

Remediation & Verification Strategy

Reliance Street, Manchester

Presented to: **Be.EV**

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As part of The Lucion Group, our combined team of 500 in the UK has a range of specialist skill sets in over 50 environmental consultancy specialisms including asbestos, hazardous materials, ecology, air and water services, geo-environmental and sustainability amongst others.



Delta-Simons is proud to be a founder member of the Inogen Environmental Alliance, enabling us to efficiently deliver customer projects worldwide by calling upon over 5000 resources in our global network of consultants, each committed to providing superior EH&S and sustainability consulting expertise to our customers. Through Inogen we can offer our Clients more consultants, with more expertise in more countries than traditional multinational consultancy.

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DRAWINGS

Drawing 1 - Proposed Site Layout

FIGURES

Figure 1 - Site Location Map

APPENDICES

Appendix A - Limitations

Appendix B - 'Hotspot' Protocol

Appendix C - Imported Soils Assessment Criteria

Appendix D - United Utilities Risk Assessment

1.0 Introduction

1.1 Appointment

Delta-Simons Limited ("Delta-Simons") was instructed by Be.EV (the "Client") to undertake the preparation of a Remediation and Verification Strategy (RVS) for Reliance Street, Manchester (the "Site"). The Site is proposed for the development of an electrical vehicle charging facility.

1.2 Context & Purpose

The purpose of this document is to:

- Present a summary of remediation requirements;
- Contribute to a sustainable development "which meets the needs of the present without compromising the ability of future generations to meet their own needs" as advocated by, for example, GPLC2¹;
- Provide a formal statement for the likely scope of remediation requirements to facilitate the proposed development at the Site; and,
- Support the discharge of planning conditions relating to land contamination.

For information on the Site setting, and full details of intrusive investigations undertaken at the Site, this Remediation Strategy and Verification Strategy should be read in conjunction with Delta-Simons' previous reports as follows:

- Delta-Simons (2022), Preliminary Geo-Environmental Risk Assessment – Reliance Street, Manchester, dated 27/09/2022, Ref, 22-1496.01_REP_Reliance Street, Manchester_PRA_20220927;
- Delta-Simons (2022), Geo-Environmental Assessment – Reliance Street, Manchester, dated 22/12/2022, Ref, 22-1496.04_87687.546937_REP_Reliance Street_GEA_221222.

1.3 Scope of Works

The scope of works undertaken for this assessment was to:

- Summarise the site setting and confirmed contaminant linkages;
- Establish the remediation objectives and metrics;
- Provide a remediation options appraisal;
- Select a preferred remediation approach; and,
- Present the remediation and verification strategy.

The works were undertaken to an agreed brief as set out in Delta-Simons' proposal (ref: 87687.557155, dated January 2023).

1.4 Limitations

This document sets out the measures that will be carried out during the construction to mitigate potentially significant risks as identified by the Site investigations in the context of the proposed end-use of the Site, it does not provide a verification or completion statement for the works. The standard limitations associated with this assessment are presented in Appendix A. In addition, there are the following specific limitations that apply to this assessment:

- This document is a strategy document and more detailed documentation in terms of a Contractor's Remediation Method Statement may need to be prepared.

2.0 Site Context

2.1 Site Information

Site Overview			
			
Contains OS data © , Crown Copyright and Database Right (2022) Contains Data from, © 2022 Landmark Information Group Ltd © OpenStreetMap contributors			
Co-ordinates	Centred at National Grid Reference 388070, 400730.	Elevation (approx..)	86 - 87 m AOD
		Area	0.13 Ha
Site Address and Location	Land off Reliance Street, Manchester, M40 1EZ. The Site is located on the corner of Reliance Street and the A62 (Oldham Road), approximately 4.8 km north-west of Manchester City Centre. Google Maps Link [Google, Imagery©2022 Infoterra Ltd & Bluesky, Maxar Technologies, The GeoInformation Group, Map data ©2022]		
Site Description	The Site comprises a roughly rectangular parcel of land which is currently vacant and undeveloped following the demolition of the former on-Site petrol filling station. The majority of the Site is covered in hardstanding with minor areas of soft landscaping limited to the northern perimeter. The above ground infrastructure relating to the former Site use has been demolished, although manhole covers for underground access, underground ground fuel storage tanks (USTs), and associated pipework, are understood to remain on-Site.		
Site History	A review of historical sources records the Site as being in residential use from earliest mapping in 1848 until 1992, after which the Site redeveloped into its former use as a petrol filling station. The on-Site petrol filling station is expected to have been demolished between 2009 and 2013 and has remained in its current layout since then.		

	The surrounding area has undergone continuous development and redevelopment since 1848 comprising residential dwellings, mills, sawmills, various works and warehouses throughout its history. Current surrounding land uses comprise warehouses, a trading estate, and residential dwellings.
Proposed Development Description	The Site is to be developed for an electrical vehicle charging station comprising a total of 16 vehicle charging stations in a circular layout with a green-roofed cover, a kiosk in the east of Site, and soft landscaping around the edges of Site.

2.2 Planning

A planning application has not yet been submitted for the proposed redevelopment, to the knowledge of Delta-Simons.

2.3 Physical Setting

Geology	The British Geological Survey (BGS) records the Site as being underlain by Devensian Till (gravelly boulder clay) and the Collyhurst Sandstone Formation, a poorly cemented medium to coarse grained sandstone. Delta-Simons' ground investigation works encountered Made Ground across the Site, present up to 2.4 m bgl in one location in the south of Site, and generally present to 2.0 m bgl across the rest of the Site. Made Ground was underlain by very soft to stiff brown slightly gravelly sandy clay, expected to be Devensian Till superficial deposits.
Aquifers and Groundwater Receptors	The Devensian Till is classified as a Secondary Undifferentiated Aquifer. The Collyhurst Sandstone is classified as a Principal Aquifer. The Site is not within a designated Source Protection Zone (SPZ) and there are no licensed abstractions recorded within 1 km of the Site.
Hydrology	The nearest surface water feature is the Rochdale Canal located approximately 140 m to the south of Site.
Land Contamination Summary	The Delta-Simons Geo-Environmental Assessment in 2022 indicated the following: • Testing of soil samples did not record elevated concentrations of contaminants when compared to screening criteria for a commercial end use scenario; • It was not possible to target soils directly adjacent and below the USTs and therefore, further assessment is required once the tanks have been removed; • Testing of groundwater samples recorded localised elevated concentrations of sulphate, arsenic and PAH compounds, although a sensitive controlled water receptor has not been identified, so no further action was considered necessary; • Gas monitoring results indicated that basic gas protection measures in line with Characteristic Situation 2 would be required; • Barrier pipework was considered likely to be required for the installation of any new water supply.

2.4 Conceptual Site Model

The following linkages in the table below have been previously confirmed as being relevant to the proposed development and warranting mitigation.

Confirmed Linkages	Source Descriptions	Pathway	Receptor
Linkage 1	Hydrocarbons have been found in concentrations above UURA thresholds	Direct infiltration in water supply pipes	Drinking water supply pipes
Linkage 2	Ground gas	Accumulation within buildings	Future kiosk users and staff, buildings

Whilst the Delta-Simons site investigation did not indicate the presence of widespread hydrocarbon contamination beneath the Site, there is still potential for localised contamination in the vicinity of the former USTs. It is recommended that a watching brief is undertaken by an Environmental Consultant during the removal of the USTs as part of the site enabling works and if any contamination is encountered, a hotspot protocol implemented. Further details regarding the watching brief are provided in Section 4.3. If required, the Remediation Strategy will be updated following removal of the USTs.

3.0 Remediation Strategy

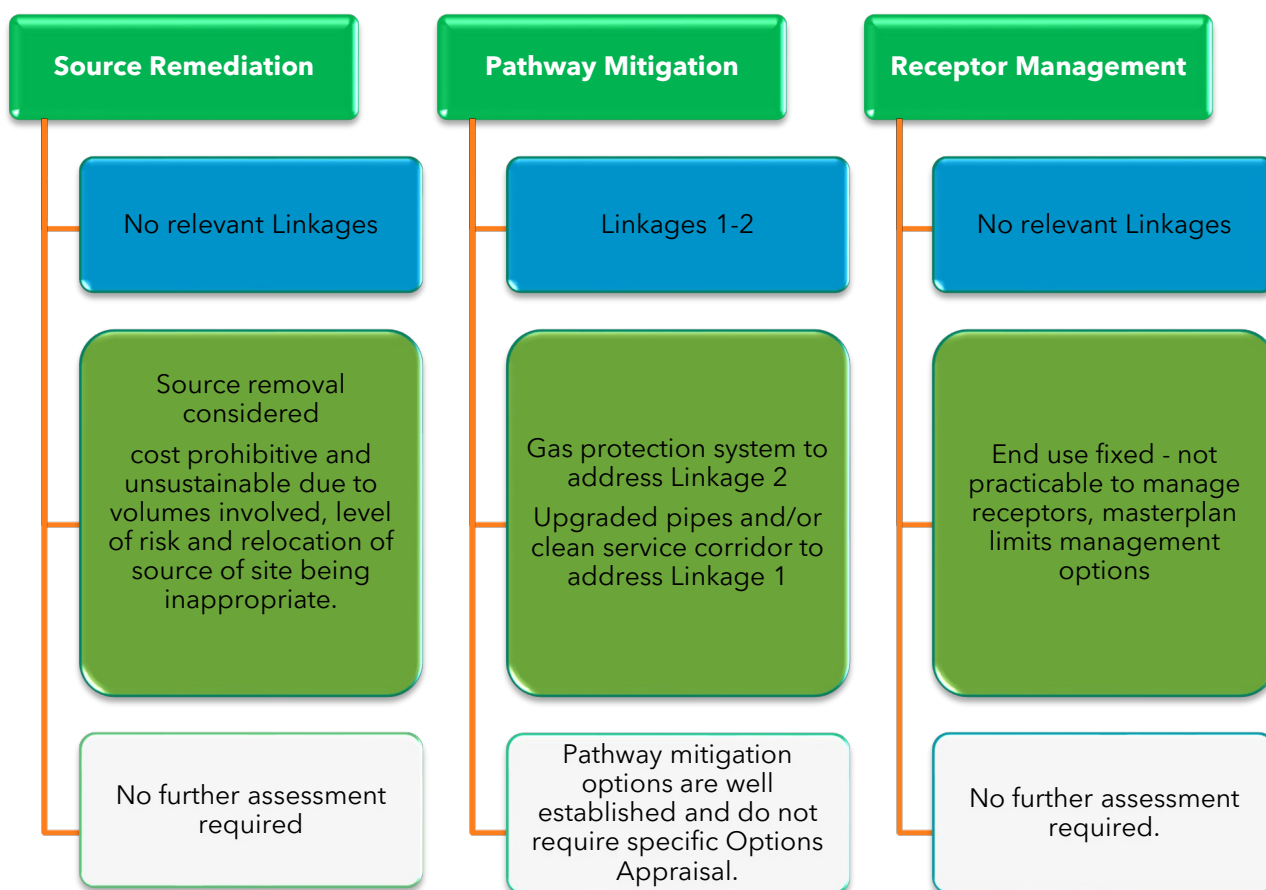
3.1 Introduction

The presence of land contamination is generally only of concern if an actual or potentially unacceptable risk exists to either the health of living organisms (i.e. humans, flora, fauna), ecological systems, property or controlled waters (i.e. rivers, aquifers etc.). Planning policy states that the Site should be 'suitable for use' and that, 'after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990'.

3.2 Remediation Options

Current UK guidance requires due consideration of sustainability indicators in the appraisal of remediation options. Reference has been made to LCRM and the SURF UK framework and this strategy broadly reflects the approach in those documents at the scale appropriate for the Site, scale of issues, and proposed development. Remediation options fall into one of three categories: Undertaking remediation of the contamination source; Mitigation of migration pathways; or, Receptor management.

Remediation strategies may incorporate a combination of techniques across the three categories to achieve the most effective and sustainable solution. The table below provides a high-level screen of remedial approaches to the identified linkages;



3.3 Stakeholders

Parties Anticipated to be Involved	Function / Interest
Be.EV	Land Owner / Purchaser / Developer
Principal Contractor (currently unknown)	Delivery of Development / CEMP permitting
Delta-Simons Ltd	Land quality risk assessment
Manchester City Council (CLO)	Regulation relating to Human Health

3.4 Overview

The Site Remediation Strategy had been devised based on the intrusive investigations undertaken in November 2022 to mitigate the risks posed by the identified contaminants of concern and break potential contaminant linkages allowing the redevelopment of the Site for a residential end use. The key features of the remedial strategy are summarised below;

Enabling Phase Works

- Excavation, breaking out and processing of below ground structures and hard materials [Section 4.3.1];
- Watching brief during the removal of the USTs and associated pipework [Section 4.3.2];
- Provision for sampling and testing of materials surrounding tanks during tank removal watching brief [Section 4.3.2];
- Verification imported material suitable for use in soft landscaping areas [Section 5.1.1].

Construction Phase Works

- Provision of localised ground gas protection measures within footprint of proposed kiosk building, in accordance with BS 8585:2015 CS2 with verification by a specialist contractor [Section 5.2];
- Installation of clean service corridors and upgraded water supply pipes [Section 5.3]; and,
- A verification report to be produced upon completion of the remedial works to confirm that the work was undertaken in accordance with this remediation strategy, relevant legislation and planning conditions.

4.0 Pre-Construction Remedial Works

4.1 Background

A contractor has not yet been appointed by the Client to undertake the pre-construction site enabling and remedial works. Once a contractor has been assigned, they should be aware that remedial works will include the removal of the USTs in the presence of an Environmental Consultant as part of the watching brief.

It is recommended that any earthworks be undertaken under a Material Management Plan (MMP) in accordance with the CL:AIRE Code of Practice to facilitate the reuse of site-won materials. The Contractor should produce the MMP, with the sign-off to be completed by a Qualified Person.

This section of the report outlines the remedial works required prior to commencement of the construction phase of the development. If required, a more detailed Earthworks Specification should be compiled by the Contractor.

4.2 Demolition and Site Clearance

All the previous Site buildings have been demolished to ground slab level.

The Site should be cleared of all residual debris, fly-tipped materials and vegetation that is required to be removed to facilitate the redevelopment of the Site. All material shall be removed to a suitably licensed landfill.

4.3 Excavation, Breaking and Processing of Sub-Surface Structures

4.3.1 Relict foundations, slabs and utilities etc.

All natural or man-made hard materials including concrete slabs, hardstanding, brickwork, foundations, utilities etc. at or below the surface shall be broken out from beneath the development platform. The location and depth of all below ground obstructions remaining during the remedial works / earthworks shall be recorded by the Contractor on the final as built drawing.

All hard materials and arisings recovered during the works which are intended for re-use shall be processed and stockpiled for chemical testing to demonstrate they are suitable for re-use within the proposed redevelopment.

4.3.2 Underground Storage Tank (UST)

Information obtained from the petroleum licencing officer indicates that there are two underground fuel storage tanks located in the northern half of the Site. These tanks are single skinned steel and have been in place since July 1988. Tank 1 has two compartments and held petroleum only. Tank two contained petroleum within two compartments, and diesel in a third. A total capacity of 35,000l of diesel and 85,000l of petroleum was available across these two tanks.

All five compartments were filled to capacity with R22 hard foam on 9th May 2001 as part of decommissioning works. Disconnection of pipework, pumps and vents, and cleaning of the interceptor, was also undertaken on this day.

A further 250g waste oil tank is identified on the site plan, in the southwest corner of the Site. It is not known if this was also filled with R22 hard foam.

The USTs shall be removed by a specialist contractor. The full extents of the USTs will require proving prior to removal of the tank. Reference should be made to the DEFRA document on Decommissioning an Underground Storage Tank (February 2016).

A watching brief should be undertaken for the duration of the tank removal exercise to inspect the surrounding soils for any visual or olfactory evidence of contamination. Verification samples will be taken from the base and sides of the excavation(s) and analysed for petroleum hydrocarbons at a frequency of 1 every 25m² for the base of the excavation, and 1 every 10m² for the sides of the excavation. In the event that hydrocarbon impact to the surrounding soils is determined, the 'hotspot protocol' as described in Section 4.6.2 will be implemented.

4.3.3 Health and Safety

Groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks and in particular the potential presence of contamination 'hotspots' and an appropriate protocol to mitigate exposure of the workforce and general public should be in place.

The Contractor will need to prepare a risk assessment which identifies a safe system of work to handle petroleum hydrocarbon containing soils which is likely to include 'hotspot protocol' training as described in section 4.6.2. The risk assessment will need to identify the appropriate levels of PPE and/or RPE required. This recommendation should be captured in Site health and safety documentation and in maintenance plans.

4.4 Disposal of Water

Any waters encountered within the formation of earthworks excavations shall be chemically assessed and disposed of in accordance with legislation either off-Site or through obtaining a discharge consent which should be issued by the appropriate authority.

Any perched water showing significant contamination should also be appropriately managed and removed from Site, potentially via localised de-watering of the Made Ground and/or superficial deposits.

4.5 Environmental Management

During the remedial works, it will be the responsibility of the Contractor to ensure that the works are managed in an appropriate way as not to further contaminate the ground and/or watercourses and pose a risk to off-site receptors. Particular attention should be made to the potential for nuisance to be caused to the existing residential development site to the west and mitigation measures provided as appropriate, together with a programme of reassurance monitoring.

The works will involve the disturbance of soils which may contain contaminants including petroleum hydrocarbons. The Contractor shall prepare a Construction Environmental Management Plan (CEMP) which shall include measures to prevent the emission of contamination to air and into the wider environment to include (but not limited to):

- Odour suppression as necessary during excavation of contaminated materials – damping down and / or misting as appropriate;
- Use of a wheel wash or road sweeper to address mud on roads;
- Control of water including surface water run-off and water in excavations to prevent escape to adjacent properties and/or watercourses;
- Operation of works only within the times permitted under the planning permission; and
- Details of incident recording procedures.

The Environmental Consultant will undertake the following monitoring during the works to ensure that the works are being managed effectively;

- Watching Brief during the excavation and removal of the USTs, to ensure no gross contamination is present in the soils surrounding the tanks.

4.6 Addressing Previously Unidentified 'Hotspots' of Contamination

4.6.1 Background

As with any 'Brownfield' development, there is a possibility that unknown localised areas of soil contamination (a 'Hotspot') may be encountered during development works. As such, a 'hotspot' protocol is required during the construction phase of the development. The purpose of the protocol is to provide a ready reference should such an area of contamination be identified by visual or olfactory means during the works.

4.6.2 Protocol

Should an area of contamination be identified by visual or olfactory means during development works, the following procedure shall be followed:

- Immediately stop all works in the area where contamination is suspected;
- Immediately inform the Site Agent who should then contact the Environmental Consultant;
- The Environmental Consultant shall provide a verbal response outlining immediate actions with regard to Site Health and Safety and to limit the potential for contaminants to migrate;
- The Environmental Consultant shall judge each occurrence on merit and should it be deemed necessary the Environmental Consultant shall attend Site to oversee the removal of the 'hotspot' and collect validation samples;
- Any excavated material should be isolated from all other material at the Site, on plastic sheeting and covered with plastic sheeting until the material can be tested for contamination and an appropriate disposal route can be identified;
- Any 'hotspot' stockpiles and excavations should be fenced off, have appropriate signage and their locations recorded on a Site drawing;
- Should any excavated material be required to be disposed of at an off-Site location, the material shall be isolated from all other material at the Site prior to disposal at a suitably licensed facility. All documentation associated with the movement and disposal of any such material shall be supplied to the Environmental Consultant shall, including waste transfer documentation;
- Subject to appropriate Site Health & Safety controls (typically comprising fencing off the excavation) the excavation will remain open until the validation has been completed. Alternatively, for Site Health & Safety reasons, it may be necessary to backfill the excavation with Site derived material. In this case, the location of the excavation will be accurately recorded and the excavation reopened if required, based on the validation results; and
- The Regulatory Authorities shall be informed by the Environmental Consultant shall of any remedial activities required and associated validation testing results. Representatives of these organisations may also wish to visit the Site.

Implementation of appropriate measures to deal with such finds remain the Contractor's responsibility.

A copy of the protocol is also presented in Appendix B to be extracted and used on-Site.

4.7 Materials Management

4.7.1 Materials Management for Earthworks

The redevelopment may include earthworks, relating to the excavation and placement of Made Ground / soils which contain contamination, albeit the concentrations within these soils are not considered to preclude them from re-use.

It is recommended that any earthworks be undertaken under a Materials Management Plan (MMP) in accordance with the CL:AIRE Code of Practice to facilitate the reuse of these materials. The Contractor shall be responsible for the preparation of a MMP and obtaining appropriate sign off from a Qualified Person prior to the commencement of earthworks.

4.7.2 Asbestos in Soils - Earthworks

The assessments undertaken to date have not recorded asbestos to be present in site soils. However, based on the historical development of the Site, it is possible Asbestos Containing Materials (ACM) may be encountered during construction works.

The groundworks Contractor should still be made aware of the possibility of encountering potential Asbestos Containing Materials (ACM) within the Made Ground across the Site and an appropriate protocol to mitigate exposure of the workforce and general public should be in place with due respect to his duties under the Control of Asbestos Regulations 2012 and with reference to the Joint Industry Working Group

Asbestos in Soil and Construction & Demolition (C&D) Materials guidance (published by CL:AIRE) titled "Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance" (shortened name CAR-SOIL™). The document was prepared with the support of the Health and Safety Executive and presents the definitive explanation of how the legal requirements of the CAR 2012 have been interpreted to apply to work with asbestos contaminated soil and construction & demolition materials. The guidance is underpinned by the fundamental requirements expressed in the Regulations, in relation to the protection of employees from risks related to exposure to asbestos but is set within a carefully considered framework designed specifically for soil and C&D materials contaminated with asbestos.

The Contractor will need to prepare a risk assessment which identifies a safe system of work to handle asbestos containing soils (if encountered) which is likely to include asbestos awareness training, a protocol for unexpected finds (should gross asbestos material be identified) as well as safe working procedures such as damping down of excavations and stockpiles in line with general dust generation mitigation.

The Contractor shall be responsible for providing appropriate documentation for inclusion within the Verification Report including details of any significant asbestos material encountered.

5.0 Construction-Phase Remediation Works

5.1 Imported Materials and Verification

5.1.1 Pre-Importation Testing

It is anticipated that topsoil will be required to be imported to Site for use in the soft landscaping areas, as suitable soils for reuse in this capacity were not encountered on-Site. A detailed understanding of the provenance of such materials is to be provided to the Environmental Consultant ahead of any further investigation or import. As a minimum, this should include:

- The materials source location;
- The supplier details and proposed quantities for import; and,
- A description of how the soils have been generated (e.g. stockpiled for removal from a site or manufactured at a recognised supplier).

Soil materials being considered for importation shall be sampled at their source or manufacture location prior to import to Site. The soil samples shall be analysed at a UKAS accredited laboratory for the required laboratory chemical analyses and the results of these analyses (as detailed in Appendix C) shall be provided to the Environmental Consultant. Written approval from the Environmental Consultant shall be obtained prior to importing the soil to Site.

Some soil materials that are suitable for use on-Site may also be wastes (not products). Examples of such soils may include soils stripped from other developments prior to construction, soils sourced from third party sites and some manufactured soils. Care is needed when considering these materials for import. Further understanding of the provenance of these materials, additional laboratory chemical analyses and an exemption, permit or other form of regulatory control are likely to be required to be able to utilise these materials within the cover system. Adherence to the Duty of Care Regulations will also likely be required if waste soils are to be recovered in the scheme. The Environmental Consultant should be consulted well in advance of when these types of material are to be utilised. The Environmental Consultant will advise on the acceptability or otherwise of such materials and agree the pathway to be followed.

If chemical data for the soil cannot be provided, then the Contractor shall procure the Environmental Consultant to undertake appropriate testing prior to importation.

Samples shall be analysed for a minimum suite of:

- Asbestos screening;
- pH, heavy metals;
- Total petroleum hydrocarbons; and
- Speciated Polyaromatic Hydrocarbons (16 PAH).

The samples shall be truly representative of the soil to be offered.

One composite sample shall be taken for every 250 m³ of imported soil to be used, with a minimum of 3 No. samples of each soil type shall be tested from each source/supplier.

The chemical criteria against which any imported soils shall be assessed is based on relevant Generic Assessment Criteria applicable at the time of the works for a residential end use, alternatively, Delta-Simons Human Health Generic Assessment Criteria as presented in Appendix C shall be used.

5.2 Ground Gas, Soil Vapour Protection

The data indicates that the Site can be classified as CS2. In accordance with CIRIA C665 (2007) and BS8584:2015 guidance it is recommended that an allowance be made for the installation of gas protection measures within the kiosk building footprint, to mitigate risk of gas accumulation inside buildings.

5.2.1 Ground Gas and Soil Vapour Risk Summary

Given that localised elevated concentrations of methane and carbon dioxide have been identified (above 1% and 5% respectively), the ground gas regime at the Site is classified as CS2 in the north of the site where basic gas protection measures are required to protect the proposed kiosk building and future users.

No sources of volatile vapours have been identified as part of the ground investigation. However, it is possible that hydrocarbon impacted soils are present below the USTs as discussed in Section 4.3.2 and this will be re-assessed during the removal of the USTs.

5.2.2 Installation of Ground Gas Protection Measures

Ground gas protection measures within the kiosk area shall be installed in accordance with BS8485:2015 guidance as appropriate and should be agreed with the Local Authority prior to adoption.

It is recommended that the design and installation of the gas protection measures is carried out by a suitably qualified and experienced subcontractor to meet the requirements of the Local Authority and BS 8485:2015.

BS:8485 provides a scoring system to determine the appropriate protection measures for a proposed development in accordance with the identified ground gas regime. Table 3 of BS:8485 summarises typical UK building types, which for this development will comprise Type B (commercial). Table 4 details the points required for the Characteristic Situation, which for CS2 is 3.5. This can be achieved by a combination of the following:

- Structural barriers (Table 5);
- Ventilation (Table 6); and
- Gas Membrane (Table 7).

The above should be considered in conjunction with the proposed foundation / floor slab design to achieve the minimum score required within BS:8485. It is recommended that the installer of the membranes should have the appropriate qualifications (NVQ Level 2 'Gas Membrane Installations').

5.2.3 Verification of Ground Gas Protection Measures.

In order to meet the requirements of BS 8485:2015 it is recommended that the installation of the gas protection measures is verified by a suitably qualified and experienced specialist independent of the developer.

It is imperative that third party inspection of the membrane and ventilation installation is undertaken whilst the gas membrane is visible.

Engineer's drawings confirming the inclusion of gas protection measures shall be included within the Verification Report.

The developer shall commission independent verification certification/integrity testing as outlined in BS 8485:2015 and photographs of the installed gas protection measures, copies of which should be provided for inclusion within the Verification Report. .

5.3 Water Pipes and Below Ground Utilities / Structures

5.3.1 Background

Concentrations of organic contaminants in soils represent a potential risk to standard plastic water supply pipes. Following the 1992 Foundation for Water Research (FWR) report an update Guidance for the Selection of Water Supply Pipes used in Brownfield Land (UKWIR 2010) has been produced.

Careful selection, design and installation of water supply pipes is required on potentially contaminated sites to ensure that pipelines are satisfactorily installed.

To fully comply with the guidance, a specific and detailed investigation of each pipe route is considered to be required. At the time of the investigations, no information on the specific pipe routes was available.

A specific investigation in compliance with the requirements of UKWIR 2010 and / or the local water supplier has not been undertaken, however, no significant contamination has been identified.

5.3.2 Standard Pipe Materials / Upgraded Pipe Material Requirements

It is recommended that the local water undertaker is consulted by the Client prior to ordering and placement of pipes in order to specify their specific requirements. A United Utilities Risk Assessment (UURA) has been undertaken and it was considered that barrier pipework was required at the Site. The UURA is included as Appendix D.

Details of any upgraded pipework should be provided to the Environmental Consultant for inclusion within the Verification Report.

5.3.3 Clean Service Corridors

Services and utility corridors should be backfilled with clean site won materials. In the event that imported materials are required for this, all material imported to Site for this use should be tested on a ratio of 1 sample per 250 m³ for a range of contaminants appropriate to the source of the material but to include testing for the presence of asbestos as a minimum.

The Contractor shall be responsible for providing the documentation associated with the testing of the imported service trench fill to the Environmental Consultant.

5.3.4 Sulphate Resistant Concrete

The site has been assessed as Class DS-1 for concrete design and the Contractor shall review and confirm the needs for sulphate resistant concrete.

6.0 Verification Reporting & Regulatory Approvals

6.1 General

Following completion of works detailed in Sections 4.0 and 5.0, for each phase of development, an Environmental Consultant shall prepare an Environmental Verification Report on the works for submission to the Local Authority to satisfy relevant planning conditions.

6.2 Verification - Enabling Phase

The Pre-Construction Phase Verification Report shall be produced upon completion of the remediation and any earthworks. This report will include as a minimum:

- Summary of works undertaken;
- Details of waste disposal of any material from the Site including waste transfer documentation and details of the receiving treatment/landfill facility;
- Confirmation of the chemical results, and transfer notes detailing the place of origin of any imported fill;
- Summary of the USTs removal works and details of the watching brief including sampling / analysis of surrounding soils, and;
- A record of any 'hotspots' found during construction and groundworks and the associated actions taken to remove them. This will include details of the chemical analysis of samples taken from these areas, verification that the entire hotspot has been removed as necessary, appropriate classification of the waste, waste transfer documentation, and details of the receiving disposal facility.

6.3 Verification - Construction Phase

The Construction Phase Verification Report will include as a minimum:

- Confirmation of the chemical results, transfer notes detailing place of origin, and details of the placement of any imported soils used in the soft landscaping areas;
- Details of the ground gas protection measures installed along with the required verification information; and,
- Details of the final water pipe material utilised within the development.

6.4 Regulatory Approvals and Planning Condition Discharge

It is intended that this report be submitted to Manchester City Council to support the discharge of likely contaminated land planning conditions (in conjunction with earlier technical reports).

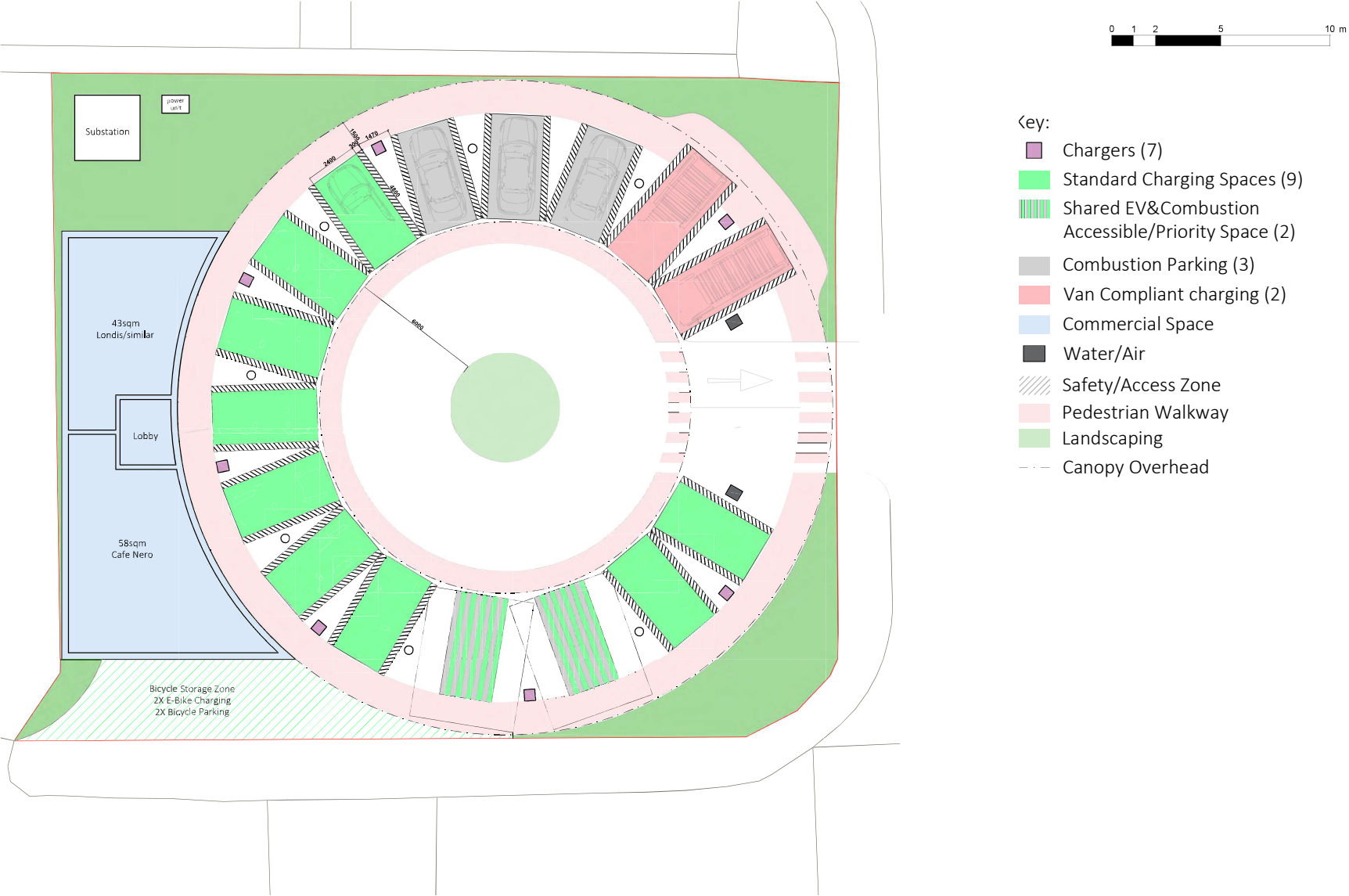
Drawings

Drawing 1 - Proposed Site Layout

WE MAKE Be.EV Reliance Street

2.0 SITE PLAN

Proposed Site Layout



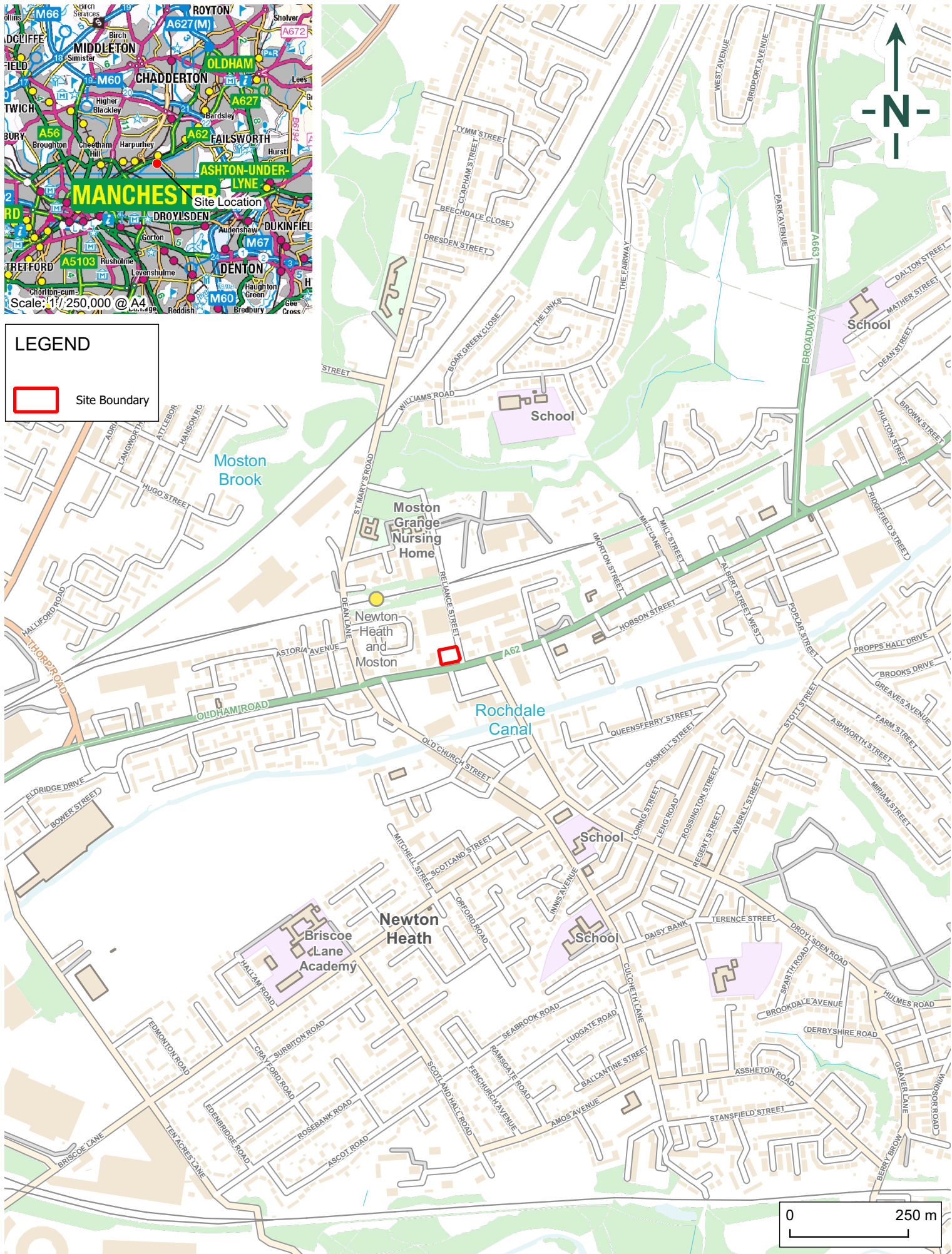
Figures

Figure 1 - Site Location Map



LEGEND

 Site Boundary



Scale: 1:10,000 @ A4

Service Layer Credits: Contains OS data @ Crown Copyright and Database Right 2019

Appendices

Appendix A - Limitations

Limitations

This Report was prepared by Delta-Simons Ltd (Delta-Simons) for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. Delta-Simons does not intend, without its written consent through a formal letter of reliance or warranty, for this Report to be disseminated to any party other than the named Client or to be used or relied upon by any party other than the named Client. Use of the Report by any other party is unauthorised and such use is at the sole risk of the user. Any party using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by Delta-Simons. Unless explicitly agreed otherwise, in writing, this Report has been prepared under Delta-Simons' Standard Terms and Conditions as included within our proposal to the Client.

The recommendations contained within this Report represent Delta-Simons professional opinions, based upon the information detailed within the Report, exercising the reasonable skill and care to be expected of a professional consultant holding itself out as having the competence, experience and resources necessary for the purpose of carrying out similar work in scope and character to the services performed. The Report needs to be considered in the light of the proposal and associated limitations of scope. The Report needs to be read and considered in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the Report.

Where Delta-Simons has obtained, reviewed and evaluated information in preparing this Report from the Client and others and Delta-Simons conclusions, opinions and recommendations has been reasonably determined using this information, Delta-Simons does not warrant the accuracy of the third-party information provided to it and cannot be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

Site surveys document the conditions encountered at the time of survey only and conditions may change due to natural processes or human intervention. As such, surveys represent an assessment at a specific point in time and Delta-Simons cannot be responsible for adverse conditions which arise or become apparent after the time of the survey or for conditions which sit outside the scope for which the survey or Report was commissioned.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work period and on the results of laboratory and field tests performed during the investigation. Ground conditions are inherently variable such that no investigation can be exhaustive to the extent that all adverse conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed or obtained as part of this assessment. It should be noted that groundwater levels vary due to seasonal and other effects and may at times differ to those measured during the investigation. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions. Where risk assessment is undertaken, this is based upon the standards, guidance and common practice at the time of the assessment and Delta-Simons cannot be responsible for conditions which become apparent following changes in guidance or practice or advancements in scientific knowledge which change the position in relation to assessment of risk.

No aspect of this Report constitutes a design. Where this information is used in design, the designer should verify the information has been used appropriately.

Where budgets are prepared and presented within the Report, these are for information only to indicate the likely magnitude of a cost and do not represent an invitation to treat for the works. All budgets and programmes presented should be reviewed and verified by appropriately qualified and experienced independent Project Managers and Cost Consultants.

Appendix B - 'Hotspot' Protocol

Protocol for Addressing Previously Unidentified 'Hotspots' of Contamination

As with any Brownfield development, there is a possibility that an unknown area of soil contamination may be encountered during excavation works. Should an area of contamination be identified by visual or olfactory means the following procedure will be followed:

- Immediately stop all works in the area where contamination is suspected;
- Immediately inform the Site Agent who should then contact the Environmental Consultant;
- The Environmental Consultant will provide a verbal response outlining immediate actions with regard to Site Health and Safety and to limit the potential for contaminants to migrate;
- The Environmental Consultant will judge each occurrence on merit and should it be deemed necessary. The Environmental Consultant will attend Site to oversee the removal of the 'hotspot' and collect validation samples;
- Any excavated material should be isolated from all other material at the Site, on plastic sheeting and covered with plastic sheeting until the material can be tested for contamination and an appropriate disposal route can be identified;
- Any 'hotspot' stockpiles and excavations should be fenced off, have appropriate signage and their locations recorded on a Site drawing;
- Should any excavated material be required to be disposed of at an off-Site location, the material will be isolated from all other material at the Site prior to disposal at a suitably licensed facility. All documentation associated with the movement and disposal of any such material will be supplied to The Environmental Consultant, including waste transfer documentation;
- Subject to appropriate Site Health & Safety controls (typically comprising fencing off the excavation) the excavation will remain open until the validation has been completed. Alternatively, for Site Health & Safety reasons, it may be necessary to backfill the excavation with Site derived material. In this case, the location of the excavation will be accurately recorded and the excavation reopened if required, based on the validation results; and
- The Regulatory Authorities shall be informed by the Environmental Consultant of any remedial activities required and associated validation testing results. Representatives of these organisations may also wish to visit the Site.

Appendix C – Imported Soils Assessment Criteria

Imported Soils Assessment Criteria

The following Generic Assessment Criteria shall apply as absolute limits for all soils imported for re-use as clean cover **regardless of the end use of the Site.**

The criteria selected are based on Residential with Plant Uptake land use scenario on the basis that imported clean cover soils should be 'clean' and not result in an increase in contaminant loading. It may be possible, in some circumstances, to agree alternative, higher criteria with the appropriate regulatory body, however, this is outside of the scope of this assessment.

Soils shall be tested for a suite of contaminants appropriate to the source land use but as a minimum for the contaminants stated below unless otherwise stated within this strategy. The below criteria assume a minimum of 1% Soil Organic Matter.

In addition to meeting the criteria below, imported materials shall be free from deleterious inclusions and shall be free from invasive weeds (Japanese Knotweed).

Any testing for asbestos must be from a UKAS accredited laboratory and the only acceptable criteria is 'Not Detected'. Any detected asbestos, even if reports as <0.001% is not acceptable. Asbestos containing soils must not be used for clean cover materials.

Criteria for Imported Materials			
Compound	GAC	Source	Comment
Arsenic	37	C4SL	
Cadmium	11	LQM	
Chromium (III)	910	LQM	
Chromium (VI)	6	LQM	
Copper	2400	LQM	
Lead	200	C4SL	
Mercury (inorganic)	40	LQM	
Nickel	130	LQM	
Selenium	250	LQM	
Zinc	3700	LQM	
Acenaphthene	210	LQM	
Acenaphthylene	170	LQM	
Anthracene	2400	LQM	
Benzo[a]anthracene	7.2	LQM	
Benzo[a]pyrene	2.2	LQM	
Benzo[b]fluoranthene	2.6	LQM	
Benzo[ghi]perylene	320	LQM	

Criteria for Imported Materials			
Compound	GAC	Source	Comment
Benzo[k]fluoranthene	77	LQM	
Chrysene	15	LQM	
Dibenz[ah]anthracene	0.24	LQM	
Fluoranthene	280	LQM	
Fluorene	170	LQM	
Indeno[123-cd]pyrene	27	LQM	
Naphthalene	2.3	LQM	
Phenanthrene	95	LQM	
Pyrene	620	LQM	
Benzene	0.2	C4SL	
Toluene	130	LQM	
Ethylbenzene	47	LQM	
Xylene - m/p	56	LQM	
Xylene - o	60	LQM	
Total Petroleum Hydrocarbons (TPH)	500		Professional judgement.
Aliphatic EC5-EC6	42	LQM	
Aliphatic >EC6-EC8	100	LQM	
Aliphatic >EC8-EC10	27	LQM	
Aliphatic >EC10-EC12	130	LQM	
Aliphatic >EC12-EC16	500	LQM	Capped at 500 - professional judgement
Aromatic >EC5-EC7	70	LQM	
Aromatic >EC7-EC8	130	LQM	
Aromatic >EC8-EC10	34	LQM	
Aromatic >EC10-EC12	74	LQM	
Aromatic >EC12-EC16	140	LQM	
Aromatic >EC16-EC21	260	LQM	

Criteria for Imported Materials			
Compound	GAC	Source	Comment
Aromatic >EC21-EC35	500	LQM	Capped at 500 - professional judgement
Asbestos	Not Detected		

The respective sources are:

- Soil Guidance Values (SGV) published by the EA;
- Category 4 Screening Levels (C4SLs) published by DEFRA;
- The 2014 Land Quality Management (LQM) / Chartered Institute of Environmental Health (CIEH) Suitable for Use Levels for Human Health Risk Assessment (S4ULs);
- The guidance values produced by the Environmental Industries Commission (EIC), the Association of Geotechnical and Geoenvironmental Specialists (AGS) and Contaminated Land: Application in Real Environments (CL:AIRE) in December 2009; and
- In house Generic Screening Values (DS-GACs) derived by Delta-Simons.

Appendix D - United Utilities Risk Assessment

Supplementary guidance for the selection of water pipes in land potentially affected by contamination

Introduction

In January 2011, UK Water Industry Research (UKWIR) published “Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites” (Ref 10/WM/03/21; the ‘UKWIR Guidance’). Its aim is to ensure that the correct materials are selected for water pipes and components to be used below ground in brownfield sites to protect the quality of drinking water whilst taking into account the service life of the water distribution system. It supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 “Laying Pipes in Contaminated Land” which has been withdrawn.

The UKWIR Guidance is for use by developers, self-lay organisations, water companies and consultants when planning, designing and constructing water mains and/or services in brownfield sites. It defines brownfield sites as “land or premises that have previously been used or developed. They may also be vacant or derelict. However, they are not necessarily contaminated.” The UKWIR Guidance states that it does not apply to greenfield sites; however, we consider this supplementary guidance and the relevant sections of the UKWIR guidance as being equally suitable for application to those greenfield sites considered to be potentially affected by contamination. Where greenfield sites are not affected by contamination a preliminary risk assessment (see below) will suffice.

The UKWIR Guidance also states that there should be no departure from its provisions “*except where formally approved by the Water Company, such departure being technically justifiable or representing advances in knowledge or product development*”.

We have adopted the UKWIR Guidance in principle and produced this company specific supplementary guidance (the ‘UUW Guidance’) which includes the Risk Assessment for Water Pipes (the ‘RA’).

This guidance does not cover operative safety, health exposure modelling or accidental pipe damage.

Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Any application for new water supplies to a development (construction of new properties, or renovation or conversion of existing buildings) in land potentially affected by contamination shall include a completed RA.

As a minimum a desk study (preliminary risk assessment) shall be provided with the RA in accordance with the framework in Environment Agency publication “Model Procedures for the Management of Land Contamination” (ref: CLR11) that sets out whether the land through

which the pipes are to be laid may be affected by contamination. The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination) and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two. There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required and a simple risk assessment will suffice. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. The testing requirements are as described in the following section.

The signatories of the Water Supply Application Form and the RA must ensure that all assessments of land condition have been carried out in accordance with applicable current standards and guidelines by or under the direction of a suitably qualified competent person.

We require the competent person to be a) a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or b) a Specialist in Land Condition (SiLC) with appropriate geo-environmental experience.

How to contact us about the information in this leaflet



DeveloperServicesWater@uuplc.co.uk



0345 072 6067

Opening hours:
8am-5pm Mon to Thurs
8am-4.30pm Fri

Testing Requirements

The soil, rock and if appropriate groundwater tests that are required on all sites where the potential for organic contamination has been identified in the desk study and where water pipes are proposed to be laid must be accredited by United Kingdom Accreditation Service (UKAS) as a minimum and where commercially available the Environment Agency's Monitoring Certification Service (MCERTS). These accredited tests should be undertaken for:

Banded hydrocarbons EC5-EC10, EC10-EC16, EC16-EC40 (Total aliphatic and aromatic hydrocarbons for each banding may be summed). Aliphatic/aromatic fractionation and subsequent banding may be required should a more detailed site specific risk assessment be undertaken. The bandings have been amended to take into account readily available laboratory tests. The equivalent carbon number (EC) is used to assess petroleum hydrocarbon mixtures rather than the actual number of carbon atoms in the molecule in line with guidance issued by the Environment Agency (2005).

Volatile organic compounds (VOCs) (method by head space or purge & trap GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting a wide range of compounds listed in US EPA Method 8260C or similar. The method should include analysis of naphthalene.

BTEX (Benzene, toluene, ethyl benzene and xylenes) plus MTBE (Methyl-tertiary butyl ether) (by head space GCMS)

Semi-Volatile Organic Compounds (SVOCs) (method by GCMS) with tentative identification of compounds greater than 20µg/kg The method used should be capable of detecting the compounds listed in US EPA Method 8270D or similar. The total concentration of SVOCs excludes polycyclic aromatic hydrocarbons, ethers, nitrobenzene, ketones, aldehydes, phenols, cresols and chlorinated phenols. Phenols, cresols and chlorinated phenols which are detected by the SVOC analysis are given their own assessment criteria.

We do not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in the RA below replaces Table 3.1 of the UKWIR Guidance.

Where previous site uses include the use, storage, treatment, disposal or manufacture of any of the following, appropriate testing for these substances will be required:

- Ethers, nitrobenzene, ketones, aldehydes and amines. Note that the presence of amines on any site at the proposed pipe depth +/- 1.0m precludes the use of polyethylene. The methods of analysis and method of calculation of total concentrations of these compounds will need to be agreed with UUW.

To comply with the testing requirements, the suites of tests that are required on all brownfield sites where wrapped steel, wrapped ductile iron or copper pipes are to be laid as minimum must include:

- pH, Conductivity and redox potential

Sufficiency of Testing

Water pipes are normally laid at between 0.75 and 1.35m from finished ground level to crown of pipe. Samples taken and tested must represent both a) the soil in which the water pipes are to be laid and b) the soil down to at least 500mm below the underside of the proposed pipe. Where the proposed depth of the pipes is unknown at the time of application, soil samples representative of the ground condition between surface level and 1.5m below finished ground level shall be taken as a minimum. Where appropriate (see UKWIR Guidance) groundwater sampling and groundwater monitoring will also be necessary. Photo-ionisation detection (PID) monitoring along the proposed route of the pipeline may be employed, though this does not provide a definitive guide to the suitability of water pipe materials.

Where required a sufficient number of test results should be obtained from the material in which the pipes are to be laid. CLAIRE/CIEH 2008 "Guidance on comparing soil contamination data with a critical concentration" may be used, where appropriate, to justify the number of soil samples tested; however, this statistical model should not be used on heterogeneous materials or used to average test results from different types of materials.

Further guidance on representative sampling is contained within BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, the Department of the Environment's Contaminated Land Research Report "Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4; 1994) and the Environment Agency's "Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR; 2000).

Where remediation has been carried out on the site, the test results obtained from validation samples will be used in the assessment. Where a horizontal capping system has been or will be employed using materials spread across a site, sufficient samples will need to be taken to characterise the capping material used and the results presented to UUW. However, the sufficiency of sampling on the horizontal capping system, in which the pipeline will be placed, may be assessed on the basis of the source, quantity and type of materials used.

Detection Limits

Only positive concentrations, ie those above the limit of detection should be used in summation of VOC and SVOC (or other test groups of compounds ie phenols, cresols and chlorinated phenols). Laboratory methods shall provide a minimum limit of detection of 10µg/kg for each individual VOC or SVOC (or other test groups of compounds) quantitatively detected in accordance with the methods described above. For tentatively identified compounds (TICs), only those compounds with a concentration of 20µg/kg or greater shall be used in the summation of VOC and SVOC (or other test groups of compounds).

Protective Measures

Where polyethylene, ductile iron, steel or copper pipes are to be laid on a brownfield site or other land potentially affected by contamination (whether or not it has been remediated) and where the concentrations exceed the generic guideline values set out in Table 1 of the RA, the developer shall provide either:

- a) a robust risk assessment to show how any contaminants will not significantly impact on proposed water supplies or buried assets over the lifetime of the assets; or
- b) more suitable pipe materials; or
- c) an engineering solution to protect the pipe work backed up by an adequate assessment of the risk.

Liquid free phase product (e.g. oil or free solvent layers) shall not remain in the ground or groundwater in the vicinity of water pipes, whether barrier pipe or any other pipe materials are used.

When designing pipe routes on land potentially affected by contamination, new preferential contamination pathways along the route of new water pipes shall not be created. Particular measures may be required to prevent the possible migration of contamination through pipe bedding and into controlled waters.

References

BS10175: 2011

“Investigation of Potentially Contaminated Sites Code of Practice”

CLAIRE/CIEH

“Guidance on comparing soil contamination data with a critical concentration” 2008

Department of the Environment Contaminated Land Research Report

“Sampling strategies for contaminated land”
prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4) 1994

Environment Agency

“Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination”
(ref: R&D Technical Report P5-066/TR) 2000

Environment Agency

“Model Procedures for the Management of Land Contamination” (ref: CLR11), 2004

Environment Agency P5-080/TR3

“The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils”, 2005

UK Water Industry Research (UKWIR)

“Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites” (Ref 10/WM/03/21) January 2011

Water Regulations Advisory Scheme (WRAS)

Information and Guidance Note 9-04-03

“Laying Pipes in Contaminated Land” 2002

Frequently asked questions

Why has UUW published supplementary guidance to the 'UKWIR Guidance for the Selection of Water Pipes to be used in Brownfield Sites'?

UUW agrees with the UKWIR Guidance in principle; we have published supplementary guidance to clarify some of the areas in which it will operate.

Does the UKWIR Guidance only apply to 'brownfield sites'?

Yes, the UKWIR Guidance does apply to brownfield sites; in addition United Utilities Water will apply this guidance and the UUW supplementary guidance to any greenfield sites which are potentially affected by contamination.

Who is responsible for completing/ signing the Risk Assessment for Water Pipes (RA)?

This may be the Developer, the Developers representative, or the competent person directing the land assessment. The signatory of the Risk Assessment for Water Pipes (RA) must ensure that all land assessments have been carried out in accordance with current standards and guidelines by or under the direction of a suitably qualified competent person. For water supply applications on land potentially affected by contamination, UUW requires the competent person to be either a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or a Specialist in Land Condition (SiLC). This level of competency is intended to promote good practice and high professional standards and is no greater than that required for planning purposes by Local Authorities.

Do we need to agree the number and location of soil samples with the Water Company as indicated by the UKWIR guidance following the Preliminary Risk Assessment (PRA)?

Where a preliminary risk assessment (PRA) highlights the need for a site investigation UUW considers it is a responsibility of the qualified competent person directing the land assessment to determine the location and frequency of sampling. UUW's role would be to confirm that the appropriate

choice of pipe material has been made on the basis of the information provided.

What do we do if the pipe route is not known when the Site Investigation report is commissioned?

Where the route of the pipe is not known at the site investigation stage, then any resultant pipe selection needs to take account of any contamination found on the site. Consideration should be given to identifying the route and depth of the pipeline at the site investigation stage to avoid unnecessary testing.

Is it acceptable not to undertake a site investigation and specify the use of barrier pipe which seems to be suitable for all conditions?

Not all brownfield land is contaminated, and because of that a default to barrier pipe is not an acceptable approach to UUW, due to the possibility of higher installation and future maintenance costs. The approach as to whether a site investigation is needed should be risk based. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the ground materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials.

Examples where defaulting to barrier pipe would not be acceptable:

- Where a capping layer (non-contaminated) is introduced within which the pipes will be installed.
- Sites with a potential low risk for contamination.
- Where liquid free phase product (e.g. oil or free solvent layers) is in the ground or groundwater in the vicinity of water pipes.
- Where the route of the pipe could be diverted to another suitable location free from contamination.

Are UUW employees who will assess the Design Proposals for contaminated sites suitably qualified?

It is the role of the Developer's suitably qualified competent person to deal with or direct the assessment of land. UUW's role is to assess the Risk Assessment for Water

Pipes and supporting Site Assessment Report (SAR) which is provided with any new water supply application (ie. it has been provided in the correct format, proposals for pipe selection are included, the methodology is in line with the UKWIR Guidance and UUW Supplementary Guidance, it has been directed by a suitably qualified competent person etc.). If UUW do need to provide assistance or information in deciding pipe materials then the assessment would be carried out under the direction of a suitably qualified competent person.

What happens to existing PE that is in the ground under the "old" guidelines?

The latest UKWIR guidance and UUW's supplementary guidance are intended to be used to decide what pipe materials will be used for new water mains and services. It will have no effect for developers with regard to any parts of UUW's existing network.

Will the Developer be required to submit a fully completed Risk Assessment for Water Pipes (RA) and supporting Site Assessment Report (SAR), including pipe material recommendation, for both the option of a mains requisition application and the option of a self-lay application?

Yes, UUW expect the 'Developer', as defined in UUW Supplementary Guidance, to submit a Risk Assessment for Water Pipes (RA) and supporting Site Assessment Report (SAR), including pipe material recommendation, in respect of any water pipes being installed on the development irrespective of who is to install them.

Does Table 1 in UUW's Risk Assessment for Water Pipes (RA) replace any of the tables to be completed in the Site Assessment Report (SAR) as required in the UKWIR Guidance?

UUW does not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in UUW's RA replaces Table 3.1 of the UKWIR Guidance.

Have any other Water Companies adopted the UKWIR Guidance yet?

You will need to contact the water company concerned if you are intending to install water pipes outside UUW's licensed area.

About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

Risk assessment for water pipes (RA)

The risk assessment for water pipes will help you choose appropriate materials for your development. We are happy to deal with a risk assessment for water pipes in advance of any formal application for a new water supply.

If you need any help completing the form please call us on **0345 072 6067**.

Section 1: Development details	
Development name (<i>if it has one</i>)	Reliance Street, Manchester
Development address	Land off Reliance Street, Manchester, M40 1EZ.
OS Grid reference (<i>mid point</i>)	388070, 400730
Developer's name	Be.EV
UUW reference number (<i>for UU use only</i>)	
Please provide details below of the current and historical use of the site and adjacent sites. <i>If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report.</i> Please see Reliance Street Preliminary Risk Assessment by Delta-Simons, dated September 2022 (ref: 22-1496.01), section 2.4. Site is a former Petroleum Filling Station. The above ground structures have been demolished but the underground fuel storage tanks (USTs) remain in-situ. It is understood that the tanks and associated pipework have been decommissioned, and the tanks filled with R22 hard foam. A further below ground waste oil tank is present on Site but is not known to have been remediated.	
Section 2: Preliminary risk assessment	
Has your desk study and site walkover identified any land potentially affected by contamination?	☒ Yes ☐ No
If the site is potentially affected by contamination but you have not completed any intrusive site investigation please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i> A site investigation undertaken in November 2022 (see Delta-Simons' report Geo-Environmental Assessment, ref 22-1496.04, dated December 2022) identified concentrations of PAH compounds above screening criteria protective of groundwater resources in water samples collected from the north-western corner of the Site. An oil sheen and odour was also noted during soil logging and groundwater monitoring in this vicinity. A water pipe assessment was not undertaken at the time of the site investigation, but has been undertaken below. The recorded concentrations of potential contaminants taken from the site investigation data have exceeded screening criteria protective of water supply for a number of potential contaminants. Investigation has not been undertaken below the USTs so it is not known if further impacted soil is present here. it has been recommended that a watching brief is undertaken for the removal of the tanks so that this can be assessed.	

Section 3: Intrusive site investigation																																	
Have you completed any intrusive site investigation?						☒ Yes ☐ No																											
Have you completed any none intrusive site investigation?						☒ Yes ☐ No																											
Date(s) when the site investigation(s) undertaken						<table border="1"> <tr> <td>2</td><td>1</td><td>1</td><td>1</td><td>2</td><td>0</td><td>2</td><td>2</td> </tr> <tr> <td>3</td><td>0</td><td>1</td><td>1</td><td>2</td><td>0</td><td>2</td><td>2</td> </tr> <tr> <td>2</td><td>0</td><td>1</td><td>2</td><td>2</td><td>0</td><td>2</td><td>2</td> </tr> </table>				2	1	1	1	2	0	2	2	3	0	1	1	2	0	2	2	2	0	1	2	2	0	2	2
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3	0	1	1	2	0	2	2																										
2	0	1	2	2	0	2	2																										
At what level has groundwater been encountered?						0.9-2.98 metres below ground level or ☐ Not encountered																											
Table 1 (Pipeline Selection Risk Assessment Summary (PSRAS)) below classifies testing required where the preliminary risk assessment has identified land potentially affected by contamination. Please provide details below of any test groups which have not been tested and the rationale for not testing. <i>If your supporting information has details of the rationale behind not testing any particular test groups, please reference below the relevant sections of your report.</i> Aldehydes are not included within the standard SVOCs suite used by Delta-Simons. There is no evidence that this has been used on Site, so has not been added to the testing.																																	
If the intrusive site investigation has identified concentrations above the PE threshold (see PSRAS) and your intended pipe selection is PE. Please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i> Data supports use of barrier pipe on Site. The route of the pipe is currently unknown.																																	
Section 4: Site remediation																																	
Please provide details below of any site remediation (which may include a change in site levels) already completed. <i>If your supporting information has details of the site remediation already completed, please reference below the relevant sections of your report.</i> No site remediation has yet been completed. Works proposed as per Delta-Simons' Remediation and Verification Strategy, dated March 2023 (ref: 87687.557155).																																	
Has the PSRAS (Table 1) been completed using appropriate data after remediation?								☐ Yes ☒ No ☐ N/A																									
Please provide details below of any proposed site remediation and an analysis of whether this will affect your intended pipe selection. <i>If your supporting information has details of any proposed site remediation and whether this will affect your intended pipe selection, please reference below the relevant sections of your report.</i> Works have been completed prior to remediation. It is intended that only visually impacted soils will be removed, at the point of tank removal. When all tanks, associated infrastructure and visually impacted material have been removed, the sides and base of the excavation will be sampled to ensure that the material left in-situ is suitable to remain.																																	

Section 5: Final use of site

Please provide details below of any chemicals (including fuel) to be stored on site and any other future contamination risks which may affect your intended pipe selection.

If your supporting information has details of potential contamination risks which may affect your intended pipe selection, please reference below the relevant sections of your report.

The final use of the Site is intended to be an electrical vehicle charging station with retail kiosk. It is not known that significant chemical storage is included within the intended redevelopment.

Concentrations of contaminants which exceed screening criteria for PE pipe use are found across Site, therefore it is recommended that any water pipes serving the kiosk should be barrier pipe.

What water pipe materials are intended to be used on site?

☐ PE ☒ PE Barrier Pipe Type A ☐ PE Barrier Pipe Type B
Other (please specify): x

Section 6: Additional information

Please use the section below to provide any additional details to support your intended pipe selection.

Section 7: Risk assessor

Name and relevant qualifications of person directing the risk assessment for water pipes

Dr. Richard Howarth BSc, Msc, PhD, FGS CSci

Name and address of risk assessor's company

Delta-Simons
Suite 4a
1 Portland Street
Manchester
M1 3BE

Date risk assessment performed

1 3 0 3 2 0 2 3

Section 8: Declaration

I confirm I have completed this form and provided supporting information in accordance with 'UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' and UUW's Supplementary Guidance. I also confirm that if any further site investigation is needed and carried out, I will be required to submit an additional Risk Assessment for Water Pipes with the relevant supporting information. I understand that failure to supply any of the required information may delay my application being processed.

Name	Jessica Muckle	Company	Delta-Simons
Telephone	07458 021143	Date	1 3 0 3 2 0 2 3

Please email the completed form and supporting information to **DeveloperServicesWater@uuplc.co.uk** or post to us at United Utilities Water, Developer Services, Second floor Grasmere House, Lingley Mere, Warrington WA5 3LP.



About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Warrington WA5 3LP.
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Table 1 - Pipe selection risk assessment summary (PSRAS)

1. Testing must be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. Please use the appropriate testing data to complete Table 1 below.

2. If more than one pipe selection is being made, for example, for pipes in different areas of a large site, a completed PSRAS is required for each selection.

What materials have been tested to populate Table 1 below?

☒ Existing ground materials ☐ Remediated materials ☐ Imported capping materials

All concentrations in mg/kg								
Test Group	Testing Required?	PE threshold	Metal Pipes/ Barrier Pipe	Laboratory Detection Limit	Testing UKAS accredited Y/N	Maximum concentration at proposed pipeline depth See Note [2]	Maximum site concentration See Note [3]	Locations and depths where concentrations exceed proposed pipeline threshold
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	0.001	Y	ND	ND	-
Total BTEX & MTBE		0.1	Pass	0.001	Y	ND	ND	-
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	0.3	Y	18.6	18.6	DS101 0.5-0.6 m; DS102 0.9-1.1 m; DS103 0.6-0.7 m; DS108 0.8
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	0.001	Y	ND	ND	-
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	2.0	Y	32	32	DS102, 0.6-0.8 m; DS103 0.6-0.7 m
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	10	Y	1376	1376	DS102, 0.6-0.8 m; DS104 0.4-0.5 m; DS105 0.4-0.5 m; DS108 0.8
Phenols* (from SVOC analysis)		2	Pass	0.2	Y	ND	ND	-
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	0.3	Y	0.6	0.6	-
Ethers*	Only where identified	0.5	Pass	0.2	Y	ND	ND	-
Nitrobenzene*		0.5	Pass	0.3	Y	ND	ND	-
Ketones*		0.5	Pass	0.2	Y	2.5	2.5	DS101 0.5-0.6 m; DS103 0.6-0.7 m; DS108 0.8-1.0 m
Aldehydes*		0.5	Pass	-	-	-	-	-
Amines		Fail	Pass	0.2	Y	ND	ND	-
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]					

Note [1] Threshold: For wrapped steel, corrosive if pH<7 and conductivity > 400µS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity > 400µS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

Note [2] Water pipes are normally laid at 0.75-1.35m below finished ground level.

Note [3] Also state if liquid free product is present in soil or groundwater.