	Jan-13	Jan-13	Jan-13	Jan-13	Jan-13	Jan-13	Jan-13	Jan-13	Jan-13
Depth	m	**0.25**	**1.50**	**2.00**	**3.00**	**0.50**	**1.00**	**0.50**	**1.00**	**1.50**	**3.00**	**1.00**	**2.00**
Lead	mg/kg	179	994	151	149	140	209	1976	-	788	306	4445	2671
Naphthalene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.5	-	<0.5	<0.5	<0.5	1.6
Acenaphthylene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	1.7	1	<0.5	0.5	<0.5	0.9	1.8	-	<0.5	<0.5	0.7	<0.5
Anthracene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	-	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	2.3	1.3	<0.5	0.7	0.7	0.9	3.6	-	0.6	<0.5	1.1	<0.5
Pyrene	mg/kg	1.7	0.9	<0.5	<0.5	<0.5	0.6	3.4	-	<0.5	<0.5	1	<0.5
Benzo(a)anthracene	mg/kg	1	0.6	<0.5	<0.5	<0.5	<0.5	2.9	-	<0.5	<0.5	1	<0.5
Chrysene	mg/kg	1	0.6	<0.5	<0.5	<0.5	<0.5	3.1	-	<0.5	<0.5	0.8	<0.5
Benzo(b)fluoranthene	mg/kg	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	2.5	-	<0.5	<0.5	1	<0.5
Benzo(k)fluoranthene	mg/kg	1	0.6	<0.5	<0.5	<0.5	<0.5	3.1	-	<0.5	<0.5	1.2	<0.5
Benzo(a)pyrene	mg/kg	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	-	<0.5	<0.5	1	<0.5
Indeno(123-cd)pyrene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.5	-	<0.5	<0.5	1	<0.5
Dibenzo(a,)anthracene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	-	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4	-	<0.5	<0.5	0.8	<0.5
PAH (sum)	mg/kg	10.2	4.9	<0.5	1.2	0.7	3.2	30.7	-	0.6	<0.5	9.4	1.6
Coronene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos		ND	-	-	-	-	ND	-	ND	-	-	ND	-
Quantification	%	-	-	-	-	-	-	-	-	-	-	-	-

		V1 (0.1-0.2m)	V2 (0.08-0.2m)	V3 (0.04-0.2m)	V4 (0.05-0.25m)	V5 (0.05-0.3m)	V6 (0.05-0.25m)	V7 (0.1-0.2m)	V8 (0.1-0.2m)	BH01 (1.0m)	BH01 (8.0m)	BH02 (0.2m)	BH02 (0.6m)	BH02 Duplicate (0.6m)	BH02 (2.75m)	BH02 (4.00m)
Date		Nov-13	Nov-13	Nov-13	Nov-13	Nov-13	Nov-13	Nov-13	Nov-13	Apr-14	Apr-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14
Depth	m	**0.1-0.2**	**0.08-0.20**	**0.04-0.20**	**0.05-0.25**	**0.05-0.30**	**0.05-0.25**	**0.1-0.2**	**0.1-0.2**	**1.00**	**8.00**	**0.20**	**0.60**	**0.60**	**2.75**	**4.00**
Lead	mg/kg	40	35	35	120	100	340	97	81	610	280	250	120	160	440	980
Naphthalene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.47	<0.05	0.31	0.18	0.17	2.9	1.5
Acenaphthylene	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	0.53	<0.20	<0.20	<0.20	<0.20	0.26	<0.20	<0.20	<0.20	<0.20
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	0.32	<0.10	0.36	<0.10	<0.10	<0.10	<0.10	0.6	<0.10	<0.10	2.7	1.1
Fluorene	mg/kg	<0.20	<0.20	<0.20	0.23	<0.20	0.47	<0.20	<0.20	<0.20	<0.20	0.53	<0.20	<0.20	2.2	1.3
Phenanthrene	mg/kg	<0.20	<0.20	<0.20	5.4	<0.20	6.1	0.61	1.1	1	1.7	7.4	1.8	1.8	15	7
Anthracene	mg/kg	<0.10	<0.10	<0.10	1.2	<0.10	1.5	0.17	0.2	0.22	1.4	2.2	0.44	0.41	2.3	1.4
Fluoranthene	mg/kg	<0.20	<0.20	<0.20	5.8	1.1	16	2.2	2.7	2.3	3	18	5.5	4.6	21	11
Pyrene	mg/kg	<0.20	<0.20	<0.20	4.6	1	14	2	2.4	2.1	2.4	16	5.3	4.4	20	8.4
Benzo(a)anthracene	mg/kg	<0.20	<0.20	<0.20	2.3	0.66	9.6	1.3	1.2	2	2.4	8.7	3.4	2.7	7.7	4.6
Chrysene	mg/kg	<0.05	<0.05	<0.05	2.6	0.68	8.3	1.3	1.7	1.3	1.9	8.4	2.6	2.4	9.3	4.2
Benzo(b)fluoranthene	mg/kg	<0.10	<0.10	<0.10	2.4	0.83	10	1.7	1.8	2.5	2.8	12	4.5	4	11	6.1
Benzo(k)fluoranthene	mg/kg	<0.20	<0.20	<0.20	1.5	0.41	6.6	1	1.2	0.91	1.7	4.8	1.6	1.1	3.3	2.1
Benzo(a)pyrene	mg/kg	<0.10	<0.10	<0.10	2.4	0.73	11	1.8	1.9	1.8	3	9.2	3.4	2.7	6.8	4.4
Indeno(123-cd)pyrene	mg/kg	<0.20	<0.20	<0.20	0.91	0.38	4.8	0.76	0.87	1	1.6	5	1.7	1.3	3.4	2.3
Dibenzo(a,)anthracene	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	0.86	<0.20	<0.20	<0.20	0.3	0.68	0.26	<0.20	0.58	0.32
Benzo(g,h,i)perylene	mg/kg	<0.05	<0.05	<0.05	1.2	0.44	5.5	0.89	1	1	1.7	4.7	1.7	1.5	3.5	2.3
PAH (sum)	mg/kg	<1.6	<1.6	<1.6	31	6.4	96	14	16	17	24	98	32	27	110	57
Coronene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quantification	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Avondale Park

		BH02 (6.00m)	BH02 (7.00m)	BH02 (9.00m)	BH03 (1.0m)	BH03 (2.75m)	BH03 (4.0m)	BH04 (0.2m)	BH04 (0.6m)	BH04 (1.4m)	BH04 (4.0m)	BH05 (0.20m)
Date		Mar-14	Mar-14	Mar-14	?	?	?	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14
Depth	m	**6.00**	**7.00**	**9.00**	**1.00**	**2.75**	**4.00**	**0.20**	**0.60**	**1.40**	**4.00**	**0.20**
Lead	mg/kg	440	960	30	370	480	850	230	240	230	38	240
Naphthalene	mg/kg	0.27	0.39	<0.05	0.63	0.66	0.6	0.47	0.42	<0.05	<0.05	<0.05
Acenaphthylene	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	0.49	<0.20	<0.20	<0.20
Acenaphthene	mg/kg	<0.10	0.21	<0.10	0.19	0.99	0.56	0.21	0.23	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.20	0.28	<0.20	<0.20	1.4	0.99	<0.20	0.43	<0.20	<0.20	<0.20
Phenanthrene	mg/kg	0.63	3	1.2	2.2	8.2	7.2	3	6.9	1.9	<0.20	0.96
Anthracene	mg/kg	0.12	0.71	0.33	0.34	1.2	0.62	0.56	1.5	0.41	<0.10	0.26
Fluoranthene	mg/kg	0.81	3.9	1.7	3.2	9.7	5.5	5.3	11	2.5	<0.20	2.4
Pyrene	mg/kg	0.75	3.1	1.4	2.6	7.3	3.9	4.3	8.6	2	<0.20	2.1
Benzo(a)anthracene	mg/kg	0.49	2	0.91	1.4	3.1	1.5	2.8	4.7	1.1	<0.20	1.3
Chrysene	mg/kg	0.48	2	0.82	1.6	3	1.6	2.7	4.3	1.1	<0.05	1.1
Benzo(b)fluoranthene	mg/kg	0.9	3	0.91	1.7	2.4	1.2	3.1	4.7	1.2	<0.10	1.3
Benzo(k)fluoranthene	mg/kg	0.2	0.71	0.53	0.88	1.5	0.71	1.4	2.5	0.52	<0.20	0.79
Benzo(a)pyrene	mg/kg	0.55	2.1	0.88	1.3	2.1	1.1	2.8	4.2	1	<0.10	1.1
Indeno(123-cd)pyrene	mg/kg	0.3	1.1	0.4	0.7	1	0.47	0.99	2	0.41	<0.20	0.48
Dibenzo(a,)anthracene	mg/kg	<0.20	0.28	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	mg/kg	0.35	1.2	0.39	0.83	1.4	0.63	1.3	2.2	0.48	<0.05	0.59
PAH (sum)	mg/kg	6	24	9.6	18	44	27	29	54	13	<1.6	12
Coronene	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Asbestos		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quantification	%	-	-	-	-	-	-	-	-	-	-	-

		BH05 (0.60m)	BH05 (1.00m)	BH05 (2.75m)	BH05 (5.00m)	BH05 (7.00m)	BH06 (0.20m)	BH06 (0.60m)	BH06 (1.00m)	BH06 (1.80m)	BH06 (2.25m)	BH07 (0.20m)
Date		Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14
Depth	m	**0.60**	**1.00**	**2.75**	**5.00**	**7.00**	**0.20**	**0.60**	**1.00**	**1.80**	**2.25**	**0.20**
Lead	mg/kg	510	720	1100	870	36	710	180	150	390	16	660
Naphthalene	mg/kg	2	1.7	0.47	0.94	<0.05	0.24	<0.05	<0.05	<0.05	<0.05	0.62
Acenaphthylene	mg/kg	12	<0.20	<0.20	<0.20	<0.20	0.36	<0.20	<0.20	<0.20	<0.20	0.4
Acenaphthene	mg/kg	2.9	<0.10	<0.10	0.81	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.62
Fluorene	mg/kg	19	<0.20	0.32	0.67	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.6
Phenanthrene	mg/kg	140	1.7	2.1	4.4	0.35	3.2	0.35	0.22	<0.20	<0.20	13
Anthracene	mg/kg	43	0.47	0.56	0.49	<0.10	0.65	<0.10	<0.10	<0.10	<0.10	3.1
Fluoranthene	mg/kg	120	3.3	5.7	5.6	0.43	8.5	0.67	0.37	<0.20	<0.20	24
Pyrene	mg/kg	93	3.1	4.7	4.4	0.35	7.3	0.55	0.34	<0.20	<0.20	20
Benzo(a)anthracene	mg/kg	48	1.8	2.5	1.7	0.21	4.3	0.35	<0.20	<0.20	<0.20	12
Chrysene	mg/kg	52	2.2	2.9	2.2	0.13	4.6	0.39	<0.05	<0.05	<0.05	9.2
Benzo(b)fluoranthene	mg/kg	46	2.1	2.7	1.8	0.21	5.5	0.28	<0.10	<0.10	<0.10	16
Benzo(k)fluoranthene	mg/kg	28	1.8	1.4	1.2	<0.20	3.5	0.3	<0.20	<0.20	<0.20	5.1
Benzo(a)pyrene	mg/kg	47	2.1	2	1.4	0.17	5.2	0.31	<0.10	<0.10	<0.10	12
Indeno(123-cd)pyrene	mg/kg	18	1	0.89	0.68	<0.20	2.7	<0.20	<0.20	<0.20	<0.20	5.5
Dibenzo(a,)anthracene	mg/kg	2.7	0.29	0.23	0.21	<0.20	0.65	<0.20	<0.20	<0.20	<0.20	1.3
Benzo(g,h,i)perylene	mg/kg	19	1	0.99	0.77	<0.05	3	<0.05	<0.05	<0.05	<0.05	5.6
PAH (sum)	mg/kg	690	22	28	27	2	50	3.2	<1.6	<1.6	<1.6	130
Coronene	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Asbestos		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quantification	%	-	-	-	-	-	-	-	-	-	-	-

		BH07 (0.60m)	BH07 (1.0m)	BH07 (2.75m)	BH07 (5.00m)	BH08 (0.20m)	BH08 (0.60m)	BH08 (1.0m)	HA1 (0.10m)	HA1 (0.30m)	HA2 (0.10m)	HA2 (0.30m)	HA3 (0.10m)	HA3 (0.30m)	HA3 (0.50m)
Date		Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14	Mar-14
Depth	m	**0.60**	**1.00**	**2.75**	**5.00**	**0.20**	**0.60**	**1.00**	**0.10**	**0.30**	**0.10**	**0.30**	**0.10**	**0.30**	**0.50**
Lead	mg/kg	650	180	620	180	620	650	920	310	390	130	210	240	230	230
Naphthalene	mg/kg	0.75	0.11	0.87	<0.05	0.52	0.34	0.15	0.58	0.21	1.1	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	mg/kg	0.31	<0.20	<0.20	<0.20	0.63	0.58	<0.20	0.29	<0.20	2.5	<0.20	<0.20	<0.20	<0.20
Acenaphthene	mg/kg	1.2	<0.10	<0.10	<0.10	4.1	2.3	0.13	<0.10	<0.10	11	<0.10	<0.10	0.29	<0.10
Fluorene	mg/kg	1.4	<0.20	<0.20	<0.20	4.3	2.6	<0.20	0.25	<0.20	13	<0.20	<0.20	0.26	<0.20
Phenanthrene	mg/kg	16	0.75	1	<0.20	35	32	2.3	3.1	0.82	140	1.1	1.4	4.2	3
Anthracene	mg/kg	4.2	0.35	0.16	<0.10	11	8.6	0.38	0.8	0.12	44	0.37	0.3	0.91	0.65
Fluoranthene	mg/kg	25	2.6	1	<0.20	50	39	3.8	7.5	2.1	200	3.9	2.7	7.5	5.4
Pyrene	mg/kg	21	2.4	1	<0.20	40	30	3.3	6.3	1.9	160	3.5	2.3	6.7	4.5
Benzo(a)anthracene	mg/kg	11	1.5	0.73	<0.20	22	16	1.8	4.4	1.1	100	2.3	1.2	3.7	2.4
Chrysene	mg/kg	11	1.6	0.8	<0.05	20	14	2	3.4	1.3	91	2.3	1.4	3.6	2.4
Benzo(b)fluoranthene	mg/kg	19	2.1	0.94	<0.10	23	15	3.4	6.7	1.6	110	4	1.8	5	3
Benzo(k)fluoranthene	mg/kg	5.6	1.3	0.57	<0.20	11	8.8	0.99	2	0.9	50	1.1	0.95	2.1	1.4
Benzo(a)pyrene	mg/kg	14	1.9	1	<0.10	19	14	2.4	4.6	1.4	93	3	1.4	3.9	2.3
Indeno(123-cd)pyrene	mg/kg	6.8	0.97	0.41	<0.20	8.8	6.3	1.3	2.8	0.84	44	1.7	0.76	2	1.1
Dibenzo(a,)anthracene	mg/kg	1.6	<0.20	<0.20	<0.20	2.2	1.6	0.28	0.4	<0.20	13	0.46	<0.20	0.44	0.3
Benzo(g,h,i)perylene	mg/kg	7.3	1	0.55	<0.05	8.9	6.6	1.3	2.8	0.91	45	1.7	0.87	2.1	1.3
PAH (sum)	mg/kg	150	17	9.2	<1.6	260	200	24	46	13	1100	25	15	43	28
Coronene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quantification	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-

		HA4 (0.10m)	HA4 (0.50m)	HA5 (0.10m)	HA5 (0.30m)	HA5 (0.50m)	HA6 (0.10m)	HA6 (0.30m)	HA6 (0.50m)	HA6 Duplicate (0.50m)	HA7 (0.10m)	HA7 (0.30m)	HA8 (0.10m)	HA8 (0.30m)
Date		Mar-14	Mar-14	Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Mar-14	Mar-14
Depth	m	**0.10**	**0.50**	**0.10**	**0.30**	**0.50**	**0.10**	**0.30**	**0.50**	**0.50**	**0.10**	**0.30**	**0.10**	**0.30**
Lead	mg/kg	550	210	190	150	350	41	400	520	350	450	170	110	120
Naphthalene	mg/kg	0.24	<0.05	0.55	1.2	0.43	0.76	0.42	0.17	0.24	0.52	7.6	0.32	0.81
Acenaphthylene	mg/kg	<0.20	<0.20	1	1.1	0.73	0.44	0.29	<0.20	0.3	0.52	28	0.58	1.4
Acenaphthene	mg/kg	<0.10	<0.10	0.88	2	0.45	0.29	<0.10	<0.10	<0.10	0.72	35	0.4	1.3
Fluorene	mg/kg	<0.20	<0.20	1.1	2.8	0.63	0.72	<0.20	<0.20	<0.20	0.8	60	0.35	1.3
Phenanthrene	mg/kg	1.8	0.44	12	23	7.5	3.2	2.1	1.2	3	7.9	600	6.2	18
Anthracene	mg/kg	0.33	<0.10	3.2	5	2	0.33	0.42	0.24	0.66	1.8	150	1.7	5.8
Fluoranthene	mg/kg	4.4	0.87	22	29	15	0.75	4.9	3.3	7.6	14	510	17	42
Pyrene	mg/kg	3.8	0.71	20	22	13	0.54	4.2	3	6.3	11	370	16	37
Benzo(a)anthracene	mg/kg	2.2	0.49	16	15	9.1	0.35	3.1	2.5	4.8	7.1	320	9.6	25
Chrysene	mg/kg	2.3	0.48	11	11	6.8	0.27	2.4	1.9	3.7	6	210	10	27
Benzo(b)fluoranthene	mg/kg	4.3	0.76	17	15	9.1	0.42	3.8	3.5	5.6	5.9	260	13	42
Benzo(k)fluoranthene	mg/kg	1.1	0.31	9.1	8.8	6.1	0.2	1.9	1.5	2.8	5.4	160	7.5	15
Benzo(a)pyrene	mg/kg	2.8	0.59	15	14	9.2	0.35	3.2	2.8	4.8	6.5	260	12	33
Indeno(123-cd)pyrene	mg/kg	1.7	0.29	8.3	7.4	5.2	<0.20	2	1.8	2.7	3.7	130	6.5	18
Dibenzo(a,)anthracene	mg/kg	0.28	<0.20	1.6	1.4	0.98	<0.20	0.38	0.32	0.53	0.61	30	1.8	5.1
Benzo(g,h,i)perylene	mg/kg	1.7	0.28	7.9	7.3	5	<0.05	2	1.7	2.8	4.1	130	7.3	19
PAH (sum)	mg/kg	27	5.2	150	170	91	8.6	31	24	46	76	3300	110	290
Coronene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos		ND	ND	ND	Chrysotile	ND	ND	ND	ND	ND	ND	ND	ND	ND
Quantification	%	-	-	-	<0.001	-	-	-	-	-	-	-	-	-

		HA9 (0.10m)	HA9 Duplicate (0.10m)	HA9 (0.50m)	HA10 (0.10m)	HA11 (0.30m)	HA12 (0.30m)	HA13 (0.10m)	HA13 (0.50m)	HA14 (0.10m)	HA14 (0.30m)
Date		Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Apr-14	Mar-14	Mar-14	Mar-14	Mar-14
Depth	m	0.10	0.10	0.50	0.10	0.30	0.30	0.10	0.50	0.10	0.30
Lead	mg/kg	140	140	270	150	360	420	350	330	360	230
Naphthalene	mg/kg	0.33	1.1	27	0.59	0.26	0.43	0.13	0.21	<0.05	0.63
Acenaphthylene	mg/kg	0.58	2	120	0.54	0.51	0.54	<0.20	0.21	<0.20	<0.20
Acenaphthene	mg/kg	0.39	0.85	25	5.3	0.51	0.52	0.22	0.76	<0.10	0.77
Fluorene	mg/kg	0.67	2.4	93	4.7	0.51	0.54	0.21	0.68	<0.20	0.58
Phenanthrene	mg/kg	8.2	25	1300	34	7.9	8.5	4.5	14	1.5	5.7
Anthracene	mg/kg	2	4.4	240	11	1.4	1.4	0.94	3.9	0.3	0.95
Fluoranthene	mg/kg	14	28	1400	62	13	15	13	30	3.8	6
Pyrene	mg/kg	11	21	990	46	10	12	12	26	3.4	5.2
Benzo(a)anthracene	mg/kg	6.6	12	630	39	6.5	7.4	7.9	15	1.9	2.6
Chrysene	mg/kg	5.3	9.2	490	41	5.2	5.9	6.6	14	2.1	2.8
Benzo(b)fluoranthene	mg/kg	7	11	660	58	6.2	8.3	11	21	2.6	3.5
Benzo(k)fluoranthene	mg/kg	3.3	7.5	390	21	4.7	3.3	5.2	8.9	1.6	1.4
Benzo(a)pyrene	mg/kg	5.9	10	590	43	6.6	6.4	8.8	17	2.3	2.8
Indeno(123-cd)pyrene	mg/kg	3.3	6.1	320	24	3.4	3.7	4.8	9.2	1.4	1.4
Dibenzo(a,)anthracene	mg/kg	0.63	1	61	5.2	0.54	0.59	0.71	1.3	0.31	0.35
Benzo(g,h,i)perylene	mg/kg	3.7	6.2	300	23	3.5	3.8	4.8	8.9	1.5	1.5
PAH (sum)	mg/kg	73	150	7600	420	71	79	81	170	23	36
Coronene	mg/kg	-	-	-	-	-	-	-	-	-	-
Asbestos		Amosite, Chrysotile, Crocidolite	Amosite, Chrysotile	ND	ND	Chrysotile	ND	ND	ND	ND	ND
Quantification	%	0.014	No Quant	-	-	<0.001	-	-	-	-	-

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