

Grenfell Investigation into Potential Land Contamination Impacts

Stage 2 Detailed Design

Royal Borough of Kensington and Chelsea

Project number: 60632092

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1. Introduction

This document sets out AECOM's proposed detailed design for the Stage 2 investigation and is based on the objectives for Stage 2 as set out in AECOM's Stage 1 Technical Note 18, RBKC's tender documents for Stage 2, and subsequent dialogue on scope details between AECOM and members of the Multi-Agency Partnership (MAP), including AECOM's data gap review and recommendations discussed with MAP at the project kick off meeting on the 9th September 2020.

The Sampling Plan set out below has been designed to reflect the relevant guidance contained within the following British Standards:

- BS 10175:2011+A2:2017. Investigation of potentially contaminated sites – Code of practice, British Standards Institution Publication. (British Standards Institute, 2017).
- BS ISO 18400-101:2017. Soil quality – Sampling. Part 101: Framework for the preparation and application of a sampling plan, British Standards Institution Publication, 2017 (British Standards Institute, 2017a).
- BS ISO 26367-1:2017. Guidelines for assessing the adverse environmental impact of fire effluents. Part 1: General, British Standards Institution Publication, 2017 (British Standards Institute, 2017b).
- BS ISO 26367-2:2017. Guidelines for assessing the adverse environmental impact of fire effluents. Part 2: Methodology for compiling data on environmentally significant emissions from fires, British Standards Institution Publication, 2017 (British Standards Institute, 2017c).

2. Factors Considered in Design of Plan

In designing the Stage 2 soil and crop sampling exercise, consideration has been given to the following factors that influence what is incorporated into the Plan (these factors are largely the same as those considered for Stage 1):

Table 01. Factors considered in design of Sample Plan

Factor	Comments	Included? Yes/No
What areas should be tested at Stage 2 and how should they be identified?	Land-uses around the tower and in the area delineated by the Met Office particle plume mapping (shown on Figure 01) and the map of locations of debris reported to have fallen by residents ¹ include residential properties, schools, recreational/sports buildings/spaces, public open spaces (communal gardens, parks, kitchen gardens), and commercial premises. The Stage 2 sampling should be targeted at areas that enable the objectives for Stage 2 to be met, specifically (1) geographical spread, (2) schools, and (3) community kitchen gardens and allotments.	N/A
Should areas targeted be limited to those identified with the highest relative sensitivity?	The land-uses with the highest relative sensitivity, based on the criteria set out in Table 02 are residential gardens, schools/nurseries, and community kitchen gardens. These land-use areas should be considered in the selection of the areas targeted for Stage 2 sampling, but the selection process should not be constrained to just land-use sensitivity. The additional considerations in the selection process are set out in Table 02.	No
Should all sensitive areas be tested at Stage 2?	It is beyond the scope of Stage 2 to test every area.	No

¹ Shown on Figure TN14-01 in AECOM report "Grenfell Investigation into Potential Land Contamination Impacts, Technical Note 14: Collated Community Information Technical Note. 30 August 2019

Factor	Comments	Included? Yes/No
Should a subset of these areas be tested?	A sub-set of areas has been identified based on the three factors identified above (i.e. targeting geographical spread from the Tower and within the particle plume delineated by the Met Office modelling. These areas provide what is considered to be a reasonable number of areas for testing that is consistent with the objectives of Stage 2.	Yes
Should sampling avoid areas with known historic contaminative land-uses	The stated ITT objective is to assess risks to health from land potentially affected by the Grenfell Tower fire as well as historic land use. The potentially affected urban area of west London has a high proportion of land potentially affected by diffuse and/or localised sources of historic contamination and ruling these out from sampling would reduce the options available in sensitive land-use areas. In addition, the knowledge of potential historic land uses can be used as part of the data interpretation and risk evaluation to address uncertainty and comparison with typical local background.	No
Should sampling be limited to the immediate vicinity of the tower?	Constraining sampling to the immediate vicinity of the tower (here defined as <200m radius) permits a greater sample density within that area but does not assist with understanding the potential wider spatial extent of the fallout from the fire. The investigation area for Stage 2 is broadly the same as for Stage 1 (i.e. a focus on a radius of 1km from the Tower, principally in a north-westerly direction consistent with the wind direction at the time of the fire and reported incidence of fire debris deposition). The distance of interest has been extended at Stage 2 to include a small number of sampling areas up to 4km from the Tower that also fall within the Met Office particle plume map.	No
Should the sampling investigate the potential change in soil concentrations with distance from the tower?	No clear pattern in soil concentrations with distance from the Tower was identified at Stage 1. This however remains an important factor to assess at Stage 2.	Yes
Should the entire potential debris/smoke particle deposition distance be investigated at Stage 2?	It is not practical to investigate the entire potential plume deposition area (as defined by the Met Office modelling report (Kendall, et al., 2019) at Stage 2. The Met Office modelling is also based on a number of assumptions meaning that the plume maps included in the Met Office report are only indicative of where soot particles may have been transported and deposited. However, it is reasonable to include some sampling areas that are representative of the modelled indicative worst-case plume deposition zones.	No

Factor	Comments	Included? Yes/No
If the entire fallout distance is not included, what sub-distance should be included?	A 1km radius around the tower has been identified as an initial pragmatic option for Stage 2, as it was for Stage 1. As no clear pattern in reported soil concentrations with distance from the Tower was identified at Stage 1 there is little justification for significantly extending this radius, with the exception of a small number of areas that could be selected to be representative of the potential worst-case plume soot deposition that is modelled to be located further than 1km from the tower. The 1km radius covers the majority (though not all) of the areas highlighted as of concern during community engagement and a radius of 1km allows for a higher percentage of the sensitive land use areas within the selected radius to be targeted than would be possible if the radius distance was extended. Six areas beyond the 1km radius in a NW direction have been specifically selected: four of these areas have been included due to specific concerns raised, and requests for sampling made, by the community during Stage 1 community engagement; and two have been included to test whether fire debris/soot deposition can be identified in chemical testing further away from the Tower within areas modelled by the Met Office as having the highest soot deposition. The furthest of these targets the central zone of modelled highest deposition; however, it was not considered necessary to select sampling areas at a greater distance than this within the plume as the deposition rate is modelled to decrease beyond this point.	N/A
Should the sampling be statistically based?	Statistically-based sampling (i.e. specifically a systematic (non-targeted) grid pattern) is not required to meet the objectives of Stage 2. The Stage 2 sampling is targeted at specific land use areas based on the factors identified in Table 02.	No
Should samples be discrete (single) samples?	Whilst composite or incremental samples are advocated for certain situations, discrete samples better meet the objectives of Stage 2 by providing better information on the potential spatial variability in soil concentrations within local areas.	Yes
Should sampling be limited to soil only?	Environmental media potentially affected by fallout from the fire include air, water, and soil. Indirect exposure is also possible from plant uptake from soil and from soil-derived dust, and from direct contact with pieces of debris/char. The Stage 2 scope is limited to soil and crop testing as these have been identified at Stage 1 as the most relevant media for human exposure and the evaluation of health risk under the regulatory requirements of Part 2A). Soil-derived dust is taken in to account in the modelling of exposure from soil. Ad hoc samples of debris or char would not provide robust evidence of what was emitted during the fire. Water, in the form of surface water and groundwater has not been identified as an environmental medium of concern. Air is considered in the modelling from soil with respect to airborne soil-derived dust and vapour. Airborne dust and vapour at the time of the fire are only applicable to a Part 2A assessment in so far as they as might have caused soil contamination.	No

Factor	Comments	Included? Yes/No
Should all possible fire effluent chemicals be tested for?	Stage 1 identified a sub-set of priority marker chemicals – the COPC – for the potential fire effluent mixture that was released during the fire. This sub-set is designed to provide both a reasonable indication of the extent of fallout from the fire and include chemicals of known toxicological concern. To support Stage 2, the Science Advisory Group commissioned an independent research study on fire effluents from the University of Edinburgh (Hadden & Switzer, 2020). The testing recommendations of this study have been incorporated with the recommendations from Stage 1 to determine which fire effluent chemicals should be tested for at Stage 2.	No

Table 02. Factors considered in selecting Sampling Areas

Factor	Details	
Land-use sensitivity	Based on sensitivity of receptor (child vs. adult), frequency and duration of likely exposure, and nature of land-use in the area of interest (activities undertaken and resultant contact with/exposure to soil)	
	Land-Use	
	Relative Sensitivity	
	Residential property with private garden	High
	Residential property without private garden	High
	School/nursery	High
	Allotments	Moderate to high
	Community kitchen garden	Moderate to high
	Communal or public open space (e.g. residential landscaped areas or public parks)	Moderate
	Sports facilities	Moderate to low
Commercial properties	Low	
Identified by community as an area of concern	Areas/locations identified during community engagement events during Stage 1, and community feedback during site walkovers for Stage 2 conducted in August 2020, and/or previous/subsequent notification to the MHCLG community liaison team. Figure TN14-03 in TN14 ² showed areas where residents had specifically requested testing and Figure TN14-04 in TN14 ² indicated areas that residents considered to have a particularly sensitive land-use. Table TN14-01 in TN14 ² provided a summary of concerns raised directly to MHCLG by local schools and nurseries, including specific requests for testing at some locations.	
Modelled plume deposition area	Areas within modelled extent of smoke plume as modelled by Met Office (Kendall, et al., 2019)	
Reported occurrence of fire debris deposition	Areas/locations identified during community engagement events during Stage 1, and community feedback during site walkovers for Stage 2 conducted in August 2020 and/or previous/subsequent notification to the MHCLG community liaison team. Figure TN14-01 in TN14 ² showed areas where residents had reported encountering debris that had fallen from the tower during the fire. The distribution of the reported debris has been used to define the extent of sampling and identify specific areas.	
Distance from tower	Potential significance of relationship between distance and particle deposition was explored at Stage 1 and no clearly identifiable relationship was found. The Met Office modelling results (Kendall, et al., 2019) does suggest a relationship between distance and deposition rate, but the relative amount of predicted particle deposition is not linear with distance i.e. the deposition rate does not increase or decrease uniformly with distance away from the tower. The indicative plume extent shown on Figure 01 indicates an areas of maximum soot particle deposition at a distance of between 3.5km and 4.5km to the northwest of the tower that would be relevant for sampling.	
Ease of accessibility	The Stage 2 sampling exercise is to be undertaken such that it can be viewed/witnessed by the community. Land areas chosen therefore should be easily accessible to the public as long as the overall aims and objectives of the project can continue be met.	

Community kitchen gardens and allotments have been assigned a ‘moderate to high’ sensitivity on the basis of the assumption of lower frequency and duration of exposure compared to the ‘high’ sensitivity assigned to schools and residential areas. This is based on the allotments Sutable 4 Use Levels (S4ULs) (Nathanail, et al., 2015) and Category 4 Screening Levels (C4SLs) (DEFRA, 2014) land-use assumptions, noting the likely potential for cultivation of such large quantities of produce as a full-scale allotments site in shared kitchen gardens is limited). The sensitivity range also indicates uncertainty and variability with the likely exposure at these locations as a group.

² AECOM, 30 August 2020. Grenfell Investigation into Potential Land Contamination Impacts, Technical Note 14: Collated Community Information Technical Note.

The areas identified for sampling in Stage 2 are listed in Table 03 below.

Table 03. Areas identified as sampling areas for Stage 2 Sampling

Area Type	Area Name	Comments and observations from site walkover
Schools and Nurseries	Latymer Alternative Provision Academy	Small grassed areas and soil beds (some raised) suitable for sampling. Single pear tree present. Soil reported not to have been changed or significantly disturbed since fire.
	Burlington Danes School	Playing field and areas of grass and soil bed landscaping suitable for sampling. Soil reported not to have been changed since fire.
	Bassett House School (St Helen's Church)	The outside play space for the children is located at the nearby St. Helen's Church. Some of area covered in artificial grass but bare earth floor and soil beds also present. Raised beds for growing produce are new with soil imported since the fire therefore no need to be sampled.
	Thomas Jones Primary School	Variety of grass, bare earth and soil beds at the school site all suitable for sampling. No soil has reportedly been changed since the fire.
	All Saints Catholic College	Variety of grass and soil bed areas at the school site all suitable for sampling. No soil has reportedly been changed since the fire.
	Barlby Primary School	A large part of the school site as it was at the time of the fire is undergoing development with new school buildings. However, some areas of bare earth that are used by the children, soil in planters and beds, and soil exposed through artificial grass all suitable for sampling. None of the soil areas identified for potential sampling have reportedly had soil changed since the fire.
	St. Francis Primary School	The north-eastern part of the school site ('the classroom of the future') has been demolished since the fire and that area is unsuitable for sampling due to the ground disturbance that has occurred. A large part of the playground is surfaced with artificial grass however there are a number of bare earth and soil bed areas around the school site that are suitable for sampling and these areas have not reportedly had any soil changed since the fire. The school also has some disused growing beds that have not been disturbed or used since the fire but that they would like to put back into use. Small fruit trees are also present near the growing beds.
	St. Anne's and Avondale Primary School and Nursery	Much of the playground areas are either hard paved or with artificial grass. There are some soil beds and an area of bare earth where the children can play and have outdoor learning. Some planted beds in the west of the site were planted with imported soil prior to the fire and have not been disturbed significantly since the fire. Pre-fire soil testing data is available in a validation report for these beds. Silver birch trees in large planters at the north of the site died the year following the fire and some parents asked the headteacher whether it could be due to contamination from the fire. The trees were removed but the planters remain and the soil has not been changed.
	Oxford Gardens Primary School	The school does not have a lot of exposed ground, either as grass or bare earth/soil borders. There are some soil beds in the west of the site, two planters in the centre of the site with soil that has not been changed, and some grass and soil along the access road at the eastern end of the site which has not reportedly been disturbed or changed.
	Golborne and Maxilla Children's Centre Forest School	An open area used by nursery children for outdoor play and learning, which includes grassed areas and some soil borders / bare earth. None of the soil in the area has reportedly been changed.

Area Type	Area Name	Comments and observations from site walkover
	Grenfell Creche Under 3s' Centre / Grenfell Nursery	The outdoor part of the nursery is located along the southern edge of Upper Clarandon Walk. There are two small areas of exposed soil and grass in the currently accessible outdoor space – none of the soil has reportedly been changed since the fire. The eastern end of the nursery is currently inaccessible to the children and comprises an area of exposed bare soil with rough vegetation which has not reportedly been disturbed since the fire. The site contact indicated that they were planning to open this area up soon (aiming for Spring 2021) for the children to play in.
	New Studio pre-school	This pre-school has a large open grassed play area with play equipment, and at its western end, a more vegetated and wooded area with bare earth surfacing where the children do outdoor play learning. Soil has not reportedly been changed in any of the areas since the fire.
	St Quintin Children and Family centre	A single site containing three different activities: a nursery, a facility for families (adults and children) and a dedicated children's centre. Some areas have rubber play surfacing, with some grassed areas and planted soil borders. Some pre-fire baseline soil data are available for this site associated with its redevelopment in the last decade, but none of the grass or soil areas have reportedly been disturbed or changed since the fire.
Community Kitchen Gardens and Allotments	Longstone Avenue allotments	A large allotment site with most plots well used since the fire. A small number of unused plots were shown to AECOM during the site visit and may be useful as being representative of soil that has not been disturbed since the fire. These included Plot 3a (no tenant (under offer)); 6a, 6b, 9, 12c, 17a, 22, 22a and 24a (all apparently untended); 12a (communal orchard with little soil disturbance). A wide variety of produce was being grown in other well-tended plots and the site representatives believed that individual plot owners would not object to some produce being sampled, though permission would need to be asked for in advance.
	St Quintin Gardens	Large community kitchen garden site on an old tarmac tennis court adjacent to an NHS facility. Some very narrow strips of ground level soil are accessible along the north, east and south sides of the site. Most of the plots are well used and have been worked and grown in since the fire. However, AECOM was shown three plots in the south-eastern corner (plots 28, 29 and 30) which reportedly have not been touched since the fire.
	St Charles Centre for Health and Wellbeing	The Equal People contact showed AECOM a separate area with raised beds used by Equal People within a larger community kitchen garden site at the St. Charles Centre for Health and Wellbeing. The kitchen garden site is located adjacent to the Grenfell Health and Wellbeing Centre. A number of raised beds used by Equal People were identified for sampling and soil here has reportedly not been changed (though cannot rule out some compost may have been added), with sample numbers allocated to Equal People to be shared with this area given the small number of planters available for sampling at the main Equal People site.
	Equal People	Five raised planters used to grow crops for use at the facility are located behind the building. The soil in these planters has reportedly not been changed since the fire.
	Portland Road and Nottingwood House	These two adjacent kitchen garden areas have been combined into a single sampling area. There are a number of well used raised beds in Nottingwood House that would be suitable for sampling.

Area Type	Area Name	Comments and observations from site walkover
		Portland Road is a standalone community kitchen garden site with a number of raised beds suitable for sampling. Although the site representative stated that they did not think soil had been changed since the fire it is likely that soil improvement has been made by the addition of compost in some beds – but precise details are unlikely to be available. There are also some areas of ground level soil where fruit shrubs are grown that are suitable for sampling.
	The Grove	The Grove has a community kitchen garden on the roof of the building. The beds have not been used this year due to Coronavirus restrictions, however they previously have been well used. The soil was reported to have not been changed since the fire.
Combined Community Kitchen Gardens and Public Open Space	Eynham Road, and land behind backing onto rail tracks	This is a strip of land approximately 5 to 10m wide that runs behind the back gardens along the full length of Eynham Road. The residents of Eynham Road lease the land from Network Rail and it was originally cleared of vegetation and debris by the residents so it could be used as an open space. The condition and history of the land prior to it being cleared is only known as 'railway land'. The space is accessible to any resident along its full length although each resident is informally responsible for the piece of the land behind their own garden. The land is used in a variety of ways with some play areas, some landscaped areas, and some areas where fruit and vegetables are grown. The resident representatives were not aware of any significant soil change being completed since the fire, although it was acknowledged that some residents may have added compost in areas where vegetables were being grown.
	Hurstway, Grenfell, Testerton and Barandon Walks (Lancaster Walkways)	This area comprises a combination of grassed public open space, some with soil borders. Two areas of kitchen garden growing beds are present in the northern part of this area; there were conflicting accounts of whether soil had been changed to any extent, although some residents appear to at least have added some fresh compost in places. One resident pointed out a location where Prof. Anna Stec (Stec, et al., 2019) collected a sample beneath a tree in the growing area between Testerton Walk and Hurstway Walk. More generally in the public open space there is a play area and a separate nursery school (though this appears to be fully hard paved)
	Henry Dickens Court	Includes a community kitchen garden in the north-east corner of the estate along with various grassed public open space areas with soil borders planted with shrubbery. An orchard is located in the southern central part of the estate area. A representative of the kitchen garden area was not available at the time of the walkover, although visual inspection suggested that all raised beds were well used and therefore addition of compost since the fire would be very likely in many of the growing areas.
	Silchester East	Comprises the public open space areas around Whitstable House and Kingsnorth House, including grassed areas, planted soil beds and two separate areas of raised beds used for growing fruit and vegetables. The raised beds to the west of Whitstable House are the most heavily used although they are not marked on RBKC GIS mapping for kitchen gardens. The mapped raised beds to the south of Whitstable House do not appear well used and are not secure. There was no representative of the kitchen garden areas specifically available for the walkover therefore the extent of any potential soil change since the fire is unknown.

Area Type	Area Name	Comments and observations from site walkover
	Allom House and Barlow House	Communal garden between the two residential buildings occupied by grassed area with raised planters well used for growing fruit and vegetables. The site representative was not aware of any soil change in the raised beds, though addition of some compost since the fire seems likely. Also raised areas planted with shrubbery and soil borders surrounding the communal area with hedge and other shrub planting.
	Morland House and Talbot Grove House	Two residential buildings with courtyards containing raised planters used for growing fruit and vegetables. The site representative was not aware of any soil change in the raised beds, though addition of some compost since the fire seems likely. Both also include landscaped open space with planted soil beds, grass, trees (olive tree at Morland House) and a bare earth area at Morland House with some wood chip cover. Two neighbouring areas combined due to small area size of kitchen garden plots
	Bramley House	Raised beds well used for growing fruit and vegetables. Soil reportedly has not been changed though has likely had some compost and fertilizer added. One resident concerned about potential contamination that might have been washed through the artificial grass surface in the main communal garden – it would be appropriate to lift a corner of this if possible and sample beneath. Narrow areas of soil beds and grass surround the building on all sides.
	Kensington Memorial Park	Includes the wider public open space of the park, including children’s play areas, sports pitches and decorative planting, as well as a small orchard and raised bed area located within a corner of the park. There was no specific representative for the raised beds present during the walkover however they appeared poorly used and would therefore be less likely to have had a major soil change or significant additional of compost that other well used growing beds.
	Treadgold House	Treadgold House has one large communal garden area that is freely accessible from the car park as well as a communal garden area around the front of the residential block which contains some soil borders and three small raised bed planters that were used for growing fruit and vegetables. There was no specific representative for the raised beds present during the walkover however they did not appear as well used as some growing beds in other areas. Some soil improvement since the fire is a possibility but the extent of any such activity is unknown.
Public Open Space	Verity Close	Verity Close comprises a combination of low-rise residential properties, a children’s play area, some public open space, and footpaths. The play area is partly hard paved by also has an area of grass adjacent. There are some small grassed areas in the public open space and alongside the footpaths. Some of the residential properties have private gardens and two of the low-rise blocks have communal garden areas.
	Little Wormwood Scrubs Including EPIC CIC Adventure Playground	A large area of parkland with short-mown grassed areas and areas of denser tree and shrub vegetation. There is a children’s outdoor play area in the south-east as well as a children’s outdoor play centre in the south-west.
	Darfield Way	The community kitchen garden indicated on the RBKC GIS mapping is not present and appears to be occupied by a Traveller site. The Traveller site appears to be fully hard paved and therefore is unsuitable for sampling. Alternative sampling areas along Darfield Way include two children’s play areas and the public open space park area.

Area Type	Area Name	Comments and observations from site walkover
	Lancaster Green	This area comprises a grass covered public open space with wide soil borders with shrubbery. The grassed area is in relatively poor repair with areas worn away and bare earth showing through. It was reported that no soil has been changed in this area since the fire, although an area of shrub planting at the very southern end of Lancaster Green at the point that it joins Treadgold Street has reportedly been improved by local residents and therefore may not be suitable for sampling.
	Robinson House	Residents reports that the soil in the raised beds had been completely changed since the fire therefore no benefit in sampling. The grassed part of the public open space as well as large soil beds in the north and south of the communal garden are suitable for sampling
	Wesley Square	The communal garden in the centre of Wesley Square has a growing area; however, all growing is now done in a new raised plot with soil imported since the fire therefore not suitable for sampling. A row of herb shrubs is planted in soil that has not been disturbed since the fire and other parts of the soil borders are known to be used by children for playing. The resident representatives specifically asked for one of the private gardens at the western end of Wesley Square to be sampled as it was considered that it was undisturbed, debris was found there, and was closest to the Tower so representative of the worst affected part of Wesley Square.
	Silchester West (North and North-West area)	This comprises mainly grassed public open space areas around Markland House but also includes communal gardens associated with the low-rise Darfield Way residential properties that are also part of the Silchester West estate. These communal gardens have substantial soil borders planted out with shrubs.
	Maxilla Walk - Maxilla Hall / Maxilla Green	This comprises a grassed piece of public open space outside the Bay 20 community space with soil borders planted out with shrubs
	Stonebridge Park	The area comprises a public open space with a grassed field, footpaths and some soil borders.
	Wormwood Scrubs	The area is a large open area of common land comprising grassed sports pitches and areas of denser wooded vegetation and shrubbery.
Currently inaccessible public open space	Tower cordon	The Tower cordon area comprises a mixture of roadways, temporary hard surfacing and cabins (for construction activities), children's play area with rubber surfacing, and landscaped areas with grass and soil borders (some of which also have woodchip cover). The areas suitable for sampling are predominantly to the north-west, north and north-east of the Tower.

Based on the above, 33 areas within the 1km radius have been chosen as Stage 2 sampling areas. Three areas (Barlby Primary School, Little Wormwood Scrubs and Burlington Danes School) are located within 1-1.5km of the Tower and have been included following specific concerns being raised, and testing in these areas requested, during Stage 1. Three additional areas (Stonebridge Park, Longstone Avenue allotments and Wormwood Scrubs³) beyond the initial 1km radius have been included to purposely target areas further away from the Tower in the direction of the smoke plume and where the Met Office modelling has predicted that relatively higher amounts of smoke and ash particles may have been deposited. Longstone Avenue allotments was further justified on the basis that an allotment holder raised concerns about observed ash deposition at the time of the fire at the community engagement workshop during Stage 1. These areas are identified on Figure 01 below.

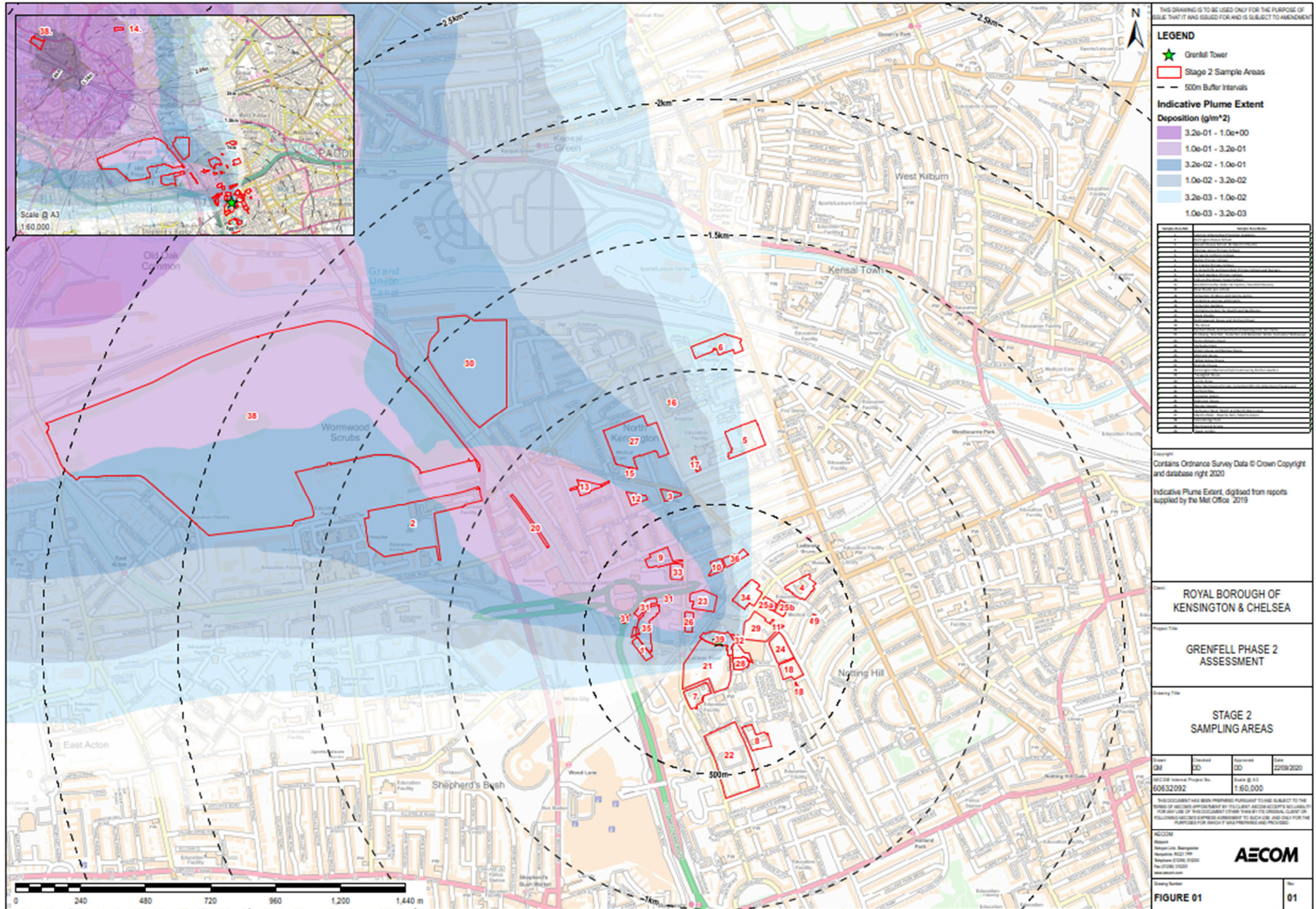
³ At time of writing, sampling at this location is pending potential requirement for permissions from the Ministry of Defence and the Old Oak and Park Royal Development Corporation (OPDC).

The locations include a combination of accessible public and private open spaces, community kitchen gardens, and schools that meet a combination of one or more of the following:

- Areas within 1km of the Tower.
- Areas where debris has been reported to have fallen during the fire.
- Areas within the Met Office defined smoke particle deposition plume.
- Areas identified by the public during community engagement events or via community communication channels with MHCLG.

Private gardens, although categorised as high sensitivity, have not been specifically selected as sampling locations for Stage 2. Sampling every residential garden is not within the scope of Stage 2 and is not necessary to establish the impact of the fire on local soil concentrations. By not prioritising the sampling of private gardens this avoids the situation where some private gardens are sampled and others are not and means that community observation of the sampling in the selected areas is possible. The selected sampling areas should act as reasonable proxies for nearby residential gardens when informing the health risk evaluation. One exception to this is the private garden that has been chosen for sampling at Wesley Square. The garden was chosen based on communal feedback from the Wesley Square contact as being a good location representative of potential impact at the edge of Wesley Square closest to the tower. Since it was not a request from an individual resident to have their own garden tested for personal reasons this was considered to be a reasonable location to include.

Figure 01. Stage 2 Sampling Areas



3. Sampling Approaches in Previous National or Regional Studies

In deciding what sampling approach to take, a review was made of Defra Science Project SP1008 (Johnson, et al., 2012) on normal background concentrations (NBC) of contaminants in soil in which the authors summarise the sampling and analytical methodologies employed by the soil sampling studies reviewed in that project. These methodologies are summarised in the table below.

Table 04. SP1008 summary of UK soil survey sampling approaches

Study referenced by authors	Sampling depth (cm)	Sampling method
UKSHS	0-5	3 cores per sample collected within a 20m x 20m square
CS (Heywood et al, 2006)	0-8	5 cores 20m apart
Jones et al, 1989	0-5	20 cores
Cousins et al, 1997	0-2.5 and 0-25	Not reported
NSI (McGrath & Loveland, 1992)	0-15	25 cores collected within a 20m square
G-BASE	5-25 (Tellus survey in SW England) 5-20	5 cores collected within a 20m square
London Earth (Johnson, 2011)	0-2 – topsoil 5-20 main sample 35-50 deeper sample	5 cores collected within a 20m square Main sample (5-20cm depth) used for published data

Sources: *Technical Guidance Sheet on normal levels of contaminants in English soils: Lead – Supplementary information. Technical Guidance Sheet No. TGS02s, July 2012. Department for Environment, Food and Rural Affairs (Defra), Soils R&D Project SP1008. Defra, 2012 (DEFRA, 2012b).*

Technical Guidance Sheet on normal levels of contaminants in English soils: Benzo[a]pyrene – supplementary information. Technical Guidance Sheet No. TGS04s, July 2012. Department for Environment Food and Rural Affairs (Defra), Soils R&D Project SP1008 (DEFRA, 2012a).

Further details for NSI and G-BASE obtained from the UK Soil Inventory website (British Geological Survey, 2019).

The authors of SP1008 state that samples used to calculate the NBCs were collected from the top 15cm of soil, and that if vegetation was present that surface leaf litter layer was not sampled. The authors additionally state that surveys reviewed that targeted the potential effects on soil of airborne pollution generally only collected samples from the top 2cm of the soil profile.

In terms of the guidance contained within British Standards, BS 10175:2011+A2:2017 (British Standards Institute, 2017) section 7.7.2.5 on sampling depths makes reference to a “surface layer” which may vary from surface to 0.5m bgl⁴ and “material that could present an immediate exposure hazard might require sampling in the uppermost 0.1m”...“where there are health hazard concerns e.g. in domestic gardens, samples should ..generally comprise shallow and surface strata”. In section 8.3.2 on collection of soil samples, an example of “surface samples” is given as “surface to 0.1m depth). Other than this the standard is not prescriptive on sampling depths.

BS ISO 15800 on soil quality - characterisation for human exposure (BSI, 2019) provides guidance on sampling depths for various land-uses and the associated exposure pathways. For private gardens (ornamental) and parks, the guidance recommends “*topsoil (first centimetres)*” as the depth of sampling for evaluating the ingestion, dust inhalation and dermal contact exposure pathways. For private gardens (kitchen) and agricultural zones, the guidance recommends “*ploughed depth soil*” as

⁴ bgl: below ground level

the sampling interval for soil and dust ingestion, dust inhalation and dermal contact; and recommends the “*plant root zone*” as the sampling depth for the ingestion of homegrown produce pathway.

From the above it is concluded that a sampling strategy that primarily targets the top 5cm of undisturbed soil is appropriate for sampling soil in areas of public open space that is potentially impacted from airborne deposition of fire-related smoke particles and debris where the specific purpose is to identify whether those fire effluent chemicals are present in the soil that people are likely to come into contact with. Sampling across a thicker horizon may be appropriate for exposure scenarios such as gardening where the top 35cm of soil might be regularly turned over, however, in this circumstance it would be expected that the concentration of the fire effluent would be lower as the surface deposition of those effluent chemicals has been mixed and diluted in a greater volume of soil. The counter argument is that the chemicals could have leached down through the soil column in the three years since the fire. However, for the COPC being addressed as part of this investigation, leaching vertically through the unsaturated zone is considered unlikely to be a significant transport mechanism in a three-year time period due to their low mobility in unsaturated soil. PAHs, lead, dioxins, furans and PCBs have low solubility and relatively high affinity for the organic matter in soil and do not migrate rapidly through the soil profile.

The sampling approach will therefore be:

- The majority of soil samples where soil disturbance is minimal will be taken at 0-2cm. This includes turfed areas and areas where bare soil does not appear to have been disturbed. Practically, it may be difficult to collect samples in this depth interval beneath thick turf with extensive roots and where this interval cannot be achieved the sample will be taken from 0-5cm depth.
- In areas where some shallow soil disturbance is evident (e.g. tended decorative flower beds) the samples will be collected from the 0-5cm depth interval.
- Where crops are grown in kitchen garden or allotment areas, the soil samples will be taken from 0-20cm to reflect an approximate root zone and ploughed depth for the soil.
- A sub-set of samples will be taken at three depth intervals in five sample areas (Lancaster West Walkways, St. Quintin’s Kitchen Garden, Longstone Avenue allotments, Eynham Road and Lancaster Green). The three depth intervals will be:
 - 0-2cm (for undisturbed locations) or 0-5cm for disturbed locations.
 - 0-20cm.
 - 50-60cm.

4. Sampling Strategy

The objective of the Stage 2 soil sampling is to build on the data obtained from Stage 1 and identify what fire effluent COPC are present in soil and at what concentrations within the geographical area of interest. The detail of the exploratory sampling is provided in the form of a Sampling Plan presented in Section 5 below.

The Stage 2 sampling strategy is designed to provide a greater level of characterisation of any one area compared to the Stage 1 sampling and adopts a combination of sub-areas and number of samples within each sub-area to give sufficient data to understand variability within individual sample areas and across the wider investigation area. It is not a sample density driven approach, but the adopted approach gives the ability to locate samples in different areas of ground cover and soil use within a single sampling area. To achieve this, up to ten sample locations have been identified for each sampling area (compared to the two randomly located sample locations in each area for Stage 1). Ten has been selected as a pragmatic number that enhances the assessment compared to Stage 1, reduces uncertainty in typical soil concentrations, and improves the understanding of variability within each sampling area, but also across the wider investigation area.

In order to assist in the evaluation of the data, the ten samples should be located to provide some evidence of spatial variability in soil concentrations, and to provide information in areas of varying

ground cover including turf, bare soil in tended beds where some disturbance is evident or likely, and bare soil in areas likely to be substantially undisturbed since the fire. The apportionment of samples between turf and bare soil is judgment-based using the walkover information.

Duplicate samples should be taken in accordance with the requirements of British Standard BS10175 (British Standards Institute, 2017). Sample locations have been positioned on a systematic grid where possible. Where raised beds or other specific parts of a sampling area need to be tested a grid-based pattern is not possible and sample locations have been positioned to target those identified sub-areas. The intended sampling areas and locations are shown in Figures A1 to A39 in Appendix A.

5. BS ISO 18400-101 Sampling Plan

The content of the Stage 2 Sampling Plan presented in **Table 05** to **Table 09** below reflects the suggested items listed in Annex A of BS ISO 18400-101 (British Standards Institute, 2017a).

Table 05. Stage 2 Sampling Plan

Item	Details	Reference/Supporting Information
General Information		
Aim of investigative programme	The complete investigative programme, which includes Stage 1 and Stage 2 (and further Stages as necessary), aims to assess to what extent the soil environment has been contaminated by fire effluents as a result of the fire at the Tower in 2017, and whether an unacceptable risk to human health (as defined by Part 2A of the Environmental Protection Act 1990 (Crown, 1990)) is associated with that contamination. It is expected that these aims will be achieved at the end of Stage 2.	
Objective for Stage 2 sampling	<p>The stated objectives for Stage 2 are to “<i>assess risks to public health from the soil and water environment in the area surrounding the Grenfell Tower as a result of the fire and from historical contamination by implementing the recommendations of the Tier 1 preliminary risk assessment. The aims are to:-</i></p> <ul style="list-style-type: none"> • <i>Determine so far as possible the geographical extent of any significant contamination caused by the fire whilst recognising the potential for underlying (pre-fire) contamination.</i> • <i>Carry out generic and detailed quantitative human health risk assessments required under Part 2A to establish whether there are unacceptable risks to human health.</i> • <i>Provide recommendations in relation to the classification of all potential significant contaminant linkages investigated as Category 1-4 in accordance with the Statutory Guidance.</i> • <i>Provide recommendations for whether or not any land appears to meet the definition of contaminated land, under Part 2A.</i> • <i>Undertake the works in accordance with the Environment Agency’s online ‘Land Contamination: Risk Management’ guidance.”</i> <p>The objective for the Stage 2 sampling is therefore to provide the soil chemistry data (and edible plant concentration data) necessary to be able to undertake the required assessment of public health risk. Where ‘<i>significant contamination</i>’ is referred to in the bullet points above, this is interpreted as being contamination that could lead to determination of land as Contaminated Land in accordance with Part 2A.</p>	RBKC ITT Scope Project/Contract Information, November 2019 (002 Service Specification Tier 2 and 3)
Quality assurance/quality control	<p>Use of AECOM approved laboratory in accordance with AECOM policy and procedure for the appointment of sub-contractors.</p> <p>Use of a United Kingdom Accreditation Service (UKAS) accredited laboratory that participates in national laboratory proficiency testing schemes (AISS, CONTEST and AQUACHECK) where possible.</p> <p>Use of UKAS accredited methods where possible.</p> <p>Use of MCERTs accredited methods where possible.</p> <p>Use of surrogate recovery for organic analysis.</p> <p>Adoption of duplicate sample and duplicate sample extract analysis as per Annex D of BS10175:2011+A2:2017 (British Standards Institute, 2017).</p> <p>Sample containers, preservation (chemical/temperature), sample volume, and holding times as per</p>	

Item	Details	Reference/Supporting Information
<p>USEPA QA manual 2016 (U.S. Environmental Protection Agency Analytical Services Branch, 2016). Request of laboratory method validation data where UKAS accreditation for the method is unavailable.</p>		
<p>Information on soil material</p>		
Site details	The “site” for the purposes of Stage 2 is defined as the investigation area around Grenfell Tower and includes mixed urban land-use up to a 4km radius from the Tower.	
History of site / origins of soil	Variable and dependent on specific area being sampled. All areas being sampled have a mixed history of urban development, including previous industrial/commercial land-use. The origins of the upper soil layers are expected to be a mix of re-worked natural soils, imported soils and imported or site-derived anthropogenic fill materials, including those potentially caused by building damage during World War Two bombing. In addition, major roads such as the nearby A40 (Westway) could have measurable impacts on site soils from atmospheric deposition of road traffic-related pollutants.	
Soil types expected	Topsoil and variable made ground including reworked natural with inclusions of anthropogenic material and predominantly anthropogenic materials.	
Land access arrangements	To be arranged by MHCLG.	
Type of samples to be collected	Discrete, disturbed, surface, and sub-surface soil samples to a maximum depth of 60cm. Discrete crop (plant) samples specifically from allotments and community kitchen gardens. Type of crop dependent on plant availability at each sampling area.	
<p>Sampling Methodology</p>		
Sampling approach and type of sampling	<p>Sampling areas have been identified based on the factors detailed in Table 02, and sample locations in each area have been identified based on site walkovers undertaken in September 2020 by AECOM and MHCLG where site access has been granted.</p> <p>Sampling approach is targeted to sub-areas of interest in each area (for example grassed open space or raised beds used for the growing of edible produce). A systematic grid approach to sampling is adopted for the larger grassed public open spaces where possible.</p> <p>Samples will be hand dug disturbed soil samples and hand pulled crop samples.</p>	
Sample areas	Sampling areas are listed in Table 03 and shown in more detail in Figures A1-A39 (Appendix A)	Table 03 and Figures A1-A39 (Appendix A)
Sub-population to be sampled	All surface soil samples will be soil taken from the top 2cm of soil across a minimum sample area of 0.25m x 0.25m where possible. The sampled area may be up to 0.5m x 0.5m in order to collect the required soil volume. Where it is not possible to collect samples from the top 2cm due to thick turf roots, the sample will be collected to a maximum depth of 5cm. Where surface soil is obviously disturbed (e.g. beds with annuals), the surface sample will be taken from the top 5cm. Deeper soil samples will be taken at one or	

Item	Details	Reference/Supporting Information
	<p>more of the following depth intervals dependent on the individual sampling requirements for that area:</p> <ul style="list-style-type: none"> • 0-20cm • 50-60cm <p>Edible crop samples will be selected on the basis of plant availability at the time of sampling</p>	
Sampling technique	<p>Hand dug for soil samples – refer to Appendix B Soil core sampler where VOC analysis required Hand-pulled for crop samples – refer to Appendix C</p>	
Place and point of sampling	<p>Provisional sample locations are identified in Figures A1-A39 (Appendix A) with rationale presented in Table 06.</p>	<p>Figures A1-A39 (Appendix A)</p>
Date and time of sampling	<p>To be confirmed. Currently programmed for October-November 2020</p>	
Person/organisation undertaking sampling	<p>Competent field engineer or scientist from AECOM</p>	
Sampling equipment to be used	<p>Hand-held stainless-steel trowels, spades, fencepost scissor shovels and plastic sheeting for soil samples. Hand-held soil core for samples to be analysed for VOCs No specific sampling equipment required for crop samples. Refer to soil and crop sampling protocols in Appendices B and C for further details of sampling methodology.</p>	<p>AECOM project-specific soil sampling protocol (Appendix B) and AECOM project-specific crop sampling protocol (Appendix C)</p>
Sampling scheme/pattern	<p>Random samples within targeted sub-areas or systematic grid for larger areas of grassed public open space.</p>	<p>AECOM project-specific soil sampling protocol (Appendix B)</p>
Number of increments/samples to be collected	<p>Soil samples to be single increments of soil taken from a surface area of 25cm x 25cm at the required depth interval. Sample to be cone and quartered to provide well-mixed sub-samples for each laboratory sample container required for the laboratory analyses. Crop samples to be samples of individual crop types. Plants of the same type will be combined to provide the necessary sample weight required for laboratory analysis.</p> <p><u>Soil samples</u> 39 sampling areas have been identified as listed in Table 02 and shown on Figure 01. Each area, with the exceptions of Kensington Memorial Park, Equal People and St. Charles Health and Wellbeing Centre, will have samples taken from 10 locations within its area. Samples will be collected from 20 locations within Kensington Memorial Park and from five locations at each of Equal People and the St. Charles Health and Wellbeing Centre. Sample depths will be dependent on the land use, with surface samples in public open space areas collected at 0-0.05m depth and surface samples in community kitchen garden growing beds and allotments collected between 0-0.2m depth.</p>	<p>AECOM project-specific soil sampling protocol (Appendix B)</p>

Item	Details	Reference/Supporting Information
	<p>This will result in a total of 390 surface soil samples, with 20 duplicates (i.e. a duplicate rate of 5%). In total, 299 of the 390 will be collected from 0-0.05m depth, with 91 collected from 0-0.2m depth.</p> <p>In addition, at 6 of the 39 areas, samples will be collected from multiple depths in a proportion of individual sample locations. This will result in a further 13 samples from 0-0.05m depth, a further 12 samples from 0-0.2m depth and 25 samples from a depth of 0.5-0.6m. The multiple depth samples will generate a further 3 duplicates (at a duplicate rate of 5%).</p> <p>In all, the sampling plan will result in 312 soil samples collected from a depth of 0-0.05m, 103 samples from a depth of 0-0.2m, and 25 samples from a depth of 0.5-0.6m. A total of 22 duplicate samples will be collected.</p> <p><u>Crop samples</u></p> <p>Following the site walkovers, 12 of the 39 areas listed in Table 02 have been identified as being suitable for the collection of crop samples. Depending on availability and permission from growers, up to 6 crop samples will be collected from each of the 12 identified areas, resulting in up to 72 crop samples. Duplicate crop samples will be collected at a rate of 5%. For each crop sample collected a paired root zone soil sample will also be collected in the 0-0.2m depth range. These paired root zone samples are additional to the 440 soil samples described in the 'soil samples' sub-section above.</p>	<p>AECOM project-specific soil sampling protocol (Appendix B) and AECOM project-specific crop sampling protocol (Appendix C)</p>
Increment/sample size	<p>Sample size dictated by laboratory analytical requirements and to be confirmed by laboratory when testing request and dispatch of sample containers is arranged. Soil sample sizes detailed in Table 07 for each type of analysis. For crop samples the laboratory (Fera) has requested that as much sample as possible is collected. The actual volume required for each test is dependent on the crop type and Fera will advise on which tests are possible based on what sample is available.</p> <p>For Suite 1, require 1 x 1kg (950ml) plastic tub, 1 x 250g (260ml) glass jars and 2 x 60g (74ml) glass jars per sample.</p> <p>For Suite 2, require 1 x 1kg (950ml) plastic tub, 2 x 250g (260ml) glass jars and 2 x 60g (74ml) glass jars per sample.</p> <p>For Suite 3, require 1 x 1kg (950ml) plastic tub, 2 x 250g (260ml) glass jars, 5 x 60g (74ml) glass jars and 2 x 40ml methanol vials per sample.</p>	
Requirements for in-site determinations	None required	
Sample code methodology	<p>Unique location code GTCS2-Xxx using a simple sequential numbering system to identify the samples (S001, S002, S003 etc. for soils and P001, 002, 003 etc. for plants) in the Stage 2 sampling. "GTCS 2" has been selected as a short form to represent 'Grenfell Tower Contamination Stage 2'.</p> <p>Due to the multiple sampling depths at some locations the unique sample ID will also include the sample depth interval. For example:</p> <ul style="list-style-type: none"> GTCS2-Sxxx_0-0.05 for samples collected between 0 and 0.05m below ground level (bgl) GTCS2-Sxxx_0-0.2 for samples collected between 0 and 0.2m bgl GTCS2-Sxxx_0.5-0.6 for samples collected between 0.5 and 0.6m bgl 	

Item	Details	Reference/Supporting Information
	For paired root zone soil samples, a separate coding system will be adopted to link the soil sample to the crop sample from whose root zone it was collected. These soil samples will be denoted by the crop sample ID with '_soil' appended. E.g. GTCS2-P001_soil.	
Safety precautions	As stipulated in the safety, health and environment (SHE) plan for the sampling works.	AECOM project-specific SHE Plan
Sub-sampling		
Procedure for sub-sampling	Sampling for VOCs using methanol preservation method will be completed separately to the main sample collection using a dedicated soil corer. For traditional VOC analysis, sample vials to be filled with minimum sample disturbance. Duplicates for VOCs will be discrete samples. Duplicates for remaining low volatility contaminants to be achieved using cone and quartering method outlined above.	AECOM project-specific soil sampling protocol (Appendix B)
Packaging, preservation, storage and transport requirements		
Packaging	Use laboratory specified packaging in accordance with laboratory method. For soil samples this will comprise glass vials, glass jars and plastic tubs. For plant samples this will comprise sealable plastic bags.	
Preservation	As specified by laboratory method. For analysis of VOCs in soil, sample preservation in methanol will be required. The methanol will be supplied sealed in the sampling vials prepared by the sub-contract laboratory (Element).	
Storage	Use laboratory supplied cool boxes. Cool boxes to be kept chilled with ice and stored out of the sun whilst on-site. Samples to be stored for the minimum time necessary and shipped once-daily to the laboratory.	
Transport	Use laboratory supplied courier. Collection of samples to be arranged daily.	
Analytical Laboratory		
Company details	Element Materials Technology Ltd (Element), Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA. UKAS Accreditation No. 4225. Fera Science Limited (Fera), National Agri-Food Innovation Campus, Sand Hutton, York, YO41 1LZ. UKAS Accreditation No. 1642	
Analysis required	Refer to Table 06 for the analysis required at each sample location with further details of the analytical method provided in Table 07 for soil analysis and Table 08 for crop analysis. A sub-set of the (up to) 72 crop / soil paired samples will be scheduled for analysis and will be selected to provide a geographical spread across the wider investigation area and a variety of different crop types (refer to Appendix C for details of different crop categories). . A maximum of 35 crop samples will be	

Item	Details	Reference/Supporting Information
	<p>scheduled for analysis of lead and PAHs at Fera. The paired soil root zone samples will be scheduled for analysis of lead at Element and for analysis of PAHs at Fera.</p> <p>No soil bioaccessibility analysis is currently indicated in the testing schedule in Table 06. Soil samples will be scheduled for bioaccessibility analysis following receipt of the results of the main soil sampling exercise once it has been determined that bioaccessibility values will be of benefit for the risk assessment stage. More detail of the decision process for scheduling soil bioaccessibility testing is included in Section 6. Up to 25 soil samples will be scheduled for bioaccessibility testing for lead and PAHs at Element.</p>	
Chain of custody requirements	As per laboratory requirements.	AECOM project-specific sampling protocols (Appendices B and C) and example chain of custody (Appendix D)
Sub-contracted laboratories	<p>Sub-contracted laboratories identified by Element are:</p> <ul style="list-style-type: none"> Marchwood Scientific Services, 371 Millbrook Road West, Southampton, SO15 0HW. UKAS Accreditation No. 1668 RPS Environmental Management Limited (RPS Mountainheath), 13 St. Martins Way, Bedford, Bedfordshire, MK42 0LF. UKAS Accreditation No. 1663 	

Table 06. Sample Locations

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Latymer Alternative Provision Academy	1	GTCS2-S001_0-0.05	Soil (+ 1 duplicate)	Suite 2	bare soil - disturbed	Raised soil bed
		GTCS2-S002_0-0.05	Soil	Suite 1, TOC	bare soil - disturbed	
		GTCS2-S003_0-0.02	Soil	Suite 1	turf	Grassed area in playground
		GTCS2-S004_0-0.02	Soil	Suite 1	turf	
		GTCS2-S005_0-0.05	Soil	Suite 1	bare soil - disturbed	Raised soil bed
		GTCS2-S006_0-0.02	Soil	Suite 2	bare soil - undisturbed	Roughly vegetated exposed ground
		GTCS2-S007_0-0.02	Soil	Suite 1	bare soil - undisturbed	Raised soil bed
		GTCS2-S008_0-0.02	Soil	Suite 1	turf	Grassed area
		GTCS2-S009_0-0.05	Soil	Suite 1	bare soil - disturbed	Raised soil bed

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Burlington Danes School	2	GTCS2-S010_0-0.02	Soil	Suite 1	bare soil - undisturbed	Grassed area
		GTCS2-S011_0-0.02	Soil	Suite 1	turf	General grid pattern coverage avoiding sports pitch playing surfaces
		GTCS2-S012_0-0.02	Soil	Suite 2	turf	
		GTCS2-S013_0-0.02	Soil	Suite 1, TOC	turf	
		GTCS2-S014_0-0.02	Soil	Suite 1	turf	
		GTCS2-S015_0-0.02	Soil	Suite 1	turf	
		GTCS2-S016_0-0.02	Soil	Suite 1	turf	
		GTCS2-S017_0-0.02	Soil	Suite 2	turf	
		GTCS2-S018_0-0.02	Soil	Suite 1	bare soil - undisturbed	Placed in flower/shrub beds – position restricted by surrounding hard cover.
		GTCS2-S019_0-0.02	Soil	Suite 1	bare soil - undisturbed	
GTCS2-S020_0-0.02	Soil	Suite 1	turf	General grid pattern coverage avoiding sports pitch playing surfaces		
Bassett House School (St Helen's Church)	3	GTCS2-S021_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage, not in the area children use regularly
		GTCS2-S022_0-0.02	Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed	
		GTCS2-S023_0-0.02	Soil	Suite 2	bare soil - undisturbed	General coverage, sample points spread across available soft ground
		GTCS2-S024_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	Alongside raised vegetable beds (not within due to new soil)
		GTCS2-S025_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage, sample points spread across available soft ground
		GTCS2-S026_0-0.02	Soil	Suite 1	bare soil - undisturbed	Alongside raised vegetable beds (not within due to new soil)
		GTCS2-S027_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage, sample points spread across available soft ground
		GTCS2-S028_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S029_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S030_0-0.02	Soil	Suite 1	bare soil - undisturbed	
Thomas Jones Primary School	4	GTCS2-S031_0-0.02	Soil	Suite 1	turf	Grassed open space areas accessible to pupils
		GTCS2-S032_0-0.02	Soil	Suite 1	turf	
		GTCS2-S033_0-0.02	Soil	Suite 1	bare soil - undisturbed	Areas with bare earth accessible to children and adjacent to unused raised beds
		GTCS2-S034_0-0.02	Soil	Suite 2	bare soil - undisturbed	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale	
		GTCS2-S035_0-0.02	Soil	Suite 1, TOC	turf	Grassed open space areas accessible to pupils	
		GTCS2-S036_0-0.02	Soil	Suite 1	turf		
		GTCS2-S037_0-0.02	Soil	Suite 1	bare soil - undisturbed	Nature garden area used for outdoor learning with grass, soil borders and bare earth	
		GTCS2-S038_0-0.02	Soil	Suite 1	bare soil - undisturbed		
		GTCS2-S039_0-0.02	Soil	Suite 2	bare soil - undisturbed	Soil border	
		GTCS2-S040_0-0.02	Soil	Suite 1	bare soil - undisturbed	Landscaped area accessible to children	
		GTCS2-S041_0-0.02	Soil	Suite 1	turf		
		GTCS2-S042_0-0.02	Soil	Suite 1	turf		
		GTCS2-S043_0-0.02	Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed		
		GTCS2-S044_0-0.02	Soil	Suite 1	turf		
All Saints Catholic College	5	GTCS2-S045_0-0.02	Soil	Suite 2	turf	General coverage, sample points spread across available soft ground	
		GTCS2-S046_0-0.02	Soil	Suite 1, TOC	turf		
		GTCS2-S047_0-0.02	Soil	Suite 1	turf		
		GTCS2-S048_0-0.02	Soil	Suite 1	turf		
		GTCS2-S049_0-0.02	Soil	Suite 1	turf		
		GTCS2-S050_0-0.02	Soil	Suite 2	bare soil - undisturbed		
		GTCS2-S051_0-0.02	Soil	Suite 2	bare soil - undisturbed		Soil floor of bike shed
		GTCS2-S052_0-0.02	Soil	Suite 1	bare soil - undisturbed		Small soil border
Barlby Primary School	6	GTCS2-S053_0-0.02	Soil	Suite 1	bare soil - undisturbed	Area of soft ground with bare earth used by children	
		GTCS2-S054_0-0.02	Soil	Suite 1	bare soil - undisturbed		
		GTCS2-S055_0-0.02	Soil	Suite 1	bare soil - undisturbed		
		GTCS2-S056_0-0.02	Soil	Suite 2	bare soil - undisturbed		
		GTCS2-S057_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	Soil exposed through hole in artificial grass	
		GTCS2-S058_0-0.02	Soil	Suite 1	bare soil - undisturbed		
		GTCS2-S059_0-0.02	Soil	Suite 1	bare soil - undisturbed		Narrow soil bed

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
St. Francis Primary School	7	GTCS2-S060_0-0.02	Soil	Suite 1	bare soil - undisturbed	Raised planter
		GTCS2-S061_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S062_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S063_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S064_0-0.02	Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed	General site coverage in available grass and soil areas, avoiding the northeast part of the site where the 'classroom of the future' has recently been demolished
		GTCS2-S065_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S066_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S067_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S068_0-0.2	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S069_0-0.2	Soil	Suite 1	bare soil - undisturbed	Within growing beds that are disused and have not been used since the fire
	GTCS2-S070_0-0.2	Soil	Suite 1	bare soil - undisturbed		
	GTCS2-P001	Plant	TBC	cultivated soil		
	GTCS2-P002	Plant	TBC	cultivated soil		
	GTCS2-P003	Plant	TBC	cultivated soil	Crop samples from fruit trees	
	GTCS2-P004	Plant	TBC	cultivated soil		
	GTCS2-P005	Plant	TBC	cultivated soil		
	GTCS2-P006	Plant	TBC	cultivated soil		
	GTCS2-P001_soil	Soil	TBC	cultivated soil		
	GTCS2-P002_soil	Soil	TBC	cultivated soil		
	GTCS2-P003_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample	
GTCS2-P004_soil	Soil	TBC	cultivated soil			
GTCS2-P005_soil	Soil	TBC	cultivated soil			
GTCS2-P006_soil	Soil	TBC	cultivated soil			
St. Anne's and Avondale Primary	8	GTCS2-S071_0-0.02	Soil	Suite 1	bare soil - undisturbed	Large planter at northern end of site where silver birch tree had died
		GTCS2-S072_0-0.02	Soil	Suite 1	bare soil - undisturbed	General site coverage, sample points spread across the limited

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
School and Nursery		GTCS2-S073_0-0.02	Soil	Suite 2	bare soil - undisturbed	available soft round.
		GTCS2-S074_0-0.02	Soil	Suite 1	bare soil - undisturbed	Sample from border nearest wall
		GTCS2-S075_0-0.02	Soil	Suite 1	bare soil - undisturbed	Sample from border nearest wall
		GTCS2-S076_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S077_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S078_0-0.02	Soil	Suite 2	bare soil - undisturbed	General site coverage, sample points spread across the limited available soft round.
		GTCS2-S079_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S080_0-0.02	Soil	Suite 1	bare soil - undisturbed	
	Oxford Gardens Primary School	9	GTCS2-S081_0-0.02	Soil	Suite 1	bare soil - undisturbed
GTCS2-S082_0-0.02			Soil	Suite 1	bare soil - undisturbed	
GTCS2-S083_0-0.02			Soil	Suite 1	bare soil - undisturbed	
GTCS2-S084_0-0.02			Soil	Suite 2	bare soil - undisturbed	Located within available soil borders
GTCS2-S085_0-0.02			Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed	
GTCS2-S086_0-0.02			Soil	Suite 1	bare soil - undisturbed	
GTCS2-S087_0-0.02			Soil	Suite 1	bare soil - undisturbed	
GTCS2-S088_0-0.02			Soil	Suite 1	bare soil - undisturbed	Large planter with soil unchanged since fire
GTCS2-S089_0-0.02			Soil	Suite 2	bare soil - undisturbed	
GTCS2-S090_0-0.05			Soil	Suite 1, TOC	bare soil - disturbed	Raised bed with soil unchanged since fire
Golborne and Maxilla Children's Centre Forest School	10	GTCS2-S091_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S092_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S093_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S094_0-0.02	Soil	Suite 1	turf	General coverage, sample points spread across available soft ground
		GTCS2-S095_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S096_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S097_0-0.02	Soil	Suite 1	bare soil - undisturbed	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Grenfell Creche Under 3s' Centre / Grenfell Nursery	11	GTCS2-S098_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S099_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S100_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S101_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S102_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S103_0-0.02	Soil	Suite 1	bare soil - undisturbed	Within outside play area of nursery, in available soft ground
		GTCS2-S104_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S105_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S106_0-0.02	Soil (+ 1 duplicate)	Suite 2	turf	
		GTCS2-S107_0-0.02	Soil	Suite 1	turf	
New Studio pre-school	12	GTCS2-S108_0-0.02	Soil	Suite 1	turf	General coverage in fenced off area intended to be used by nursery in spring
		GTCS2-S109_0-0.02	Soil	Suite 1	turf	
		GTCS2-S110_0-0.02	Soil	Suite 1	turf	
		GTCS2-S111_0-0.02	Soil	Suite 1	turf	
		GTCS2-S112_0-0.02	Soil	Suite 2	turf	
		GTCS2-S113_0-0.02	Soil	Suite 1, TOC	turf	
		GTCS2-S114_0-0.02	Soil	Suite 1	turf	
		GTCS2-S115_0-0.02	Soil	Suite 1	turf	General coverage, sample points spread across available soft ground which covers the large majority of the outdoor area
		GTCS2-S116_0-0.02	Soil	Suite 1	turf	
		GTCS2-S117_0-0.02	Soil	Suite 2	turf	
St Quintin Children and Family centre	13	GTCS2-S118_0-0.02	Soil	Suite 1	turf	
		GTCS2-S119_0-0.02	Soil	Suite 1	turf	
		GTCS2-S120_0-0.02	Soil	Suite 1	turf	
St Quintin Children and Family centre	13	GTCS2-S121_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage, sample points spread across available soft ground with some limitations due to buildings, artificial grass surfaces and rubber floor of play area
		GTCS2-S122_0-0.02	Soil	Suite 1	bare soil - undisturbed	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Longstone Avenue allotments	14	GTCS2-S123_0-0.02	Soil	Suite 2	bare soil - undisturbed	General coverage of the full site area, selecting a combination of plots that are reportedly unused alongside other that are heavily used.
		GTCS2-S124_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S125_0-0.02	Soil	Suite 1	turf	
		GTCS2-S126_0-0.02	Soil	Suite 1	turf	
		GTCS2-S127_0-0.02	Soil(+ 1 duplicate)	Suite 1	turf	
		GTCS2-S128_0-0.02	Soil	Suite 2	turf	
		GTCS2-S129_0-0.02	Soil	Suite 1	turf	
		GTCS2-S130_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S131_0-0.2	Soil	Suite 3	bare soil - disturbed	
		GTCS2-S132_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S132_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S132_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S133_0-0.2	Soil	Suite 3	bare soil - disturbed	
		GTCS2-S134_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S134_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S134_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S135_0-0.2	Soil	Suite 3	bare soil - disturbed	
		GTCS2-S136_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S136_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S136_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
GTCS2-S137_0-0.2	Soil	Suite 3	bare soil - disturbed			
GTCS2-S138_0-0.02	Soil	Suite 2	bare soil - undisturbed			
GTCS2-S138_0-0.2	Soil	Suite 2	bare soil - undisturbed			
GTCS2-S138_0.5-0.6	Soil	Suite 2	bare soil - undisturbed			
GTCS2-S139_0-0.2	Soil (+ 1 duplicate)	Suite 3	bare soil - disturbed			

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
		GTCS2-S140_0-0.05	Soil	Suite 1	bare soil - disturbed	Crop samples from permitted locations, TBC at time of sampling
		GTCS2-S140_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S140_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-P007	Plant	TBC	cultivated soil	
		GTCS2-P008	Plant	TBC	cultivated soil	
		GTCS2-P009	Plant	TBC	cultivated soil	
		GTCS2-P010	Plant	TBC	cultivated soil	
		GTCS2-P011	Plant	TBC	cultivated soil	
		GTCS2-P012	Plant	TBC	cultivated soil	
		GTCS2-P007_soil	Soil	TBC	cultivated soil	
		GTCS2-P008_soil	Soil	TBC	cultivated soil	
		GTCS2-P009_soil	Soil	TBC	cultivated soil	
		GTCS2-P010_soil	Soil	TBC	cultivated soil	
		GTCS2-P011_soil	Soil	TBC	cultivated soil	
		GTCS2-P012_soil	Soil	TBC	cultivated soil	
St Quintin Kitchen Gardens	15	GTCS2-S141_0-0.02	Soil	Suite 2	bare soil - undisturbed	Ground level soil at the northernmost edge of the site.
		GTCS2-S142_0-0.05	Soil	Suite 1	bare soil - disturbed	General coverage of raised beds within the kitchen garden.
		GTCS2-S142_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S142_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S143_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S144_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S144_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S144_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S145_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S146_0-0.05	Soil	Suite 1	bare soil - disturbed	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
		GTCS2-S146_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S146_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S147_0-0.2	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S148_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S148_0-0.2	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S148_0.5-0.6	Soil	Suite 1	bare soil - undisturbed	Targeted at raised bed that reportedly has not been used since the fire.
		GTCS2-S149_0-0.2	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S150_0-0.02	Soil (+ 1 duplicate)	Suite 2	bare soil - undisturbed	
		GTCS2-S150_0-0.2	Soil (+ 1 duplicate)	Suite 2	bare soil - undisturbed	
		GTCS2-S150_0.5-0.6	Soil (+ 1 duplicate)	Suite 2	bare soil - undisturbed	
		GTCS2-P013	Plant	TBC	cultivated soil	
		GTCS2-P014	Plant	TBC	cultivated soil	
		GTCS2-P015	Plant	TBC	cultivated soil	Crop samples from permitted locations, TBC at time of sampling
		GTCS2-P016	Plant	TBC	cultivated soil	
		GTCS2-P017	Plant	TBC	cultivated soil	
		GTCS2-P018	Plant	TBC	cultivated soil	
		GTCS2-P013_soil	Soil	TBC	cultivated soil	
		GTCS2-P014_soil	Soil	TBC	cultivated soil	
		GTCS2-P015_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample
		GTCS2-P016_soil	Soil	TBC	cultivated soil	
		GTCS2-P017_soil	Soil	TBC	cultivated soil	
		GTCS2-P018_soil	Soil	TBC	cultivated soil	
St Charles Centre for Health and Wellbeing	16	GTCS2-S151_0-0.2	Soil	Suite 2	bare soil - disturbed	
		GTCS2-S152_0-0.2	Soil	Suite 1, TOC	bare soil - disturbed	Samples within the raised growing beds used by Equal People
		GTCS2-S153_0-0.2	Soil	Suite 1	bare soil - disturbed	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Equal People	17	GTCS2-S154_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S155_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-P022	Plant	TBC	cultivated soil	
		GTCS2-P023	Plant	TBC	cultivated soil	Crop samples from Equal People plots, TBC at time of sampling
		GTCS2-P024	Plant	TBC	cultivated soil	
		GTCS2-P022_soil	Soil	TBC	cultivated soil	
		GTCS2-P023_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample
		GTCS2-P024_soil	Soil	TBC	cultivated soil	
		GTCS2-S156_0-0.2	Soil	Suite 2	bare soil - disturbed	
		GTCS2-S157_0-0.2	Soil (+ 1 duplicate)	Suite 1, TOC	bare soil - disturbed	Sample from one of the five large square raised growing beds at the rear of Equal People site
		GTCS2-S158_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S159_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S160_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-P019	Plant	TBC	cultivated soil	Crop samples from small Equal People plots to the side of building (soil reported to have come from within the large square raised beds at the rear)
GTCS2-P020	Plant	TBC	cultivated soil			
GTCS2-P021	Plant	TBC	cultivated soil			
GTCS2-P019_soil	Soil	TBC	cultivated soil			
GTCS2-P020_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample		
GTCS2-P021_soil	Soil	TBC	cultivated soil			
Portland Road and Nottingwood House	18	GTCS2-S161_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S162_0-0.2	Soil	Suite 2	bare soil - disturbed	
		GTCS2-S163_0-0.2	Soil	Suite 1, TOC	bare soil - disturbed	Sample within raised growing beds in Nottingwood House
		GTCS2-S164_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S165_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S166_0-0.2	Soil	Suite 2	bare soil - disturbed	Sample within ground level growing beds in Portland Road kitchen

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale	
		GTCS2-S167_0-0.2	Soil	Suite 1	bare soil - disturbed	garden	
		GTCS2-S168_0-0.2	Soil	Suite 1	bare soil - disturbed	Sample within raised growing beds in Portland Road community kitchen garden	
		GTCS2-S169_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S170_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-P025	Plant	TBC	cultivated soil		Crop samples from permitted locations, TBC at time of sampling
		GTCS2-P026	Plant	TBC	cultivated soil		
		GTCS2-P027	Plant	TBC	cultivated soil		
		GTCS2-P028	Plant	TBC	cultivated soil		
		GTCS2-P029	Plant	TBC	cultivated soil		
		GTCS2-P030	Plant	TBC	cultivated soil		
		GTCS2-P025_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample	
		GTCS2-P026_soil	Soil	TBC	cultivated soil		
		GTCS2-P027_soil	Soil	TBC	cultivated soil		
		GTCS2-P028_soil	Soil	TBC	cultivated soil		
		GTCS2-P029_soil	Soil	TBC	cultivated soil		
		GTCS2-P030_soil	Soil	TBC	cultivated soil		
		GTCS2-S171_0-0.2	Soil	Suite 1	bare soil - disturbed	Sample within rooftop growing beds. Only exposed soil is in growing beds	
		GTCS2-S172_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S173_0-0.2	Soil	Suite 2	bare soil - disturbed		
		GTCS2-S174_0-0.2	Soil	Suite 1, TOC	bare soil - disturbed		
The Grove	19	GTCS2-S175_0-0.2	Soil(+ 1 duplicate)	Suite 1	bare soil - disturbed		
		GTCS2-S176_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S177_0-0.2	Soil	Suite 2	bare soil - disturbed		
		GTCS2-S178_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S179_0-0.2	Soil	Suite 1	bare soil - disturbed		

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Eynham Road, and land behind backing onto rail tracks	20	GTCS2-S180_0-0.2	Soil	Suite 1	bare soil - disturbed	General coverage of the full site area, incorporating grassed areas, soil borders, children's play areas and growing beds.
		GTCS2-S181_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S182_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S182_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S182_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S183_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S184_0-0.05	Soil	Suite 2	bare soil - disturbed	
		GTCS2-S184_0-0.2	Soil	Suite 2	bare soil - disturbed	
		GTCS2-S184_0.5-0.6	Soil	Suite 2	bare soil - disturbed	
		GTCS2-S185_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S186_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S186_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S186_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S187_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S188_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S188_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S188_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S189_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S190_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S190_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S190_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-P031	Plant	TBC	cultivated soil	Crop samples from permitted locations, TBC at time of sampling
		GTCS2-P032	Plant	TBC	cultivated soil	
		GTCS2-P033	Plant	TBC	cultivated soil	
GTCS2-P034	Plant	TBC	cultivated soil			

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
		GTCS2-P035	Plant	TBC	cultivated soil	Paired crop root zone soil sample
		GTCS2-P036	Plant	TBC	cultivated soil	
		GTCS2-P031_soil	Soil	TBC	cultivated soil	
		GTCS2-P032_soil	Soil	TBC	cultivated soil	
		GTCS2-P033_soil	Soil	TBC	cultivated soil	
		GTCS2-P034_soil	Soil	TBC	cultivated soil	
		GTCS2-P035_soil	Soil	TBC	cultivated soil	
		GTCS2-P036_soil	Soil	TBC	cultivated soil	
Hurstway, Grenfell, Testerton and Barandon Walks (Lancaster Walkways)	21	GTCS2-S191_0-0.05	Soil	Suite 1	bare soil - disturbed	Sample in fruit and veg growing beds
		GTCS2-S191_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S191_0.5-0.6	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S192_0-0.02	Soil	Suite 1	turf	Grassed area of public open space communal garden
		GTCS2-S193_0-0.05	Soil (+ 1 duplicate)	Suite 1	bare soil - disturbed	Sample in fruit and veg growing beds
		GTCS2-S193_0-0.2	Soil (+ 1 duplicate)	Suite 1	bare soil - disturbed	
		GTCS2-S193_0.5-0.6	Soil (+ 1 duplicate)	Suite 1	bare soil - disturbed	
		GTCS2-S194_0-0.2	Soil	Suite 1	bare soil - undisturbed	Sample in fruit and veg growing bed (currently unused)
		GTCS2-S195_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S195_0-0.2	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S195_0.5-0.6	Soil	Suite 2	bare soil - undisturbed	General coverage of public open space
		GTCS2-S196_0-0.02	Soil	Suite 1, TOC	turf	
		GTCS2-S197_0-0.02	Soil	Suite 1	turf	
		GTCS2-S197_0-0.2	Soil	Suite 1	turf	
		GTCS2-S197_0.5-0.6	Soil	Suite 1	turf	
GTCS2-S198_0-0.02	Soil	Suite 1	turf			
GTCS2-S199_0-0.02	Soil	Suite 1	turf			

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
		GTCS2-S199_0-0.2	Soil	Suite 1	turf	Crop samples from permitted locations, TBC at time of sampling
		GTCS2-S199_0.5-0.6	Soil	Suite 1	turf	
		GTCS2-S200_0-0.02	Soil	Suite 2	turf	
		GTCS2-P037	Plant	TBC	cultivated soil	
		GTCS2-P038	Plant	TBC	cultivated soil	
		GTCS2-P039	Plant	TBC	cultivated soil	
		GTCS2-P040	Plant	TBC	cultivated soil	
		GTCS2-P041	Plant	TBC	cultivated soil	
		GTCS2-P042	Plant	TBC	cultivated soil	
		GTCS2-P037_soil	Soil	TBC	cultivated soil	
		GTCS2-P038_soil	Soil	TBC	cultivated soil	
		GTCS2-P039_soil	Soil	TBC	cultivated soil	
		GTCS2-P040_soil	Soil	TBC	cultivated soil	
		GTCS2-P041_soil	Soil	TBC	cultivated soil	
		GTCS2-P042_soil	Soil	TBC	cultivated soil	
		Henry Dickens Court	22	GTCS2-S201_0-0.2	Soil	
GTCS2-S202_0-0.2	Soil			Suite 1	bare soil - disturbed	
GTCS2-S203_0-0.2	Soil			Suite 1	bare soil - disturbed	
GTCS2-S204_0-0.2	Soil			Suite 1	bare soil - disturbed	
GTCS2-S205_0-0.2	Soil			Suite 2	bare soil - disturbed	
GTCS2-S206_0-0.02	Soil			Suite 1, TOC	turf	
GTCS2-S207_0-0.02	Soil (+ 1 duplicate)			Suite 1	turf	
GTCS2-S208_0-0.02	Soil			Suite 1	turf	
GTCS2-S209_0-0.02	Soil			Suite 1	turf	
GTCS2-S210_0-0.02	Soil			Suite 1	turf	
						Spread across public open space
						Public open space, within orchard area

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
		GTCS2-P043	Plant	TBC	cultivated soil	Crop samples from permitted locations, TBC at time of sampling
		GTCS2-P044	Plant	TBC	cultivated soil	
		GTCS2-P045	Plant	TBC	cultivated soil	
		GTCS2-P046	Plant	TBC	cultivated soil	
		GTCS2-P047	Plant	TBC	cultivated soil	
		GTCS2-P048	Plant	TBC	cultivated soil	
		GTCS2-P043_soil	Soil	TBC	cultivated soil	
		GTCS2-P044_soil	Soil	TBC	cultivated soil	
		GTCS2-P045_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample
		GTCS2-P046_soil	Soil	TBC	cultivated soil	
		GTCS2-P047_soil	Soil	TBC	cultivated soil	
		GTCS2-P048_soil	Soil	TBC	cultivated soil	
		GTCS2-S211_0-0.02	Soil	Suite 1	turf	General coverage of public open space
		GTCS2-S212_0-0.2	Soil	Suite 2	bare soil - disturbed	Sample in raised beds of community kitchen garden
		GTCS2-S213_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S214_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S215_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S216_0-0.02	Soil	Suite 2	turf	General coverage of public open space
Silchester East	23	GTCS2-S217_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S218_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S219_0-0.02	Soil	Suite 1	turf	
		GTCS2-S220_0-0.02	Soil	Suite 1	turf	Crop samples from permitted locations, TBC at time of sampling
		GTCS2-P049	Plant	TBC	cultivated soil	
		GTCS2-P050	Plant	TBC	cultivated soil	
		GTCS2-P051	Plant	TBC	cultivated soil	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Allom House and Barlow House	24	GTCS2-P052	Plant	TBC	cultivated soil	Paired crop root zone soil sample
		GTCS2-P053	Plant	TBC	cultivated soil	
		GTCS2-P054	Plant	TBC	cultivated soil	
		GTCS2-P049_soil	Soil	TBC	cultivated soil	
		GTCS2-P050_soil	Soil	TBC	cultivated soil	
		GTCS2-P051_soil	Soil	TBC	cultivated soil	
		GTCS2-P052_soil	Soil	TBC	cultivated soil	
		GTCS2-P053_soil	Soil	TBC	cultivated soil	
		GTCS2-P054_soil	Soil	TBC	cultivated soil	
	GTCS2-S221_0-0.02	Soil	Suite 1	turf	General coverage of communal garden grass and soil beds	
	GTCS2-S222_0-0.02	Soil	Suite 1	turf		
	GTCS2-S223_0-0.02	Soil	Suite 2	bare soil - undisturbed		
	GTCS2-S224_0-0.02	Soil	Suite 1	bare soil - undisturbed		
	GTCS2-S225_0-0.02	Soil	Suite 1	turf		
	GTCS2-S226_0-0.2	Soil	Suite 1	bare soil - disturbed		
	GTCS2-S227_0-0.2	Soil	Suite 1	bare soil - disturbed		
	GTCS2-S228_0-0.2	Soil (+ 1 duplicate)	Suite 2	bare soil - disturbed		
	GTCS2-S229_0-0.02	Soil	Suite 1, TOC	turf		
	GTCS2-S230_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage of communal garden grass and soil beds	
GTCS2-P055	Plant	TBC	cultivated soil	Crop samples from permitted locations, TBC at time of sampling		
GTCS2-P056	Plant	TBC	cultivated soil			
GTCS2-P057	Plant	TBC	cultivated soil			
GTCS2-P058	Plant	TBC	cultivated soil			
GTCS2-P059	Plant	TBC	cultivated soil			
GTCS2-P060	Plant	TBC	cultivated soil			

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale	
		GTCS2-P055_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample	
		GTCS2-P056_soil	Soil	TBC	cultivated soil		
		GTCS2-P057_soil	Soil	TBC	cultivated soil		
		GTCS2-P058_soil	Soil	TBC	cultivated soil		
		GTCS2-P059_soil	Soil	TBC	cultivated soil		
		GTCS2-P060_soil	Soil	TBC	cultivated soil		
Morland House and Talbot Grove House	25	GTCS2-S231_0-0.2	Soil	Suite 1	bare soil - disturbed	In raised growing beds at Morland House	
		GTCS2-S232_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S233_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S234_0-0.2	Soil	Suite 2	bare soil - disturbed		In soil beds with fruit (fig) tree at Morland House
		GTCS2-S235_0-0.02	Soil	Suite 1	turf		Coverage of public open space in Talbot Grove House
		GTCS2-S236_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S237_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S238_0-0.2	Soil	Suite 1	bare soil - disturbed		In raised growing beds at Talbot Grove House
		GTCS2-S239_0-0.2	Soil	Suite 2	bare soil - disturbed		
		GTCS2-S240_0-0.02	Soil	Suite 1, TOC	turf		Coverage of public open space in Talbot Grove House
		GTCS2-P061	Plant	TBC	cultivated soil		Crop samples from permitted locations, TBC at time of sampling
		GTCS2-P062	Plant	TBC	cultivated soil		
		GTCS2-P063	Plant	TBC	cultivated soil		
		GTCS2-P064	Plant	TBC	cultivated soil		
		GTCS2-P065	Plant	TBC	cultivated soil		
		GTCS2-P066	Plant	TBC	cultivated soil		
		GTCS2-P061_soil	Soil	TBC	cultivated soil		Paired crop root zone soil sample
		GTCS2-P062_soil	Soil	TBC	cultivated soil		
		GTCS2-P063_soil	Soil	TBC	cultivated soil		

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Bramley House	26	GTCS2-P064_soil	Soil	TBC	cultivated soil	
		GTCS2-P065_soil	Soil	TBC	cultivated soil	
		GTCS2-P066_soil	Soil	TBC	cultivated soil	
		GTCS2-S241_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	General coverage of communal garden area
		GTCS2-S242_0-0.02	Soil	Suite 1	turf	
		GTCS2-S243_0-0.02	Soil	Suite 1	bare soil - undisturbed	Beneath artificial grass where residents say debris was washed after fire
		GTCS2-S244_0-0.02	Soil	Suite 1	bare soil - undisturbed	In olive tree pot, soil not changed since fire
		GTCS2-S245_0-0.02	Soil	Suite 2	bare soil - undisturbed	Beneath artificial grass where residents say debris was washed after fire
		GTCS2-S246_0-0.02	Soil	Suite 1	bare soil - undisturbed	In olive tree pot, soil not changed since fire
		GTCS2-S247_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage of communal garden area
		GTCS2-S248_0-0.2	Soil	Suite 1	bare soil - disturbed	Sample in raised growing beds
		GTCS2-S249_0-0.2	Soil (+ 1 duplicate)	Suite 2	bare soil - disturbed	
		GTCS2-S250_0-0.02	Soil	Suite 1	turf	General coverage of communal garden area
		GTCS2-P067	Plant	TBC	cultivated soil	
		GTCS2-P068	Plant	TBC	cultivated soil	
		GTCS2-P069	Plant	TBC	cultivated soil	Crop samples from permitted locations, TBC at time of sampling
		GTCS2-P070	Plant	TBC	cultivated soil	
		GTCS2-P071	Plant	TBC	cultivated soil	
		GTCS2-P072	Plant	TBC	cultivated soil	
		GTCS2-P067_soil	Soil	TBC	cultivated soil	Paired crop root zone soil sample
		GTCS2-P068_soil	Soil	TBC	cultivated soil	
		GTCS2-P069_soil	Soil	TBC	cultivated soil	
		GTCS2-P070_soil	Soil	TBC	cultivated soil	
		GTCS2-P071_soil	Soil	TBC	cultivated soil	
		GTCS2-P072_soil	Soil	TBC	cultivated soil	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale	
Kensington Memorial Park	27	GTCS2-S251_0-0.02	Soil	Suite 2	turf	General coverage of public open space areas - avoid sports pitch playing surface.	
		GTCS2-S252_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed		
		GTCS2-S253_0-0.02	Soil	Suite 1	bare soil - undisturbed		
		GTCS2-S254_0-0.02	Soil	Suite 1	turf		
		GTCS2-S255_0-0.02	Soil	Suite 1	turf		
		GTCS2-S256_0-0.02	Soil	Suite 2	turf		
		GTCS2-S257_0-0.02	Soil	Suite 1	turf		
		GTCS2-S258_0-0.02	Soil	Suite 1	turf		
		GTCS2-S259_0-0.02	Soil	Suite 1	turf		
		GTCS2-S260_0-0.02	Soil	Suite 1	turf		
		GTCS2-S261_0-0.02	Soil	Suite 2	bare soil - undisturbed		
		GTCS2-S262_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed		
		GTCS2-S263_0-0.02	Soil	Suite 1	bare soil - undisturbed		
		GTCS2-S264_0-0.02	Soil	Suite 1	bare soil - undisturbed		
		GTCS2-S265_0-0.05	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S266_0-0.02	Soil	Suite 2	turf		Soil near fruit trees in orchard area
		GTCS2-S267_0-0.02	Soil	Suite 1	turf		
		GTCS2-S268_0-0.2	Soil	Suite 1	bare soil - disturbed		
		GTCS2-S269_0-0.2	Soil	Suite 1	bare soil - disturbed		Raised bed in community kitchen garden
		GTCS2-S270_0-0.2	Soil (+ 1 duplicate)	Suite 1	bare soil - disturbed		
Treadgold House	28	GTCS2-S271_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage of public open space garden areas	
		GTCS2-S272_0-0.02	Soil	Suite 2	bare soil - undisturbed		
		GTCS2-S273_0-0.02	Soil	Suite 1, TOC	turf		
		GTCS2-S274_0-0.02	Soil	Suite 1	turf		
		GTCS2-S275_0-0.02	Soil	Suite 1	turf		

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale		
		GTCS2-S276_0-0.2	Soil	Suite 1	bare soil - disturbed	Sample in raised beds in garden areas		
		GTCS2-S277_0-0.2	Soil	Suite 2	bare soil - disturbed			
		GTCS2-S278_0-0.2	Soil	Suite 1	bare soil - disturbed			
		GTCS2-S279_0-0.02	Soil	Suite 1	turf	General coverage of public open space garden areas		
		GTCS2-S280_0-0.05	Soil	Suite 1	bare soil - disturbed	General coverage of public open space soil bed (indicated as raised growing bed on RBKC mapping)		
		Verity Close	29	GTCS2-S281_0-0.02	Soil (+ 1 duplicate)	Suite 1	turf	General coverage of the area including grassed area in public open space
				GTCS2-S282_0-0.02	Soil	Suite 1	turf	
				GTCS2-S283_0-0.05	Soil	Suite 2	bare soil - disturbed	General coverage of the area including soil bed in public open space
				GTCS2-S284_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	General coverage of the area including soil beds within communal gardens of low-rise residential blocks
				GTCS2-S285_0-0.02	Soil	Suite 1	bare soil - undisturbed	
GTCS2-S286_0-0.02	Soil			Suite 1	turf	General coverage of the area including grassed area within the children's playground		
GTCS2-S287_0-0.02	Soil			Suite 1	bare soil - undisturbed	General coverage of the area including soil beds within communal gardens of low-rise residential blocks		
GTCS2-S288_0-0.02	Soil			Suite 2	bare soil - undisturbed			
GTCS2-S289_0-0.02	Soil			Suite 1	turf	General coverage of the area including grassed area within the children's playground		
GTCS2-S290_0-0.02	Soil			Suite 1	turf			
Little Wormwood Scrubs Including EPIC CIC Adventure Playground	30	GTCS2-S291_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage of public open space including heavily vegetated area		
		GTCS2-S292_0-0.02	Soil	Suite 1	turf	General coverage of public open space including scrubby vegetated area		
		GTCS2-S293_0-0.02	Soil	Suite 1	turf			
		GTCS2-S294_0-0.02	Soil	Suite 2	turf			
		GTCS2-S295_0-0.02	Soil	Suite 1, TOC	turf	General coverage of public open space including grassed area		
		GTCS2-S296_0-0.02	Soil	Suite 1	turf			
		GTCS2-S297_0-0.02	Soil	Suite 1	turf			
		GTCS2-S298_0-0.02	Soil	Suite 1	bare soil - undisturbed		General coverage of public open space including outdoor gym	
		GTCS2-S299_0-0.02	Soil	Suite 2	turf	General coverage of public open space including adventure playground		

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Darfield Way	31	GTCS2-S300_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage of public open space including play area 'Conker tree' play area with exposed soil and grassed areas General coverage of small public open space park 'Honey bee' play area with exposed soil and grassed areas
		GTCS2-S301_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S302_0-0.02	Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed	
		GTCS2-S303_0-0.02	Soil	Suite 1	turf	
		GTCS2-S304_0-0.02	Soil	Suite 1	turf	
		GTCS2-S305_0-0.02	Soil	Suite 2	turf	
		GTCS2-S306_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S307_0-0.02	Soil	Suite 1	turf	
		GTCS2-S308_0-0.02	Soil	Suite 1	turf	
		GTCS2-S309_0-0.02	Soil	Suite 1	bare soil - undisturbed	
Lancaster Green	32	GTCS2-S310_0-0.02	Soil	Suite 2	bare soil - undisturbed	General coverage of public open space including grassed areas and soil borders
		GTCS2-S311_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S312_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S313_0-0.02	Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed	
		GTCS2-S313_0-0.2	Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed	
		GTCS2-S313_0.5-0.6	Soil (+ 1 duplicate)	Suite 1	bare soil - undisturbed	
		GTCS2-S314_0-0.02	Soil	Suite 1	turf	
		GTCS2-S315_0-0.02	Soil	Suite 1	turf	
		GTCS2-S316_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S317_0-0.02	Soil	Suite 2	bare soil - undisturbed	
GTCS2-S317_0-0.2	Soil	Suite 2	bare soil - undisturbed			
GTCS2-S317_0.5-0.6	Soil	Suite 1, TOC	bare soil - undisturbed			
GTCS2-S318_0-0.02	Soil	Suite 1	bare soil - undisturbed			
GTCS2-S319_0-0.02	Soil	Suite 1	turf			
GTCS2-S320_0-0.02	Soil	Suite 1	turf			

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Robinson House	33	GTCS2-S321_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage of public open space garden including grassed area and soil borders with bare earth
		GTCS2-S322_0-0.02	Soil	Suite 2	turf	
		GTCS2-S323_0-0.02	Soil	Suite 1	turf	
		GTCS2-S324_0-0.02	Soil	Suite 1	turf	
		GTCS2-S325_0-0.02	Soil	Suite 1	turf	
		GTCS2-S326_0-0.02	Soil	Suite 1	turf	
		GTCS2-S327_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S328_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
		GTCS2-S329_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S330_0-0.02	Soil	Suite 1	bare soil - undisturbed	
Wesley Square	34	GTCS2-S331_0-0.2	Soil	Suite 1	bare soil - disturbed	Within herb growing beds General coverage of public open space Next to raised growing bed. (not in growing bed as soil entirely new since fire)
		GTCS2-S332_0-0.2	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S333_0-0.2	Soil	Suite 2	bare soil - disturbed	
		GTCS2-S334_0-0.02	Soil (+ 1 duplicate)	Suite 1	turf	
		GTCS2-S335_0-0.05	Soil	Suite 1	bare soil - disturbed	
		GTCS2-S336_0-0.02	Soil	Suite 1	turf	
		GTCS2-S337_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S338_0-0.02	Soil	Suite 2	bare soil - undisturbed	
		GTCS2-S339_0-0.02	Soil	Suite 1, TOC	bare soil - undisturbed	
GTCS2-S340_0-0.02	Soil	Suite 1	bare soil - undisturbed	Bare earth in private garden on one property, untouched since fire		
Silchester West (North and North West area)	35	GTCS2-S341_0-0.02	Soil	Suite 1	bare soil - undisturbed	General coverage of public open space around Markland House and the communal gardens of the properties along Darfield Way
		GTCS2-S342_0-0.02	Soil	Suite 1	turf	
		GTCS2-S343_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S344_0-0.02	Soil	Suite 2	turf	
		GTCS2-S345_0-0.02	Soil	Suite 1	turf	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Maxilla Walk - Maxilla Hall / Maxilla Green	36	GTCS2-S346_0-0.02	Soil	Suite 1	turf	General coverage of public open space
		GTCS2-S347_0-0.02	Soil	Suite 1	turf	
		GTCS2-S348_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S349_0-0.02	Soil	Suite 2	turf	
		GTCS2-S350_0-0.02	Soil	Suite 1, TOC	turf	
		GTCS2-S351_0-0.02	Soil	Suite 1, TOC	turf	
		GTCS2-S352_0-0.02	Soil	Suite 1	turf	
		GTCS2-S353_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S354_0-0.02	Soil	Suite 1	turf	
		GTCS2-S355_0-0.02	Soil (+ 1 duplicate)	Suite 2	turf	
GTCS2-S356_0-0.02	Soil	Suite 1	turf			
GTCS2-S357_0-0.02	Soil	Suite 1	turf			
GTCS2-S358_0-0.02	Soil	Suite 1	bare soil - undisturbed			
GTCS2-S359_0-0.02	Soil	Suite 1	turf			
GTCS2-S360_0-0.02	Soil	Suite 2	turf			
Stonebridge Park	37	GTCS2-S361_0-0.02	Soil	Suite 3	turf	General coverage of public open space. Almost entire park is covered with grass except for paths and very minor areas of soil right at edge near fences. Samples all placed on turfed areas as this is the predominant cover and exposure to the very small bare soil areas likely to be minimal
		GTCS2-S362_0-0.02	Soil	Suite 1	turf	
		GTCS2-S363_0-0.02	Soil	Suite 3	turf	
		GTCS2-S364_0-0.02	Soil	Suite 1	turf	
		GTCS2-S365_0-0.02	Soil	Suite 3	turf	
		GTCS2-S366_0-0.02	Soil (+ 1 duplicate)	Suite 1	turf	
		GTCS2-S367_0-0.02	Soil	Suite 3	turf	
		GTCS2-S368_0-0.02	Soil	Suite 1	turf	
		GTCS2-S369_0-0.02	Soil	Suite 3	turf	
		GTCS2-S370_0-0.02	Soil	Suite 1	turf	

Sample Location Area	Sample Area ID number	Unique sample code	Sample type	Scheduled Analysis*	Ground Cover	Rationale
Wormwood Scrubs <i>(N.B – at the time of preparing this sampling plan, sampling at this location was pending potential requirements for permissions from MoD and OPDC)</i>	38	GTCS2-S371_0-0.02	Soil	Suite 1	turf	General coverage of public open space. Samples located in grassed areas and vegetated scrub areas. There is very little bare soil across the area and therefore samples have been chosen in grassed locations as this will be the predominant conditions for potential exposure
		GTCS2-S372_0-0.02	Soil	Suite 2	turf	
		GTCS2-S373_0-0.02	Soil	Suite 1, TOC	turf	
		GTCS2-S374_0-0.02	Soil	Suite 1	turf	
		GTCS2-S375_0-0.02	Soil	Suite 1	turf	
		GTCS2-S376_0-0.02	Soil	Suite 1	turf	
		GTCS2-S377_0-0.02	Soil (+ 1 duplicate)	Suite 2	turf	
		GTCS2-S378_0-0.02	Soil	Suite 1	turf	
		GTCS2-S379_0-0.02	Soil	Suite 1	turf	
		GTCS2-S380_0-0.02	Soil	Suite 1	turf	
Tower cordon	39	GTCS2-S381_0-0.02	Soil	Suite 1	bare soil - undisturbed	Grassed areas and soil borders in outer cordon accessible for school staff and pupils during arrival and departure
		GTCS2-S381_0-0.2	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S381_0.5-0.6	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S382_0-0.02	Soil	Suite 3	bare soil - undisturbed	
		GTCS2-S383_0-0.02	Soil	Suite 3	turf	
		GTCS2-S384_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S385_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S385_0-0.2	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S385_0.5-0.6	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S386_0-0.02	Soil	Suite 3	turf	
		GTCS2-S387_0-0.02	Soil	Suite 1	bare soil - undisturbed	
		GTCS2-S388_0-0.02	Soil	Suite 3	turf	
		GTCS2-S389_0-0.02	Soil	Suite 2	turf	
GTCS2-S389_0-0.2	Soil	Suite 2	turf			
GTCS2-S389_0.5-0.6	Soil	Suite 2	turf			
		GTCS2-S390_0-0.02	Soil (+ 1 duplicate)	Suite 1	turf	Rough vegetated area recently cut and outside the emergency exit for the school. Possible evidence of fire-related debris on the ground surface

- * **Suite 1** = PAHs; lead; asbestos (+ asbestos quantification where fibres are detected)
 - Suite 2** = PAHs; lead; asbestos (+ asbestos quantification where fibres are detected); antimony; chlorinated dioxins & furans; brominated dioxins & furans; PCB (WHO-12); TOC
 - Suite 3** = Metals; VOCs + TICs, SVOCs + TICs, PAHs, SVOC forensic scan, PCB 7, PCB (WHO-12), chlorinated dioxins and furans, brominated dioxins and furans, organophosphorous flame retardants; brominated flame retardants (PBDEs); poly-brominated biphenyls (PBBs); tetrabromobisphenol A; hexabromocyclododecane (1,2,5,6,9,10-); isocyanates; cyanides; TOC; asbestos (+ asbestos quantification where fibres are detected); SVF/MMMF.
- See Table 07 below for full details of these analytical suites

The analytical methods outlined below reflect the COPC identified by the Stage 1 fire chemistry evidence review (TN04⁵) and additional COPC identified by the more recent University of Edinburgh independent review of fire effluent chemistry (Hadden & Switzer, 2020). The objective of selecting these methods for Stage 2 is to provide sufficient evidence to support the health risk assessment.

⁵ TN04: Fire chemistry and identification of COPC, AECOM, 2019

Table 07. Analytical Methods for Soil Samples

Analyte/Group (refer to Stage 1 TN04 for details)	Testing Rationale	Laboratory	Laboratory Method	Detection Limit (mg/kg unless specified)*	UKAS Accredited Method?	Sample Handling
Metals {Al(50), Sb (1), As(0.5), Ba(1), Be(0.5), B (0.1), Cd(0.1), Cr(0.5), Cr VI (0.3), Cr III (0.5), Cu(1), Pb(5), Hg(0.1), Ni(0.7), Se(1), V(1), Zn(5)}	Evidence based on research following World Trade Center collapse (described in TN04) and metals are included as a COPC in BS ISO 26367-1:2017. Guidelines for assessing the adverse environmental impact of fire effluents. (British Standards Institute, 2017b). Aluminium included as Grenfell Tower cladding panels were an aluminium composite material. Antimony added based on University of Edinburgh study (Hadden & Switzer, 2020).	Element	Modified US EPA Method 200.7, 6010B and BS EN ISO 11885:2009. Aqua Regis extract ICP-OES / Kone Analyser. 1g dried and ground sample.	In brackets alongside metal in analyte column.	Y	Brown glass jar (260ml)
VOCs (US EPA target list (US Government, 2012) plus tentatively identified compounds)	VOCs such as benzene released during combustion of carbon-based materials	Element	Headspace GC-MS - modified USEPA 8260. 5g as received sample, 2g salt, made up to 10ml with deionised water	Target list – 1-30µg/kg TICs – 100µg/kg	Y (for 48 of 61 target list compounds)	Brown glass vial (74ml)
		Element	Headspace GC-MS – EPA5035. 10ml methanol, 5g of sample, shaken, 1ml of methanol removed and made up with 9ml of deionised water	50µg/kg 100µg/kg for m,p-xylene	Y (for 4 compounds: benzene, toluene, ethylbenzene, xylenes)	40ml glass vial with methanol preservative

Analyte/Group (refer to Stage 1 TN04 for details)	Testing Rationale	Laboratory	Laboratory Method	Detection Limit (mg/kg unless specified)*	UKAS Accredited Method?	Sample Handling
SVOCs (US EPA target list (US Government, 2012) plus tentatively identified compounds)	SVOCs released during combustion of carbon-based materials	Element	GC-MS – modified USEPA 8270 on DCM extract	Target list – 10µg/kg Phthalates and TICs – 100µg/kg	Y (for 16 of 59 target list compounds)	Brown glass jar (260ml)
PAHs (US EPA priority 16 (US Government, 2012) plus coronene)	PAHs released during combustion of carbon-based materials	Element	GC-MS. Solvent extraction on as received sample. In house method modified USEPA 8270. End over end solvent extraction of solid sample using 5g sample and 10ml DCM	0.02 – 0.07	Y (for 15 of 16 target compounds)	Brown glass jar (260ml)
PAHs (28 compounds – combination of US EPA priority 16 plus European Food Safety Authority (EFSA) priority compounds for foodstuffs. Refer to Table 08 footnote for full list of compounds)	PAHs released during combustion of carbon-based materials	Fera	FSG/410 using High Resolution Gas Chromatography-Low Resolution Mass Spectrometry Isotope Dilution with ¹³ C - labelled internal standards	0.0001 – 0.005	N (accredited for food and feed matrix, not currently for soil)	Brown glass jar (260ml)
SVOC forensic scan	Ability to identify a wider range of semi-volatile organic compounds that might have been released during the combustion of carbon-based materials, including 7,12-dimethylbenzo(a)anthracene.	Element	Semi volatile scan by GC-MS. Extracted from as received sample. Longer run-time capable of detecting alkylated and halogenated PAHs, and heavier PAHs	NA	N	Brown glass jar (260ml)
PCB 7 (Dutch 7 congeners: 101,118,138,153,180,28,52)	Linked to combustion of carbon-based materials (including chlorinated plastics)	Element	Modified US EPA method 8270 by GC MS. End over end extraction from as received sample.	0.005 per congener	Y	Brown glass jar (260ml)
PCB (WHO12) 12 congeners: 77,81,105,114,118,123,126,156,157,167,169,189	Linked to combustion of carbon-based materials (including chlorinated plastics)	Marchwood	Sub-contracted. USEPA 1613 using solvent extraction followed by chromatographic clean-up and High Resolution GCMS Micromass Ultima Autospec instrumentation.	Variable Typically 0.2 – 1 ng/kg	Y	Brown glass jar (260ml)

Analyte/Group (refer to Stage 1 TN04 for details)	Testing Rationale	Laboratory	Laboratory Method	Detection Limit (mg/kg unless specified)*	UKAS Accredited Method?	Sample Handling
Chlorinated Dioxins and furans	Linked to combustion of carbon-based materials (including chlorinated plastics)	Marchwood	Sub-contracted. USEPA 1613 using solvent extraction followed by chromatographic clean-up and High Resolution GCMS Micromass Ultima Autospec instrumentation.	Variable Typically 0.2 – 1 ng/kg	Y	Brown glass jar (260ml)
Brominated Dioxins and furans	Linked to the combustion of carbon-based materials (including brominated flame retardants)	Marchwood	Sub-contracted BSEN 1948 part 2 & 3 utilising solvent extraction techniques followed by chromatographic clean-up and High Resolution GCMS using Thermo Scientific Dual Focus Spectrometer (DFS).	Variable Typically 0.2 – 1 ng/kg	Y	Brown glass jar (260ml)
Organophosphorus flame retardants	Marker compounds for organophosphorus-based flame retardants	RPS Mountainheath	tris(1-chloro-2-propyl) phosphate TCPP and tris(2-ethylhexyl) phosphate by solid: liquid extraction and analysis by GC-MS	0.1 – 0.8	N	Brown glass jar (260ml)
Brominated flame retardants (PBDEs: 2,2',4,4',6-pentabromodiphenyl ether, 2,2',3,4,4',5'-hexabromodiphenyl ether, 2,2',4,4',5,5'-hexabromodiphenyl ether, 2,2',4,4',5,6'-hexabromodiphenyl ether, 2,2',4-tribromodiphenyl ether, 2,4,4'-tribromodiphenyl ether, 2,2',4,4'-tetrabromodiphenyl ether, 2,3',4,4'-tetrabromodiphenyl ether, 2,2',3,4,4'-pentabromodiphenyl ether, 2,2',4,4',5-pentabromodiphenyl ether, 2,2',3,4,4',5',6'-heptabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'-decabromodiphenylether)	Type of flame retardants of known health concern	RPS Mountainheath	Analysis by solid: liquid extraction and analysis by GC-MS	0.1	N	Brown glass jar (260ml)

Analyte/Group (refer to Stage 1 TN04 for details)	Testing Rationale	Laboratory	Laboratory Method	Detection Limit (mg/kg unless specified)*	UKAS Accredited Method?	Sample Handling
Polybrominated biphenyls (PBBs): hexabromobiphenyl (2,2',4,4',5,5'-) (PBB 153) 4,4'-dibromobiphenyl (PBB 15) 2,2',5-tribromobiphenyl (PBB 18) 2,2'-dibromobiphenyl (PBB 4) tetrabromobiphenyl (3,3',5,5'-) (PBB 80)	Brominated fire retardant described in TN04	RPS Mountainheath	Analysis by solid: liquid extraction and analysis by GC-MS	0.5	N	Brown glass vial (74ml)
Polybrominated biphenyls (PBBs): Hexabromobiphenyl (2,2',4,4',5,5'-) (PBB 153) tetrabromobiphenyl (3,3',5,5'-) (PBB 80) Tetrabromobiphenyl (2,2',4,5'-) (PBB 49) Tetrabromobiphenyl (2,2',5,5'-) (PBB 52) Pentabromobiphenyl (2,2',4,5,5'-) (PBB 101) Decabromobiphenyl (2,2',3,3',4,4',5,5',6,6'-) (PBB 209)	Brominated fire retardant described in TN04	Fera	Analysis by solid: liquid extraction and analysis by GC-MS	0.01 – 2 ng/g	N	Brown glass vial (74ml)
Tetrabromobisphenol A	Brominated fire retardant described in TN04	RPS Mountainheath	Solvent extraction into Methanol and analysis by LC-MS/MS	0.5	N	Brown glass vial (74ml)
hexabromocyclododecane (1,2,5,6,9,10-)	Brominated fire retardant described in TN04	RPS Mountainheath	Solvent extraction into Methanol and analysis by LC-MS/MS	0.1	N	Brown glass vial (74ml)

Analyte/Group (refer to Stage 1 TN04 for details)	Testing Rationale	Laboratory	Laboratory Method	Detection Limit (mg/kg unless specified)*	UKAS Accredited Method?	Sample Handling
Isocyanates	COPC from combustion of foam-based insulation materials	Element	No available commercial laboratory method for soil identified to date. Intention is to develop a LCMS method based on ISO17734-1:2013 for air samples and US EPA method CTM-036a for the extraction of cyanates from soil. Will identify most but not all isocyanates identified in TN04 on fire chemistry as below <u>Isocyanic acid</u> <u>Methyl isocyanate</u> <u>Ethyl isocyanate</u> <u>Propyl isocyanate</u> <u>Hexamethylene di-isocyanate</u> <u>Toluene-2,4-diisocyanate</u> <u>Toluene-2,6-diisocyanate</u> <u>Methylene-bis-(phenylisocyanate)</u>	0.25 – 0.5	N	Brown glass jar (260ml)
Cyanides (total, free and thiocyanate)	Linked to release and environmental fate of isocyanates	Element	Modified US EPA method OIA-1667 by flow injection / Skalar. Extracted with 1M NaOH by orbital shaker on as received sample.	Total – 0.5 Free – 0.5 Thiocyanate – 0.6	Y	Brown glass jar (260ml)
Asbestos	COPC from building fabric	Element	Optical microscopy HSG 248 and SCA Blue Book.	Presence/absence screen	Y	1 kg (950ml) white plastic tub
Synthetic Vitreous Fibres (SVF) / Man-made Mineral Fibres (MMMMF)	COPC from combustion of foam-based insulation products	Element	Optical microscopy	In-house screen, no quantification.	N	1 kg (950ml) white plastic tub (combined for asbestos above)
TOC	Measure of total organic carbon in soil. Used to predict phase partitioning of organic substances in soil	Element	Modified BS 7755-3:1995 by Eltra TOC. Dried and ground, washed with HCl and deionised water.	0.02%	Y	Brown glass jar (260ml)

Analyte/Group (refer to Stage 1 TN04 for details)	Testing Rationale	Laboratory	Laboratory Method	Detection Limit (mg/kg unless specified)*	UKAS Accredited Method?	Sample Handling
Asbestos quantification (where required/ requested)	COPC from building fabric	Element	PCM (Phased Contrast Microscopy) and discriminating techniques as outlined in HSE contract report 83/96 Respirable fibres can be calculated from this method but must be requested at time of scheduling	0.001% by weight	Y	1 kg (950ml) white plastic tub
Lead bioaccessibility	Priority COPC from Stage 1 with soil ingestion as a key exposure pathway	Element	BS ISO 17924:2018 modified Unified BARGE Method (UBM). Preparation of 3 extracts; stomach, stomach-intestine (Synthetic digestive fluids) and total (Aqua Regia). Followed by analysis of Lead by ICP-MS and calculation of bioaccessible fraction.	-	N	Brown glass jar (260ml)
PAH bioaccessibility	Priority COPC from Stage 1 with soil ingestion as a key exposure pathway	Element	FOREhST extraction followed by GC-MS analysis. PAH-16 priority compounds will be reported.	-	N	Brown glass jar (260ml)

* Detection limits have been chosen so that as a minimum they are lower than the generic screening criteria identified in the Stage 1 Technical Note 8: COPC Toxicity

Table 08. Analytical Methods for Crop Samples

Analyte/Group	Testing Rationale	Laboratory	Laboratory Method*	Detection Limit (mg/kg unless specified)	UKAS Accredited Method?	Sample Handling
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Analyte/Group	Testing Rationale	Laboratory	Laboratory Method*	Detection Limit (mg/kg unless specified)	UKAS Accredited Method?	Sample Handling
Lead	Priority COPC from Stage 1 with consumption of homegrown produce as a potential exposure pathway	Fera	tbc	tbc	Yes	Refer to Appendix C ⁶
PAHs**	Priority COPC from Stage 1 with consumption of homegrown produce as a potential exposure pathway	Fera	GC-MS	0.01 – 0.02µg/kg	Yes	Refer to Appendix C ⁴

* For crop samples, Fera will immediately freeze the samples on receipt pending later analytical scheduling. Upon receipt of the samples, Fera will inform AECOM of those crop types that require preparation prior to freezing. At this stage AECOM will provide instructions to Fera in terms of preferred sample preparation for those samples that require preparation before freezing. Fera does not have a standardized approach to preparation of specific plant types and therefore the general principle will be for the plants to be prepared to a reasonably precautionary condition for consumption. This is particularly relevant for roots and tubers where there is evidence that some contaminants can be more concentrated in the skin/peel. In these cases the plants will not be peeled prior to preparation for analysis.

** The Fera PAH suite includes acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, benzo[c]fluorene, pyrene, benzo[ghi]fluoranthene, benzo[a]anthracene, benzo[b]naphtho[2,1-d]thiophene, cyclopenta[cd]pyrene, chrysene, 5-methylchrysene, benzo[b]fluoranthene, benzo[j]fluoranthene, benzo[k]fluoranthene, benzo[e]pyrene, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[a,h]anthracene, benzo[ghi]perylene, anthanthrene, dibenzo[a,l]pyrene, dibenzo[a,e]pyrene, dibenzo[a,i]pyrene, dibenzo[a,h]pyrene, coronene

⁶ Instructions from Fera are to sample as much of each crop as possible and place in sealable plastic bags. Fera will advise on receipt of the samples what analysis is possible as the required sample size is plant-dependent.

Table 09. Sample and Testing Schedule

Sample Type	Sample Number	Analytical Suites
Surficial soil samples in sample areas excluding Longstone Avenue, Tower cordon and Stonebridge Park	360 samples (10 individual samples from 36 areas)	All 360 samples for Suite 1: lead, PAHs, asbestos screen. 2 of 10 samples from each location (total of 72) for antimony and dioxins, furans & dioxin-like PCBs 3 of 10 samples from each location (total of 108) for TOC Asbestos quantification for samples where fibres are identified (up to maximum 30% of all samples)
Deeper soil samples	50 samples from 6 selected areas.	All 50 samples for Suite 1: lead, PAHs, asbestos screen. One sample in each of the 6 areas from each deeper horizon (total 12 samples) for antimony, TOC and dioxins, furans & dioxin-like PCBs Asbestos quantification for samples where fibres are identified (up to maximum 30% of all samples)
Paired soil and edible crop samples	Up to 72 samples (6 samples from 12 locations)	TBC. 35 of the 72 samples to be scheduled for lead and PAH analysis. The laboratory will advise on receipt of plant samples whether sample is sufficient for testing. For certain crop types sample preparation will be required on receipt of the sample in order to maintain sample for testing. This will occur before samples are scheduled for testing.
Surficial soil samples in Longstone Avenue, Tower cordon and Stonebridge Park	30 samples (10 individual samples from 3 areas)	Tower cordon: 4 of 10 for Suite 3; 6 of 10 for Suite 1. Longstone Avenue: 5 of 10 for Suite 3; 5 of 10 for Suite 1. Stonebridge Park: 5 of 10 for Suite 3; 5 of 10 for Suite 1. Asbestos quantification for samples where fibres are identified (up to maximum 30% of all samples)
Duplicate samples*	Duplicate samples taken at random from any of the sample locations from any of the sample areas, at a duplicate rate of 5%.	The same as for the original sample
Long-term storage samples	440 soil samples (those from rows 1, 2 and 4 of this table) will have a full duplicate of sample containers collected and labelled as duplicates for long-term storage	No analysis – samples to be stored for potential future analytical requirements

*Considerations for duplicate samples:

For Stage 1, duplicate sampling was conducted as described in (British Standards Institute, 2017), namely eight duplicate samples were selected at random to allow for the estimates of uncertainty. The duplicates were a separate sample from the same sampling hole. The two samples were then sub-sampled twice by the laboratory, providing a total of four samples for analysis. The data analysis was based on CL:AIRE Research Project (RP4) (Taylor, et al., 2007). This demonstrated that the sampling and analytical error was satisfactory, and on this basis a simplified approach to duplicate sampling is justified at Stage 2, comprising the collection of a separate sample from the same sampling hole and a single laboratory sub-sample being tested from it, providing a total of two samples for analysis (one original, one duplicate).

6. Data Interpretation

Data evaluation and risk assessment will be carried out in accordance with the requirements of Part 2A, and appropriate good practice guidance (and technical procedures), including the *Analysis and*

Interpretation Methodology for the Soil Investigation at Grenfell Tower (EA, PHE, 2019) developed specifically by PHE and the EA for this project.

Specific aspects of the data evaluation and risk assessment will include:

- Assessment and comparison of soil concentration data with GSC, including the use of appropriate spatial or non-spatial statistical techniques. At this stage, AECOM will recommend any additional testing viewed necessary to assist with further stages of DQRA, including (but not necessarily limited to) soil bioaccessibility, further crop analysis, or analysis of additional samples for dioxins and furans. These recommendations will be based on the EA/PHE methodology (which notes that DQRA will be implemented for linkages that cannot immediately be placed into Category 4) and AECOM's experience in completion of DQRA and the benefits of this information for SSAC derivation.
- DQRA may be required for some contaminants and some reasonably possible significant contaminant linkages where shallow soil concentrations exceed both GSC and normal background concentrations.
- DQRA may also be required for some contaminants with no GSC or no data on normal background levels.
- Similarly, if necessary, a DQRA using further site-specific information and criteria can be undertaken to resolve any residual uncertainties from the GQRA as to whether unacceptable risks to human health are present. This task may be used as the sole method for quantitative assessment of risks, or it may be used to refine earlier assessments.
- The development of site-specific screening criteria (SSSC) to reduce uncertainty to acceptable levels and allow final decisions to be made. SSSC may be derived using soil bioaccessibility data of key contaminants or the sampling of home grown produce to investigate fruit and vegetable uptake pathways.
- Similarly, examples of provisional, supplementary work for inform the DQRA could include quantitative asbestos analyses and additional sampling around significant outliers. These activities will be recommended to MAP by AECOM following the initial data screening and evaluation of spatial distributions if they are considered to benefit the risk estimation process.
- Stage 2 data interpretation will include risk assessment to establish whether there are unacceptable risks to human health as defined in Part 2A. The process should follow the tiered risk assessment steps highlighted in LC:RM. These are:
 - Risk assessment is an iterative process (PRA→GQRA→DQRA).
 - For each tier you must identify the hazard (establish contaminant source), assess the hazard (using the S-P-R approach), estimate the risk by predicting what degree of harm might result and how likely it is to occur, and evaluate the risk (deciding on whether risk is acceptable).
 - The steps to take for GQRA are: define objectives, identify appropriate GAC, confirm suitability of GAC, use existing GAC and/or derive new GAC, decide what information is required, collect information, confirm pollutant linkages to assess, assess risk, and conclude GQRA by updating the conceptual model, identify potentially unacceptable risks, and determine what is required in the form of DQRA to address uncertainties.
 - The steps to take for DQRA are: define the objectives, decide what information to collect, collect information, confirm the relevant pollutant linkages (RPLs) to be assessed, assess the risk for each RPL using a relevant risk estimation tool, and conclude DQRA by updating the conceptual model, identify potentially unacceptable risks, and determine what is required in the form of further DQRA to address uncertainties (if appropriate).
- GSC are set out in AECOM's Stage 1 TN17. They will be used in the order of preference shown in TN17 section 6.1 unless other more appropriate criteria are agreed with MAP.
- The Analysis and Interpretation Methodology (Information Sheet 2) (EA, PHE, 2019) provides advice on the use of GSC and the hierarchy of GSC that should be used in Stage 2.

Relevant good practice guidance and technical procedures (in addition to the EA's LC:RM and Defra's statutory guidance for Part 2A) are cross-referenced for the proposed individual tasks and sub-tasks

below and include the Environment Agency's SC050021 series of science reports including the CLEA methodology (2006-2015), CIRIA C733 (Nathanail, et al., 2014), Defra SP1010 C4SLs (2014), BS ISO 15800:2019 (BSI, 2019), BS ISO 18400 series (British Standards Institute, 2017a), BS ISO 10175:20011+A2:2017 (British Standards Institute, 2017), (CL:AIRE, 2020), (Olea, 2009), (McKone, T.E, 2007), (US Department of Defense, 2017), (CIEH, 2009) and (National Institute for Public Health and the Environment, 2014).

6.1 Data Analysis (and presentation)

The first step in data analysis will be the assignment of data to specific groups and sub-groups. These will likely be the investigation area, sample depth, land-use, and soil/ground type (e.g. turf, bare soil, raised beds), but could include additional categories dependent on what is encountered. Duplicate sample analytical data will also be reviewed as part of a wider data adequacy assessment that will be informed by the sub-tasks detailed below. The Stage 1 data will be evaluated with the Stage 2 data to determine when it may be appropriate to combine the Stage 1 and Stage 2 results into a single dataset.

AECOM will assess and present the soil quality data spatially using our in-house GIS platforms that can superimpose sample locations on detailed base maps of the area, and graphically represent concentrations using various symbology and colour scales. This will be used to inform on potential spatial patterns in the data that might infer different data populations that has relevance to the use of the data for traditional statistical analysis of data percentiles, averages, etc. It will also inform whether there are areas within the inspection area where contaminant concentrations are noticeably higher than in other areas, or where individual results appear anomalous. This will include layering the analytical results over existing and historical land-uses to identify any potential correlation between the spatial pattern in soil concentrations and land-use.

For PAH data and dioxin data, because they are complex mixtures, additional compositional (or profile) analysis will be used to assess whether there are spatial changes in composition and therefore potential source. The graphical composition profiling methods used for Stage 1 will also be used for Stage 2.

AECOM will also assess the data using traditional descriptive statistics to determine percentiles, averages, outliers., etc, using existing accepted UK methodologies and software tools. AECOM will use the USEPA ProUCL software to complete the traditional statistical assessments as well as using the (CL:AIRE, 2020) guidance. Statistical tests will only be reported if the data supports their use (specifically sample size) and the statistical output adds weight to the data evaluation (i.e. is a useful line of evidence). AECOM will use graphical methods to display the data in a way that is meaningful to the comparison of data against background data and/or screening criteria (for example the box and whisker plots used for Stage 1). This reflects the guidance in Defra SP1010 Appendix I (2014), the approach taken by AECOM for Stage 1, and the approach taken in the (CL:AIRE, 2020) guidance.

The statistical analysis will be informed by the spatial analysis of the data. At this stage it is anticipated that the data will be grouped for individual test areas (i.e. an individual school, community garden or other area of public open space). Wider spatial variability will also be considered, for example whether averaging across larger areas is justified. This is specifically aimed at assessing the validity of using the data to reliably represent unsampled areas. Data adequacy will also be assessed based on sample data QA/QC indicators such as duplicate analysis (Ramsey, 2016).

In undertaking the spatial and traditional statistical assessments, data selection will be determined by sample depth, reported soil descriptions, ground cover type (turf, disturbed bare soil, undisturbed bare soil, raised growing beds) and potentially contaminative historic land-use such that different populations of data are separated where possible and not erroneously combined.

The data evaluation and presentation of that data will be determined by the available data for each contaminant. The data will be screened using the generic screening criteria established for Stage 1 and contaminants that are detected but do not have any reported concentrations above the GSC will not be subject to detailed data evaluation and presentation. The screening process itself will be reported as part of the generic quantitative risk assessment (see section 6.3).

The data obtained from Stage 2 will be combined with the data from Stage 1 for the purposes of data evaluation and presentation.

6.2 Preliminary Risk Assessment

The first step is to re-evaluate the conceptual model developed for Stage 1. This will be done using the same approach adopted in Stage 1 TN16 and comparing the Stage 1 results with the Stage 2 results using the data evaluation information detailed in section 6.2 above. This will enable a revised conceptual model to be presented using the approach taken in Stage 1 to confirm existing and identify new contaminant linkages where appropriate.

6.3 Generic Quantitative Risk Assessment

This will be achieved by comparing the data obtained for Stage 2 against the GSC, in accordance with the MAP methodology, the data will then be evaluated on the basis of margins of exceedance and comparison with available background soil data. This will be achieved using the graphical and statistical data analysis noted for the data evaluation above. The CLEA model and published information on the GSC will be used to identify exposure pathways of most concern. Consistency with the approach for Stage 1 will be maintained so that the evaluation of Stage 2 areas is comparable to those evaluated at Stage 1. Data gaps and uncertainties identified as part of the GQRA process will be identified that will define the scope of any required DQRA.


Data will be screened based on the GSC relevant to the current land-use. Data will also be screened against other generic land-use GSC to enable the potential significance of the data for other land uses in the area to be assessed.

It is noted that generic land-use GSC are not available for all current land uses in the proposed investigation area. These include schools and community gardens. GSC for land-uses that are precautionary in their exposure assumptions will initially be used to screen the data for these land-use areas. More land-use specific GSC may be derived for contaminants for which reported soil concentrations exceed the initial GSC screening.

At Stage 1 the following methodology was set out and will be adopted again for Stage 2 for determining the potential significance of CLs and prioritisation of further assessment:

The Part 2A statutory guidance includes two tests of significance with respect to the assessment of contaminant linkages associated with human health. Paragraph 2.13 states that if at any stage the local authority considers, on the basis of the information obtained from inspection activities, that there is no longer a reasonable possibility that a significant contaminant linkage exists on the land, the authority should not carry out any further inspection in relation to that linkage. Paragraphs 4.4-4.27 define significant harm and significant possibility of significant harm and four categories of land; categories 1-4. Category 4 is associated with a range of risk from none to low. Category 3 is associated with a range of risk from “not low” to not unacceptable. Categories 1 and 2 are associated with an unacceptable risk. These categories can be placed in a matrix that assists in prioritising which contaminant linkages should be assessed further. This matrix is illustrated below:

Table TN16-010. Prioritisation Matrix

Possibility of SCL being present	Risk	Possible land category	Priority
Less than reasonable possibility	None (e.g. no CL)	4	Lowest
Less than reasonable possibility	Low	4	
Reasonable possibility	Not Low	3	
More than reasonable possibility	Unacceptable (on a precautionary basis)	2	
High possibility	Unacceptable	1	

Factors that can be used to assess the possibility of the presence of an SCL include:

- Frequency and spatial distribution of COPC detection in soil samples
- Proportion of COPC concentrations that exceed generic screening criteria (GSC)

- The degree to which COPC concentrations exceed GSC⁷
- Comparison of reported COPC soil concentrations with local, regional and national background levels
- The level of confidence in the available data (what uncertainties or data gaps remain)

These factors can be translated into the prioritisation matrix in Table TN16-09 above as shown in Table TN16-11 below, which is taken directly from the EA/PHE Analysis and Interpretation Methodology for the Soil Investigation at Grenfell Tower (v8_2).

Table TN16-11. Contaminant linkage prioritisation using soil data*

Detection and spatial distribution of COPC in soil	Proportion of COPC concentrations above GSC	Comparison with normal levels in urban soils	Linkage Ranking
Most if not all results less than suitable method detection limits (MDL) and/or sample depth and location inconsistent with potential exposure pathways	N/A	N/A	No further investigation required (evidence suggests that there is no reasonable possibility of a significant contaminant linkage)
Most results above MDL and sample depth and location consistent with potential exposure pathways, but no indication of spatial patterns or hot spot consistent with fire emissions	All results at or below a relevant GSC	All results considered to be within typical background levels	Low priority for further investigation (evidence suggests that there is unlikely to be a reasonable possibility of a significant contaminant linkage)
Most results above MDL and sample depth and location consistent with potential exposure pathways, but no indication of spatial patterns or hot spot consistent with fire emissions	Some results well-above a relevant GSC	Some results above typical background levels	Medium priority for targeted further investigation (evidence suggests there could be a reasonable possibility of a significant contaminant linkage)
Results above MDL and sample depth and location consistent with potential exposure pathways. Results indicate a strong spatial pattern and/or hot spot(s) that are consistent with fire emissions	Majority of results above relevant GSC and many results well-above a relevant GSC	Majority of results above typical background levels	High priority for further investigation (evidence suggests there could be a reasonable possibility of a significant contaminant linkage)
Results above MDL and sample depth and location consistent with potential exposure pathways. Results indicate of a strong spatial pattern or hot spot that is consistent with fire emissions	Majority of results well-above a relevant GSC	Majority of results well-above typical background levels	Highest priority for further investigation (evidence suggests there is a reasonable possibility of a significant contaminant linkage)

* Not shown in the above matrix is the assessment of uncertainty and the identification of information gaps for each contaminant linkage. If confidence in the assessment of a contaminant linkage is low, this may indicate the need for further investigation.

The GSC and typical background levels to be adopted as part of the assessment process described above were identified during Stage 1 and were presented in Stage 1 Technical Note (TN) 8: COPC Toxicity and Stage 1 Technical Note (TN) 9: Published Data on National and Regional Urban Background Soil Concentrations.

The conceptual model will be updated with the relevant contaminant linkages that have been identified as posing a possibility of significant harm. It is these linkages that will be assessed further at DQRA.

⁷ Footnote 2 of paragraph 3.29 of the statutory guidance states that the level of risk posed by land contamination will depend on more than simply the amount of contaminant in the soil; it will also depend on what form the contaminants take, where they are in the soil, the efficiency of the pathway by which receptors may be exposed, the sensitivity of receptors, the likely degree and duration of exposure, and the dose-response relationship of that contaminant. These factors will vary from case to case, sometimes very substantially. Footnote 3 goes on to state that GSC (because of the variability in how they are derived) can be exceeded by a substantial degree (sometimes by orders of magnitude) but in other cases there may be a considerably smaller margin and in some cases it may be that GSC are only exceeded by a few times for land to fall outside of Category 4.

6.4 Detailed Quantitative Risk Assessment

AECOM considers that the most likely additional data requirements for the DQRA are:

- Additional soil data where individual soil sample results indicate an outlier or concentration hotspot. The purpose of the data to reduce the uncertainty in the representativeness of that data point.
- The testing of deeper soil samples if shallow samples are reported with elevated concentrations.
- Additional soil sampling and testing if unexpected ground conditions are encountered. The comparison of soil concentrations against GSC and typical background concentrations as described in Section 6.3 above will help in the identification of unexpected conditions.
- Testing for the bioaccessibility of contaminants other than lead and PAHs. This might be for other metals using the extracts from the UBM tests, or it could include the testing of the extracts from the FOREhST tests for dioxins or PCBs.
- Testing of plant tissue samples where the soil results and GSC screening suggests an elevated exposure from consumption of homegrown produce.
- Detailed quantitative analysis of soil samples identified to contain greater than trace quantities of asbestos (to include individual fibre counting, reporting of data in fibres per gram, and the potential for dustiness testing on selected samples if necessary).
- Further evaluation of published background datasets to define normal background concentrations as per Defra SP1008 (for example for dioxins using the UKSHS dataset), or more detailed evaluation of reported local concentrations beyond that used at GQRA if this is identified as a critical step as a result of the GQRA.
- Detailed extraction of historical analytical data from site investigation reports on council Planning portals. This task will only be completed if it is judged after the initial data presentation and GQRA that there is a high level of uncertainty with potential background concentrations that could be complicating the interpretation of the data.

Any extra data requirements considered to be required following the initial data evaluation and GSC screening will be communicated to MAP along with justifications.

AECOM proposes to undertake the DQRA as follows (dependent on need):

- Use the CLEA model v1.07 to incorporate site-specific bioaccessibility estimates for metals and PAHs and derive site-specific screening criteria.
- Use the CLEA model v1.07 to assess the sensitivity of bioavailability assumptions for dioxins and furans and PCBs (if required) using literature search of most recent research in this area.
- Use the CLEA model v1.07 to incorporate site-specific plant concentration factors and derive site-specific screening criteria. (subject to such plant testing being done)
- Compare plant tissue samples to regulatory limits for contaminants in food (subject to such plant testing being done and regulatory limits being available), noting that the regulatory limits are not directly applicable to small quantities of homegrown produce but could be a useful comparison for risk communication if measured concentrations are below these limits.
- Compare estimates of soil derived exposure doses (using the CLEA model in ratio mode) to background intakes from food, water and air where such data is readily available.
- Use the CLEA model v1.07 to assess the sensitivity of some key exposure parameters (those identified in Defra SP1010). For example, soil ingestion rate and dermal absorption factors, if relevant.
- Use the CLEA model v1.07 to reduce the homegrown produce consumption rates on the basis that the kitchen gardens are much smaller than a standard CLEA allotment.
- Recognition of the basis of the health criteria values used in the derivation of the GSC and SSSC and the margin of exceedance of the HCV by the predicted exposure. Relevant information on the HCV has already been collated in TN8 and AECOM will request information from PHE (in their role on MAP) on more detailed toxicological aspects where required. *AECOM has therefore*

not scoped for detailed toxicological evaluation (either by AECOM or by an independent toxicologist appointed by AECOM). Toxicological reviews such as those required for the derivation of LLTC are beyond the scope of this project.

Justification for the DQRA scope developed above is provided in the DQRA scoping checklist included in **Appendix E**.

6.5 Part 2A Significance

The stated aims in the ITT with respect to Part 2A are to:

- Carry out generic and detailed quantitative human health risk assessments required under Part 2A to establish whether there are unacceptable risks to human health.
- Provide recommendations in relation to the classification of all potential significant contaminant linkages investigated as Category 1-4 in accordance with the Statutory Guidance.
- Provide recommendations for whether or not any land appears to meet the definition of contaminated land, under Part 2A.

As per the ITT requirements, the data will be assessed using Generic Screening Criteria and associated assumptions to conclude whether there are likely to be any unacceptable risks. This will firstly be based on the use of the PHE methodology outlined in section 6.3 to identify contaminant linkages associated with a reasonable possibility. This step will also identify the key uncertainties that remain to be resolved before any decision can be made on which Part 2A category land falls within and set out whether these uncertainties can be resolved by further actions under a DQRA. The steps for the DQRA have been outlined in the previous sections. The initial evaluation of the DQRA will follow the logic of the PHE methodology for the use of GSC, namely that site-specific screening criteria (SSSC) and or exposure dose estimates will be used to screen out contaminant linkages that likely to be associated with a low level of risk as per paragraph 4.22 of the statutory guidance.

Potentially significant contaminant linkages that are screened out either on the basis of the PHE methodology for GSC (aligned to paragraph 4.21 of the statutory guidance) or on the basis of the DQRA will be used as the basis for placing individual sample areas into Category 4

If land cannot be clearly placed in Category 4 based on the comparison of reported soil concentrations to GSC, SSSC, and normal background concentrations, and comparison of exposure doses to typical daily intakes, AECOM will make preliminary recommendations in line with paragraphs 4.24-4.26 of the statutory guidance for consideration by MAP in relation to the likely land category.

6.6 Interpretative Reporting

The Part 2A compliant interpretative report will include:

- The Generic and Detailed Quantitative Risk Assessments.
- A summary of the Stage 2 work and refined Conceptual Model.
- Recommendations under Part 2A (including Category 1-4 classification) for all reasonably possible significant contaminant linkages investigated and recommendations for any further actions that may be needed.

The interpretative report will include any photographs, graphics, plans and tables required to illustrate the outputs of the site inspection work and risk assessment.

The interpretative report will include a succinct non-technical summary which will be intended for use for wider circulation to a non-specialist audience, and it is recognised that the resulting information may be used by RBKC and/or other boroughs for the purposes of making regulatory decisions. For this reason, all data / information will be collected in full accordance with relevant guidance, good practice and regulations and reported in a clear and unambiguous way.

The structure and content of the report will be in compliance with good practice guidance e.g. minimum reporting requirements from the Environment Agency's Land Contamination: Risk Management guidance (the relevant section is "Stage 1: Risk assessment reports" in the LC:RM guidance).

The interpretative report will include the mechanics of the data presentation (GIS and statistics), GQRA, and DQRA as appendices, with the main report text focused on the clear communication of what those tasks mean in the context of Part 2A, using a line of evidence approach to the explanation of the results.

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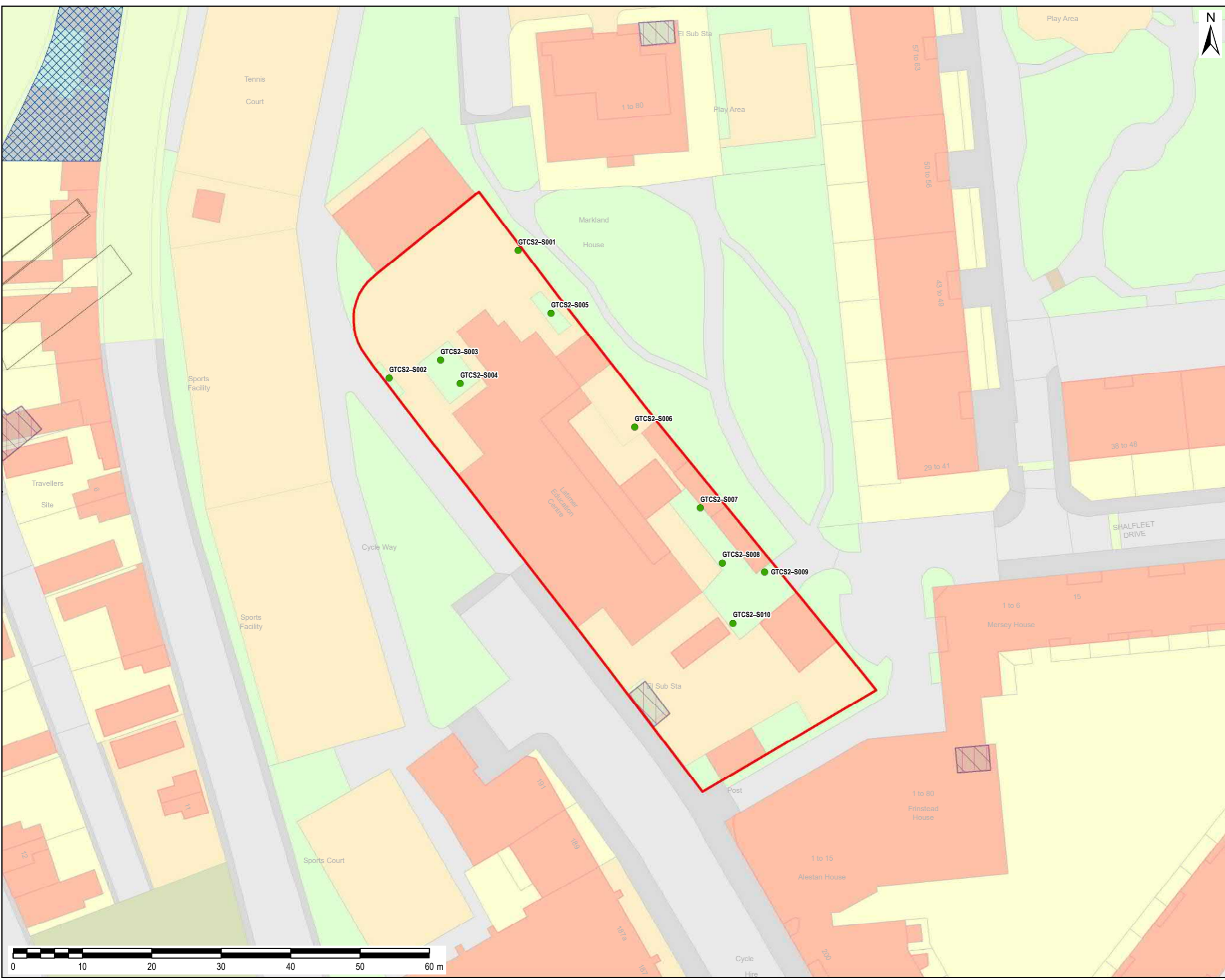
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Appendix A Figures

File Name: \\sru.aecommet.com\EMIA\UK\CRD1\Jobs\PR-458020_Grenfell_Tower_Stage_2\GIS\02_Maps\Figure 06 - Stage 2 Sampling Locations - All Sites.mxd



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LEGEND

- Site Outline
- Proposed Sample
- Food Growing
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- Food Growing
- RBKC registered trade directory
- GeoEnviron Sites Historic

Name, Ground_Cover

GTCS2-S001, bare soil - disturbed
GTCS2-S002, bare soil - disturbed
GTCS2-S003, turf
GTCS2-S004, turf
GTCS2-S005, bare soil - disturbed
GTCS2-S006, bare soil - undisturbed
GTCS2-S007, bare soil - undisturbed
GTCS2-S008, turf
GTCS2-S009, bare soil - disturbed
GTCS2-S010, bare soil - undisturbed

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Drawing Title
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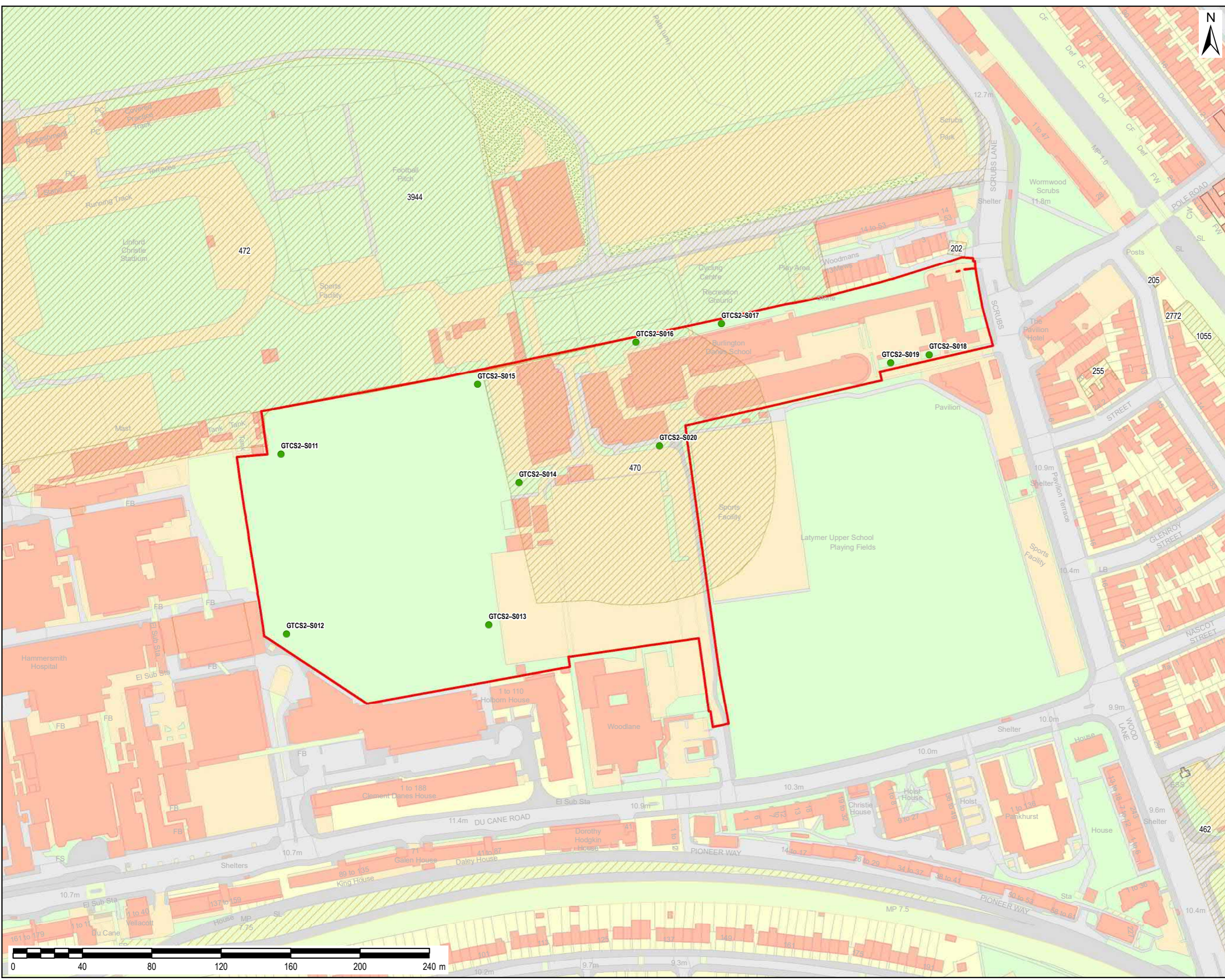
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- Site Outline
 - Proposed Sample Location
 - LBHF identified potential contaminated sites
 - RBKC identified potentially contaminated land
 - RBKC registered trade directory entries

- Name, Ground_Cover**
- GTCS2-S011, turf
 - GTCS2-S012, turf
 - GTCS2-S013, turf
 - GTCS2-S014, turf
 - GTCS2-S015, turf
 - GTCS2-S016, turf
 - GTCS2-S017, turf
 - GTCS2-S018, bare soil - undisturbed
 - GTCS2-S019, bare soil - undisturbed
 - GTCS2-S020, turf

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2 BURLINGTON DANES SCHOOL

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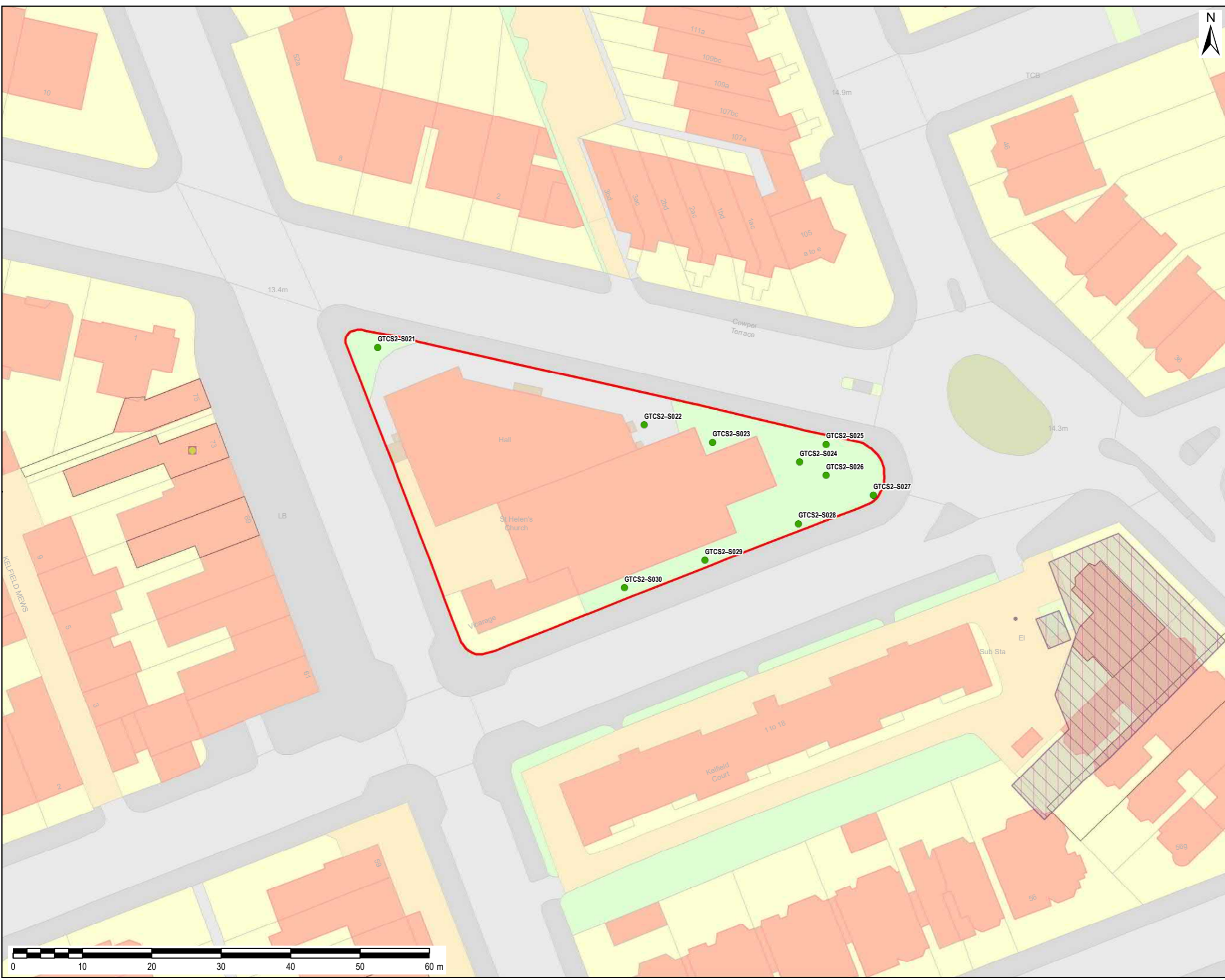
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FIGURE A2

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- LEGEND**
- Site Outline
 - Proposed Sample
 - RBKC identified potentially contaminated land
 - Part B
 - Dry Cleaners
 - RBKC identified areas of Geoenvironmental interest
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

- Name, Ground_Cover**
- GTCS2-S021, bare soil - undisturbed
 - GTCS2-S022, bare soil - undisturbed
 - GTCS2-S023, bare soil - undisturbed
 - GTCS2-S024, bare soil - undisturbed
 - GTCS2-S025, bare soil - undisturbed
 - GTCS2-S026, bare soil - undisturbed
 - GTCS2-S027, bare soil - undisturbed
 - GTCS2-S028, bare soil - undisturbed
 - GTCS2-S029, bare soil - undisturbed
 - GTCS2-S030, bare soil - undisturbed

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GRENFELL PHASE 2 ASSESSMENT

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**3
BASSETT HOUSE SCHOOL (ST HELEN'S CHURCH)**

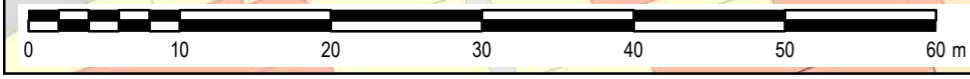
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LEGEND

- Site Outline
- Proposed Sample Location
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- RBKC registered trade directory entries
- GeoEnviron Sites Historic Maps

Name, Ground_Cover

- GTCS2-S031, turf
- GTCS2-S032, turf
- GTCS2-S033, bare soil - undisturbed
- GTCS2-S034, bare soil - undisturbed
- GTCS2-S035, turf
- GTCS2-S036, turf
- GTCS2-S037, bare soil - undisturbed
- GTCS2-S038, bare soil - undisturbed
- GTCS2-S039, bare soil - undisturbed
- GTCS2-S040, bare soil - undisturbed

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4 THOMAS JONES PRIMARY SCHOOL

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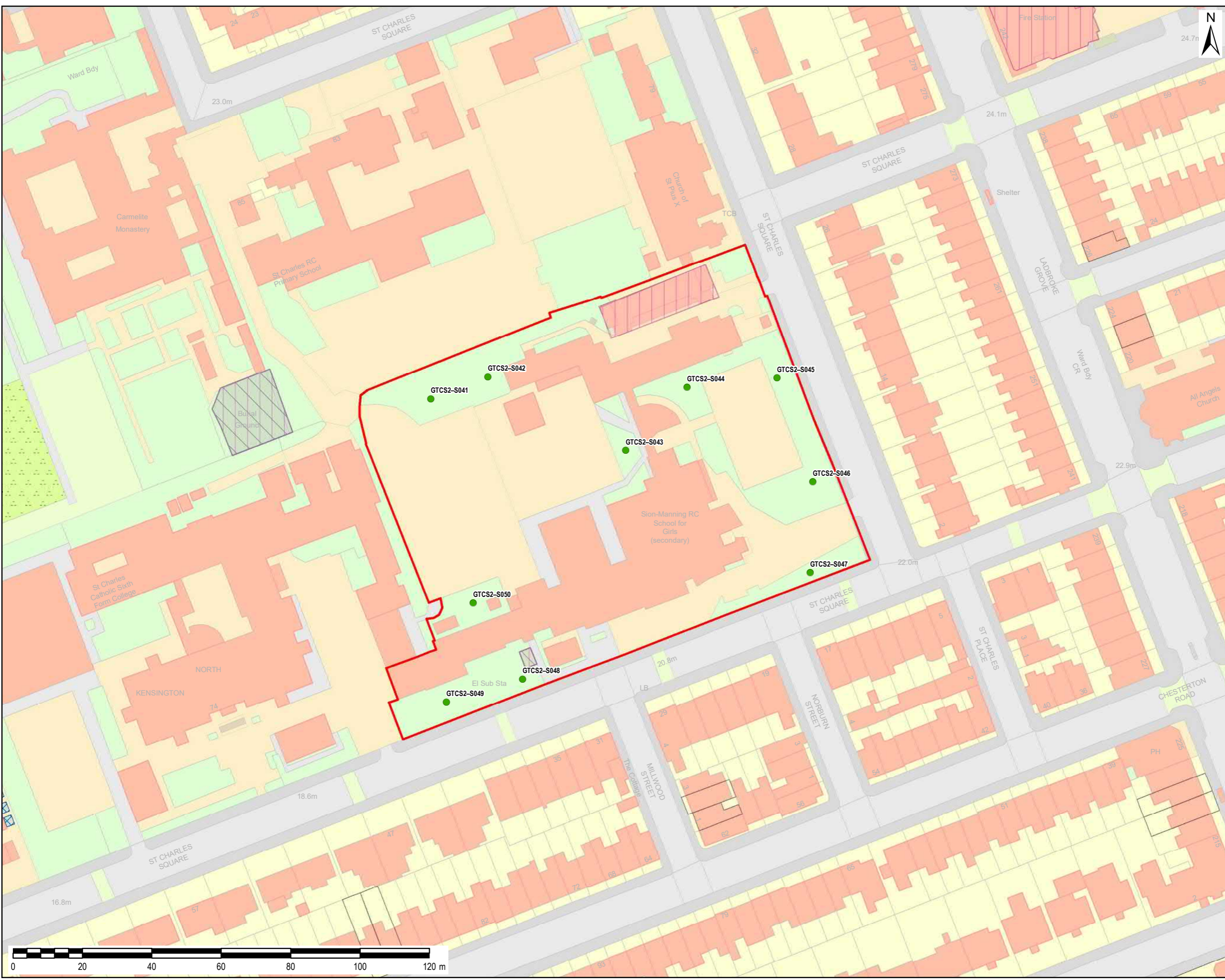
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- LEGEND**
- Site Outline
 - Proposed Sample
 - Food Growing
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - RBKC database location of
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

- Name, Ground_Cover**
- GTCS2-S041, turf
 - GTCS2-S042, turf
 - GTCS2-S043, bare soil - undisturbed
 - GTCS2-S044, turf
 - GTCS2-S045, turf
 - GTCS2-S046, turf
 - GTCS2-S047, turf
 - GTCS2-S048, turf
 - GTCS2-S049, turf
 - GTCS2-S050, bare soil - undisturbed

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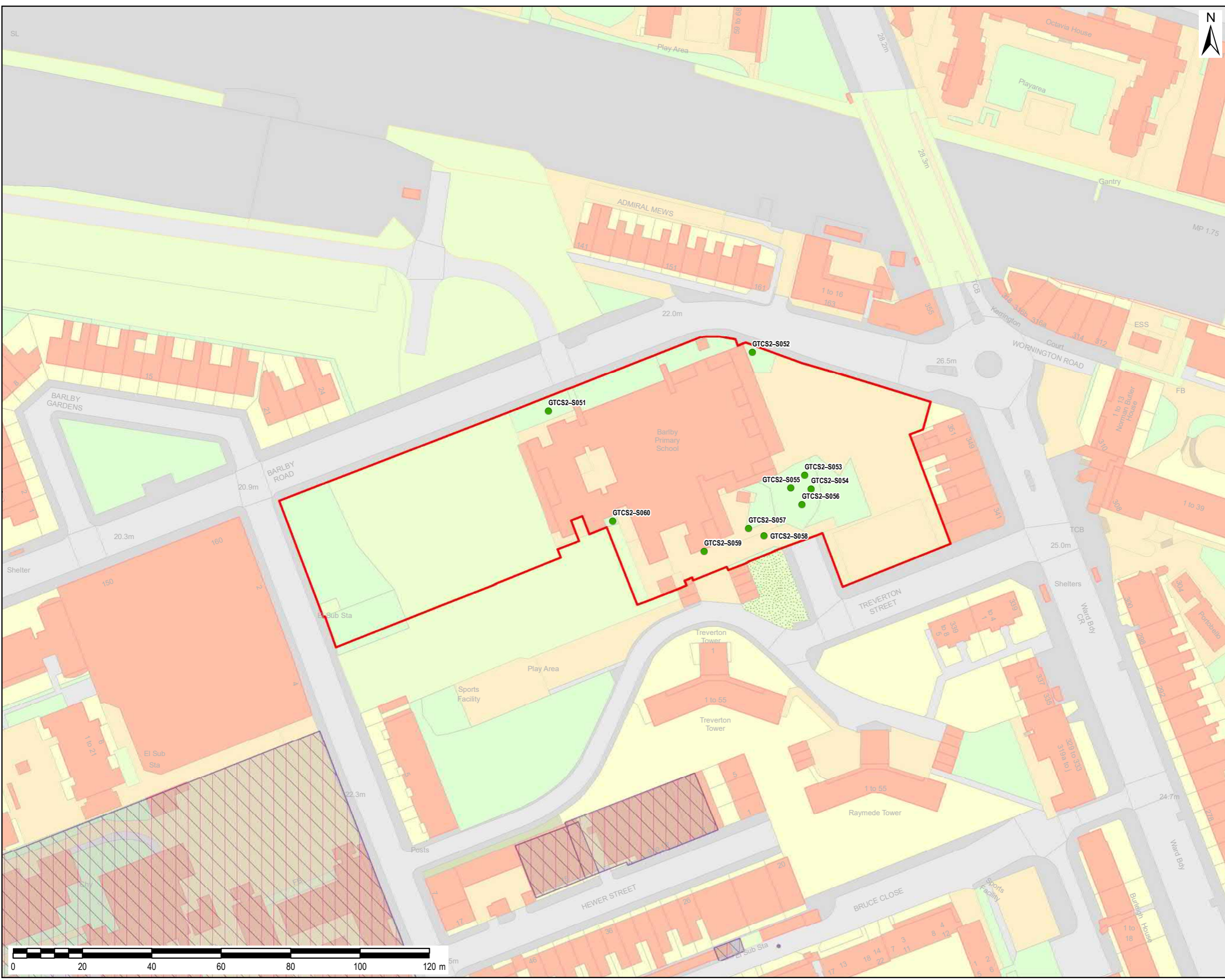
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FIGURE A5

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- LEGEND**
- Site Outline
 - Proposed Sample Location
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - GeoEnviron Sites Historic Maps

- Name, Ground_Cover**
- GTCS2-S051, bare soil - undisturbed
 - GTCS2-S052, bare soil - undisturbed
 - GTCS2-S053, bare soil - undisturbed
 - GTCS2-S054, bare soil - undisturbed
 - GTCS2-S055, bare soil - undisturbed
 - GTCS2-S056, bare soil - undisturbed
 - GTCS2-S057, bare soil - undisturbed
 - GTCS2-S058, bare soil - undisturbed
 - GTCS2-S059, bare soil - undisturbed
 - GTCS2-S060, bare soil - undisturbed

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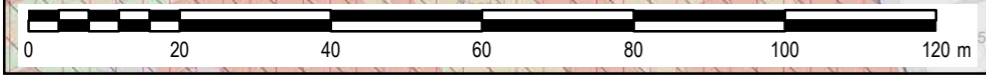
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**6
BARLBY PRIMARY SCHOOL**

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LEGEND

- Site Outline
- Proposed Sample
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- RBKC registered trade directory
- GeoEnviron Sites Historic

Name, Ground_Cover

- GTCS2-S061, bare soil - undisturbed
- GTCS2-S062, bare soil - undisturbed
- GTCS2-S063, bare soil - undisturbed
- GTCS2-S064, bare soil - undisturbed
- GTCS2-S065, bare soil - undisturbed
- GTCS2-S066, bare soil - undisturbed
- GTCS2-S067, bare soil - undisturbed
- GTCS2-S068, bare soil - undisturbed
- GTCS2-S069, bare soil - undisturbed
- GTCS2-S070, bare soil - undisturbed

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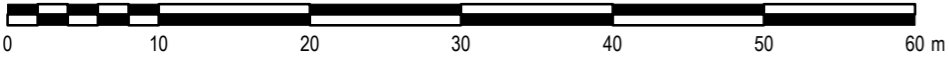
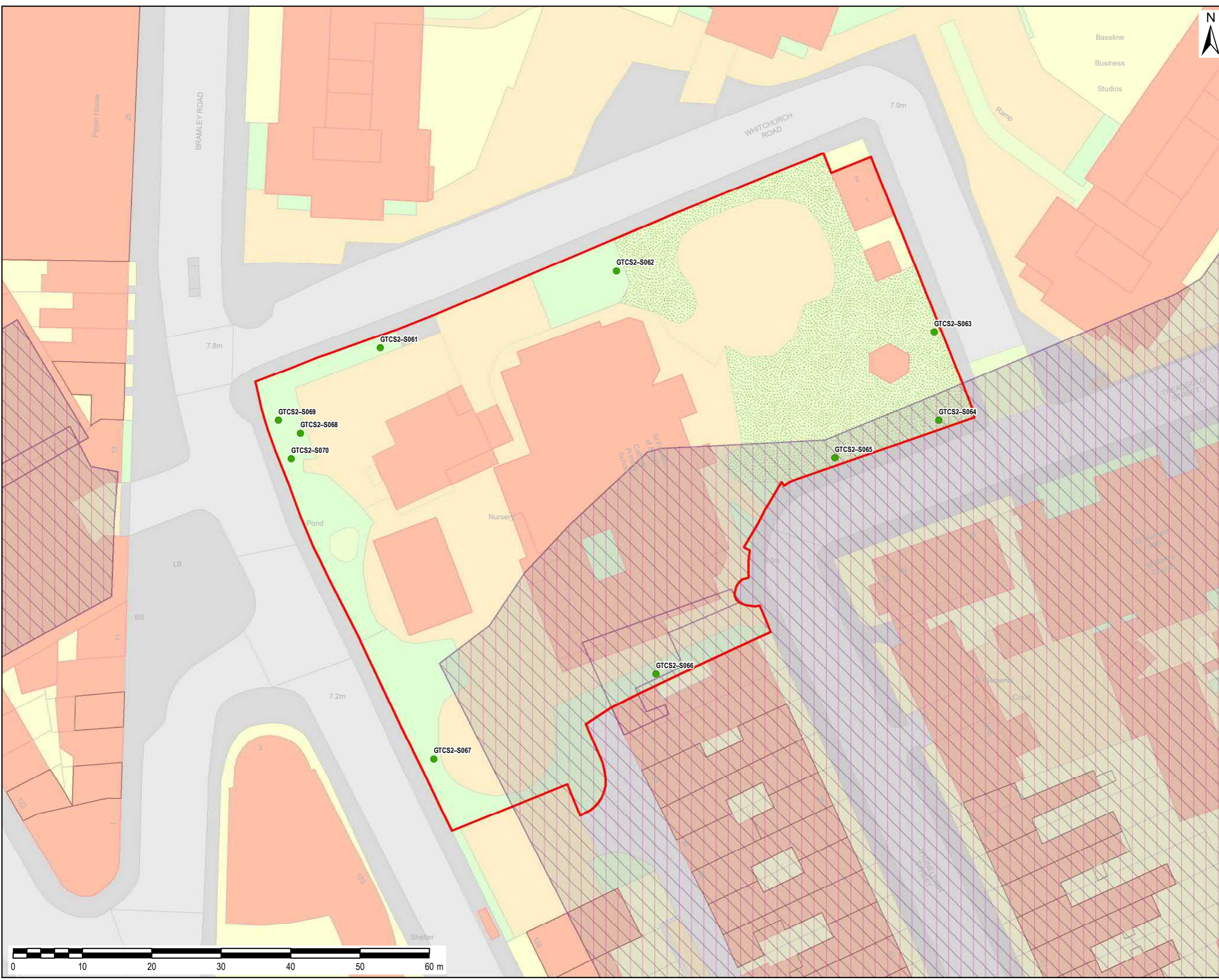
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7 ST. FRANCIS PRIMARY SCHOOL

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LEGEND

- Site Outline
- Proposed Sample
- Food Growing
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- Food Growing
- GeoEnviron Sites Historic

Name, Ground_Cover

GTCS2-S071, bare soil - undisturbed
GTCS2-S072, bare soil - undisturbed
GTCS2-S073, bare soil - undisturbed
GTCS2-S074, bare soil - undisturbed
GTCS2-S075, bare soil - undisturbed
GTCS2-S076, bare soil - undisturbed
GTCS2-S077, bare soil - undisturbed
GTCS2-S078, bare soil - undisturbed
GTCS2-S079, bare soil - undisturbed
GTCS2-S080, bare soil - undisturbed

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Project Title
GRENFELL PHASE 2 ASSESSMENT

Drawing Title
8 ST. ANNE'S AND AVONDALE PRIMARY SCHOOL AND NURSERY

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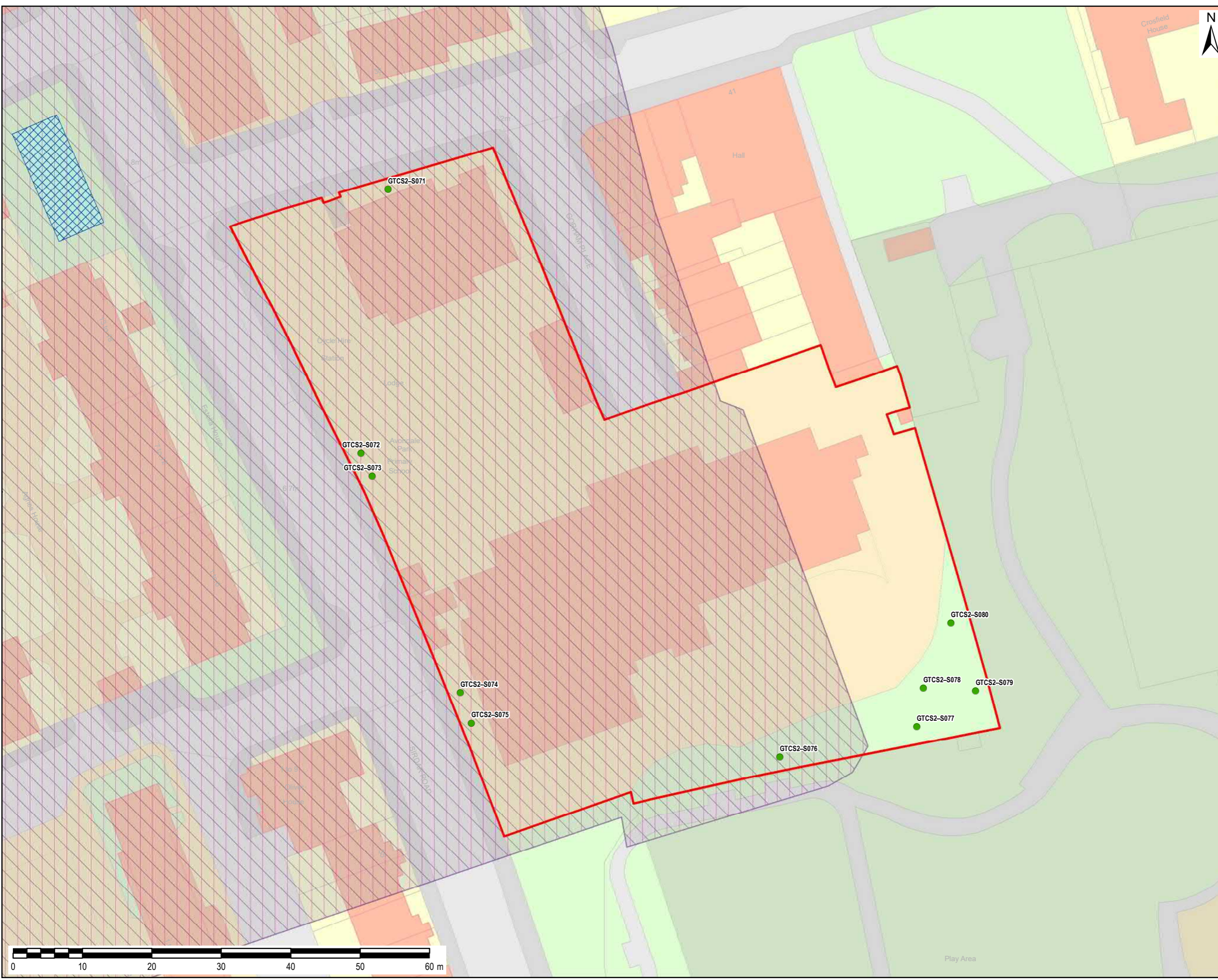
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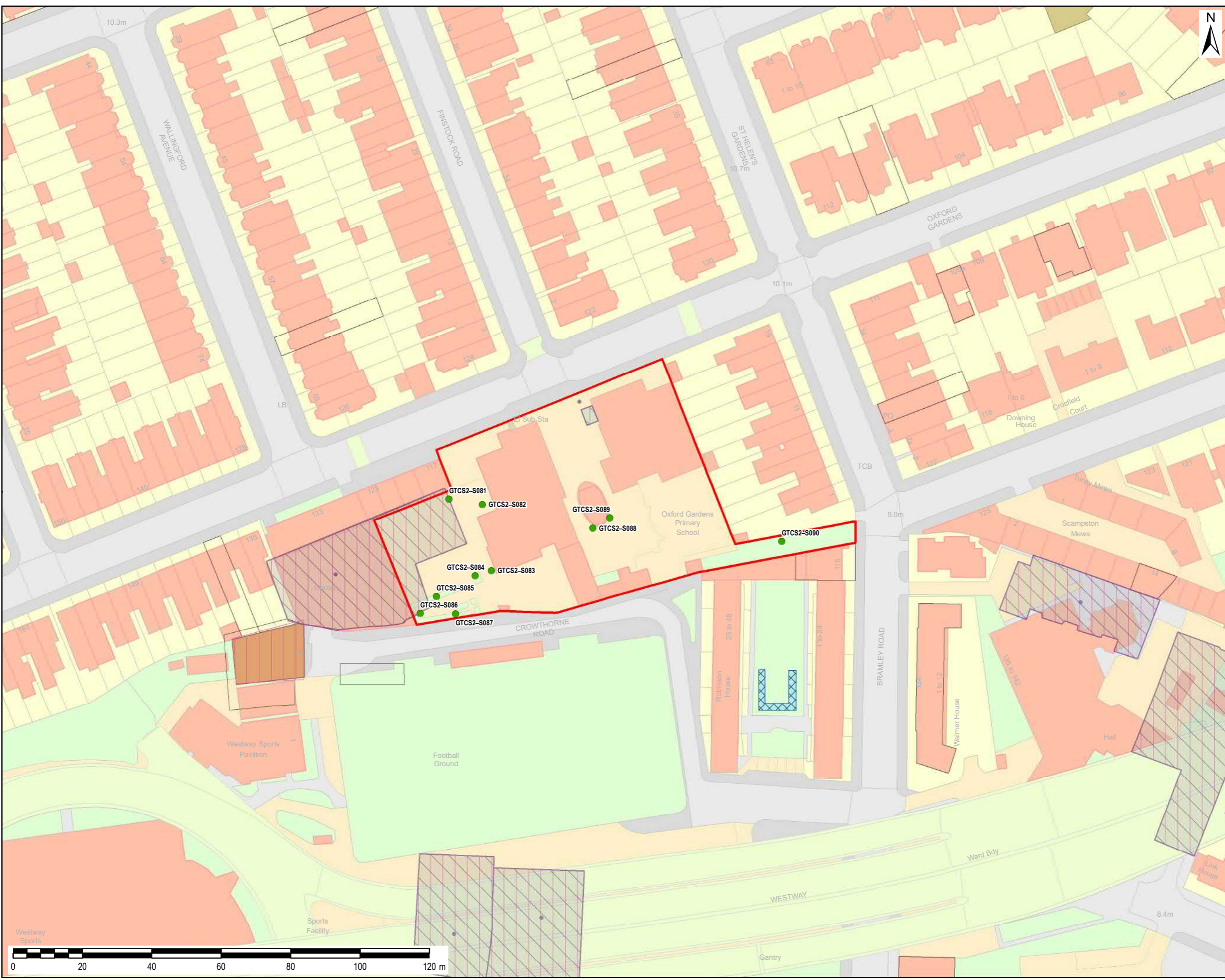
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FIGURE A8

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File Name: \\aecommet.com\EMIAUK\UKCRD1\Jobs\PR-468020_Grenfell_Tower_Stage_2_GIS\950_Stage2_GIS\02_Maps\Figure 06 - Stage 2 Sampling Locations - All Sites.mxd



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- LEGEND**
- Site Outline
 - Proposed Sample
 - Food Growing
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - Brownfield Land Register
 - RBKC database location of
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

- Name, Ground_Cover**
- GTCS2-S081, bare soil - undisturbed
 - GTCS2-S082, bare soil - undisturbed
 - GTCS2-S083, bare soil - undisturbed
 - GTCS2-S084, bare soil - undisturbed
 - GTCS2-S085, bare soil - undisturbed
 - GTCS2-S086, bare soil - undisturbed
 - GTCS2-S087, bare soil - undisturbed
 - GTCS2-S088, bare soil - undisturbed
 - GTCS2-S089, bare soil - undisturbed
 - GTCS2-S090, bare soil - disturbed

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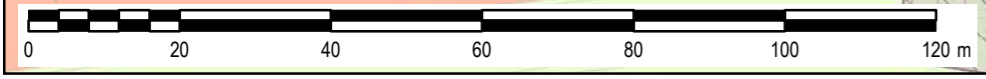
Project Title
GRENELL PHASE 2 ASSESSMENT

Drawing Title
9 OXFORD GARDENS PRIMARY SCHOOL

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FIGURE A9

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- LEGEND**
- Site Outline
 - Proposed Sample Location
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

- Name, Ground_Cover**
- GTCS2-S091, bare soil - undisturbed
 - GTCS2-S092, bare soil - undisturbed
 - GTCS2-S093, bare soil - undisturbed
 - GTCS2-S094, turf
 - GTCS2-S095, bare soil - undisturbed
 - GTCS2-S096, bare soil - undisturbed
 - GTCS2-S097, bare soil - undisturbed
 - GTCS2-S098, bare soil - undisturbed
 - GTCS2-S099, bare soil - undisturbed
 - GTCS2-S100, bare soil - undisturbed

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Project Title
GRENFELL PHASE 2 ASSESSMENT

Drawing Title
**10
GOLBORNE & MAXILLA CHILDREN'S CENTRE FOREST SCHOOL**

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LEGEND

- Site Outline
- Proposed Sample

Name, Ground_Cover

GTCS2-S101, bare soil - undisturbed
GTCS2-S102, bare soil - undisturbed
GTCS2-S103, bare soil - undisturbed
GTCS2-S104, bare soil - undisturbed
GTCS2-S105, bare soil - undisturbed
GTCS2-S106, turf
GTCS2-S107, turf
GTCS2-S108, turf
GTCS2-S109, turf
GTCS2-S110, turf

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Project Title
GRENFELL PHASE 2 ASSESSMENT

Drawing Title
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GRENFELL CRECHE UNDER 3S'
CENTRE / GRENFELL NURSERY**

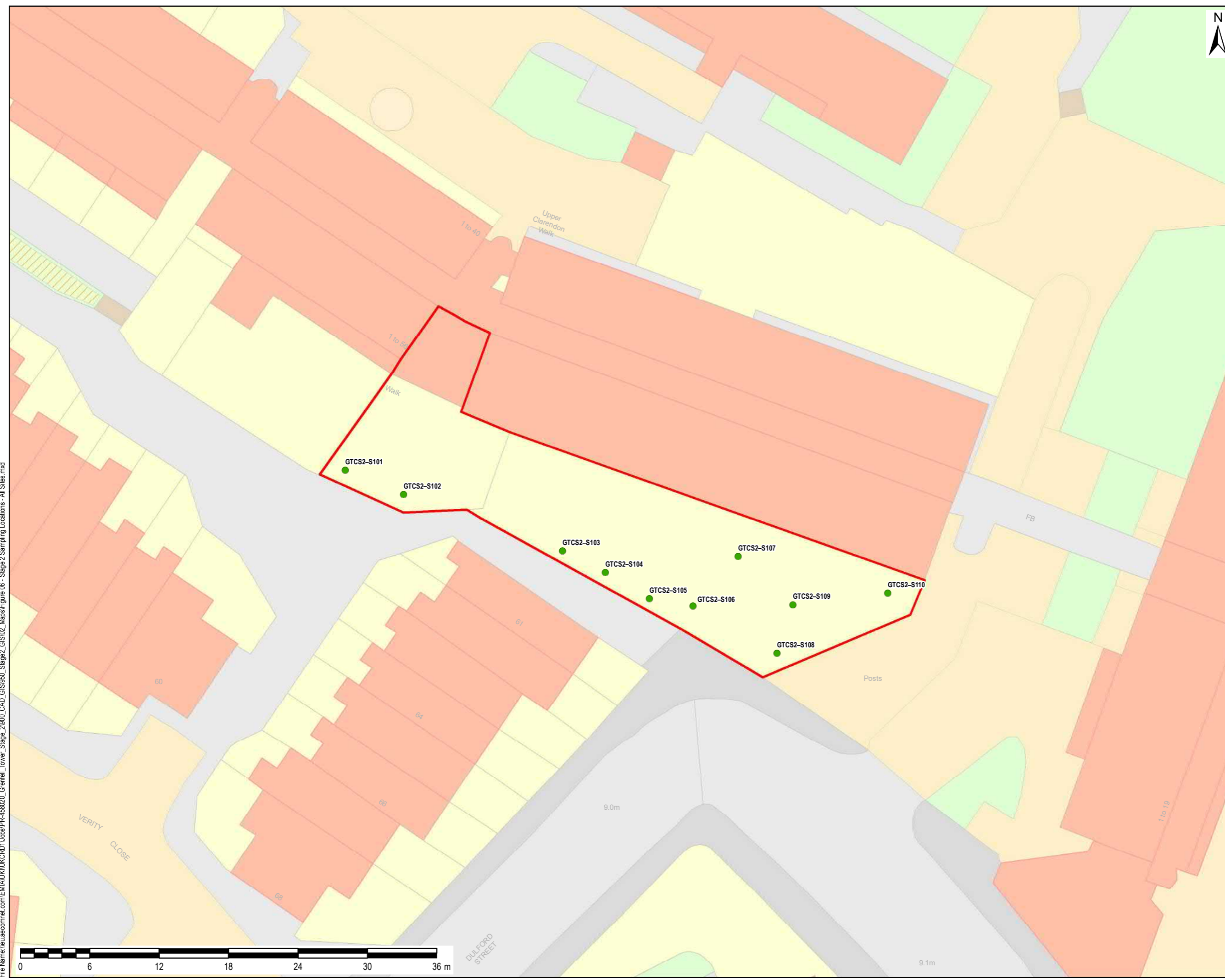
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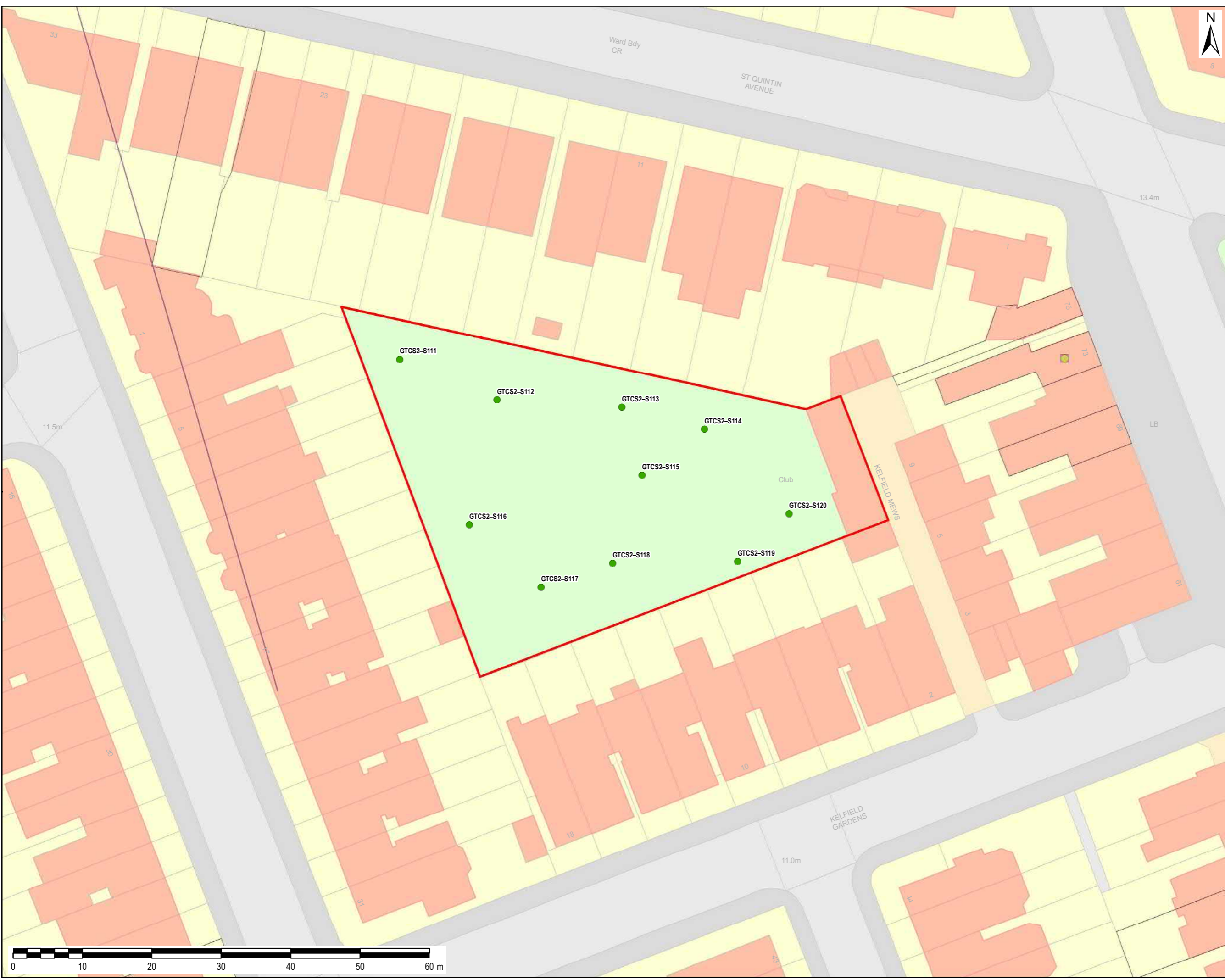


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File Name: \\aecomnet.com\EMIAUK\UKCRD1\Jobs\PR-468020_Grenfell_Tower_Stage_2_GIS\02_Maps\Figure 06 - Stage 2 Sampling Locations - All Sites.mxd



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LEGEND

- Site Outline
- Proposed Sample
- Part B Processes
- Dry Cleaners
- RBKC registered trade directory

Name, Ground_Cover

- GTCS2-S111, turf
- GTCS2-S112, turf
- GTCS2-S113, turf
- GTCS2-S114, turf
- GTCS2-S115, turf
- GTCS2-S116, turf
- GTCS2-S117, turf
- GTCS2-S118, turf
- GTCS2-S119, turf
- GTCS2-S120, turf

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NEW STUDIO PRE-SCHOOL**

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- LEGEND**
- Site Outline
 - Proposed Sample Location
 - Food Growing Sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing Sites
 - Brownfield Land Register
 - RBKC database location of USTs
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

- Name, Ground_Cover**
- GTCS2-S121, bare soil - undisturbed
 - GTCS2-S122, bare soil - undisturbed
 - GTCS2-S123, bare soil - undisturbed
 - GTCS2-S124, bare soil - undisturbed
 - GTCS2-S125, turf
 - GTCS2-S126, turf
 - GTCS2-S127, turf
 - GTCS2-S128, turf
 - GTCS2-S129, turf
 - GTCS2-S130, bare soil - disturbed

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Project Title
GRENFELL PHASE 2 ASSESSMENT

Drawing Title
13 ST QUINTIN CHILDREN AND FAMILY CENTRE

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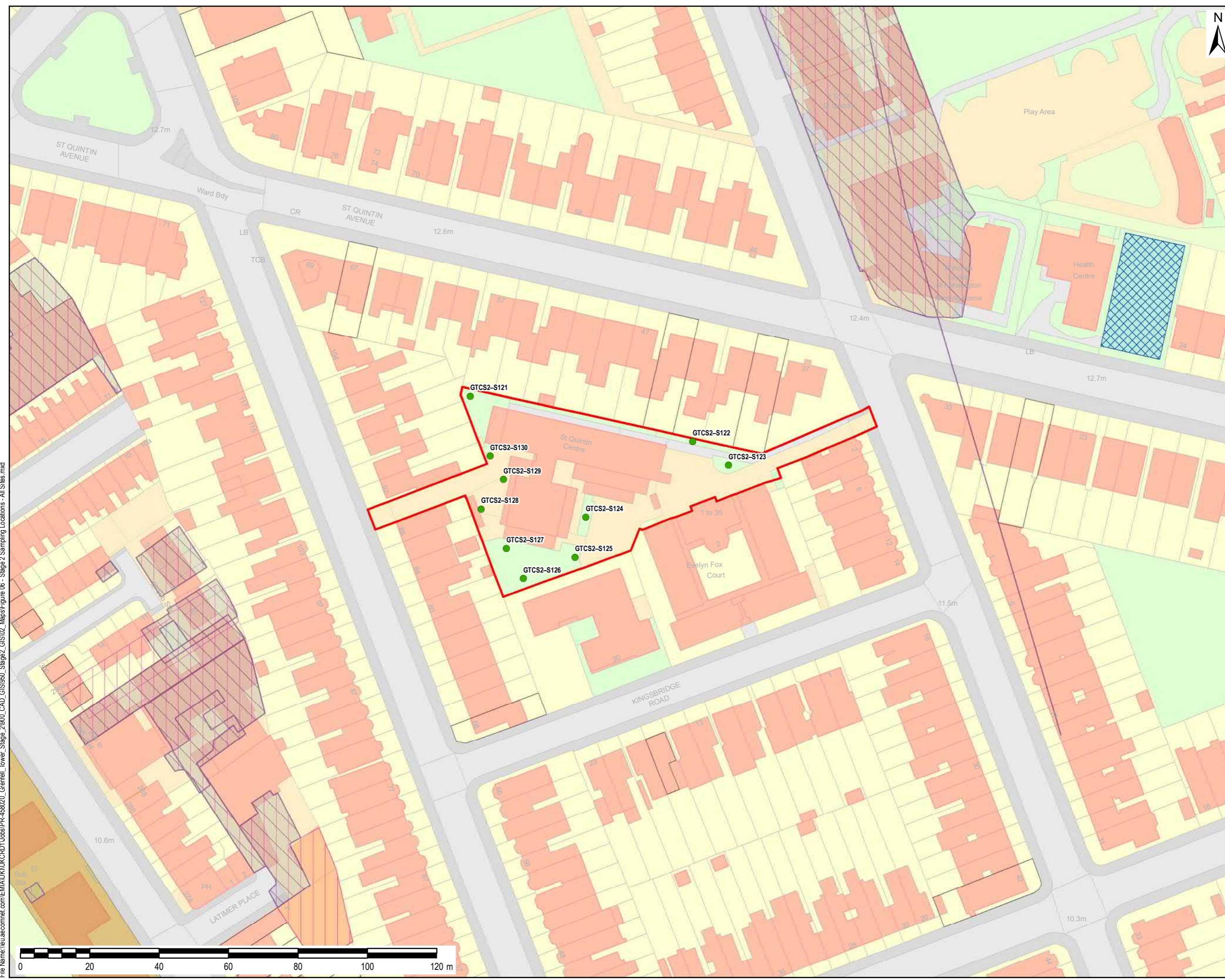
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FIGURE A13

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LEGEND

- Site Outline
- Proposed Sample
- Suggested Deeper Sampling

Name, Ground_Cover

GTCS2-S131, bare soil - disturbed
GTCS2-S132, bare soil - disturbed
GTCS2-S133, bare soil - disturbed
GTCS2-S134, bare soil - disturbed
GTCS2-S135, bare soil - disturbed
GTCS2-S136, bare soil - disturbed
GTCS2-S137, bare soil - disturbed
GTCS2-S138, bare soil - undisturbed
GTCS2-S139, bare soil - disturbed
GTCS2-S140, bare soil - disturbed

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14 LONGSTONE AVENUE ALLOTMENTS

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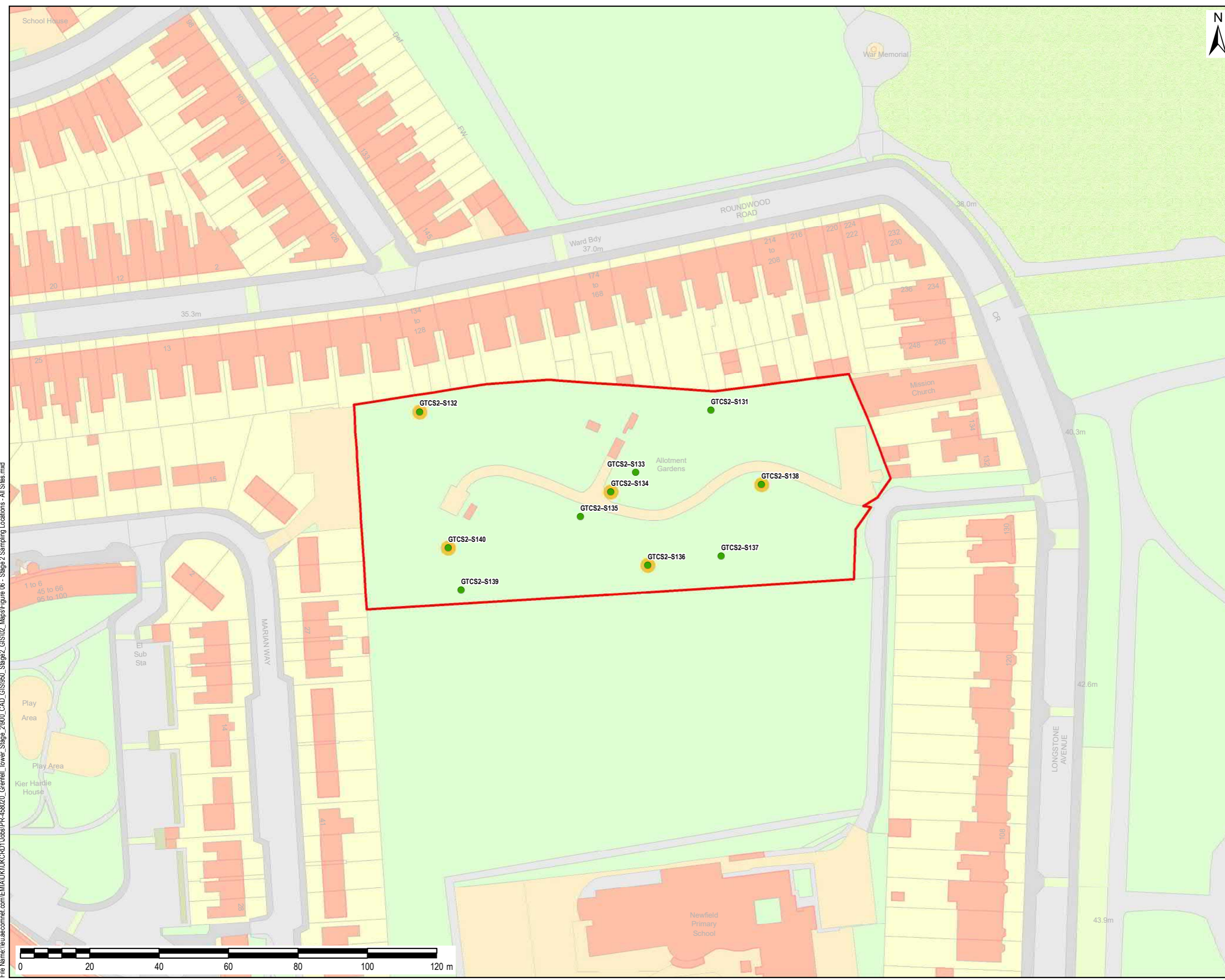
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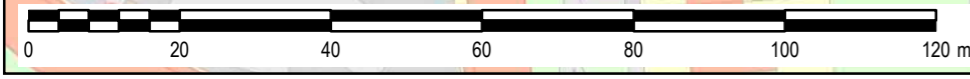


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FIGURE A14

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LEGEND

- Site Outline
- Stage 1 Sample Location
- Proposed Sample Location
- Suggested Deeper Sampling Location
- Food Growing Sites
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- Food Growing Sites
- RBKC registered trade directory entries
- GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S141, bare soil - disturbed
GTCS2-S142, bare soil - disturbed
GTCS2-S143, bare soil - disturbed
GTCS2-S144, bare soil - disturbed
GTCS2-S145, bare soil - disturbed
GTCS2-S146, bare soil - disturbed
GTCS2-S147, bare soil - undisturbed
GTCS2-S148, bare soil - undisturbed
GTCS2-S149, bare soil - undisturbed
GTCS2-S150, bare soil - undisturbed

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15 ST QUINTIN GARDENS

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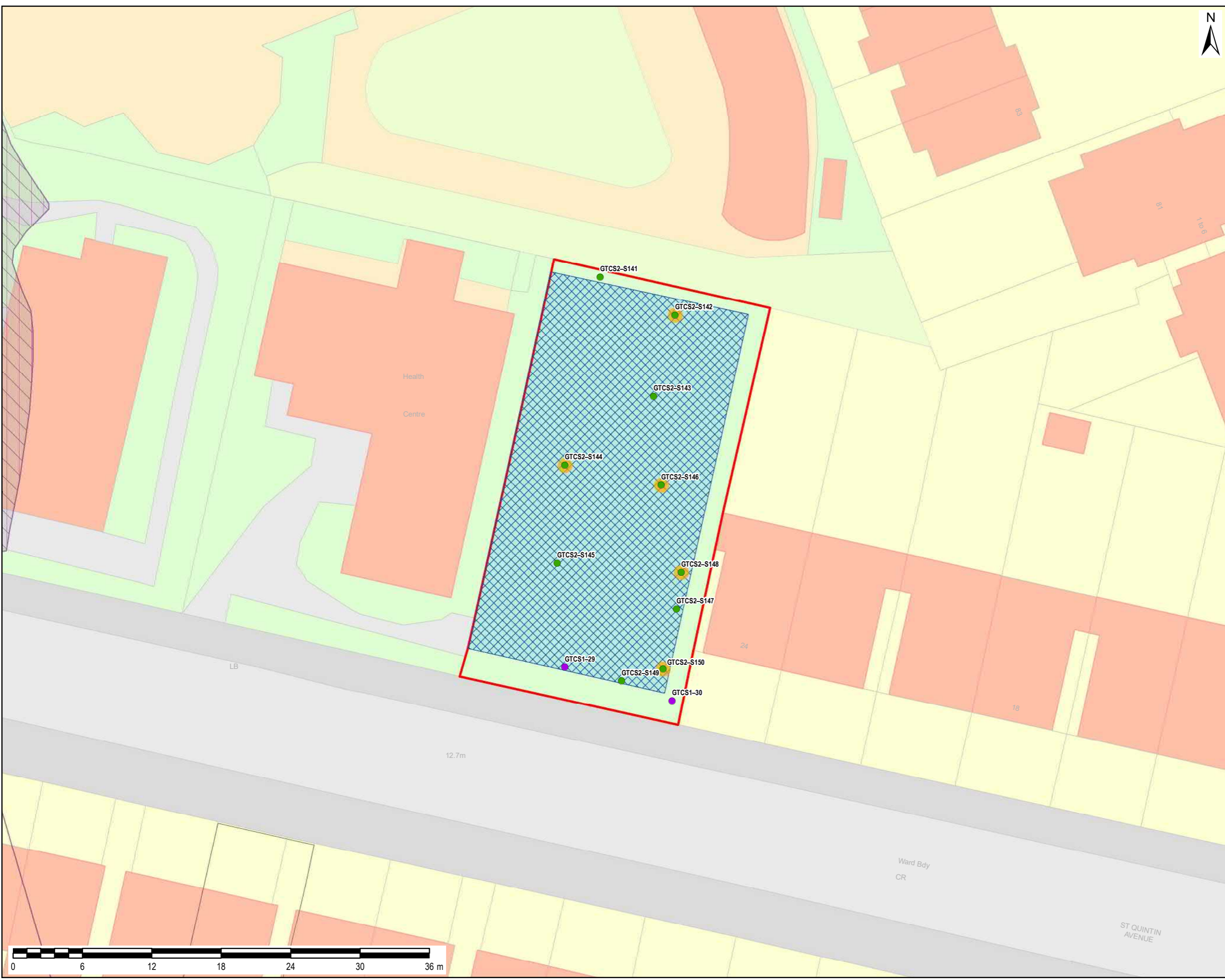
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FIGURE A15

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LEGEND

- Site Outline
- Proposed Sample
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- GeoEnviron Sites Historic

Name, Ground_Cover

GTCS2-S151, bare soil - disturbed
GTCS2-S152, bare soil - disturbed
GTCS2-S153, bare soil - disturbed
GTCS2-S154, bare soil - disturbed
GTCS2-S155, bare soil - disturbed

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ST CHARLES CENTRE FOR HEALTH AND WELLBEING**

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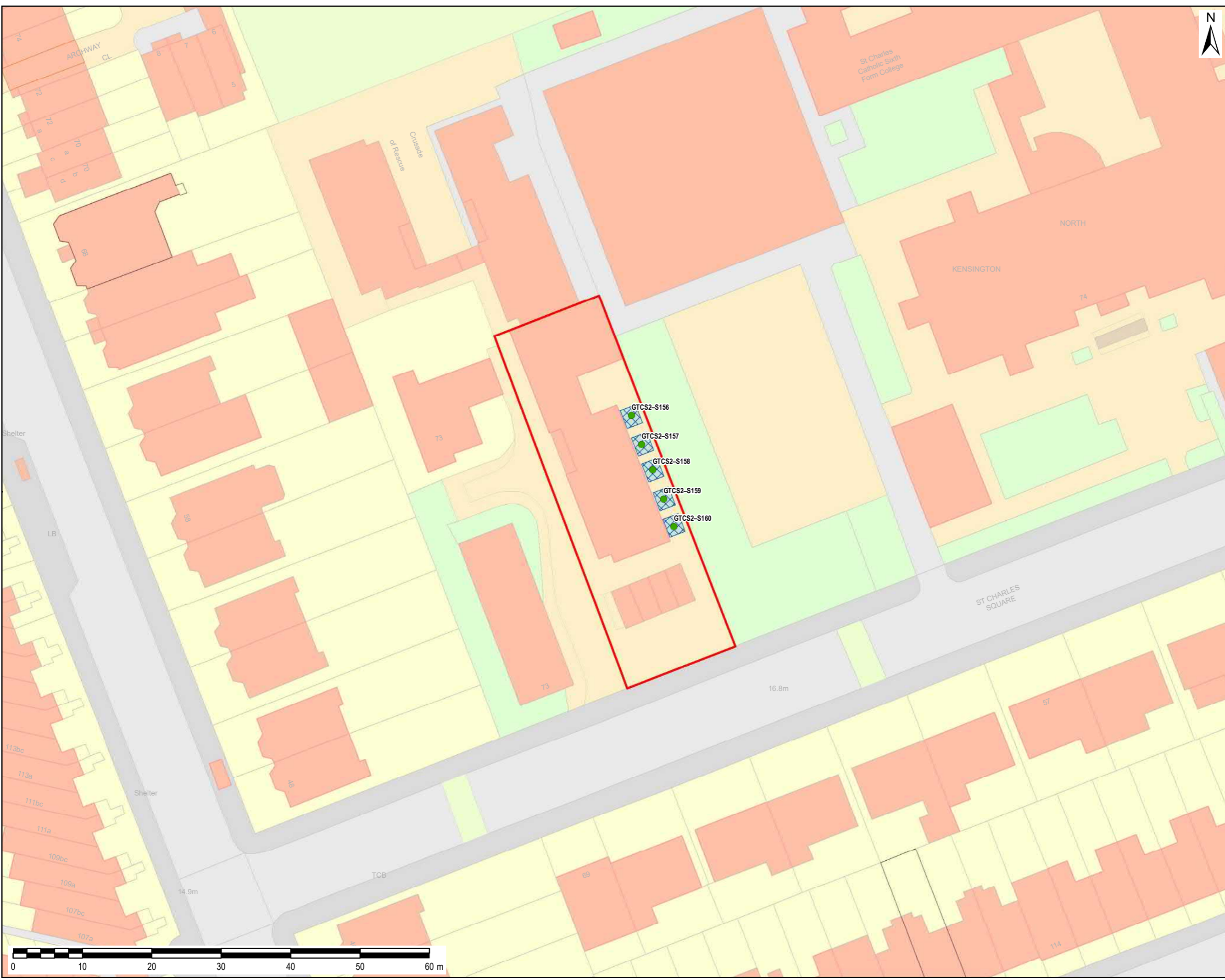
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FIGURE A16

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LEGEND

- Site Outline
- Proposed Sample
- Food Growing
- Food Growing
- RBKC registered trade directory

Name, Ground_Cover

- GTCS2-S156, bare soil - disturbed
- GTCS2-S157, bare soil - disturbed
- GTCS2-S158, bare soil - disturbed
- GTCS2-S159, bare soil - disturbed
- GTCS2-S160, bare soil - disturbed

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EQUAL PEOPLE**

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LEGEND

- Site Outline
- Stage 1 Sample Location
- Proposed Sample Location
- Food Growing Sites
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- Food Growing Sites
- RBKC database location of
- RBKC registered trade directory entries
- GeoEnviron Sites Historic Maps

Name, Ground_Cover

- GTCS2-S161, bare soil - disturbed
- GTCS2-S162, bare soil - disturbed
- GTCS2-S163, bare soil - disturbed
- GTCS2-S164, bare soil - disturbed
- GTCS2-S165, bare soil - disturbed
- GTCS2-S166, bare soil - disturbed
- GTCS2-S167, bare soil - disturbed
- GTCS2-S168, bare soil - disturbed
- GTCS2-S169, bare soil - disturbed
- GTCS2-S170, bare soil - disturbed

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18 NOTTINGWOOD HOUSE AND PORTLAND ROAD

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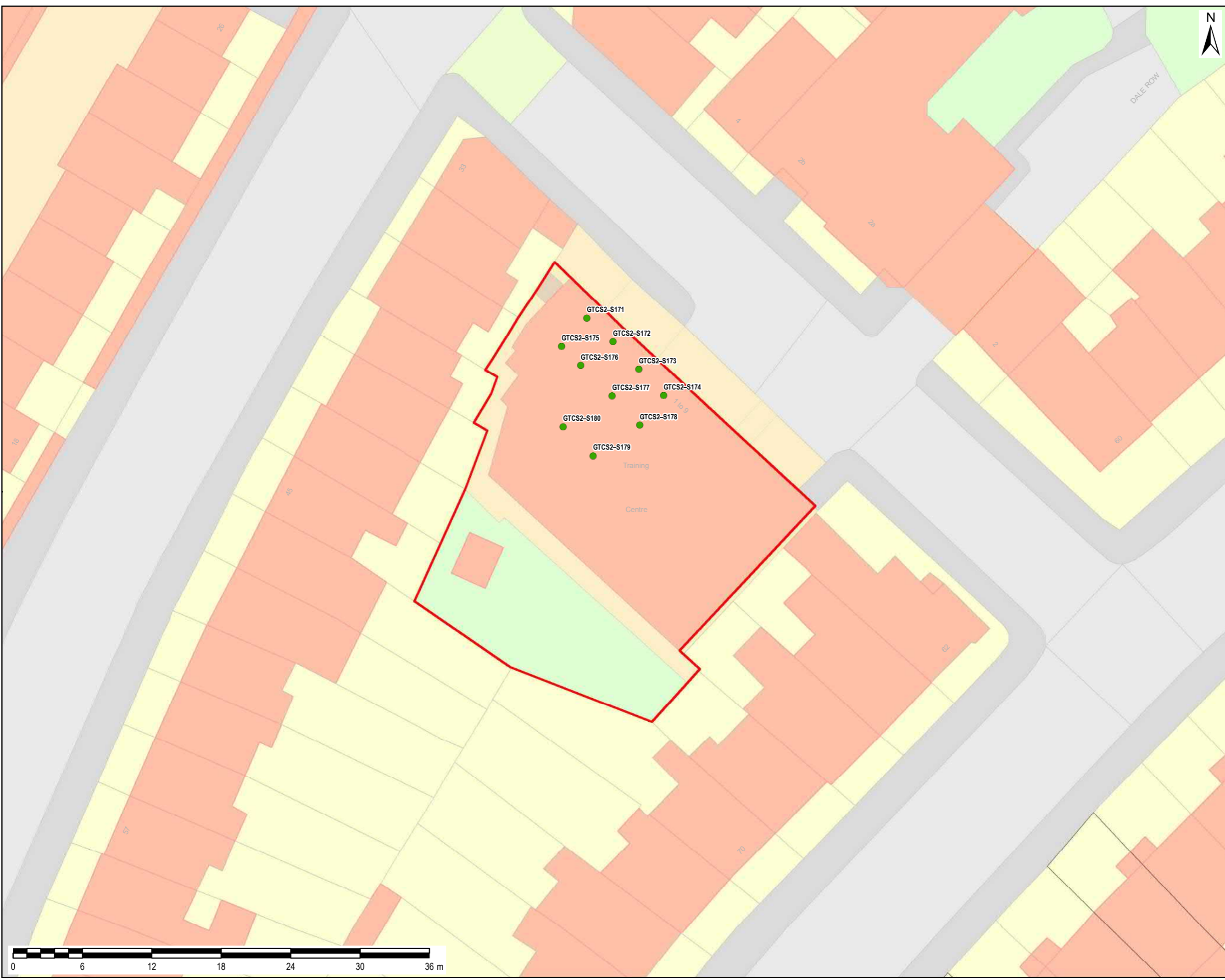
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LEGEND

- Site Outline
- Proposed Sample
- RBKC registered trade directory

Name, Ground_Cover

- GTCS2-S171, bare soil - disturbed
- GTCS2-S172, bare soil - disturbed
- GTCS2-S173, bare soil - disturbed
- GTCS2-S174, bare soil - disturbed
- GTCS2-S175, bare soil - disturbed
- GTCS2-S176, bare soil - disturbed
- GTCS2-S177, bare soil - disturbed
- GTCS2-S178, bare soil - disturbed
- GTCS2-S179, bare soil - disturbed
- GTCS2-S180, bare soil - disturbed

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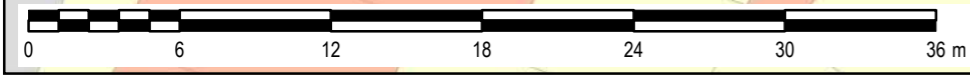
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- LEGEND**
- Site Outline
 - Proposed Sample Location
 - Suggested Deeper Sampling Location
 - LBHF identified potential contaminated sites
 - RBKC identified potentially contaminated land
 - ◆ Waste Oil Burners
 - RBKC identified areas of Geoenvironmental interest
 - Brownfield Land Register
 - RBKC database location of USTs
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S181, bare soil - undisturbed
GTCS2-S182, bare soil - disturbed
GTCS2-S183, bare soil - undisturbed
GTCS2-S184, bare soil - disturbed
GTCS2-S185, bare soil - undisturbed
GTCS2-S186, bare soil - disturbed
GTCS2-S187, bare soil - undisturbed
GTCS2-S188, bare soil - disturbed
GTCS2-S189, bare soil - undisturbed
GTCS2-S190, bare soil - disturbed

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Project Title
GRENFELL PHASE 2 ASSESSMENT

Drawing Title
20 EYNHAM ROAD, AND LAND BEHIND BACKING ONTO RAIL TRACKS

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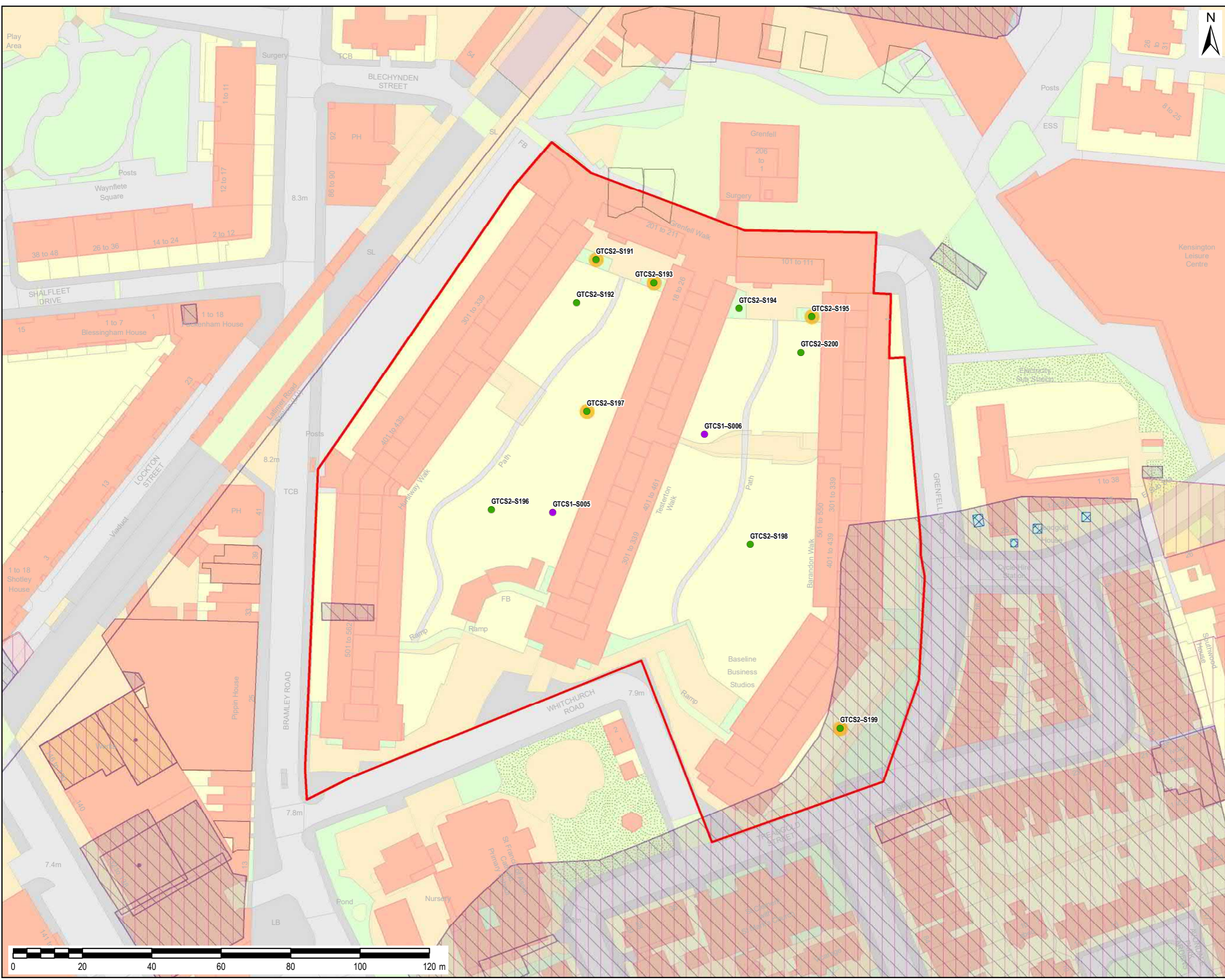
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FIGURE A20

Rev
01

File Name: \\aecommet.com\EMIAUK\UKCRD1\Jobs\PR-458020_Grenfell_Tower_Stage_2_GIS\950_CAD_GIS\950_Stage2_GIS\02_Maps\Figure 06 - Stage 2 Sampling Locations - All Sites.mxd



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- LEGEND**
- Site Outline
 - Stage 1 Sample
 - Proposed Sample
 - Suggested Deeper Sampling
 - Food Growing
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - RBKC database location of
 - RBKC database location of
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

- Name, Ground_Cover**
- GTCS2-S191, bare soil - disturbed
 - GTCS2-S193, bare soil - disturbed
 - GTCS2-S192, bare soil - disturbed
 - GTCS2-S194, bare soil - undisturbed
 - GTCS2-S195, bare soil - undisturbed
 - GTCS2-S196, turf
 - GTCS2-S197, turf
 - GTCS2-S198, turf
 - GTCS2-S199, turf
 - GTCS2-S200, turf

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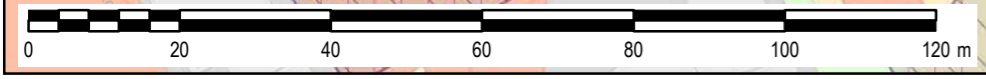
Project Title
GRENELL PHASE 2 ASSESSMENT

Drawing Title
**21
HURSTWAY, GRENELL,
TESTERTON AND BARANDON
WALKS (LANCASTER WALKWAYS)**

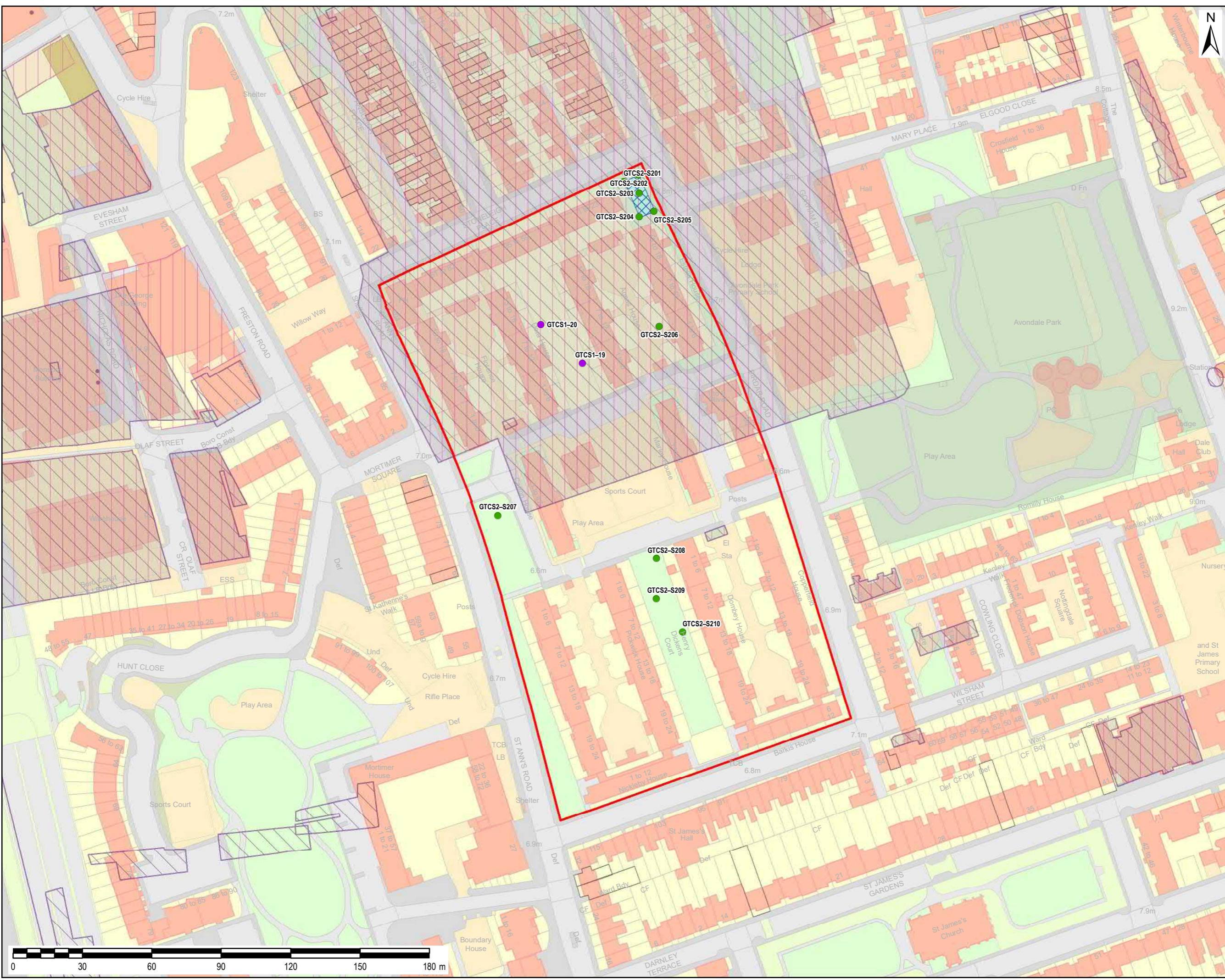
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- LEGEND**
- Site Outline
 - Stage 1 Sample Location
 - Proposed Sample Location
 - Food Growing Sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing Sites
 - Brownfield Land Register
 - RBKC database location of USTs
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

- Name, Ground_Cover**
- GTCS2-S201, bare soil - disturbed
 - GTCS2-S202, bare soil - disturbed
 - GTCS2-S203, bare soil - disturbed
 - GTCS2-S204, bare soil - disturbed
 - GTCS2-S205, bare soil - disturbed
 - GTCS2-S206, turf
 - GTCS2-S207, turf
 - GTCS2-S208, turf
 - GTCS2-S209, turf
 - GTCS2-S210, turf

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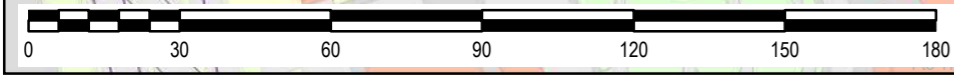
Project Title
GRENFELL PHASE 2 ASSESSMENT

Drawing Title
22 HENRY DICKENS COURT

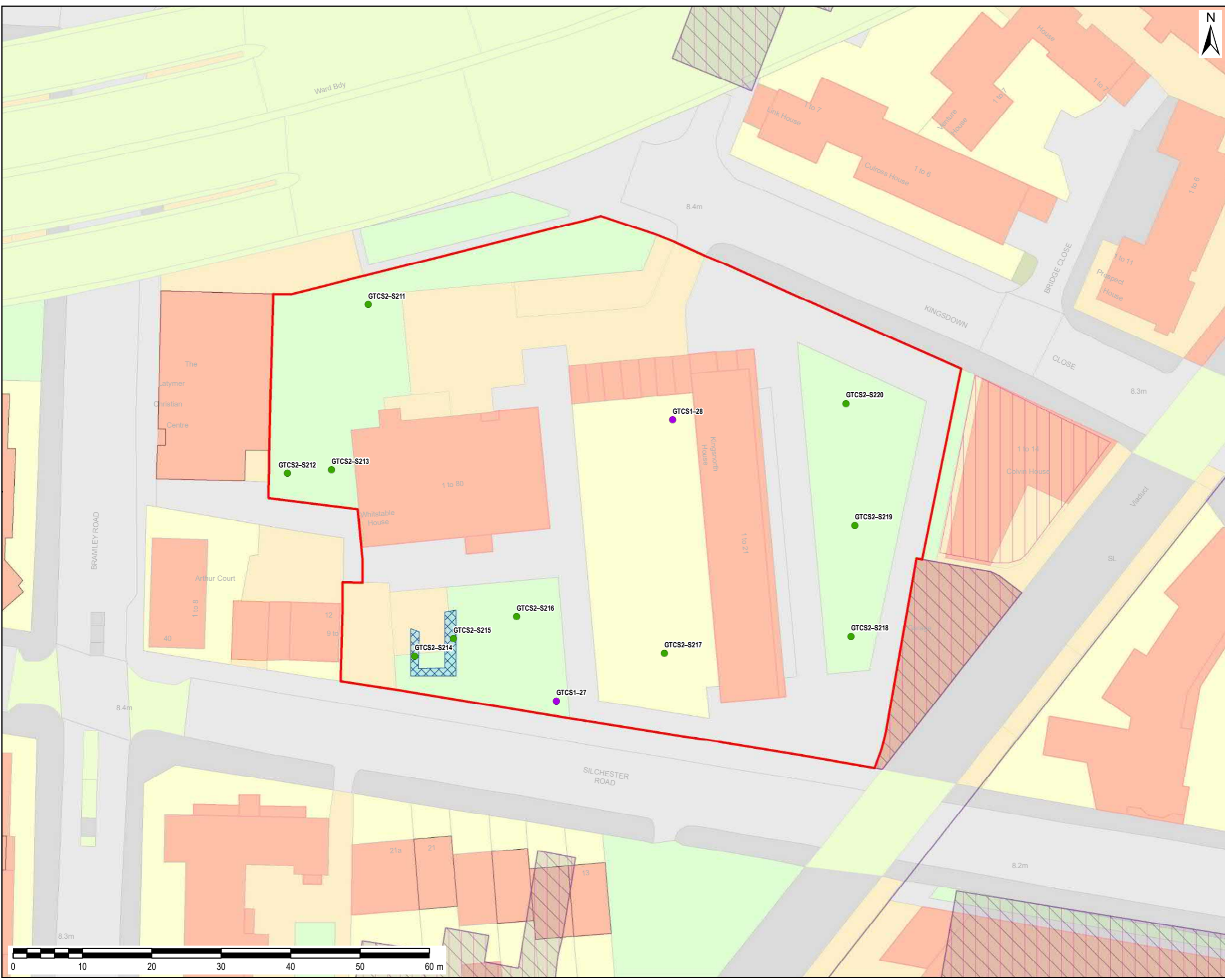
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- LEGEND**
- Site Outline
 - Stage 1 Sample Location
 - Proposed Sample Location
 - Food Growing Sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing Sites
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S211, turf
GTCS2-S212, bare soil - disturbed
GTCS2-S213, bare soil - disturbed
GTCS2-S214, bare soil - disturbed
GTCS2-S215, bare soil - disturbed
GTCS2-S216, turf
GTCS2-S217, bare soil - undisturbed
GTCS2-S218, bare soil - undisturbed
GTCS2-S219, turf
GTCS2-S220, turf

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Drawing Title
23 SILCHESTER EAST

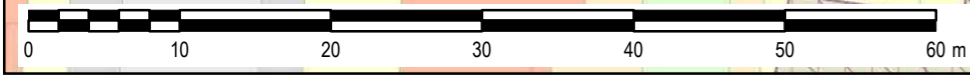
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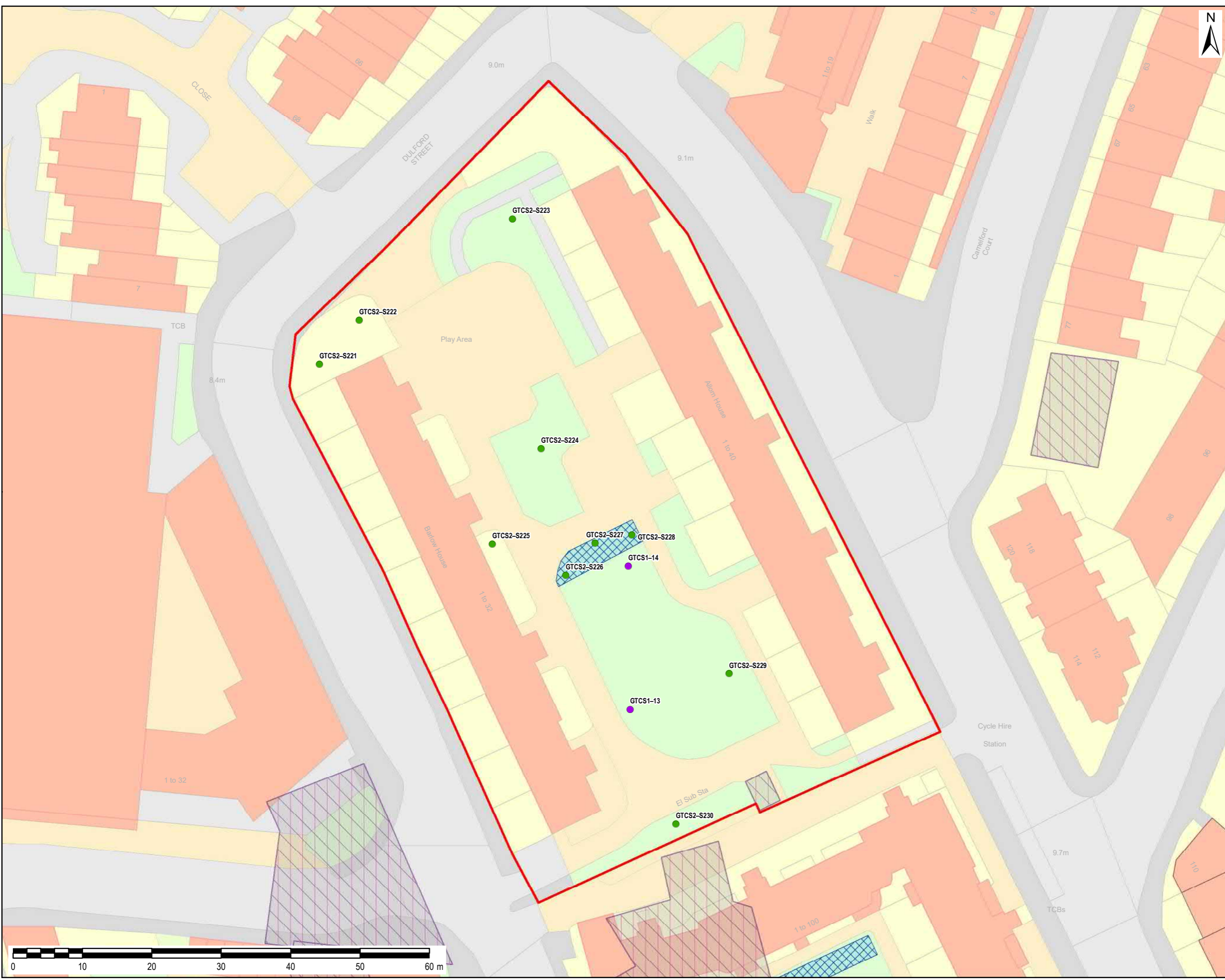
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- LEGEND**
- Site Outline
 - Stage 1 Sample
 - Proposed Sample
 - Food Growing
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

Name, Ground_Cover

GTCS2-S221, turf
GTCS2-S222, turf
GTCS2-S223, bare soil - undisturbed
GTCS2-S224, bare soil - undisturbed
GTCS2-S225, turf
GTCS2-S226, bare soil - disturbed
GTCS2-S227, bare soil - disturbed
GTCS2-S228, bare soil - disturbed
GTCS2-S229, turf
GTCS2-S230, bare soil - undisturbed

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24 ALLOM HOUSE AND BARLOW HOUSE

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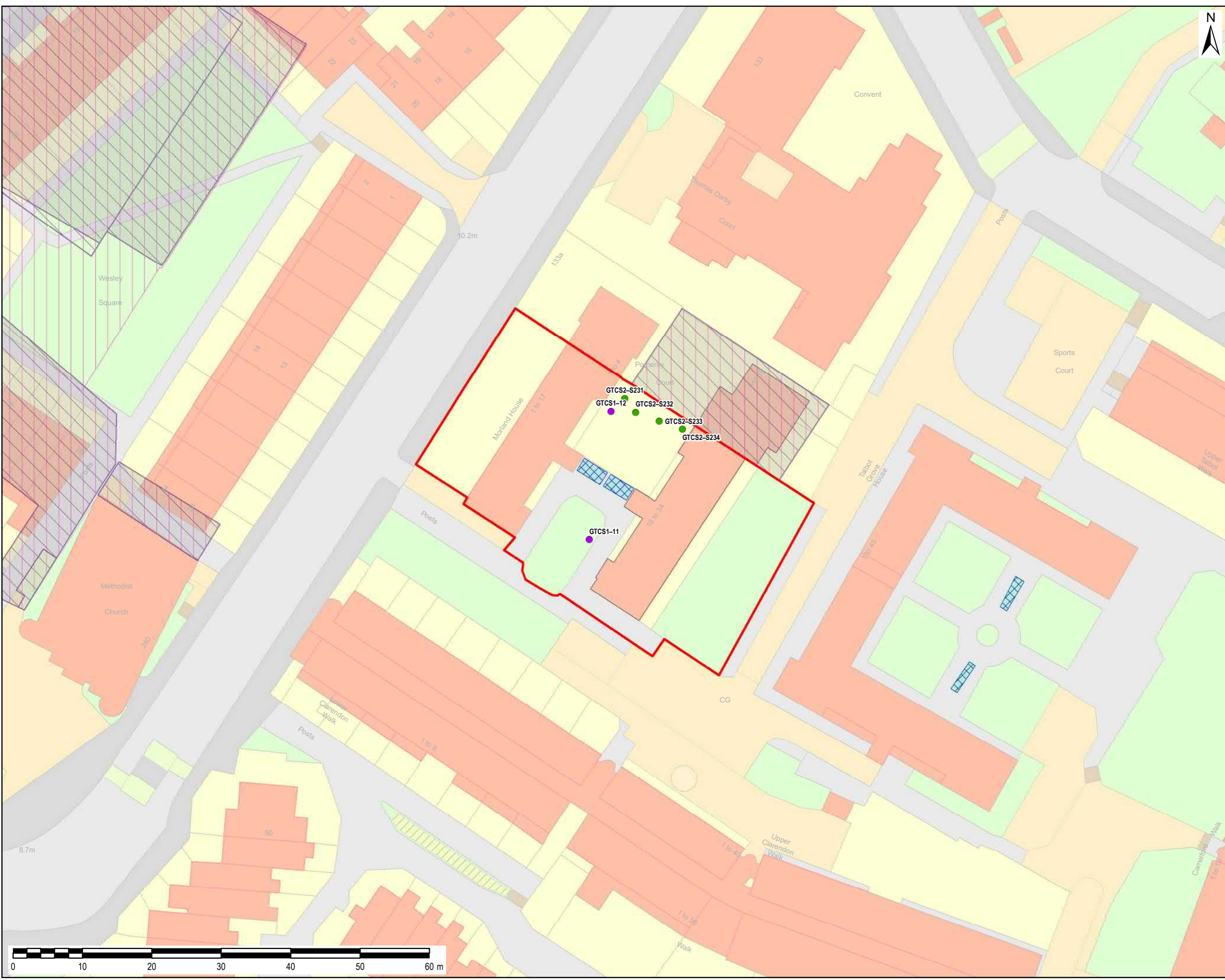
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- LEGEND**
- Site Outline
 - Stage 1 Sample
 - Proposed Sample
 - Food Growing
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

Name, Ground_Cover

GTCS2-S231, bare soil - disturbed
GTCS2-S232, bare soil - disturbed
GTCS2-S233, bare soil - disturbed
GTCS2-S234, bare soil - disturbed

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GRENFELL PHASE 2 ASSESSMENT

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25A MORLAND HOUSE

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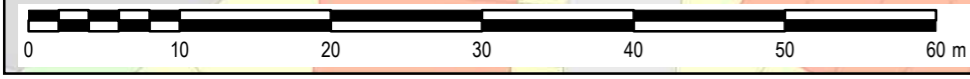
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FIGURE A25A

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LEGEND

- Site Outline
- Proposed Sample
- Food Growing
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- Food Growing
- RBKC registered trade directory
- GeoEnviron Sites Historic

Name, Ground_Cover

- GTCS2-S235, turf
- GTCS2-S236, bare soil - disturbed
- GTCS2-S237, bare soil - disturbed
- GTCS2-S238, bare soil - disturbed
- GTCS2-S239, bare soil - disturbed
- GTCS2-S240, turf

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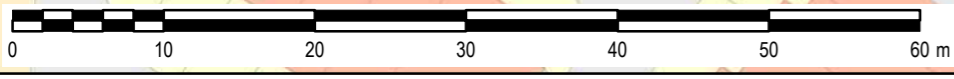


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FIGURE A25B

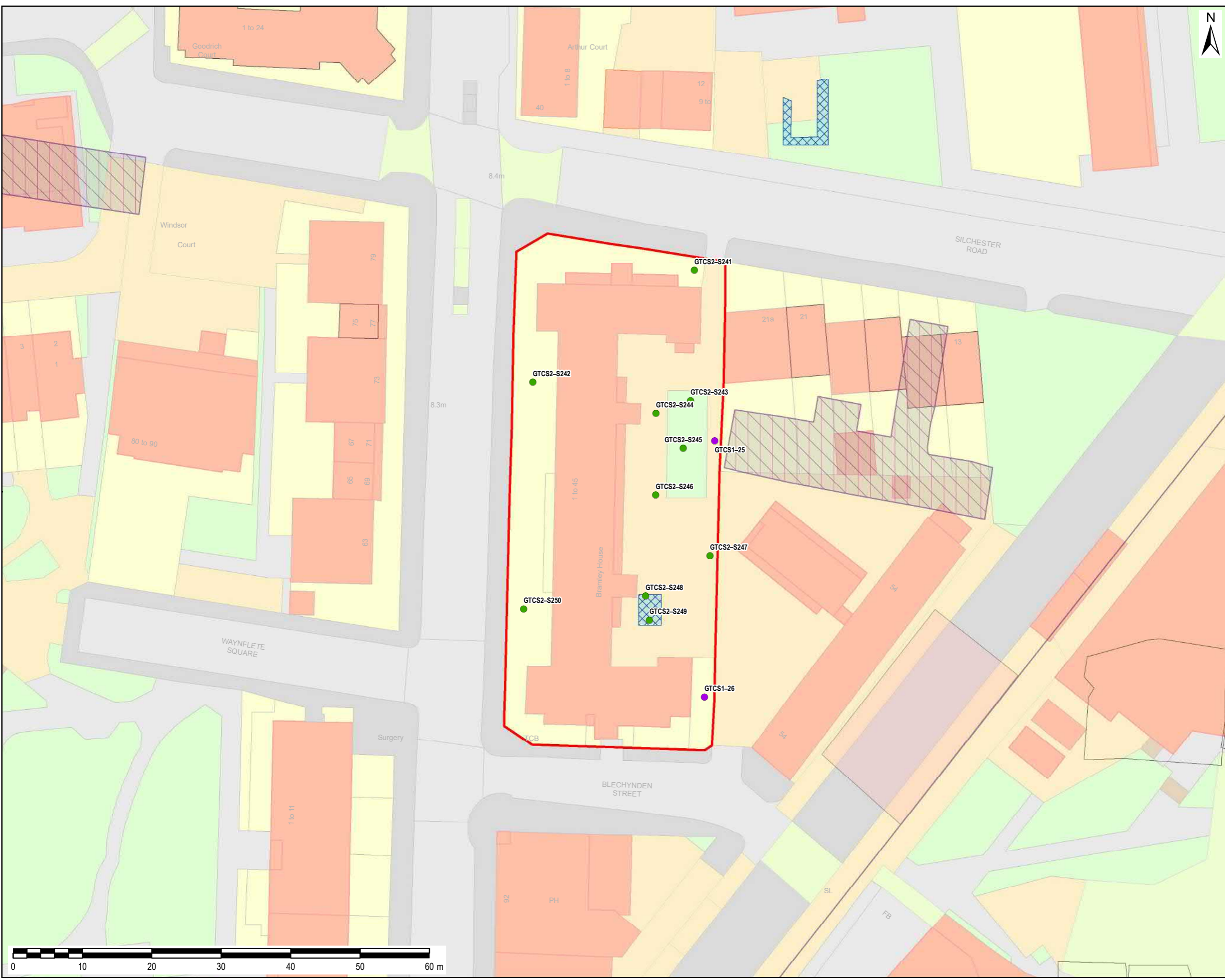
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File Name: \\au.aecomnet.com\EMIA\UK\CRD1\Jobs\PR-468020_Grenfell_Tower_Stage_2\GIS\02_Maps\Figure 06 - Stage 2 Sampling Locations - All Sites.mxd



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- LEGEND**
- Site Outline
 - Stage 1 Sample Location
 - Proposed Sample Location
 - Food Growing Sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing Sites
 - RBKC database location of
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S241, bare soil - undisturbed
GTCS2-S242, turf
GTCS2-S243, astroturf
GTCS2-S244, bare soil - undisturbed
GTCS2-S245, astroturf
GTCS2-S246, bare soil - undisturbed
GTCS2-S247, bare soil - undisturbed
GTCS2-S248, bare soil - disturbed
GTCS2-S249, bare soil - disturbed
GTCS2-S250, turf

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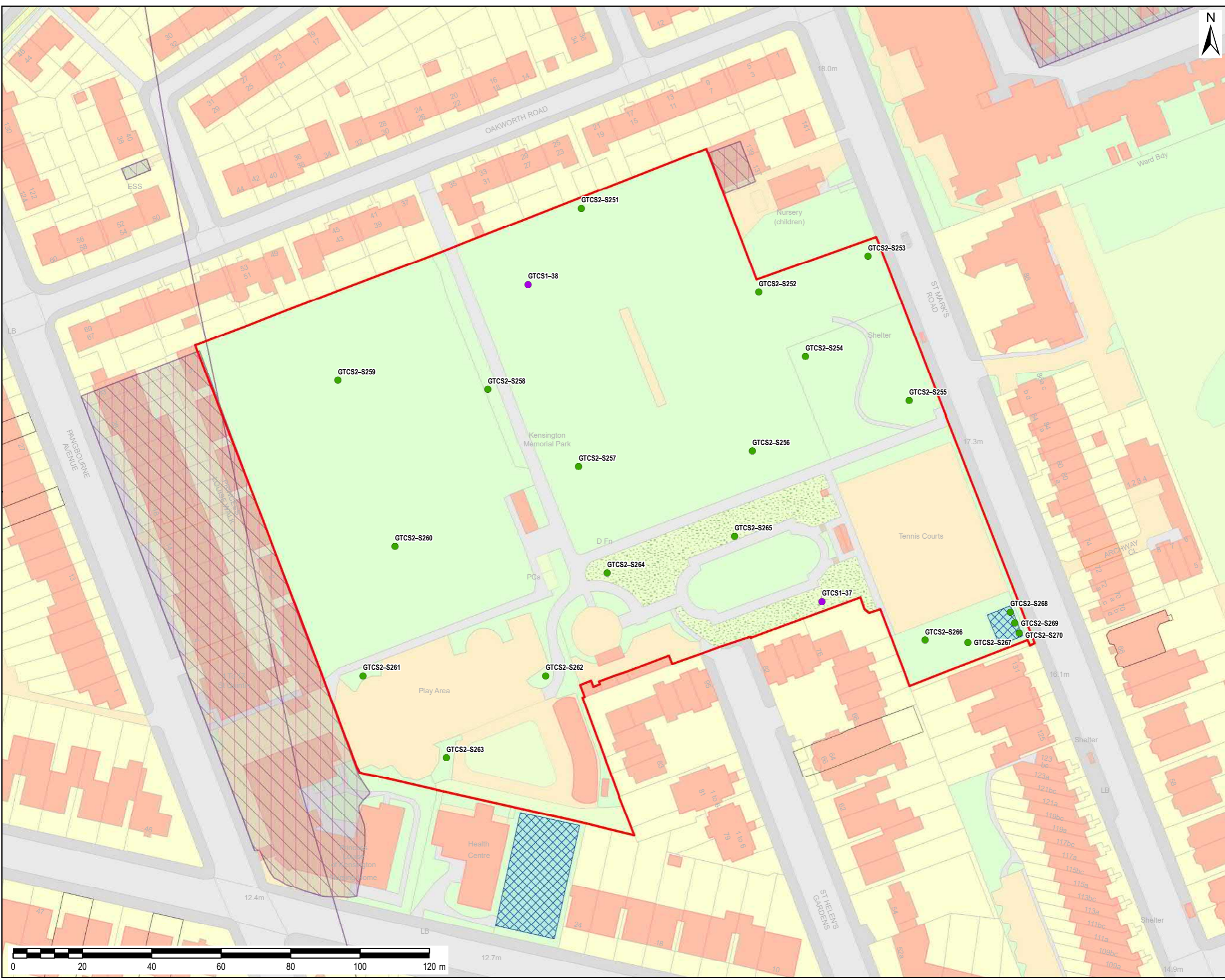
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FIGURE A26

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LEGEND

- Site Outline
- Stage 1 Sample
- Proposed Sample
- Food Growing
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- Food Growing
- RBKC registered trade directory
- GeoEnviron Sites Historic

Name, Ground_Cover

- GTCS2-S251, turf
- GTCS2-S252, <Null>
- GTCS2-S253, <Null>
- GTCS2-S254, turf
- GTCS2-S255, turf
- GTCS2-S256, turf
- GTCS2-S257, turf
- GTCS2-S258, turf
- GTCS2-S259, turf
- GTCS2-S260, turf
- GTCS2-S261, bare soil - undisturbed
- GTCS2-S262, bare soil - undisturbed
- GTCS2-S263, bare soil - undisturbed
- GTCS2-S264, bare soil - undisturbed
- GTCS2-S265, bare soil - disturbed
- GTCS2-S266, turf
- GTCS2-S267, turf
- GTCS2-S268, bare soil - disturbed
- GTCS2-S269, bare soil - disturbed
- GTCS2-S270, bare soil - disturbed

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27 KENSINGTON MEMORIAL PARK COMMUNITY KITCHEN GARDEN

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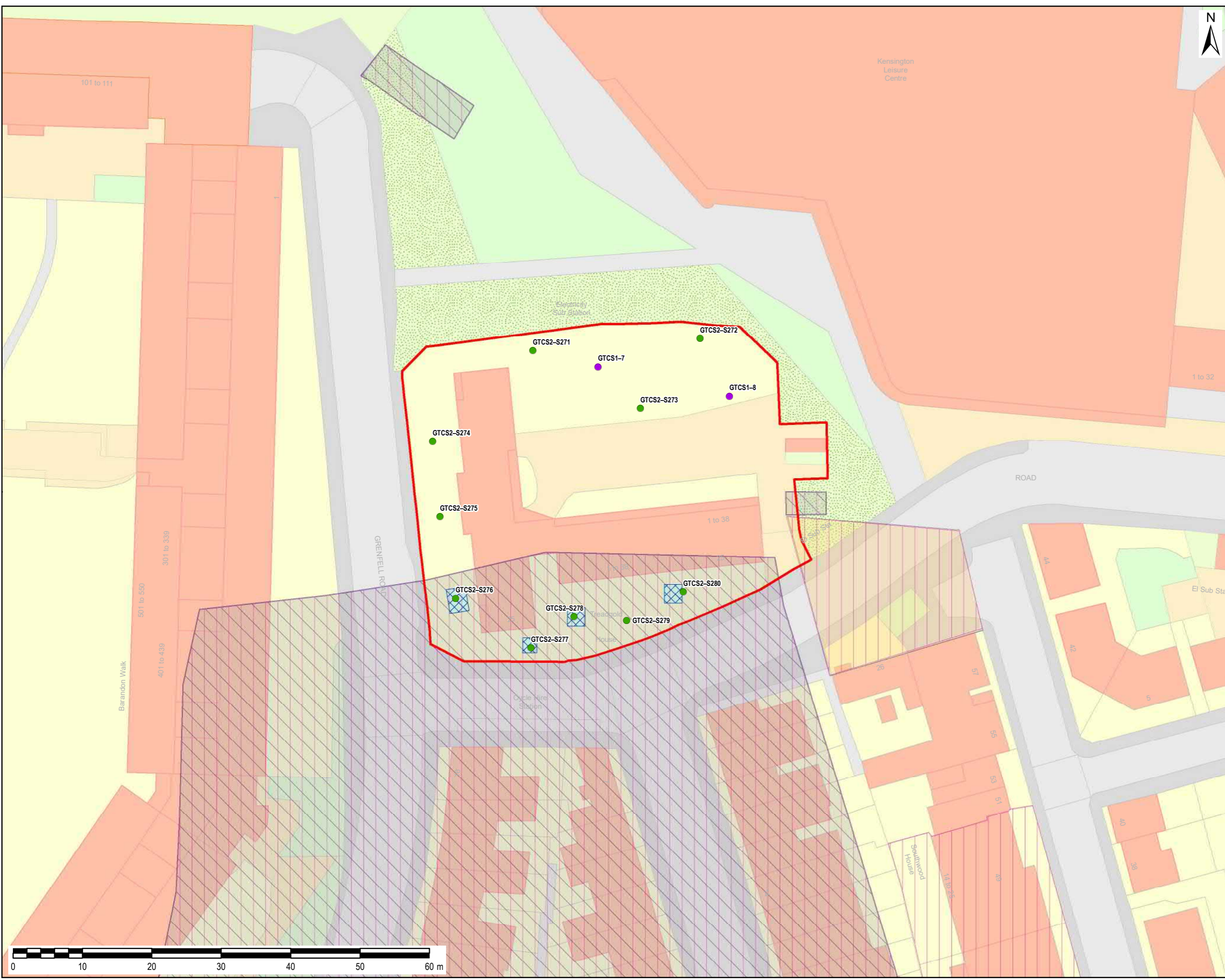
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FIGURE A27

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LEGEND

- Site Outline
- Stage 1 Sample Location
- Proposed Sample Location
- Food Growing Sites
- RBKC identified potentially contaminated land
- RBKC identified areas of Geoenvironmental interest
- Food Growing Sites
- RBKC database location of USTs
- GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S271, bare soil - undisturbed
GTCS2-S272, bare soil - undisturbed
GTCS2-S273, turf
GTCS2-S274, turf
GTCS2-S275, turf
GTCS2-S276, bare soil - disturbed
GTCS2-S277, bare soil - disturbed
GTCS2-S278, bare soil - disturbed
GTCS2-S279, turf
GTCS2-S280, bare soil - disturbed

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28 TREADGOLD HOUSE

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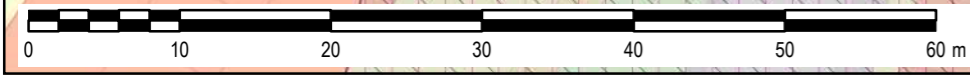
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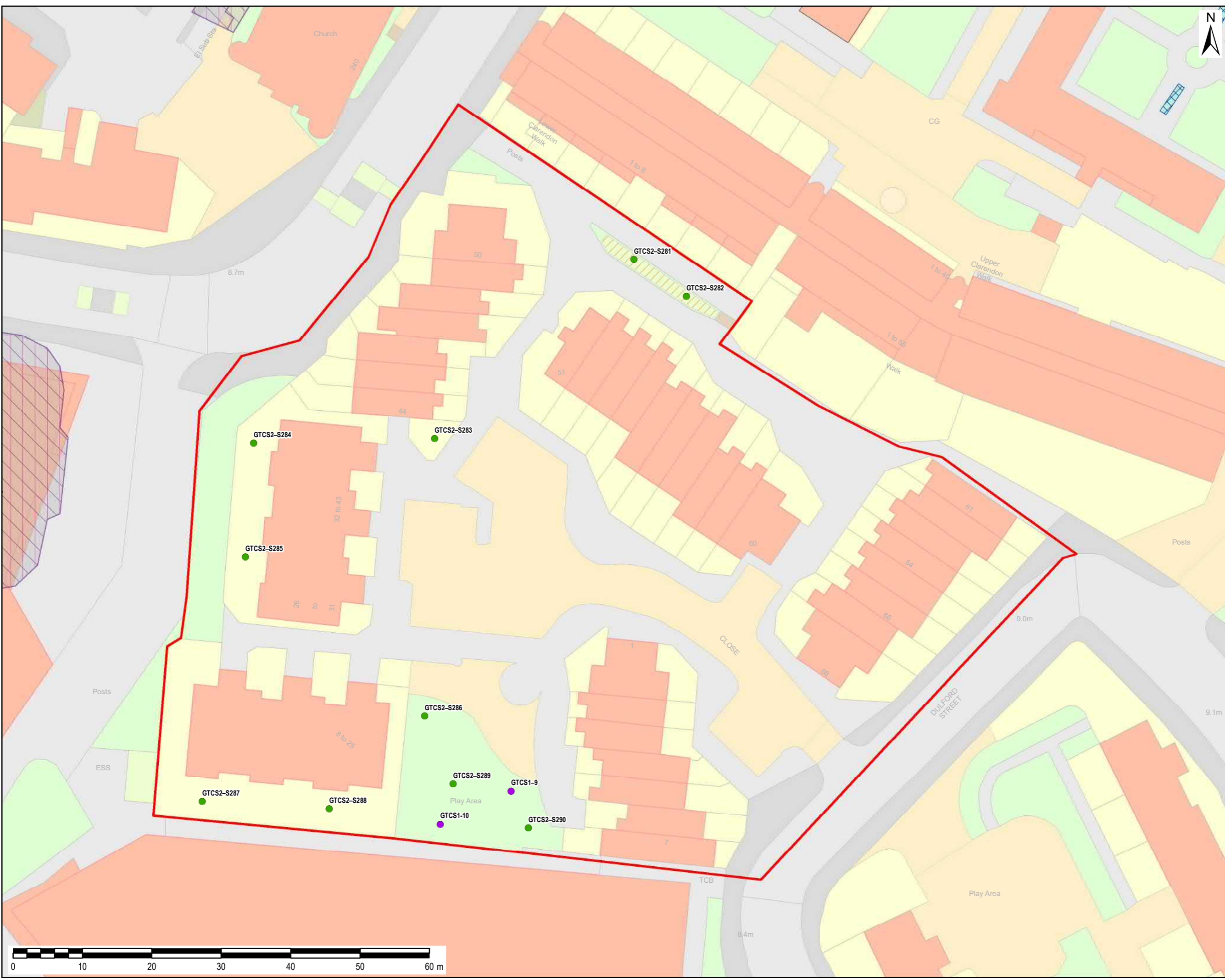


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FIGURE A28

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- LEGEND**
- Site Outline
 - Stage 1 Sample Location
 - Proposed Sample Location
 - Food Growing Sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing Sites
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S281, turf
GTCS2-S282, turf
GTCS2-S283, bare soil - disturbed
GTCS2-S284, bare soil - undisturbed
GTCS2-S285, bare soil - undisturbed
GTCS2-S286, turf
GTCS2-S287, bare soil - undisturbed
GTCS2-S288, bare soil - undisturbed
GTCS2-S289, turf
GTCS2-S290, turf

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GRENFELL PHASE 2 ASSESSMENT

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VERITY CLOSE**

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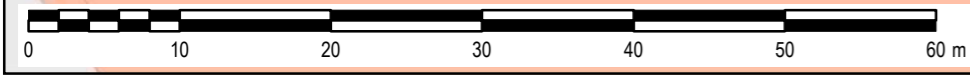
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LEGEND

- Site Outline
- Proposed Sample Location
- LBHF identified potential contaminated sites

- Name, Ground_Cover**
- GTCS2-S291, bare soil - undisturbed
 - GTCS2-S292, turf
 - GTCS2-S293, turf
 - GTCS2-S294, turf
 - GTCS2-S295, turf
 - GTCS2-S296, turf
 - GTCS2-S297, turf
 - GTCS2-S298, bare soil - undisturbed
 - GTCS2-S299, turf
 - GTCS2-S300, bare soil - undisturbed

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Project Title
GRENELL PHASE 2 ASSESSMENT

Drawing Title
**30
LITTLE WORMWOOD SCRUBS INCLUDING EPIC CIC ADVENTURE PLAYGROUND**

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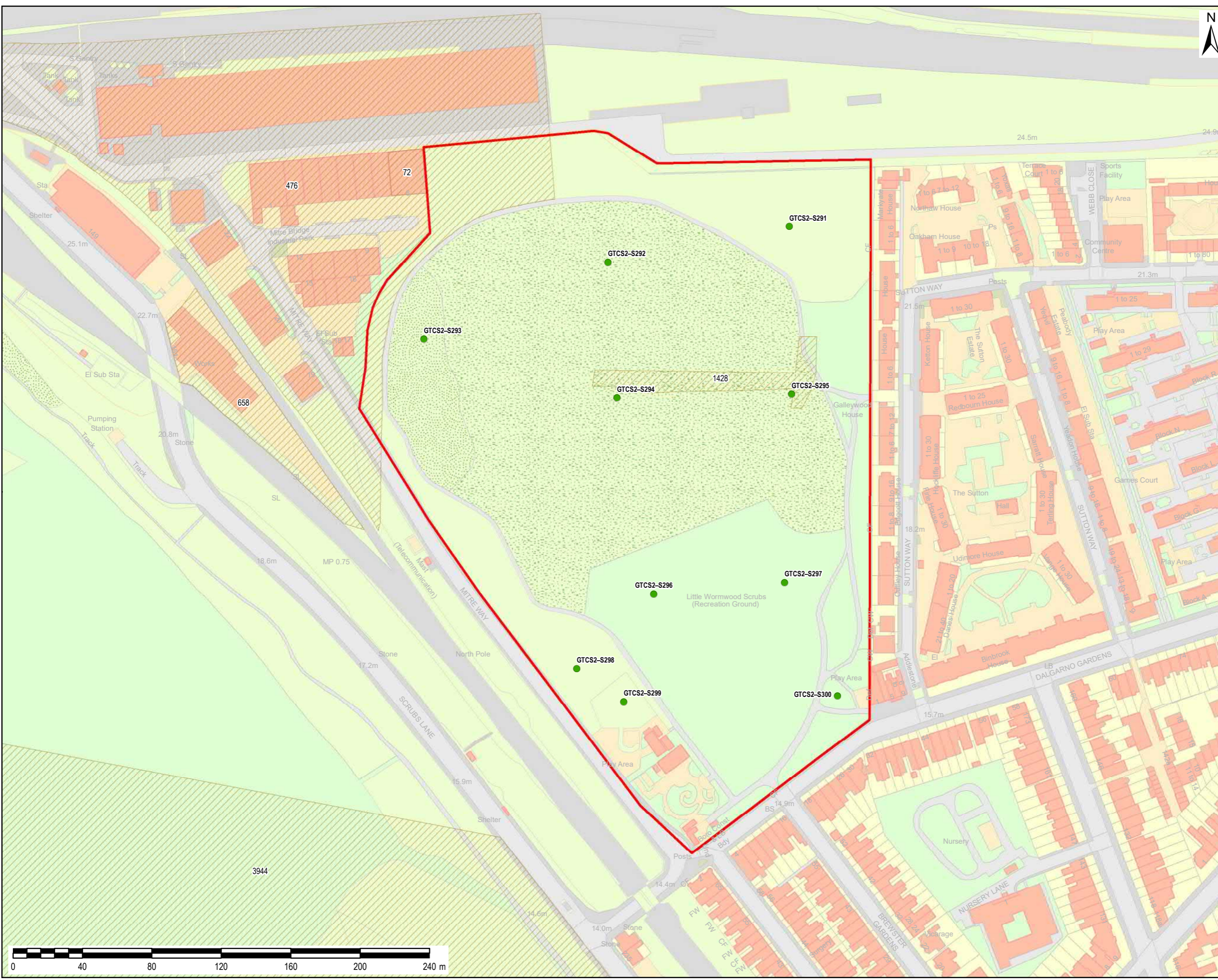
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FIGURE A30

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File Name: \\eucorps\share\GIS\GIS02_Maps\Stage2_GIS\950_Stage2_GIS\950_CAD_GIS\950_Stage2_Sampling_Locations - All Sites.mxd

File Name: \\aecom.com\EMIA\UK\CRD1\Jobs\PP-458020_Grenfell_Tower_Stage_2_GIS\950_Stage2_GIS\950_CAD_GIS\950_Stage2_GIS\950_Map\Figure 06 - Stage 2 Sampling Locations - All Sites.mxd



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- LEGEND**
- Site Outline
 - Stage 1 Sample
 - Proposed Sample
 - Food Growing
 - LBHF identified potential contaminated sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - Brownfield Land Register
 - RBKC database location of
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

- Name, Ground_Cover**
- GTCS2-S301, bare soil - undisturbed
 - GTCS2-S302, bare soil - undisturbed
 - GTCS2-S303, turf
 - GTCS2-S304, turf
 - GTCS2-S305, turf
 - GTCS2-S306, bare soil - undisturbed
 - GTCS2-S307, turf
 - GTCS2-S308, turf
 - GTCS2-S309, bare soil - undisturbed
 - GTCS2-S310, bare soil - undisturbed

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Project Title
GRENFELL PHASE 2 ASSESSMENT

Drawing Title
31 DARFIELD WAY

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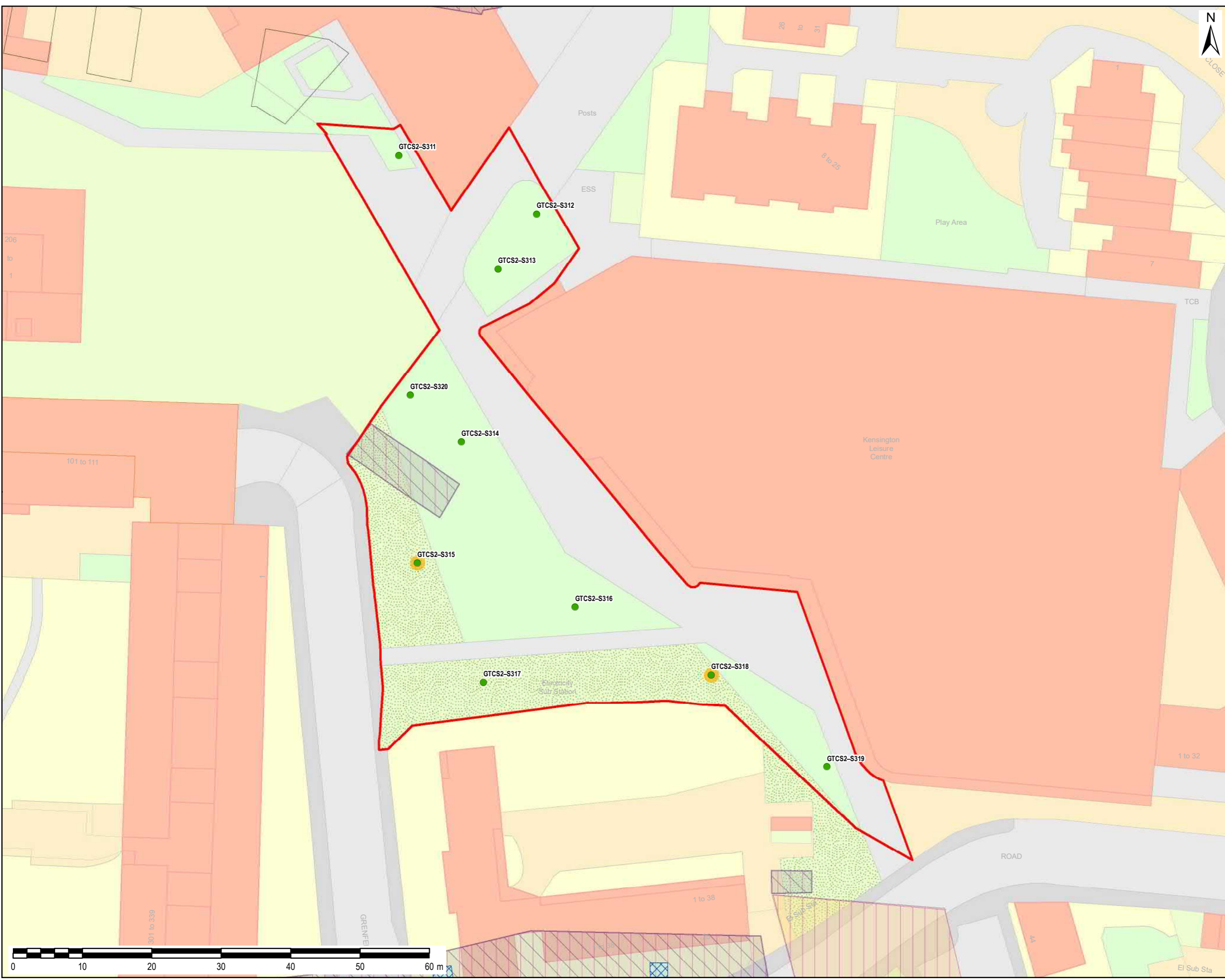
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- LEGEND**
- Site Outline
 - Proposed Sample Location
 - Suggested Deeper Sampling Location
 - Food Growing Sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing Sites
 - RBKC database location of USTs
 - RBKC registered trade directory
 - GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S311, bare soil - undisturbed
GTCS2-S312, bare soil - undisturbed
GTCS2-S313, bare soil - undisturbed
GTCS2-S314, turf
GTCS2-S315, turf
GTCS2-S316, bare soil - undisturbed
GTCS2-S317, bare soil - undisturbed
GTCS2-S318, bare soil - undisturbed
GTCS2-S319, turf
GTCS2-S320, turf

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GRENFELL PHASE 2 ASSESSMENT

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32 LANCASTER GREEN

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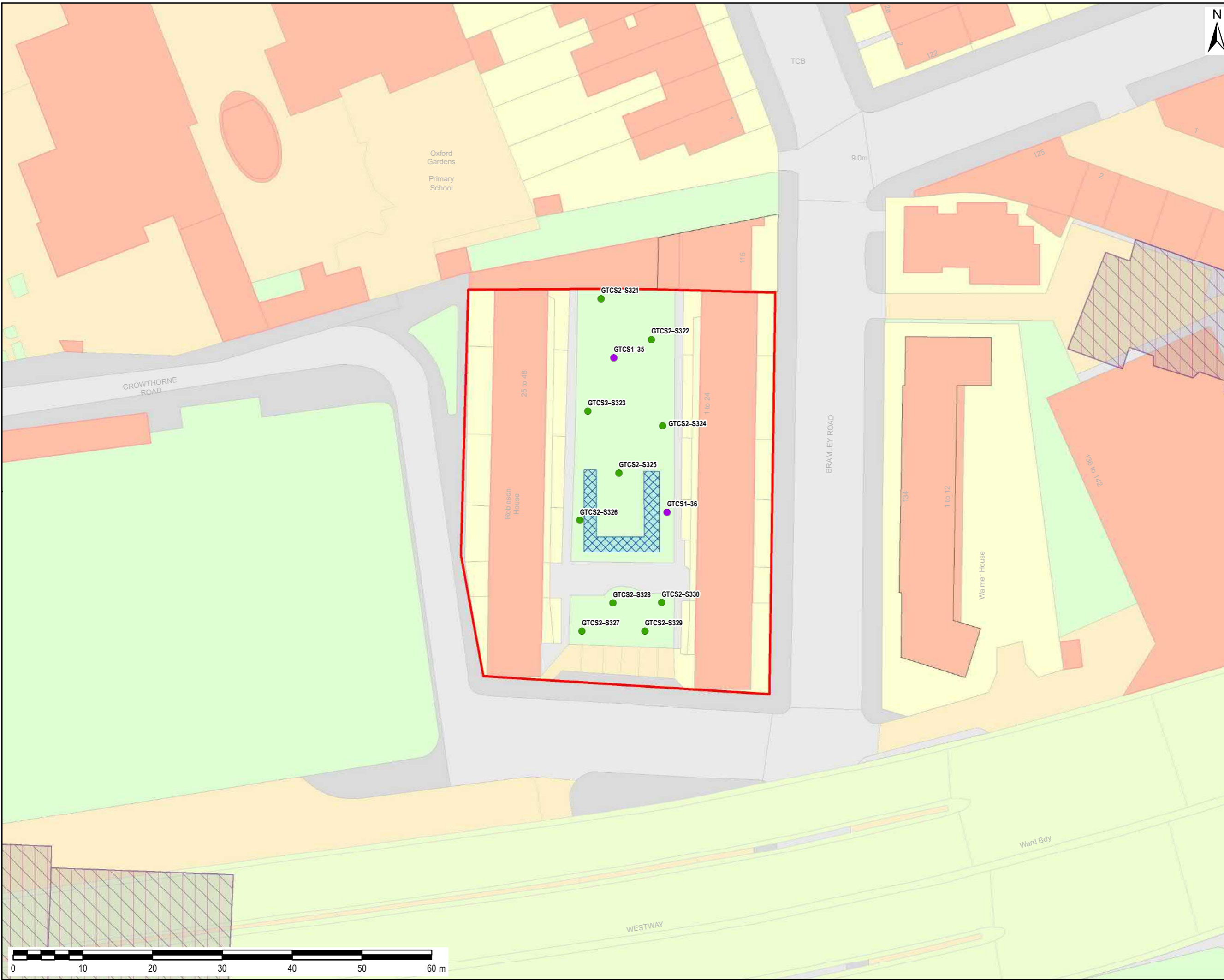
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- LEGEND**
- Site Outline
 - Stage 1 Sample
 - Proposed Sample
 - Food Growing
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

Name, Ground_Cover

GTCS2-S321, bare soil - undisturbed
GTCS2-S322, turf
GTCS2-S323, turf
GTCS2-S324, turf
GTCS2-S325, turf
GTCS2-S326, turf
GTCS2-S327, bare soil - undisturbed
GTCS2-S328, bare soil - undisturbed
GTCS2-S329, bare soil - undisturbed
GTCS2-S330, bare soil - undisturbed

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GRENFELL PHASE 2 ASSESSMENT

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33 ROBINSON HOUSE

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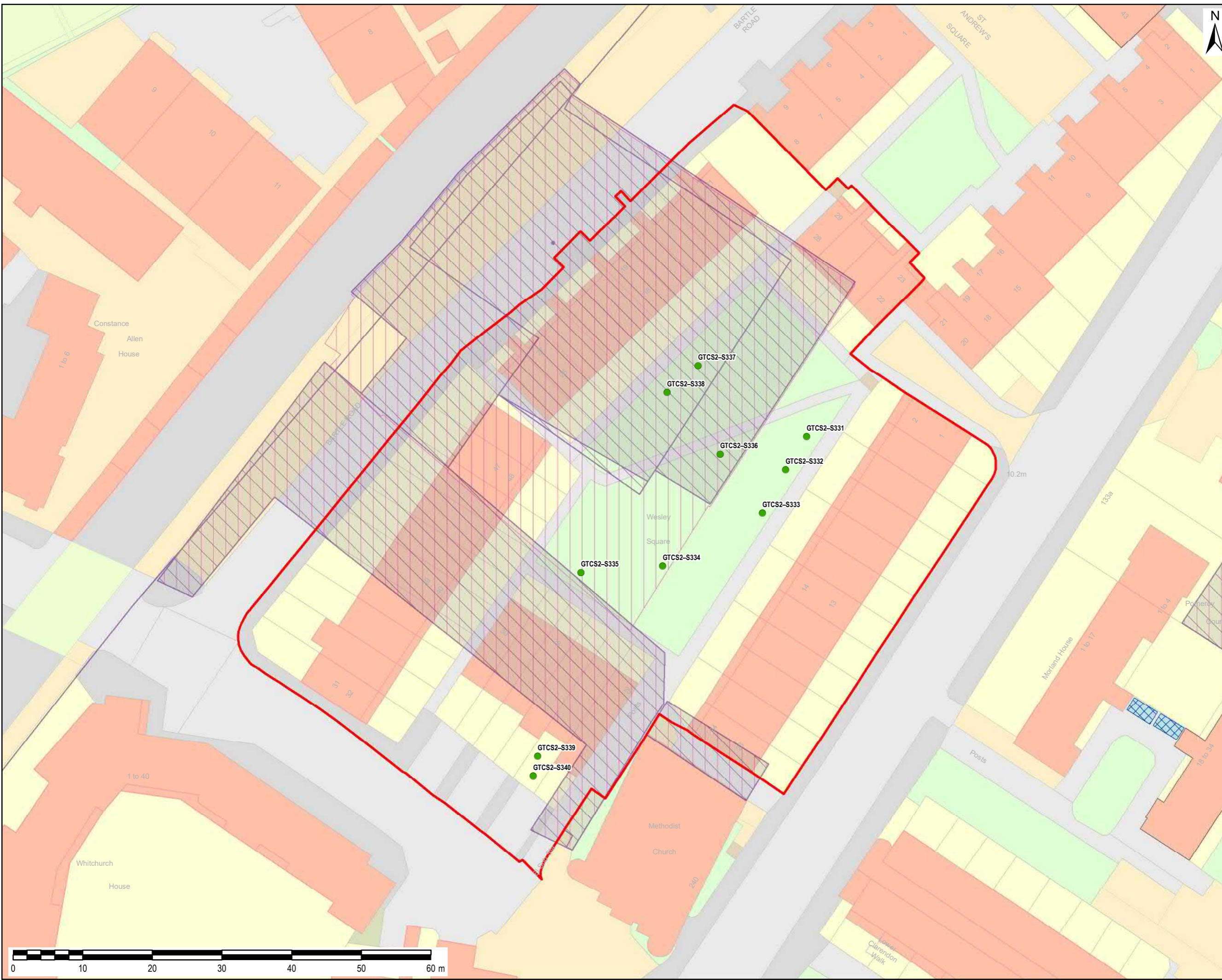
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- LEGEND**
- Site Outline
 - Proposed Sample Location
 - Food Growing Sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing Sites
 - RBKC registered trade directory entries
 - GeoEnviron Sites Historic Maps

- Name, Ground_Cover**
- GTCS2-S331, bare soil - disturbed
 - GTCS2-S332, bare soil - disturbed
 - GTCS2-S333, bare soil - disturbed
 - GTCS2-S334, turf
 - GTCS2-S335, bare soil - disturbed
 - GTCS2-S336, turf
 - GTCS2-S337, bare soil - undisturbed
 - GTCS2-S338, bare soil - undisturbed
 - GTCS2-S339, bare soil - undisturbed
 - GTCS2-S340, bare soil - undisturbed

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GRENFELL PHASE 2 ASSESSMENT

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34 WESLEY SQUARE

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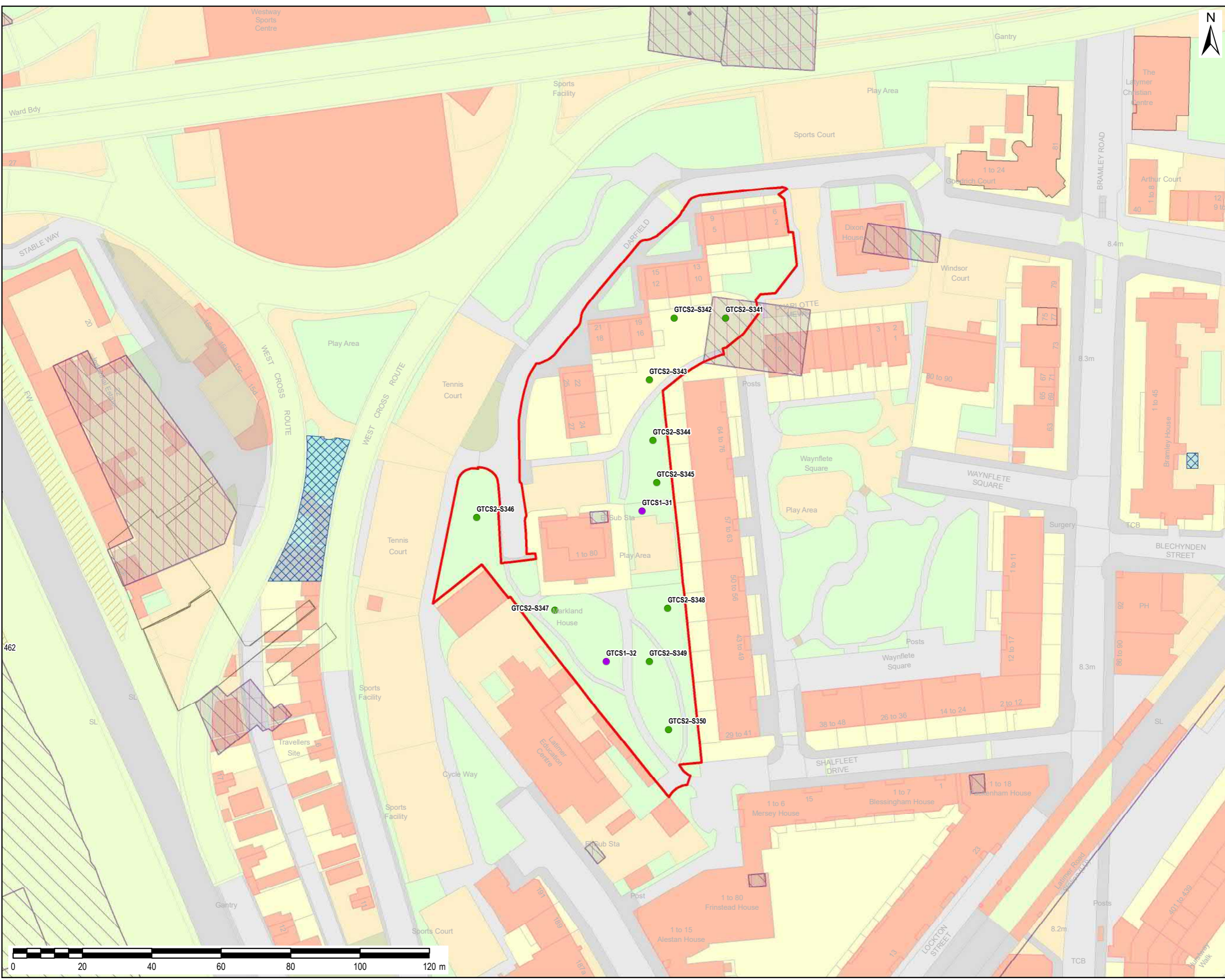
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FIGURE A34

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- LEGEND**
- Site Outline
 - Stage 1 Sample
 - Proposed Sample
 - Food Growing
 - LBHF identified potential contaminated sites
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - Food Growing
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

- Name, Ground_Cover**
- GTCS2-S341, bare soil - undisturbed
 - GTCS2-S342, turf
 - GTCS2-S343, bare soil - undisturbed
 - GTCS2-S344, turf
 - GTCS2-S345, turf
 - GTCS2-S346, turf
 - GTCS2-S347, turf
 - GTCS2-S348, bare soil - undisturbed
 - GTCS2-S349, turf
 - GTCS2-S350, turf

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35 SILCHESTER WEST (NORTH AND NORTH WEST AREA)

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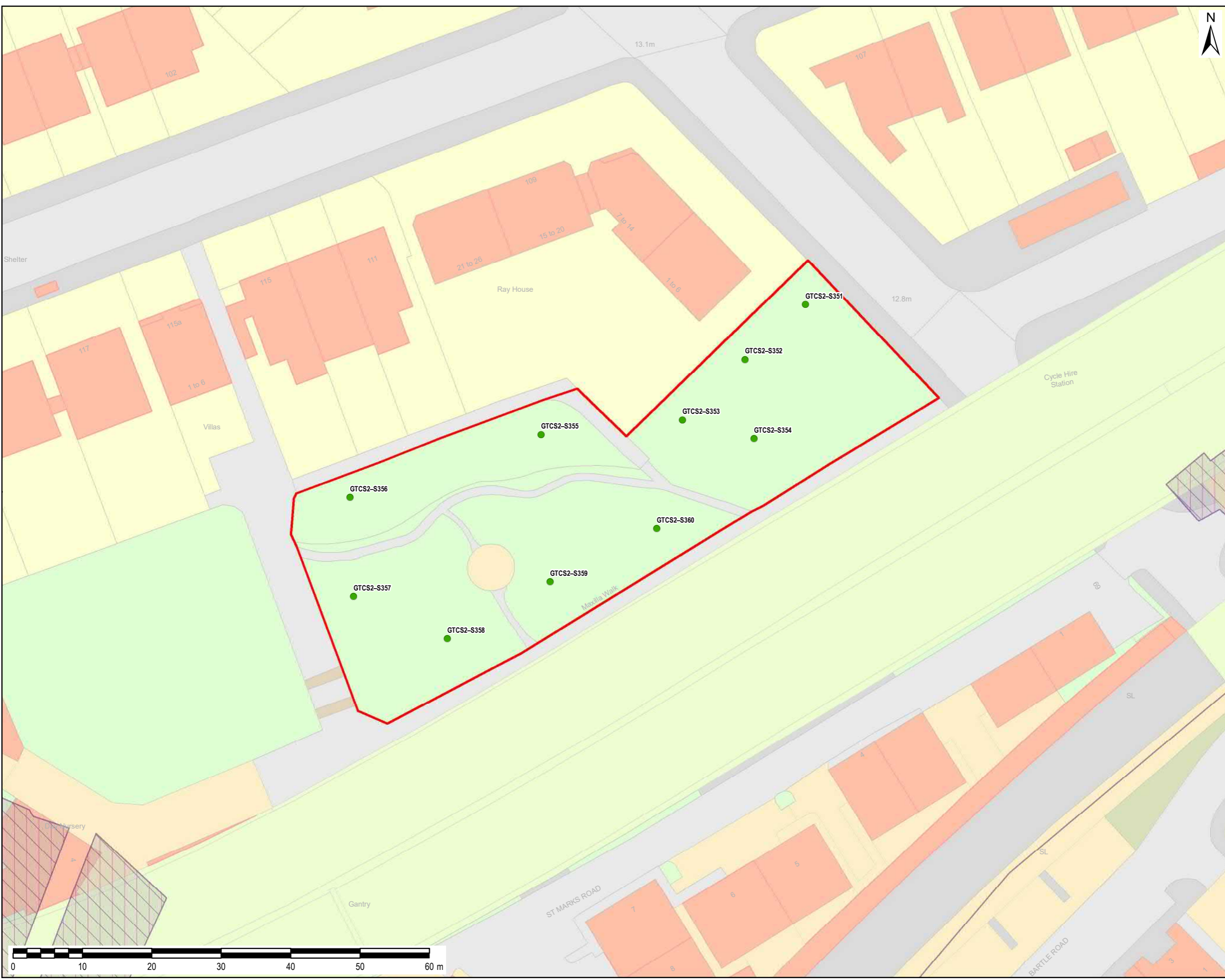


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FIGURE A35

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- LEGEND**
- Site Outline
 - Proposed Sample Location
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - GeoEnviron Sites Historic Maps

Name, Ground_Cover

GTCS2-S351, turf
GTCS2-S352, turf
GTCS2-S353, bare soil - undisturbed
GTCS2-S354, turf
GTCS2-S355, turf
GTCS2-S356, turf
GTCS2-S357, turf
GTCS2-S358, bare soil - undisturbed
GTCS2-S359, turf
GTCS2-S360, turf

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Project Title
GRENFELL PHASE 2 ASSESSMENT

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**36
MAXILLA WALK - MAXILLA HALL / MAXILLA GREEN**

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FIGURE A36

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LEGEND

- Site Outline
- Proposed Sample

Name, Ground_Cover

GTCS2-S361,	turf
GTCS2-S362,	turf
GTCS2-S363,	turf
GTCS2-S364,	turf
GTCS2-S365,	turf
GTCS2-S366,	turf
GTCS2-S367,	turf
GTCS2-S368,	turf
GTCS2-S369,	turf
GTCS2-S370,	turf

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Project Title
GRENELL PHASE 2 ASSESSMENT

Drawing Title
**37
STONEBRIDGE PARK**

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AECOM Internal Project No. 60632092		Scale @ A3 1:1,000	

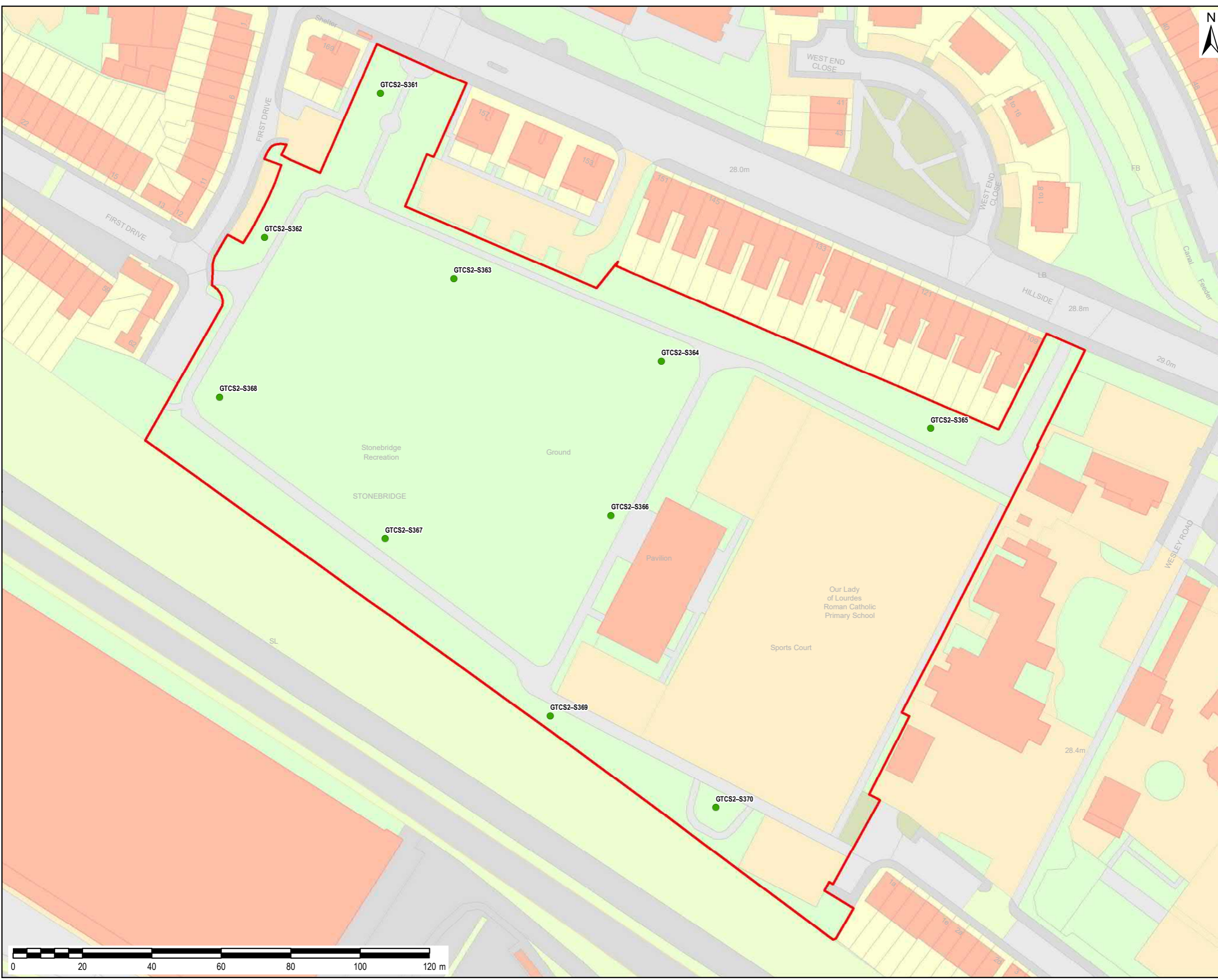
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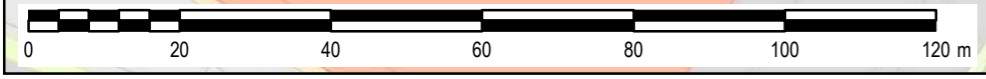


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FIGURE A37

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LEGEND

- Site Outline
- Proposed Sample
- LBHF identified potential contaminated sites

Name, Ground_Cover

- GTCS2-S371, turf
- GTCS2-S372, turf
- GTCS2-S373, turf
- GTCS2-S374, turf
- GTCS2-S375, turf
- GTCS2-S376, turf
- GTCS2-S377, turf
- GTCS2-S378, turf
- GTCS2-S379, turf
- GTCS2-S380, turf

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38 WORMWOOD SCRUBS

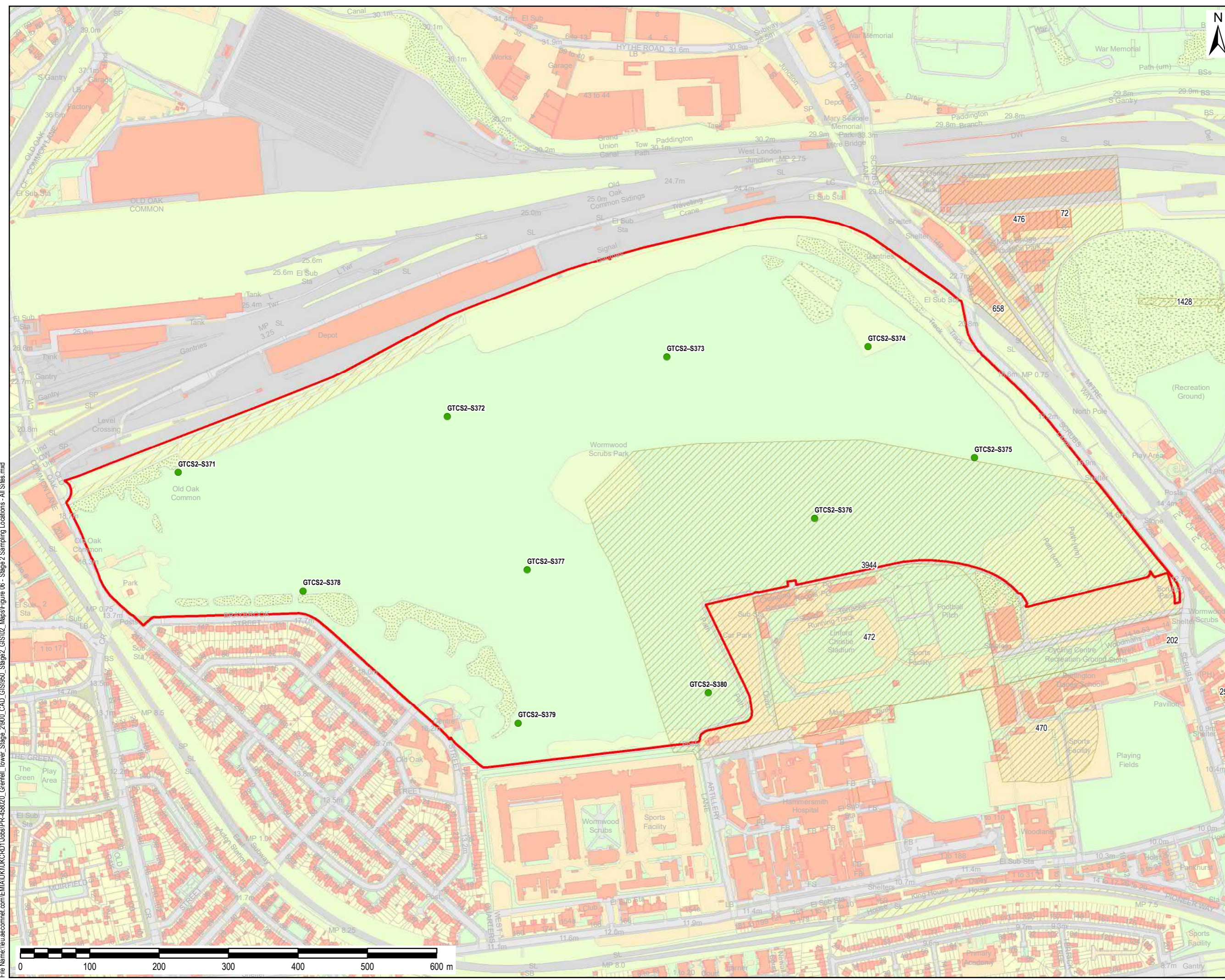
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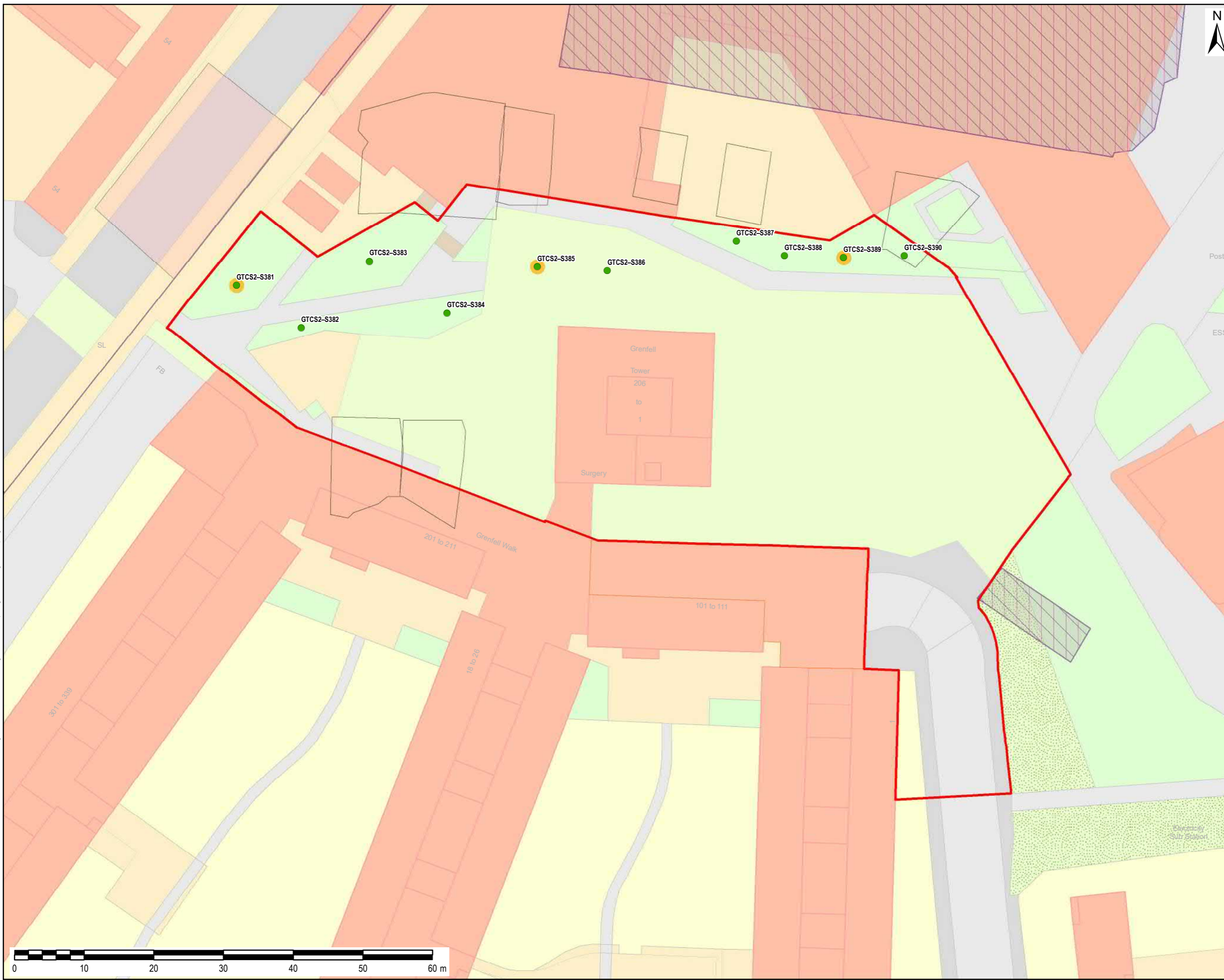
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FIGURE A38

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- LEGEND**
- Site Outline
 - Proposed Sample
 - Suggested Deeper Sampling
 - RBKC identified potentially contaminated land
 - RBKC identified areas of Geoenvironmental interest
 - RBKC database location of
 - RBKC registered trade directory
 - GeoEnviron Sites Historic

Name, Ground_Cover

GTCS2-S381, bare soil - undisturbed
GTCS2-S382, bare soil - undisturbed
GTCS2-S383, turf
GTCS2-S384, bare soil - undisturbed
GTCS2-S385, bare soil - undisturbed
GTCS2-S386, turf
GTCS2-S387, bare soil - undisturbed
GTCS2-S388, turf
GTCS2-S389, turf
GTCS2-S390, turf

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39 TOWER CORDON

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FIGURE A39

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Appendix B Soil Sampling Protocol

Remediation Services

Grenfell Stage 2 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 project 60632092. It relates specifically to the collection of soil samples from the following types of location:

- Surface or near-surface soil (primarily 0-2cm, maximum depth of 5cm where thick turf root zone prevents 0-2cm depth)
- Sub-surface soil to a maximum depth of 60cm.

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 will be either discrete random sample locations chosen within the target area, or locations positioned on a systematic (regular) grid pattern.

The individual random 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 will be indicated in the sampling plan. 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 location details listed in Table 06 of the Grenfell Stage 2 Detailed Design.
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 per the sample plan, 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 50cm x 50cm square. Lay down an approximate 70cm x 70cm piece of clean unused 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 either:
 - a. 0-2cm for turfed areas and undisturbed bare soil (e.g. soil beds with perennials and trees). If impractical due to thick turf, this may be extended to 0-5cm;
 - b. 0-5cm for areas of disturbed bare soil (e.g. in flower beds where annuals are grown).
 - c. 0-20cm for soil samples in areas where edible crops are grown
 - d. 50-60cm where deeper soil samples are required
 - e. At the root zone of the paired plant being sampled, typically in the 0-20cm depth horizon.
9. **Confirm requirement for duplicate sample at sample location.** Duplicate samples are required at 5% of locations. The requirement for a duplicate sample is specified in Table 06 of the Grenfell Stage 2 Detailed Design.
10. **Remove overburden soils to reach target sampling depth.** Using a decontaminated unpainted stainless-steel hand trowel a square area 50cm x 50cm of soil should be cleared to the required sample depth. If turf is present and a 0-2cm soil sample is required, 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 0-2cm sample as possible. Overburden soil should be carefully placed to the side of the sample location for subsequent use as backfill to restore the sample location once the required soil sample has been recovered.
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 50cm x 50cm 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 samples 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. **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.
14. **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.
15. **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.

16. **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.
17. **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).
18. **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.
19. **Photograph reinstated location.** This photograph should aim to replicate that taken in Step 4 and should be sufficient to show that reinstatement is satisfactory.
20. **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
- b. 1 x set of laboratory sample containers as per Sample plan requirements, including:
 - i. 1 x 950ml plastic tub.
 - ii. 2 x 270ml amber glass jar.
 - iii. 5 x 74ml amber glass jar.
 - iv. 2 x 40ml glass liquid vial.
- 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

Stage 2 Grenfell Potential Land Contamination Soil Sampling Proforma

Project Reference: 60632092		Date:	
Sample Area Name:			
Sample Area No.:	Time Start:	Time complete:	
Weather Conditions:			
Field team:			
Soil Sample number			Sample taken (tick)
GTCS2 - S			
Photo subject	Photo taken (tick when taken)	Photo checked (tick when checked)	Photographer name (camera ID if different)
1 st undisturbed sample location			
2 nd sample excavated on plastic sheeting			
3 rd sample in sampleware			
4 th sample location reinstated			
Sample log			
Observed CoPC: (note of any ash etc.)			
Further reinstatement required (Yes or No)			
Sample location marked on attached map with measurements (tick)			
Tools decontaminated after sampling and reinstating (tick when decontaminated)			
Additional Notes			

Stage 2 Grenfell Potential Land Contamination Soil Sampling Proforma – deeper samples

Project Reference: 60632092		Date:			
Sample Area Name:					
Sample Area No.:			Sampling Time :		
Weather Conditions:					
Field team:					
Soil Sample number			Sample taken (tick)		
GTCS2 - S			0 - 0.2m	0 - 0.5m	0.5 - 0.6m
Photo (<i>tick in box when done</i>)	Photo taken 0 - 0.2m	Photo taken 0 - 0.5m	Photo taken 0.5 - 0.6m	Photos checked	Photographer name (camera ID if different)
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

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 procedure 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.

- 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.
- 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.
- 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.
- 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.
- 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 – check for lab-specific requirements. 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°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.

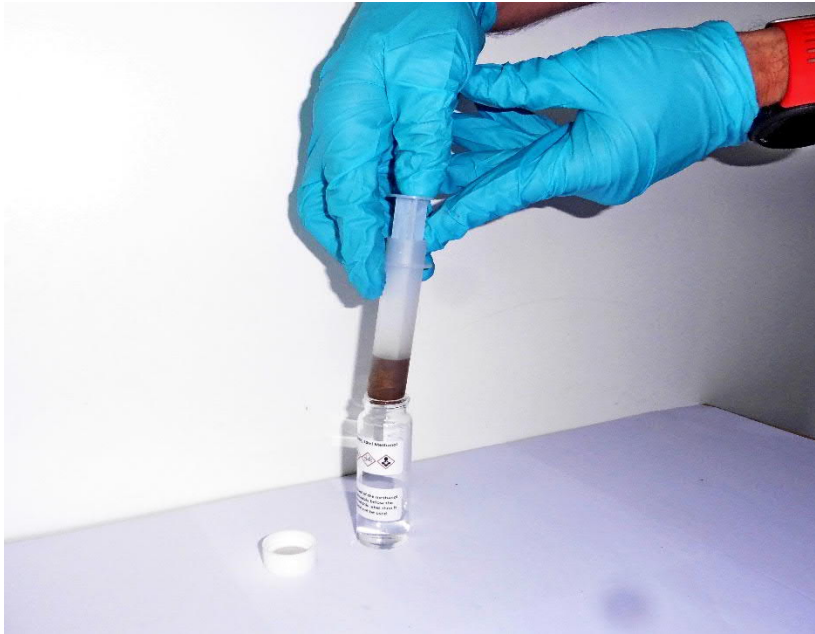


Step 2

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.

Appendix C Crop Sampling Protocol

Remediation Services

Grenfell Stage 2: Crop sampling Procedure

1. Purpose and Scope

The purpose of this field procedure is to set out the process for sampling crops for analysis in a laboratory for potential contamination. It relates specifically to the collection of crop samples from the following types of location:

- a. community kitchen gardens;
- b. allotments; and
- c. informal cultivation of home-grown crops.

This procedure applies to AECOM staff in the UK and Ireland, including subcontractors working on AECOM's behalf. The procedure should be read and understood by both field staff and project managers undertaking the work.

There are no formal standards or guidance for sampling and testing fruit and vegetables from public allotments or private domestic gardens. However, in order to ensure that crop samples obtained provide representative, reliable and relevant data the collection of crop samples for chemical analysis has been guided by EC Regulation 333/2007. The principles of the approach are in general accordance with EC Regulation 333/2007 but given the size of the sampling areas the full application of methodology and approach is unachievable and cannot and will not be applied.

2. Procedure

Crop samples are to be collected for subsequent laboratory analysis with their condition and type documented. Samples will be collected that are representative of the crops being grown at the chosen sample location, with soil samples from the growing medium root zone being taken at the same time. The soil sampling will follow the Grenfell Stage 2 Soil Sampling Protocol with soil samples collected across the 0-0.2m depth interval.

In all cases, care needs to be taken to maintain the condition of the crop sample. This means minimising the disturbance of the crop during removal and transport 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. Wherever possible, the sampling will be carried out when the crops are ready for eating.

2.1 Steps

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 if necessary plant-based detergent.
2. **Prepare crop sample containers.** Ensure that all necessary laboratory sample containers or bags are available and correctly labelled. Minimum information should include project code, sample area, sample ID, sample type and date. Refer to laboratory chain of custody for full information requirements.
3. **Identify crops to sample.** Sample areas will be indicated on maps in the detailed design document. These are indicative areas and are subject to availability and permission being granted by the land owner/crop grower to harvest the crop sample. If on the day of sampling specific locations are not accessible, alternative locations can be chosen. Consult with the Sampling Manager or Project Manager if this situation arises.

Crop sampling should avoid locations where the soil has been changed or greatly added to since June 2017 to be consistent with the overarching aims of the sampling.

4. **Photograph crop sample location.** Crops should be photographed using a trial pit board / pre-printed sheet with size and colour scales prior to harvesting. The sample location and code must be exactly as per the sample plan.

5. **Record sample location.** 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).
6. **Wear dedicated disposable gloves at each location.** A dedicated clean pair of disposable nitrile (powder free) gloves should be worn to collect each sample and all reasonable measures taken when conducting the work to avoid cross-contamination of samples (clean plastic sheeting may be used to assist with cross-contamination minimisation).
7. **Confirm requirement for duplicate crop sample at sample location.** Duplicate samples are required at 5% of locations. The requirement for a duplicate sample in an area will be specified in the sampling plan and subject to quantity of crop available.
8. **Collect crop sample.**
 - a. For roots and tubers: Using a decontaminated unpainted stainless-steel hand trowel or garden fork carefully dig up the individual crop.
 - b. For green vegetables: Either pick by hand or using decontaminated unpainted stainless-steel secateurs carefully harvest the individual crop.
 - c. For tree, herbaceous or shrub fruit: Either pick by hand or using decontaminated unpainted stainless-steel secateurs carefully harvest the individual crop.

If necessary place crop on to a clean piece of plastic sheeting.

9. Clean and prepare crop sample. Any excess surface soil should be removed using a soft brush and deionised water as necessary. For carrots, potatoes and turnips etc, the inedible plant tops should be removed. For strawberries, rhubarb etc the stem or leaves should be removed. For woody stem herbs the inedible stem should be removed.
10. **Weigh individual crop sample.** Using clean portable scales weigh each individual crop sample (recording weight on the sampling sheet). The sample quantity required is dependent on the analytic testing suite the sample is to be tested for.
 - a. For Lead and PAHs aim to collect a **minimum of 200g**. The laboratory defined minimum is 100g*
 - b. For persistent organic pollutants (POPs)**, aim to collect a **minimum of 800g**. The laboratory defined minimum is 400g*

***Where the water content of a crop is high, a greater sample weight should be harvested**

(** POP suite includes polychlorinated dioxins/furans, polychlorinated biphenyls, polybrominated diphenylethers, polybrominated biphenyls, polybrominated dioxins/furans, mixed bromo-chloro dioxins/furans, mixed bromo-chloro biphenyls)

11. **Bag and label crop samples.** Place the sample in a labelled freezer bag (individual items which together will make up one sample, such as several beans or plums, can be bagged together), and zip lock or tie the bag. Double bag the samples by placing this bag into a second labelled freezer bag, and zip lock or tie the bag.
12. **Photograph wrapped and bagged crop sample.** Crop samples should be photographed using a trial pit board / pre-printed sheet with size and colour scales (as item 4).
13. **Record description of crop sample.** A written record of the crop sampling should be completed on the sample proforma sheet for each crop sample including any key observations. Complete the 'Stage 2 Grenfell Potential Land Contamination, Crop and Root Zone Soil Sampling Proforma' sheets for each sample (Appended as Attachment 1).
14. **Secure samples for transportation.** Samples should be securely packaged for transportation as soon as possible using the appropriate packaging containers agreed by the laboratory. Samples should be stored and transported according to the analytical laboratory guidance provided, which includes sealing to prevent evaporative losses, maintenance of a stable temperature (generally in the range 0-4 degrees C) using ice packs and not freezing samples prior to or during transit.
15. **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). Crop sample time and crop 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. Chain of Custody must also include a notification to FERA that **all samples need to be frozen immediately on arrival at the laboratory**, and where crops require laboratory pre-treatment prior to freezing (due to the crop water content) FERA are to advise and discuss with AECOM the appropriate preparation (such as peeling / coring).

16. **Photograph completed chain of custody.** Email photo to FERA on day of collection to prewarn of the sample quantity and type arriving the next day. The sheets should be placed inside cool box with samples, and cool box sealed and addressed.
17. **Courier to laboratory.** Transport to laboratory using an overnight courier service, whenever possible dispatching on day of sampling. Notify laboratory of sample dispatch and expected arrival time.

2.2 Crop Sample Types

There are six different types of crop listed in the CLEA guidance, these are detailed in the table below with examples. Wherever possible AECOM will aim to collect as many different crop types as possible from each of the crop sampling areas, with the ideal being one of each type from each sampling area.

Crop Type	Examples
Green Vegetables	Runner beans / peas / cabbage / cauliflower / kale / spinach / lettuce / chard / squash / courgette / broccoli
Root vegetables	Carrot / parsnip / beetroot / horseradish / swede / turnip / radish / onions
Tuber vegetables	Potato / Jerusalem artichoke / yam
Herbaceous fruit <i>(none wooded stems)</i>	Strawberries / rhubarb / soft stem herbs (basil, parsley, mint)
Shrub fruit <i>(perennial woody plant)</i>	Blackcurrant / gooseberry / blackberry / raspberry / wooded stem herbs e.g. rosemary and thyme
Tree Fruit	Apple / pear / plum / fig / lemon

2.3 Crop Sample Areas

Twelve areas have been identified during the site walkovers as potential crop sampling locations. Wherever possible AECOM will aim to collect up to six different samples from each of the crop sampling areas (ideally one of each crop type group detailed in the table above). The areas are listed in the table below along with the detail of the type of growing area at each location.

Potential Crop Sample Area	Details
Allom House and Barlow House	Raised beds within communal garden
Bramley House	Raised beds within communal garden
Equal People (x 2 areas)	Raised beds within courtyard at St Charles Square, and Community kitchen garden with raised beds at the St Charles Centre for Health and Wellbeing

Potential Crop Sample Area	Details
Eynham Road	Communal garden with fruit trees, raised and ground level beds
Henry Dickens Court	Community kitchen garden, and orchard area within communal garden
Moreland House and Talbot Grove House	Raised beds within communal garden
Hurstway, Grenfell, Testerton and Barandon Walks	Raised beds within communal garden
Longstone Avenue allotments	Allotment Gardens
Portland Road and Nottingwood House	Portland -Community kitchen garden with raised and ground level beds Nottingwood - Raised beds within communal garden
St Francis Primary School	Fruit trees on the site
St Quintin Kitchen Garden	Community kitchen garden with raised and ground level beds
Silchester East (Whitstable House and Kingsnorth House)	Kitchen garden with raised beds (to the west of Whitstable House)

Note: Robinson House and Wesley Square have been excluded from this list as the soil in the vegetable growing beds has either been completely changed or are new since 2017.

Equipment, PPE & Materials List

Item	Essential?	Notes
HASP & First Aid Kit	Y	To provide information
Sample location plan	Y	To mark up exact sample collection location
Contact details for crop owners	Y	To ensure permission is provided for collection. Client may hold this information
Sample containers / bags	Y	To place crop sample in
Sample labels	Y	To go on individual sample containers
Chain of Custody Forms	Y	For laboratory
Cool boxes, frozen ice packs (or instant ice pack) and address labels	Y	For transportation of samples to laboratory
Plastic sheeting	Y	To prevent cross contamination
Tape measure	Y	To mark up exact sample collection location
Stainless steel hand trowel	Y	To assist with collection of samples
Stainless steel secateurs	Y	To assist with collection of samples
Measuring scales	Y	To ensure sufficient quantity of crop sample collected
Soft vegetable brush	Y	To remove excess soil from roots / tubers
Sample proforma sheets, site diary, pens	Y	For recording observations and details of sampling
Camera / phone camera	Y	Important to collect visual record

Item	Essential?	Notes
Sample ID board / preprinted sheet	Y	Important to collect visual record
Sampling equipment for decontamination (detergent, deionised water, water spray and cleaning cloth, or disposable wipes)	Y	For decontamination of sampling equipment between sample locations
Disposable coveralls, cut resistant gloves, nitrile gloves, laced safety boots	Y	Minimum PPE during work which includes potential contact with soil, Made Ground, crops.
Other PPE	Y	As defined in the SHE Plan (also refer to ELS guidance on mandatory PPE and training requirements for site work available in the Health & Safety folder on the ELS sharepoint site)

3. Responsibilities

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

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

4. Safety

All work must be undertaken in accordance with the requirements of the project Safety, Health and Environment (SHE) Plan.

5. Terms and Definitions

Not Required.

6. References

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

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

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

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

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

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

CCME Guidance manual for environmental site characterisation in support of environmental and human health risk assessment, Volume 3, Suggested operating procedures, PN 1555, Canadian Council of Ministers of the Environment, 2016

Commission Regulation (EC) No 333/2007 - Laying down the methods of sampling and analysis for the official control of the levels of lead, cadmium, mercury, inorganic tin, 3-MCPD and benzo(a)pyrene in foodstuffs, 2007.

Environment Agency, UKSHS Report No. 2 – UK Soil and Herbage Pollutant Survey, Chemical and Radiometric Sample Collection Methods, 2007.

7. Records

- a. Sample Location map (annotated with exact location measurements)
- b. Photographic record (pre sampling and post sampling with samples in containers)
- c. Crop and Root Zone Soil Sampling Proforma sheet (including crop owner permission details, soil logging record, sampling observations)
- d. Laboratory Chain of Custody
- e. Daily field diary

8. Appendices

- a. Attachment 1 – Stage 2 Grenfell Potential Land Contamination, Crop and Root Zone Soil Sampling Proforma

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

Stage 2 Grenfell Potential Land Contamination Crop and Root Zone Soil Sampling Proforma

Project Reference: 60632092		Date:				
Sample Area Name:						
Sample Area No.:		Time Start:		Time complete:		
Plot / bed number or owner:						
Crop harvest permission provided:						
Weather Conditions:						
Field team:						
Crop species: (& circle crop type below)						
Green vegetable	Root Vegetable	Tuber Vegetable	Tree Fruit	Herbaceous Fruit	Shrub fruit	Not known
Crop Sample number			Sample Weight (g)		Sample taken (tick)	
GTCS2 - P						
Photo subject		Photo taken (tick when taken)	Photo checked (tick when checked)		Photographer name (camera ID if different)	
1 st crop prior to harvest						
2 nd crop harvested; foil wrapped & labelled						
Comments / observations:						

Project Reference: 60632092		Date:	
Sample Area Name cont:			
Root Zone Soil Sample number			Sample taken (tick)
GTCS2 – P soil			
Photo subject	Photo taken (tick when taken)	Photo checked (tick when checked)	Photographer name (camera ID if different)
3 rd open hole in root zone			
4th samples collected & labelled			
Sample Log:			
Observed CoPC: (note of any ash etc.)			
Further reinstatement required (yes or No)			
Sample location marked on attached map with measurements (tick)			
Tools decontaminated after sampling and reinstating (tick when decontaminated)			
Notes			

Appendix D Example Chain of Custody

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

Appendix E DQRA Checklist

This checklist is based on the ITRC's guidance on options for human health risk assessment⁸ and the EA's LC:RM guidance⁹.

Table D1. DQRA Checklist

DQRA component	Include?	Justification for choice
1.Data evaluation (if not done in detail at GQRA)	No	A data evaluation scope has been defined to support the GQRA step in order to inform GSC data screening
1.1 Identify and address data gaps (collect additional data and/or justify assumptions)	No	Scope of GQRA includes for this
1.2 Data usability (measurement units, determining cross-contamination by reviewing sample blanks, assess data representativeness)	No	Scope of GQRA includes for this
1.3 Data reduction (use of duplicates, pooled data, flagged data, non-detects, outliers, tentatively identified compounds, and non-specific method data)	No	Scope for GQRA includes for this
1.4 Data visualisation and analysis (accurate display and visualisation of data, statistical analysis, identifying chemicals for further evaluation from GQRA results, chemicals without GAC, identifying data bias, background concentrations)	No	Scope for GQRA includes for this
2. Exposure assessment	Yes	
2.1 Determine appropriate exposure factors (justify site-specific exposure factors, identify those that warrant prorating)	Yes	This is considered to be an important element of the risk assessment when exposure to the same contaminant is likely to occur across different land use areas (for example consideration of exposure at home and at the nearby school)
2.2 Account for bioavailability	Yes	Bioaccessibility testing for lead and PAHs is proposed, and the tests for these two contaminants can be extended to test for other metals (e.g. arsenic) and organic contaminants (e.g. dioxins). Scientific literature does suggest that the bioaccessibility of these contaminants may be different to that assumed in the derivation of the GSC.
2.3 Account for exposure areas that are not representative of actual exposure patterns	Yes	Connected to the prorating of exposure factors and the determination of averaging areas for soil concentrations. The exposure assumptions need to match the assumptions in the representative soil concentration as much as possible
2.4 Selection of measured versus modelled point of exposure concentrations (e.g. plant uptake, vapour intrusion, airborne dust)	Yes	Specifically for plant uptake if plant tissue samples are to be taken. This will be subject to whether plant uptake is predicted to be a significant exposure route for a contaminant.
2.5 Uncertainties in F&T modelling for PECs	Yes	Particularly relevant to plant uptake and asbestos fibre release

⁸ ITRC (2015) Decision Making at Contaminated Sites: Issues and Options in Human Health Risk Assessment, RISK-3, Interstate Technology and Regulatory Council, January 2015

⁹

DQRA component	Include?	Justification for choice
2.6 Uncertainties in estimating exposure concentration from measurements (choice of statistical measure)	Yes	Individual areas are being tested but the significance of the data for the wider investigation area is an important consideration
3. Toxicity	Yes	
3.1 Choice of sources of toxicity values	Yes	It has been established in TN8 that different sources of toxicological information are required for the range of contaminants being considered. The difference in published values and the choice of those values is therefore important.
3.2 What to do when a toxicity value is not readily available	Yes	A critical data gap if it occurs. TN8 has identified relevant and appropriate HCV for the majority of contaminants.
3.3 Assessing toxicity of chemical groups and/or mixtures	Yes	PAHs and dioxins have been identified as contaminants of concern and both exhibit additive toxicity. Existing choice of GSC includes for toxicity additivity.
3.4 Choice of uncertainty/safety factors and margins of exposure	Yes	Relevant to the choice of HCV and to the interpretation of the margin of exceedance for predicted exposures
3.5 Implication of uncertainty in toxicity values for risk management decisions	Yes	Directly relevant to the considerations on POSH required by Part 2A
3.6 Comparison of predicted exposure from soil to exposure from other sources such as diet, water and air	Yes	Directly relevant to the considerations on POSH required by Part 2A

