

Validation Completion Report

For a site at

Blackrock Street, Manchester

Undertaken for

John Southworth Builders Ltd

Report Title:	Blackrock Street, Manchester Validation Completion Report
Report Reference:	8850G-WML-XX-ZZ-RP-G-0004
Client:	John Southworth Builders Ltd
Issue Date:	15th September 2021
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Revision Status / History

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1.0 INTRODUCTION

Appointment

- 1.1 WML Consulting (WML) has been commissioned by John Southworth Builders Ltd to prepare a Validation Report in relation to development of a section of Blackrock Street, Manchester.

Proposed Development

- 1.2 The project comprised the construction of 22no low rise residential structures, of Passive House design, with hardstanding for access and parking together with private gardens and amenity landscaping.
- 1.3 A copy of the proposed development plans by GWP Architecture is presented in Appendix 01.

Background

- 1.4 WML were initially commissioned to undertake a Phase 1 Desk Study and Phase 2 Investigation and Assessment. These culminated in the following reports.
- Phase 1 Desk Study and Preliminary Geoenvironmental Assessment Report, Reference 8850G-WML-00-XX-RP-G-0001, dated June 2019.
 - Phase 2 Geo-environmental Investigation and Assessment, Reference 8850G-WML-00-XX-RP-G-0002, dated January 2020.
- 1.5 Subsequently WML produced the following report in consideration of the need for remedial measures to be outlined and agreed as a pre-development requirement.
- Remediation Strategy, 8850G-WML-00-XX-RP-G-0003, dated February 2020.
- 1.6 The reports have been presented to Manchester City Council Planning Division in support of Planning Application No. 125383/FO/2019.

Verification

- 1.7 This report presents the compilation of the remediation / validation information obtained during the redevelopment programme associated with the capping of soft landscaping as identified within the Remediation Strategy.

2.0 SUMMARY OF ENVIRONMENTAL CONDITIONS

- 2.1 The following paragraphs summarise the most relevant findings of the Phase 1 and Phase 2 reports.
- 2.2 The site is indicated by the BGS to be underlain by Devensian Glacial Till underlain by the Carboniferous Etruria Formation which comprises mainly sandstone and mudstone. The Phase 2 investigation determined that risk from mining within shallow coal seams and non-coal mining activities at the site is also considered to be low.
- 2.3 The property is not in a radon affected area as defined by the BGS/Public Health England as less than 1% of properties are above the action level of exposure.
- 2.4 The superficial deposits underlying the site are classified as a 'Secondary (Undifferentiated) Aquifer'. The underlying bedrock is classified as a 'Secondary (A) Aquifer'. However, the site is not within an Environment Agency Source Protection Zone (SPZ) and there are no groundwater abstraction licences within 500m of the site.
- 2.5 There are no surface water features recorded within 250m of the site.
- 2.6 There are no active or historic landfill sites recorded within 500m of the site.
- 2.7 There is 1no potentially contaminative industrial site within 250m of the subject site. This relates to an electricity sub-station 93m north.
- 2.8 The earliest map dated 1848 indicate the majority of the site to have been undeveloped in rural / agricultural use with a field pond in the north-western corner of the site. By 1891 the field pond had been infilled and Albert Road had been constructed along the northern site boundary. By 1906 the site had been developed with residential terraced housing along Albert Street to the north and Blackrock Street to the east. These remained until sometime between 2002 and 2010 when the site was cleared.

Ground Conditions

- 2.9 Ground investigation work was undertaken by LOT Geotechnics Ltd on 16th December 2019. This comprised the formation of 7no window sample probeholes to a maximum depth of 5.00 metres below ground level (mbgl) and 3no hand excavated trial pits to a maximum depth of 0.30mbgl.
- 2.10 Ground conditions encountered during the intrusive investigation comprise made ground to depths of between 1.70m and 2.50mbgl, this being underlain by glacial till to a maximum proven depth of 5.00mbgl.
- 2.11 Standing groundwater was measured within the standpipes at depths of between 1.30m and 2.30mbgl.
- 2.12 Chemical analysis indicated several exceedances of CoCs within the Made Ground, when compared to the current LQM/CIEH (Suitable 4 Use Levels (S4ULs) reference values for residential with plant uptake. These relate to localised concentrations of arsenic, lead and mercury within samples of shallow made ground all obtained from <0.40mbgl. No asbestos fibres were detected in any of the samples analysed.
- 2.13 Risks to controlled waters from the site were considered low with no environmental remediation considered necessary.
- 2.14 Ground gas monitoring, primarily for methane and carbon dioxide, with associated flow rates, was undertaken on 6no occasions between 20th January and 23rd March 2020.

- 2.15 The results indicate concentrations of peak and steady state methane not exceeding 0.1% by volume in air (v/v) and peak and steady state carbon dioxide concentrations not exceeding 2.2% v/v. No detectable ground gas flows have been recorded during the monitoring visits.
- 2.16 The results give a maximum composite Qhg value of 0.0022l/hr and indicate the site to classify as Characteristic Situation (CS) 1 – Very Low Gas Risk', with no specific gas protection measures required.

3.0 SUMMARY OF REMEDIATION OBJECTIVES

3.1 The following objectives were outlined in the Remediation Strategy.

Capping Requirements for Private Gardens

3.2 As the level of contamination in the made ground rendered it unsuitable for direct use beneath proposed landscaped areas, development were to include the provision of a clean cover over the made ground to break the direct contact pollution linkage.

3.3 Subsequently, all new landscaped areas were to be capped with a nominal 600mm clean cover over the existing made ground to break the direct contact pollution linkage. The make-up of the 600mm cover would be expected to comprise from the top down of:

- 150mm (minimum) of clean imported Topsoil;
- 450mm of clean imported sub-soil.

3.4 The following were also to be provided.

- Results of chemical analysis of imported Topsoil/sub-soil to confirm compliance with the Site Specific Assessment Criteria.
- Records of the volumes and suitability of all imported fill, Topsoil and sub-soil delivered to site in the form of certificates.
- Photographic evidence of suitable sub-soil/Topsoil cover in gardens where underlain by Made Ground.

General

3.5 The following additional information was also to be provided.

- Details of any unexpected ground contamination (soils and groundwater) and the measures undertaken to deal with this, to include records of excavation, the results of chemical analysis resulting from the removal of contaminated soil and / or groundwater.
- Sample waste management records confirming compliance with Duty of Care regulations.
- Confirmation of potable water supply pipe materials.

3.6 On completion of the Remediation Works, a Validation Report including the information as summarised above was to be submitted to the Local Planning Authority for approval.

4.0 VALIDATION

Unforeseen Ground Contamination

- 4.1 No evidence of contamination, unusual ground conditions, organic materials such as peat, and/or asbestos have been reported to WML during the construction phase of the works.
- 4.2 Furthermore, no evidence of such was reported by WML during the visits to site to inspect the building construction works.

General Groundworks

- 4.3 Due to the low levels of contamination within the existing topsoil and made ground, together with the requirement to maintain site elevations in association with the existing road network, all site-derived soils were removed from site to an appropriate landfill.

Imported Topsoil / Subsoil

- 4.4 No suitable site-won topsoil or subsoil was available for re-use at the site for the capping of proposed garden areas. Therefore, all topsoil required for use as capping soil was imported to site via Freeland Horticulture Limited from a source referred to as in Astley, Greater Manchester.
- 4.5 A clean granular material used as a subsoil was obtained via PP O'Connors direct from:

Fletcher Bank Quarry
Manchester Road
Ramsbottom
Greater Manchester
BL0 0DH
- 4.6 Chemical analysis carried out at source indicated the soils were suitable for reuse and are presented in Appendix 03 and Appendix 04 respectively.
- 4.7 After import of the capping soils, WML attended site on 31st August 2021 in order to obtain samples from the emplaced soil in order to submit them for chemical analyses and to check the thickness of the capping strata.
- 4.8 During the inspection four samples of the imported topsoil (Plot 5C, Plot 8D, Plot 11F and Plot 16H) and four samples of the imported subsoil (SS1, SS2, SS3 and SS4 from Plot 5C, Plot 8D, Plot 11F and Plot 16H respectively) were obtained. The samples, were submitted for chemical analyses and the test results are presented in Appendix 05.
- 4.9 Comparison of these results with the Assessment Criteria for 'residential with home-grown produce' as provided within Appendix 06, indicates that none of the relevant criteria were exceeded. Therefore, the soil was considered suitable, in terms of contamination levels, for the intended use.

Capping Thickness

- 4.10 The capping thicknesses were also verified by WML with the formation of hand excavated validation pits on 31st August 2021 within Plots 5, Plot 8, Plot 9, Plot 11 and Plot 16. During the inspection Plots 1 to 3 were in the process of being completed. It has since been confirmed that these have been suitably capped.
- 4.11 The imported topsoil generally comprised a dark brown, variably gravelly, organic sand with rootlets and small woody fragments. The imported subsoil generally comprised a greyish brown, gravelly sand/ sandy gravel.

- 4.12 Photographs of the validation pits are provided in Appendix 02 and indicate generally 400mm to 450mm of subsoil and 150mm to 200mm of topsoil in all garden areas.
- 4.13 A drawing showing the locations of the validation pits, referenced 8850G – SK01, is presented in Appendix 01.

Testing Volumes

- 4.14 Approximately 700m³ of capping soils were imported to site for use in the garden areas. This comprised approximately 233m³ of topsoil from Freeland Horticulture and 467m³ of subsoil from Fletcher Bank Quarry. This equates to a sampling regime of imported topsoil undertaken at a ratio of one sample per 58m³ and imported subsoil at a ratio of one sample per 117m³. When the source samples are included this reduces the ratio to one per 47m³ and 1 per 93 m³ respectively.

Water Supply Pipes

- 4.15 United Utilities Water were consulted with regards the selection of suitable water supply pipe materials for the development. In light of the ground conditions encountered, the requirement for specific materials and measures to protect the water supply from ground contamination was not required. A copy of the United Utilities Risk Assessment is presented in Appendix 07.

5.0 CONCLUSIONS

Capping Requirements for Garden / Landscaped Areas

- 5.1 Clean imported topsoil and subsoil were found to be generally emplaced to depths of at least 600mm. The Topsoil and sub-soil have been confirmed by chemical analysis to generally conform to appropriate site specific assessment criteria.
- 5.2 Therefore, as far as can be established the pre-occupation works required in relation to the relevant Planning Conditions have been undertaken to a reasonable standard of workmanship and appropriately validated.

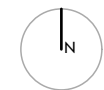
APPENDIX 01

Drawings



For plot levels see Block drawings from: 0040 - 0050

Trees in highway subject to agreement with statutory authorities. See drawings: (PA) 0004 Plot Boundaries, Highway Adoption Status & Sectionals (PA) 0005 Landscape Plan & Plant Schedule (PA) 0007 Tree Pit Detail



PHASE 1

Existing Development	
3b4p Home	4
2b3p Home	12
4b5p Home	2
Total Dwellings	18

PHASE 2

2b3p Home	4
Total Dwellings	4
Total Dwellings All	22

Wall to Street Frontage

Unadopted Land - Potential for additional green / garden space. TBD.

Soft Landscaping

Existing Trees - To be retained where possible, subject to tree survey

Omitted Trees

Proposed Trees

Entrance / Aspect

Proposed Site Development Boundary TBC

Bike Store - Tiger Low Pent Compact 7X3 Timber Bike Shed. Capacity- 2x Bicycles (refer to drawing 0008-Bike storage)

200l Water butts

Tarmac Roads / Paths

Dwelling Paving. 450 x 450 PCC natural finish paving flags.

Private car parking. Hot rolled tarmac w/natural pin kerb edging.

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Scale - 1:500 @A3

C01	18.08.20	Construction Issue	CT	DT
P03	22.04.20	General Update	CT	DT
P02	06.04.20	Final Tender issue	CT	DT
P01	28.02.20	Tender issue	JA	DT
Rev	Date	Comment	Dr	Ch

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Job Reference (299)1926

Job Title Blackrock Street

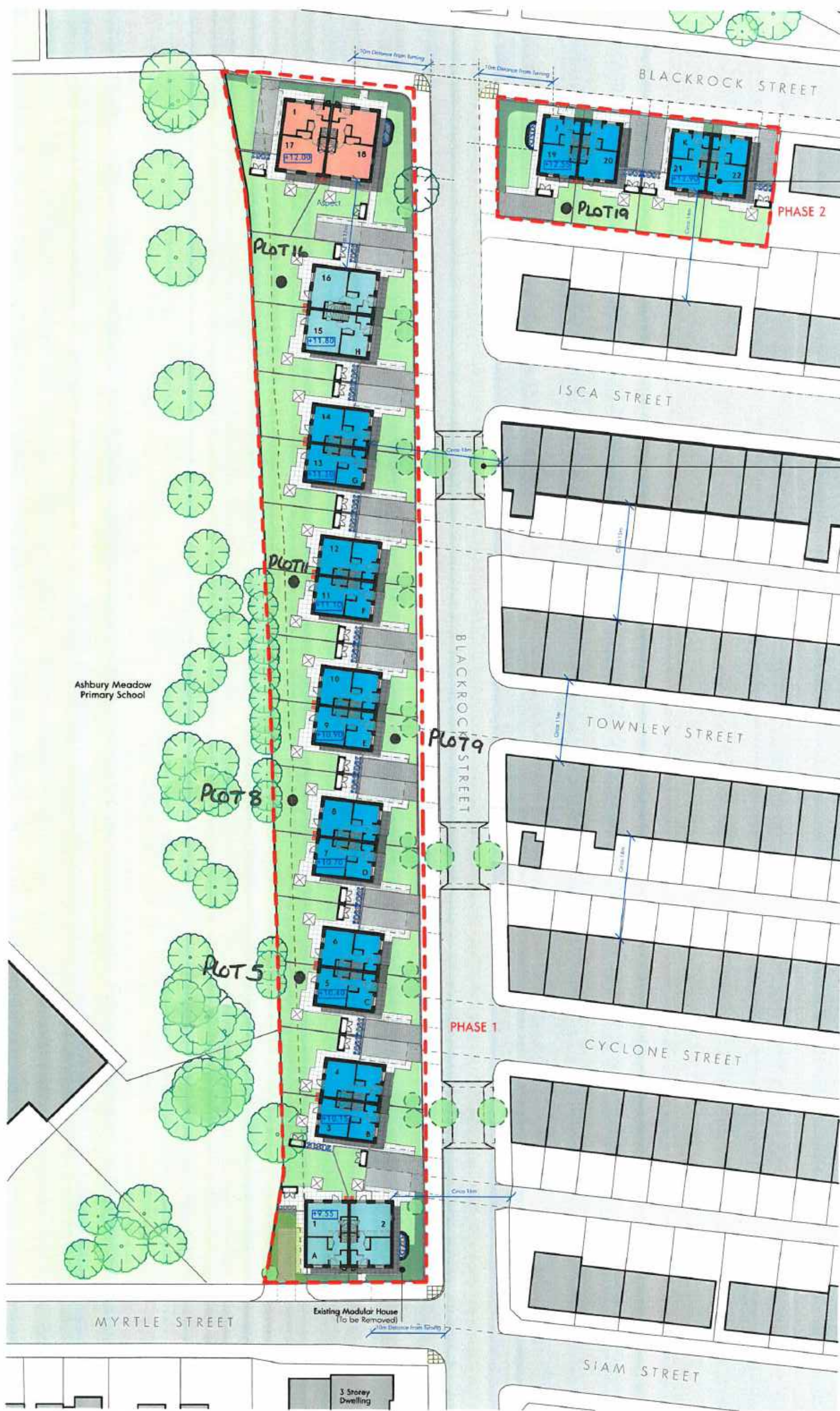
Client one manchester

Proposed Site Plan			
Name	1926-GWP-00-00-DR-A-(00)-0003		
Scale	1:500@A3	Revision	C01
Drawn/Checked	JA / DT	First Issue	28.02.20
Drawing Status	A - Construction		



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For plot levels see Block drawings from: 0040 - 0050

Trees in highway subject to agreement with statutory authorities. See drawings: (PA) 0004 Plot Boundaries, Highway Adoption Status & Sectional; (PA) 0005 Landscape Plan & Plant Schedule; (PA) 0007 Tree Pit Detail



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	Total Dwellings	4
	Total Dwellings All	22

	Wall to Street Frontage
	Unadopted Land - Potential for additional green / garden space. TBD.
	Soft Landscaping
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Blackrock Street (299)1926

one manchester

WMLCONSULTING

Project: **BLACKROCK ST**

Drg Title: **VALIDATION PLAN**

Job No: **88506** By: **TPB**

Drg No: **SK01** Rev: **-**

Date: **31/8/21** Scale: **1:500**

GWP

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INTERIOR DESIGNERS
SCAPE PLANNERS
PROJECT MANAGERS
LANDSCAPE ARCHITECTS

Blackrock House | Level 3, 110-112, 114-116, 118-120, 122-124, 126-128, 130-132, 134-136, 138-140, 142-144, 146-148, 150-152, 154-156, 158-160, 162-164, 166-168, 170-172, 174-176, 178-180, 182-184, 186-188, 190-192, 194-196, 198-200, 202-204, 206-208, 210-212, 214-216, 218-220, 222-224, 226-228, 230-232, 234-236, 238-240, 242-244, 246-248, 250-252, 254-256, 258-260, 262-264, 266-268, 270-272, 274-276, 278-280, 282-284, 286-288, 290-292, 294-296, 298-300, 302-304, 306-308, 310-312, 314-316, 318-320, 322-324, 326-328, 330-332, 334-336, 338-340, 342-344, 346-348, 350-352, 354-356, 358-360, 362-364, 366-368, 370-372, 374-376, 378-380, 382-384, 386-388, 390-392, 394-396, 398-400, 402-404, 406-408, 410-412, 414-416, 418-420, 422-424, 426-428, 430-432, 434-436, 438-440, 442-444, 446-448, 450-452, 454-456, 458-460, 462-464, 466-468, 470-472, 474-476, 478-480, 482-484, 486-488, 490-492, 494-496, 498-500, 502-504, 506-508, 510-512, 514-516, 518-520, 522-524, 526-528, 530-532, 534-536, 538-540, 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APPENDIX 02

Photographs



Photograph 1
Compacted subsoil to Plot 3 during installation.



Photograph 2
View south along rear gardens from Plot 6 to Plot 1 in the background.



Photograph 3
Plot 5 rear garden with 600mm capping.



Photograph 4
Plot 5 rear garden with 600mm capping.



Photograph 5
Rear garden of Plot 8 with 600mm capping.



Photograph 6
Plot 8 rear garden.



Photograph 7
Plot 8 rear garden with granular subbase just visible.



Photograph 8
Plot 11 rear garden.



Photograph 9
View from Plot 11 to Plot 17.



Photograph 10
Plot 16 rear garden



Photograph 11
Plot 19 rear garden with granular subbase visible on the surface.



Photograph 12
Plot 19 rear garden with granular subbase visible at 150mm.



Photograph 13
Plot 10 to 16 front gardens with granular subbase just visible.



Photograph 14
Plot 9 front garden.



Photograph 15

Plot 9 front garden with 600mm of capping and granular sub base just visible at 400mm.

APPENDIX 03

Chemical Analyses from Source - Topsoil



Freeland Horticulture Ltd
Rosedale Nursery
College Road
Hextable
Kent BR8 7LT

Attention: Philippa Lambourne

Our Ref: SLC-924-SA

6 May 2021

Dear Philippa

Topsoil Analysis Report: Astley, Greater Manchester Topsoil – May 2021

We have completed the analysis of the topsoil sample recently taken from the above site and it has been forwarded to an approved laboratory for analysis and have the pleasure of reporting our findings. The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes and its compliance with the current British Standard for topsoil (BS3882).

SOIL SAMPLING & EXAMINATION

At the time of our sampling visit the topsoil was stored in a stockpile. A series of 10 hand augered trial holes were constructed across the stockpile for the purpose of soil examination and sample collection. As the soil examination confirmed a consistent topsoil composition, the ten samples were combined together to form one composite sample for analysis purposes. The soil was described as dark brown, slightly moist and friable with a well-developed, fine to medium granular structure. The soil contained a low fraction of small stones and no deleterious materials (eg. building waste materials, glass, roots or rhizomes of pernicious weeds) or unusual odours (eg. hydrocarbons) were recorded.

LABORATORY ANALYSIS

The topsoil sample was submitted to a UKAS and MCERTS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil. The following parameters were determined:

- ⊕ pH & electrical conductivity values;
- ⊕ major plant nutrients (N, P, K, Mg) & organic matter content;
- ⊕ particle size distribution and stone content;
- ⊕ heavy metals & potentially toxic elements (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- ⊕ sulphate, sulphur, sulphide;
- ⊕ total cyanide and total (mono) phenols;
- ⊕ speciated PAHs (US EPA16)
- ⊕ banded aromatic and aliphatic petroleum hydrocarbons (C₅-C₃₅).
- ⊕ Asbestos

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

Phone: 01322 619161;

Freeland horticulture Ltd, Registered in England: Rosedale Nursery, College Road, Hextable, Kent BR8 7LT
Company Registration No: 04015968

COMMENTS**pH & Electrical Conductivity (salinity) Values**

The sample was alkaline in nature (pH 8.3) with a pH value that would be considered suitable for general landscaping purposes.

The electrical conductivity (salinity) value using the soil:water extract was (654 μ S/cm) indicating that soluble salts are not present at levels that would be harmful to plants.

The electrical conductivity values by CaSO₄ extract (BS3882 requirement) fell below the maximum specified value (3300 μ S/cm) given in BS3882:2015.

Organic Matter & Nutrient Status

The sample was rich in organic matter and all major plant nutrients. No further additions of compost or fertiliser are required, or indeed recommended, for at least the first growing season.

The C:N ratio of the sample was acceptable for general landscape purposes

Particle Size Distribution & Stone Content

The sample contained 71% sand and fell into the sandy loam texture class. This particle size distribution is considered suitable for a broad range of landscape applications, including tree and shrub planting, turfing and seeding.

The sample was Virtually free from stones of 50 mm and upwards in diameter and only contained a slight fraction of smaller stones (3.4%). As such, stones will not restrict the use of the soil for landscaping purposes.

Potential Contaminants

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil. This includes human health, environmental protection and metals considered toxic to plants. In the absence of any site-specific assessment criteria, the concentrations that affect human health have been compared with the 'residential with homegrown produce' land use in the Suitable For Use Levels presented in 'The LQM/CIEH S4UIs' for Human Health Risk Assessment (2015) and DEFRA SP1010: 'Development of Category 4 Screening Levels' for Assessment of Land Affected by Contamination – Policy Companion Document (2014).

Of the potential contaminants determined, none was found at levels that would exceed their respective guideline values.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes. From the soil examination and laboratory analysis, the soil is described as an alkaline, non-saline, loamy sandy. The organic matter and nutrient levels are acceptable, and no significant contamination was found with respect to the parameters determined. This soil would adhere to the current BS3882 specification for 'multipurpose grade'.

To conclude, based on our findings, the topsoil would be considered well-suited to general landscaping purposes provided the physical condition of the soil is maintained.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

George Longmuir MSc Soil Sci. M.I Soil Sci.

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	May 21
Our Ref	0924-SA
Date	06 May 2021

Composite sample
pH Value & Salinity

pH value (1:2.5 soil/water ext)	units	8.3
Electrical Conductivity (1:2.5 soil/water ext)	µS/cm	654
Electrical Conductivity (1:2.5 soil/CaSO ₄ ext)	µS/cm	2525
Neutralising Value (CaCO ₃ equivalent)	%	4.3

Organic Matter & Nutrient Status

Organic Matter (LOI)	%	3.4
Organic Carbon (Derived)	%	2.0
Total Nitrogen	%	0.107
Carbon:Nitrogen Ratio	:1	18.5
Available Phosphorus	mg/l	25.2
Available Potassium	mg/l	542
Available Magnesium	mg/l	161

Particle Size Analysis & Stones

Clay (<0.002mm)	%	10
Silt (0.063-0.002mm)	%	19
Sand (2.0-0.063mm)	%	71
Texture Class	UK Class	Sandy Loam

Stones 2-20mm	% by DW	3.4
Stones 20-50mm	% by DW	0.0
Stones >50mm	% by DW	0.0

Potential Contaminants

Total Arsenic (As)	mg/kg	3.1
Total Cadmium (Cd)	mg/kg	0.14
Total Chromium (Cr)	mg/kg	16.8
Hexavalent Chromium (Cr ^{VI})	mg/kg	<0.2
Total Copper (Cu)	mg/kg	9.1
Total Lead (Pb)	mg/kg	16.6
Total Mercury (Hg)	mg/kg	<0.2
Total Nickel (Ni)	mg/kg	<10
Total Selenium (Se)	mg/kg	0.13
Total Zinc (Zn)	mg/kg	33.5
Total Beryllium (Be)	mg/kg	<1
Total Barium (Ba)	mg/kg	33.4
Total Vanadium (V)	mg/kg	10.2
Hot Water Soluble Boron (B)	mg/kg	0.8
Total Cyanide (CN)	mg/kg	<1
Elemental Sulphur (S)	mg/kg	<5
Easily Liberated Sulphide (S ²⁻)	mg/kg	<1
Water Soluble Sulphate (SO ₄ ²⁻)	mg/l	144
Total Phenols Index	mg/kg	<1
Asbestos Screen	-	N.D.

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	May 21
Our Ref	0924-SA
Date	06 May 2021

Polyaromatic Hydrocarbons

Naphthalene	mg/kg	<0.05
Acenaphthylene	mg/kg	<0.05
Acenaphthene	mg/kg	<0.05
Fluorene	mg/kg	<0.05
Phenanthrene	mg/kg	0.2
Anthracene	mg/kg	<0.05
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo[a]anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo[b]fluoranthene	mg/kg	<0.1
Benzo[k]fluoranthene	mg/kg	<0.1
Benzo[a]pyrene	mg/kg	<0.1
Indeno[1,2,3-cd]pyrene	mg/kg	<0.1
Dibenzo[a,h]anthracene	mg/kg	<0.1
Benzo[g,h,i]perylene	mg/kg	<0.1
Total PAHs sum US EPA 16	mg/kg	<1

Banded Petroleum Hydrocarbons

Aliphatic TPH >C ₅ -C ₆	mg/kg	1.60
Aliphatic TPH >C ₆ -C ₈	mg/kg	0.25
Aliphatic TPH >C ₈ -C ₁₀	mg/kg	0.05
Aliphatic TPH >C ₁₀ -C ₁₂	mg/kg	<10
Aliphatic TPH >C ₁₂ -C ₁₆	mg/kg	<10
Aliphatic TPH >C ₁₆ -C ₂₁	mg/kg	<10
Aliphatic TPH >C ₂₁ -C ₃₅	mg/kg	14.0
Aliphatic TPH >C ₃₅ -C ₄₄	mg/kg	20.0

Aromatic TPH >C ₅ -C ₇	mg/kg	<0.05
Aromatic TPH >C ₇ -C ₈	mg/kg	<0.05
Aromatic TPH >C ₈ -C ₁₀	mg/kg	<0.05
Aromatic TPH >C ₁₀ -C ₁₂	mg/kg	<10
Aromatic TPH >C ₁₂ -C ₁₆	mg/kg	<10
Aromatic TPH >C ₁₆ -C ₂₁	mg/kg	<10
Aromatic TPH >C ₂₁ -C ₃₅	mg/kg	15.0
Aromatic TPH >C ₃₅ -C ₄₄	mg/kg	22.0

Total Petroleum Hydrocarbons (C ₅ -C ₄₄)	mg/kg	72.8
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BTEX

Benzene	mg/kg	<0.02
Toluene	mg/kg	<0.2
Ethyl Benzene	mg/kg	<0.04
m- & p- Xylene	mg/kg	<0.2
o-Xylene	mg/kg	<0.1

APPENDIX 04

Chemical Analyses from Source - Subsoil

Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 712587-1

Date of Report: 07-Feb-2018

Customer: PP O'Connor
Woodrow Way
Thames Trading Estate
Irlam
Manchester
M44 6NN

Customer Contact: Mr Nigel Hambleton

Customer Job Reference:

Customer Site Reference: Fletcher Bank Quarry, Ramsbottom

Date Job Received at Concept: 31-Jan-2018

Date Analysis Started: 01-Feb-2018

Date Analysis Completed: 07-Feb-2018

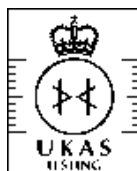
The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Aleksandra Pacula
Customer Service Advisor

Issued by :
Aleksandra Pacula
Customer Service Advisor



Concept Reference: 712587 Project Site: Fletcher Bank Quarry, Ramsbottom Customer Reference: Soil Analysed as Soil Heavy Metals(9)					
Concept Reference					712587 001
Customer Sample Reference					Jar of Sand
Date Sampled					31-JAN-2018
Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	A40	1	mg/kg	6
Cadmium	T6	A40	1	mg/kg	<1
Chromium	T6	A40	1	mg/kg	14
Copper	T6	A40	1	mg/kg	110
Lead	T6	A40	1	mg/kg	34
Mercury	T6	A40	1	mg/kg	<1
Nickel	T6	A40	1	mg/kg	12
Selenium	T6	A40	3	mg/kg	<3
Zinc	T6	A40	1	mg/kg	180

Concept Reference: 712587 Project Site: Fletcher Bank Quarry, Ramsbottom Customer Reference: Soil Analysed as Soil Total and Speciated USEPA16 PAH					
Concept Reference					712587 001
Customer Sample Reference					Jar of Sand
Date Sampled					31-JAN-2018
Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T16	AR	0.1	mg/kg	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1
Pyrene	T16	AR	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1
PAH(total)	T16	AR	0.1	mg/kg	<0.1

Concept Reference: 712587 Project Site: Fletcher Bank Quarry, Ramsbottom Customer Reference: Soil Analysed as Soil Miscellaneous					
Concept Reference					712587 001
Customer Sample Reference					Jar of Sand
Date Sampled					31-JAN-2018
Determinand	Method	Test Sample	LOD	Units	
Total Petroleum Hydrocarbons	T8	AR	1	mg/kg	(13) g
Asbestos ID	T27	AR			N.D.

Index to symbols used in 712587-1

Value	Description
A40	Assisted dried < 40C
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
U	Analysis is UKAS accredited

Notes

Asbestos was subcontracted to REC Asbestos.

Method Index

Value	Description
T6	ICP/OES
T16	GC/MS
T8	GC/FID
T27	PLM

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Total Petroleum Hydrocarbons	T8	AR	1	mg/kg	U	001
Asbestos ID	T27	AR			SU	001
Naphthalene	T16	AR	0.1	mg/kg	U	001
Acenaphthylene	T16	AR	0.1	mg/kg	U	001
Acenaphthene	T16	AR	0.1	mg/kg	U	001
Fluorene	T16	AR	0.1	mg/kg	U	001
Phenanthrene	T16	AR	0.1	mg/kg	U	001
Anthracene	T16	AR	0.1	mg/kg	U	001
Fluoranthene	T16	AR	0.1	mg/kg	U	001
Pyrene	T16	AR	0.1	mg/kg	U	001
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	U	001
Chrysene	T16	AR	0.1	mg/kg	U	001
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	U	001
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	U	001
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	U	001
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	U	001
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	U	001
PAH(total)	T16	AR	0.1	mg/kg	U	001
Arsenic	T6	A40	1	mg/kg	U	001
Cadmium	T6	A40	1	mg/kg	U	001
Chromium	T6	A40	1	mg/kg	U	001
Copper	T6	A40	1	mg/kg	U	001
Lead	T6	A40	1	mg/kg	U	001
Mercury	T6	A40	1	mg/kg	U	001
Nickel	T6	A40	1	mg/kg	U	001
Selenium	T6	A40	3	mg/kg	U	001
Zinc	T6	A40	1	mg/kg	U	001

APPENDIX 05

Chemical Analyses from Site



Final Report

Report No.:	21-30525-1		
Initial Date of Issue:	10-Sep-2021		
Client	WML Consulting Ltd		
Client Address:	No. 8 Oak Green Stanley Green Business Park Earl Rd Cheadle SK8 6QL		
Contact(s):	Sam Seddon Tom Booth		
Project	8850G Blackrock Street		
Quotation No.:		Date Received:	03-Sep-2021
Order No.:	8850G	Date Instructed:	03-Sep-2021
No. of Samples:	8		
Turnaround (Wkdays):	5	Results Due:	09-Sep-2021
Date Approved:	10-Sep-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Soil

Project: 8850G Blackrock Street

Client: WML Consulting Ltd	Chemtest Job No.:				21-30525	21-30525	21-30525	21-30525	21-30525	21-30525	21-30525	21-30525
Quotation No.:	Chemtest Sample ID.:				1272180	1272181	1272182	1272183	1272184	1272185	1272186	1272187
Order No.: 8850G	Client Sample Ref.:				1	1	1	1	1	1	1	1
	Sample Location:				Plot 5C	Plot 8D	Plot 11F	Plot 16H	SS1	SS2	SS3	SS4
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.15	0.10	0.10	0.10	1.10	2.10	3.10	4.10
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	11	7.7	11	14	4.2	5.2	5.7	19
pH	U	2010		4.0	[A] 8.2	[A] 8.1	[A] 8.3	[A] 8.5	[A] 9.1	[A] 9.1	[A] 9.2	[A] 9.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	[A] 0.73	[A] 1.8	[A] 1.4	[A] 0.84	[A] < 0.40	[A] < 0.40	[A] < 0.40	[A] < 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 0.033	[A] 0.12	[A] 0.11	[A] 0.016	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Total Sulphur	U	2175	%	0.010	[A] 0.028	[A] 0.063	[A] 0.059	[A] 0.032	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Cyanide (Total)	U	2300	mg/kg	0.50	[A] < 0.50	[A] 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50
Sulphate (Total)	U	2430	mg/kg	100	[A] 530	[A] 910	[A] 930	[A] 600	[A] < 100	[A] < 100	[A] < 100	[A] < 100
Arsenic	U	2450	mg/kg	1.0	2.8	5.5	5.3	3.6	1.2	< 1.0	1.7	< 1.0
Cadmium	U	2450	mg/kg	0.10	0.11	0.18	0.17	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Copper	U	2450	mg/kg	0.50	10	31	19	12	2.3	2.0	3.0	1.5
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	12	13	14	12	9.1	9.2	11	7.5
Lead	U	2450	mg/kg	0.50	16	27	28	20	9.2	9.2	9.9	8.1
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	14	18	18	15	10	9.9	13	8.9
Zinc	U	2450	mg/kg	0.50	45	59	59	47	29	27	32	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	[A] 3.1	[A] 4.5	[A] 4.7	[A] 3.9	[A] < 0.40	[A] < 0.40	[A] 0.45	[A] < 0.40
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	0.18	0.23	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	0.11	0.10	0.13	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.11	0.49	0.68	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	0.12	0.48	0.63	0.29	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.14	0.49	0.38	0.14	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	0.13	0.40	0.45	0.19	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	0.16	0.42	0.52	0.30	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.10	0.23	0.32	0.16	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	0.17	0.38	0.38	0.22	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	0.11	0.23	0.25	0.12	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.11	< 0.10	0.13	0.11	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	0.15	0.21	0.28	0.14	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	3.6	4.4	2.1	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1272180	1		Plot 5C		A	Amber Glass 250ml
1272180	1		Plot 5C		A	Plastic Tub 500g
1272181	1		Plot 8D		A	Amber Glass 250ml
1272181	1		Plot 8D		A	Plastic Tub 500g
1272182	1		Plot 11F		A	Amber Glass 250ml
1272182	1		Plot 11F		A	Plastic Tub 500g
1272183	1		Plot 16H		A	Amber Glass 250ml
1272183	1		Plot 16H		A	Plastic Tub 500g
1272184	1		SS1		A	Amber Glass 250ml
1272184	1		SS1		A	Plastic Tub 500g
1272185	1		SS2		A	Amber Glass 250ml
1272185	1		SS2		A	Plastic Tub 500g
1272186	1		SS3		A	Amber Glass 250ml
1272186	1		SS3		A	Plastic Tub 500g
1272187	1		SS4		A	Amber Glass 250ml
1272187	1		SS4		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

APPENDIX 06

Soil Assessment Criteria

Site Specific Assessment Criteria for Residential (with homegrown produce) assuming a 1% SOM for Hydrocarbons

Contaminant	Assessment Criteria for Residential (mg/kg)
Metals	
Arsenic	37
Boron	290
Cadmium	26
Chromium III	910
Chromium VI	6
Copper	2,400
Lead*	200
Mercury	1.2
Nickel	130
Selenium	250
Vanadium	410
Zinc	3,700
Non – Metals	
Phenol	120
Polyaromatic Hydrocarbons (PAH)	
Benz[a]anthracene	7.2
Benzo[a]pyrene	2.2
Benzo[b]fluoranthene	2.6
Benzo[ghi]perylene	320
Benzo[k]fluoranthene	77
Chrysene	15
Dibenz[ah]anthracene	0.24
Fluoranthene	280
Indeno[123-cd]pyrene	27
Naphthalene	2.3
Pyrene	620

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* Where not included in the S4UL's criteria for a limited number of contaminants, namely lead, have been derived by DEFRA in their document entitled SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, April 2014.

Contaminant	Criteria for Residential End Use (mg/kg)
Volatile Organic Compounds (VOCs)	
Benzene	0.087
Ethylbenzene	47
Toluene	130
Xylene	56
1,2-Dichloroethane	0.0071
1,1,1-Trichloroethane	8.8
Tetrachloroethane	1.6
Tetrachloroethene (PCE)	0.18
Tetrachloromethane	0.026
Trichloroethene (TCE)	0.016
Trichloromethane	0.91
Vinyl Chloride	0.00064
Semi-Volatile Organic Compounds (SVOCs)	
1,2-Dichlorobenzene	23
1,4-Dichlorobenzene	61 ^f
1,2,4-Trichlorobenzene	2.6
Hexachlorobenzene	1.8 (0.2) ^{vap}
Total Petroleum Hydrocarbons (TPH)	
Aliphatic C5-6	42
Aliphatic C6-8	100
Aliphatic C8-10	27
Aliphatic C10-12	130(48) ^{vap}
Aliphatic C12-16	1,100(24) ^{sol}
Aliphatic C16-35	65,000(8.48) ^{f, sol}
Aliphatic C35 - 44	65,000(8.84) ^{f, sol}
Aromatic C5 – 7 (benzene)	70
Aromatic C7 – 8 (toluene)	130
Aromatic C8-10	34
Aromatic C10-12	74
Aromatic C12-16	140
Aromatic C16-21	260 ^f
Aromatic C21-35	1,100 ^f
Aromatic C35 - 44	1,100 ^f

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* Where not included in the S4UL's criteria for a limited number of contaminants, namely lead, have been derived by DEFRA in their document entitled SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, April 2014.

APPENDIX 07

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 (if it has one)	Blackrock Street
Development address	Blackrock Street, Manchester, M11 3NA
OS Grid reference (mid point)	386577E, 397994N
Developer's name	Eco-Res LLP
UUW reference number (for UU use only)	
Please provide details below of the current and historical use of the site and adjacent sites. If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report. The earliest map dated 1848 indicates the majority of the site to have been undeveloped in rural / agricultural use with a field pond in the north-western corner of the site. By 1891 the field pond had been infilled and Albert Road had been constructed along the northern site boundary. By 1906 the site had been developed with residential terraced housing along Albert Street to the north and Blackrock Street to the east. These remained until sometime between 2002 and 2010 when the site was cleared. The surrounding area originally comprised undeveloped land in rural / agricultural use. Between the 1890's and 1910s the surrounding area underwent extensive residential development and in the 2000's Ashbury Meadow Primary School was constructed immediately to the west. Localised historical industrial developments in the surrounding area included a brewery 20 north-east, brick field 150m south and a Jam, Sauce and Pickle Works 150m west.	
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. If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report. Not Applicable, please refer to the Phase 2 report by WML. Phase 2 Geo-environmental Investigation and Assessment, referenced 8550G-WML-00-XX RP-G-0002, dated January 2020.	

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>1</td><td>6</td> <td>1</td><td>2</td> <td>2</td><td>0</td><td>1</td><td>9</td> </tr> <tr> <td>D</td><td>D</td> <td>M</td><td>M</td> <td>Y</td><td>Y</td><td>Y</td><td>Y</td> </tr> <tr> <td>D</td><td>D</td> <td>M</td><td>M</td> <td>Y</td><td>Y</td><td>Y</td><td>Y</td> </tr> </table>	1	6	1	2	2	0	1	9	D	D	M	M	Y	Y	Y	Y	D	D	M	M	Y	Y	Y	Y
1	6	1	2	2	0	1	9																		
D	D	M	M	Y	Y	Y	Y																		
D	D	M	M	Y	Y	Y	Y																		
At what level has groundwater been encountered?	1.300 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> Historical information does not identify any past industrial land use with the site only being developed for use as residential properties. Although the area was levelled with colliery spoil, no significant visual / olfactory evidence of contamination was noted during the site investigations. Therefore, chemical analysis was limited to speciated hydrocarbons. 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> Not Applicable																									
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> None completed to date.																									
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> No specific remedial measures required with the exception of suitable capping to soft landscaped areas.																									

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 site is to be developed with residential housing with no storage of chemicals / hydrocarbons anticipated.

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):

Section 6: Additional information

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

Not Applicable

Section 7: Risk assessor

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

Samantha Seddon BSc (Hons), MSc, EurGeol, CGeol, FGS

Name and address of risk assessor's company

WML Consulting, No. 8 Oak Green | Earl Road | Stanley Green Business Park | Cheadle Hulme | Cheshire | SK8 6QL

Date risk assessment performed

1 2 0 2 2 0 2 0

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

Samantha Seddon

Company

WML Consulting

Telephone

01614820600

Date

1 2 0 2 2 0 2 0

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.
Registered in England and Wales. Registered Number 2366678.

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	NA	NA	NA	NA	NA
Total BTEX & MTBE		0.1	Pass	NA	NA	NA	NA	NA
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	NA	NA	NA	NA	NA
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	NA	NA	NA	NA	NA
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	NA	NA	NA	NA	NA
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	NA	NA	NA	NA	NA
Phenols* (from SVOC analysis)		2	Pass	NA	NA	NA	NA	NA
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	NA	NA	NA	NA	NA
Ethers*	Only where identified	0.5	Pass	NA	NA	NA	NA	NA
Nitrobenzene*		0.5	Pass	NA	NA	NA	NA	NA
Ketones*		0.5	Pass	NA	NA	NA	NA	NA
Aldehydes*		0.5	Pass	NA	NA	NA	NA	NA
Amines		Fail	Pass	NA	NA	NA	NA	NA
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]	NA	NA	NA	NA	NA

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.