Our Ref: AM/JK/JN0877
Your Ref:

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21st December 2016

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For the attention of Howard Dowell

Dear Sir,

Re: Phase II Investigation Preliminary Review for Upper New Street, Barnsley
National Grid Reference: SE 345 059
Geology: Pennine Middle Coal Measures (Coal outcropping on site)

1 Scope

This report presents a review of our preliminary Phase II Site investigation findings, exploratory hole logs and test results (to date) and our interpretation of these data.

As with any site there may be differences in soil conditions between exploratory hole positions.

This report is not an engineering design and the figures and calculations contained in the report should be used by the Engineer, taking note that variations will apply, according to variations in design loading, in techniques used, and in site conditions. Our figures therefore should not supersede the Engineer's design.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd believes are reliable. Nevertheless, Southern Testing Laboratories Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Glanville Group. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The recommendations contained in this report may not be appropriate to alternative development schemes. The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

2 Site Description and Proposed construction

The site in Barnsley, South Yorkshire, which extends for approximately 0.5ha, currently comprises a former bingo hall with blacktop car park to the front. The site lies within the land bound by Upper New Street, Thomas Street, Burleigh Street and John Street.

It is proposed to develop the site with a new McDonalds Restaurant, as per the AEW feasibility site layout option 3, dated 20/06/16.

3 Geology

The site is shown on the 1:50,000 British Geological Survey map of the area (No.87 Barnsley) to be underlain by the Pennine Middle Coal Measures (PMCM) although, specifically, the Woolley Edge Rock, with two coal seams shown to be outcropping on site, namely the Meltonfield (Woodmoor, Wathwood) Coal centrally, and the Two-Foot (Royston, Half Yard) Coal, reflecting the westerly local slope. Deeper coal seams include the Abdy (Winter) Coal, Top Beamshaw (Kilnhurst) Coal, Low Beamshaw Coal.

Coal Seam	Thickness	Types of workings
Meltonfield	0.0-1.4m	Worked (opencast)
Two-Foot	0.1-2.1m	Minor Workings (mine, opencast)
Adby	0.0-1.9m	Worked (crop, mine, opencast)

Geology of the Barnsley District – a brief explanation of the geological map sheet 87 Barnsley, 2007.

3.1 BGS Archive Information

BGS Archives have records of a site investigation comprising 4 No. boreholes, to depth of between 15.5-22m bgl. The boreholes are dated 1989, and therefore appear to be associated with the development of the existing building, from the former garage usage.

Two boreholes logs describe the top 4m in detail, indicating 2.6-3.6m of made ground comprising clay with brick, sandstone, metal, coal and mudstone fragments. This is underlain by natural mudstones. The other boreholes suggest 3.3-4.8m of clayey overburden, which is potentially also made ground material. BH3 indicates the possible presence of workings at the base of the fill which could be the legacy of the Meltonfield Coal, mapped to outcrop on site.

Intact coal was reported in BH1 from 4.1-4.3m bgl; BH2, BH3 and BH4 all recorded 1.15-1.2m of intact coal from 8.0-10.4m, between 1.15-1.2m thick. The two deeper boreholes, BH1 and BH3, reported loose damp mudstone and coal from 20.2-21.4 in BH1 and 19.2-20.3m in BH3, suspected as being old mine workings (1.1-1.2m thick).

It is likely that the first seam is the Meltonfield Coal and the deeper underlying seam is the Two-Foot Coal, believed to have been worked locally – see section 8 below.

4 Site investigation Method

The strategy adopted for the intrusive investigation comprised the following:

- 7 No. window sampler trial holes drilled internally to a maximum depth of 3.0m bgl.
- The installation of 3No gas monitoring well and four subsequent monitoring visits (monitoring currently ongoing – the first two visits are summarised in section10).
- 5 No. test pits were excavated using a hydraulic backhoe excavator.

Exploratory hole locations are shown in Figure 1 in Appendix A.

Further Phase III Works, post demolition, are proposed and likely to comprise additional trial pitting below the former building footprint and 3 No. rotary boreholes to investigate the deeper coal mining legacy issues.

5 Soils as found

The soils encountered are described in detail on the attached exploratory hole logs (Appendix A). We have summarised the internal and external hole separately below.

5.1 External Trial Pits (TP's 1-5)

Depth	Thickness	Soil Type	Description
GL – 0.1/0.2m	0.1-0.2m	BLACKTOP	Blacktop car park.
- 0.6/1.25	0.5-1.05m	MADE GROUND	Variable layers of fill comprising: Moderately compact buff, silty sandy fine to coarse limestone (SUB-BASE). Loose to moderately compact dark grey, silty sandy gravel, including brick, concrete, clinker, mudstone, coal and sandstone. Loose sandstone boulders with a sandy matrix.
- 1.25/2.1	0.65-0.85m	CLAY	Firm to stiff, grey orange brown, mottled, silty CLAY, with some weak mudstone gravel.
- 2.9m+	1.65m+	MUDSTONE	Extremely weak, light grey orange-brown disused MUDSTONE, with sandy clay matrix, with occasional ferruginous concretions. Not encountered in the shallower TP5

5.2 Internal Window Sample Holes (WS1-7)

Depth	Thickness	Soil Type	Description
GL – 0.15/0.19m	0.15-0.19m	CONCRETE	Concrete floor slab with reinforcement.
- 0.25/0.5m	0.09-0.33m	MADE GROUND (SUBBASE)	Light grey/ buff, silty sandy GRAVEL. Gravels consist of fine to coarse, sub-angular limestone/ siltstone.
- 0.5/2.8m	0.25-2.5m	MADE GROUND	Brown, sandy gravelly CLAY, with brick, ash and concrete. *[Only identified in WS1 and WS4]*
- 0.8/3.0m+	0.5-2.2m+	CLAY	Stiff to hard, grey mottled orange-brown, silty CLAY, with weak lithorelict structure. No identified in WS4 and WS6
-2.8m+	1.5m+	MUDSTONE	Very weak, grey, thinly laminated MUDSTONE. Occasional ferruginous staining on mudstone faces. Not identified in WS2 and WS3

5.3 Visual and Olfactory Evidence of Contamination

Evidence of possible contamination was more notable and widespread within the external trial pits, largely noted as demolition rubble made ground comprising brick, concrete, clinker, sandstone cobbles and coal. Similar made ground was noted within the window sample holes, but only with WS and WS4.

5.4 Groundwater Strikes

Groundwater was not encountered within any of the trial holes.to a maximum depth of 3m.

6 Geotechnical Discussion

In general, less made ground was encountered in this investigation than reported for in BGS archive boreholes, drilled by others in 1989, although it did extend to 2.8m in WS4.

Based upon the proposals, it is understood that the eastern boundary, parts of the north and southern boundaries are to be retained following a reduce-dig exercise to level the site with the access from Upper New Street in the west. We understand that finished floor levels will be at around 112m, and the existing building slab lies at around 110.6-111.2m AOD on the ground/lower ground floor, and at 113.5m AOD on the upper ground floor.

On the basis of the fieldwork to date, therefore, a natural formation of stiff clays or weak grey mudstones is largely anticipated for the proposed building, although deeper made ground should be anticipated locally (such as around WS4). Coal was encountered (potentially intact natural) within WS2 and WS7, which largely coincides with the mapped Meltonfield Coal Seam, shown to outcrop across the site and believed to underlie site westward of the outcrop. Is was not noted within WS3 on the lower ground floor (slightly surprisingly, given proximity to WS2) or within WS4-WS6 on the upper ground floor, but this is possibly due to the difference in levels. Based on the reduce-dig required, it is likely that the coal will be removed from around WS7 during the earthworks, but potentially some may remain in-situ based upon the levels encountered at in WS2. As this seam is confirmed to outcrop on site and dip under the site (including the proposed building), a potential mining risk from this seam at shallow level persists (as a workable outcropping seam), together with the deeper Two-Foot Coal which is known to have been worked locally.

The table below details the levels in which the coal was encountered.

Hole ID	Thickness (m)	Top of coal m(AOD)	Base of Coal m(AOD)
WS2	0.5	110.29	109.79
WS7	0.7	113.22	112.52

The site lies within a Mineral Safeguarding Area (MSA). The Coal Authority is actively encouraging the need for prior extraction through responses to planning application where surface coal recourses are within the application site. We understand that this is implemented by the Local Authority and is within the Barnsley Core Strategy. Whether or not this is required will be dependent upon the local authority strategy, together with the volume and quality of the coal, which would be determined by the Phase III investigation.

Further works are proposed, post-demolition, comprising trial pitting to further investigate the shallow coal and three rotary boreholes to investigate the deeper coal risk. Depending upon the findings of the Phase III works, grouting of former workings may to be required.

6.1 Swelling & Shrinkage

Four Atterberg Limit tests were scheduled on representative samples of the underlying clays and mudstone recovered from varying depths. Two results are complete to date and have returned Plasticity Indices between 17-18%. It is anticipated that the one of the remaining samples will report a higher value, as such, at this stage NHBC Medium Volume Change Potential (VCP), should be adopted for design in terms of NHBC Chapter 4.2 guidelines for the design of new foundations/floor slabs – subject to final laboratory results.

7 Sulphates and Acidity

The water soluble sulphate concentration and soil pH have been analysed in six samples of the soils recovered, at various depths. The samples recorded pH values in the range of 5.3-8.3, slightly acidic to slightly alkaline. All samples reported a water soluble sulphate concentration of <500mg/l.

The appropriate Design Sulphate Class is therefore DS-1 and, given the absence of groundwater, the ACEC site classification is AC-1s.

Conditions at depth have not been proven to date and may be more onerous in terms of sulphate concentrations. This would need confirmation if, for example, a contiguous bored pile wall was under consideration.

7.1 Foundations

As discussed above, development is likely to mostly involve a 'cut' exercise (of around 1.5-2m) on the build print, but also include making up levels (again of approximately 1.5-2m) on certain parts of the western elevation, where it spans over the basement level. Such works may also be accentuated by local extra-dig requirements (old foundations, coal outcrop etc).

On the basis of the investigation to date, and anticipated mining risk, a raft or deepened beam foundation would be preferred, deepened through any remnant made ground (following the proposed reduce-dig), and placed upon the firm to stiff clays or weak mudstones. For low-medium VCP substrate, a minimum foundation depth of 0.9m applies (subject to final laboratory results). On these formations, an allowable bearing pressure of 125kN/m^2 may be considered. If coal persists at or near the formation level (potentially around the areas of WS2), foundations should be stepped to deepen through this material onto the underlying clays or mudstone. Depending upon the results of the rotary boreholes and trial pits, with regard to the mine workings, a grouting exercise may also be required.

Foundations through or intersecting shallow seams would require a permit from the Coal Authority. Should prior extraction of the coal be undertaken, then an incidental coal agreement would be required. If large scale extraction is undertaken, then this would require a review of the foundation solution, upon completion of any earthworks.

Defunct infrastructure (cellars, foundations and drains etc) will potentially affect groundworks, and nominal allowances should be made for associated over-break and delays etc. 'Pumps and wells' were indicated on old maps and, similarly, any such features encountered will need to be considered by the structural engineer, and decommissioned in line with Environment Agency guidelines – structural cover slab, inert backfill etc.

7.2 Floor slabs

Suspended slabs or sub-raft venting, with land gas design precautions, are also a likely consideration given the on-site workings and potential off-site land gas risk – subject to the results of the gas risk assessment (on-going). The removal of the clays, as part of the reduce-dig, will result in an element of heave, which should be addressed in design by way of additional slab reinforcement and consideration of proprietary compressible void formers.

7.3 Excavations & Retaining

The investigation to date suggests that the works may be largely 'dry' in terms of groundwater seepages / control issues. However, in the absence of more detailed investigation and long term monitoring, design should allow for the inclusion of wall drainage etc.

Statutory support will be required in all excavations where personnel must work. The mixed fill and very gravelly clay deposits may be prone to instability and unheralded collapse. Accordingly, great care should be taken when designing temporary and permanent support/propping systems. Safe batter angles for construction might therefore vary according to weather conditions.

Deep excavations are likely to encounter obstructions in the form of defunct in-ground concrete (sandstone boulders were common in the made ground) and natural stronger rock bands. Pneumatic breaking equipment may need to be employed for deep sewers or the ground level reduction exercise.

A substantial retaining structure is likely to be necessary around the eastern perimeter of the site, retaining the footpath and highway for John, Burleigh & Thomas Streets. Local Authority Highways engineers are likely to require consultation on this aspect. Cantilever flight auger or sheet pile retaining walls may not be viable given the possibility of encountering relatively shallow rockhead, once site levels have been reduced. Reinforced mass concrete retaining structures might be considered, as above, but similarly may also be subject to pre-drill & grout of coal workings. Crib-lock and gabion types, which anticipate limited movement, may not be suited.

The investigations to date suggest that, following ground level reductions, a natural competent bearing formation for the new wall may be present relatively near surface, and for which an ABP of 125kPa would be applicable, as above.

The following parameters are suggested for each of the soil types present:

Soil Type	Angle of Friction (ϕ')	Bulk Density (γ_b)	Cohesion (c')
Made Ground	28°	18kN/m^3	0
Clay	28°	19kN/m^3	0
Mudstone	30°	19kN/m^3	0

8 Environmental Results

There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

The CLEA model[1] provides a methodology for quantitative assessment of the long term risks posed to human health by exposure to contaminated soils. Toxicological data is used to calculate a Soil Guideline Value (SGV) for an individual contaminant, based on the proposed site use; these represent minimal risk concentrations and may be used as screening values.

In the absence of any published SGVs for certain substances, Southern Testing have derived or adopted Tier 1 screening values for initial assessment of the soil, based on available current UK guidance including the LQM/CIEH[2] S4UL's and CL:AIRE[3] generic assessment criteria. In addition, in March 2014, DEFRA[4] published the results of a research programme to develop screening values to assist decision making under Part 2A of the Environmental Protection Act. Category 4 screening levels were published for 6 substances, with reference to human health risk only. This guidance includes revisions of the CLEA exposure parameters, presenting parameters for public open space land use scenarios, and also of the toxicological approach. The screening levels represent a low risk scenario, based on a 'Low Level of Toxicological Concern' rather than the 'Minimal Risk' of CLEA, and the analytical results of this investigation may be considered relative to these levels.

The values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based upon them. Their validity should be confirmed at the time of site development.

Site-specific assessments are undertaken wherever possible and/or applicable.

CLEA requires a statistical treatment of the test results to take into account the normal variations in concentration of potential contaminants in the soil and allow comparisons to be made with published guidance.

Ground gases are assessed in accordance with the guidance given in CIRIA report C665.

[1] Environment Agency Publication SC050021/SR3 'Updated technical background to the CLEA Model' (2009).
[2] The LQM/CIEH S4ULs for Human Health Risk Assessment. (2014).
[3] The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment (2009).
[4] SP1010 Development of Category 4 Screening Levels foe Assessment of Land Affected by Contamination. DEFRA, 2014.

9 Site Investigation – Soil

The number of sample locations was limited and was partly targeted at potential sources of contamination and partly to provide general coverage. Access was restricted by the presence of the existing building.

The potential for contamination by heavy metals, PAHs, asbestos, petroleum hydrocarbons and VOCs was identified in the preliminary conceptual model and observations made on site and, therefore, the following tests were selected.

Test Suite	Number of Samples	Soil Tested
STC Suite 2	7	MADE GROUND/ NATURAL
STC Suite 3	6	MADE GROUND
VOCs	4	MADE GROUND
Asbestos Quantification	3	MADE GROUND
WAC	3	MADE GROUND/ NATURAL

The test results are presented in full in Appendix B. A summary and discussion of the significance of the results and identified contamination sources is given below.

9.1 General Contaminants

The results of the key contaminant tests have been analysed in accordance with the CLEA methodology. The samples have been grouped into two populations comprising MADE GROUND and NATURAL soils. For each parameter in each population the sample mean is calculated and compared to a Tier 1 screening value. If the sample mean exceeds the screening value, the soil may be regarded as contaminated and further assessment may be required. If neither the sample mean nor any single value exceeds the screening value, the soil may be regarded as not contaminated, though further confirmatory assessment may be required. Where any single parameter value exceeds the screening value but the sample mean does not, further statistical analysis may be applied to that parameter if the available data is suitable. Such analysis would include an assessment of the Normality of the distribution of the data, consideration of the presence of outliers, and the calculation of a UCL estimate of the mean.

Summary data is presented in the tables below and the laboratory analysis is included in Appendix B. The screening values and source notes are presented in Table 1 "Tier 1 Screening Values" at the front of Appendix B.

Soil Type: MADE GROUND

Contaminants	Units	No of Samples Tested	Range	Sample Mean	Tier 1 Screening Value
Arsenic (As)	mg/kg	10	37-55	20	640
Cadmium (Cd)	mg/kg	10	<0.2-1.9	0.59	190
Total Chromium (Cr)	mg/kg	10	12-35	18	--
Hexavalent Chromium (CrVI)	mg/kg	10	<4	4.0	33
Lead (Pb)	mg/kg	10	15-270	93	2330
Mercury (Hg)	mg/kg	10	<0.3-1.3	0.45	29-330
Selenium (Se)	mg/kg	10	<1	1.0	12,000
Nickel (Ni)	mg/kg	10	14-35	22	980
Copper (Cu)	mg/kg	10	29-92	53	68,000

Zinc (Zn)	mg/kg	10	43-220	89	730,000
Benzo[a]pyrene	mg/kg	10	<0.1-8.0	1.4	36
Naphthalene	mg/kg	10	<0.05-0.94	0.23	77-430
Acidity (pH value)	Units	10	5.9-9.3	8.2	--
Soil Organic Matter	%	10	1.1-10	2.9	--

The made ground analysed from across the site was largely free from significant contamination, relative to the corresponding tier 1 screening values. Some elevated concentrations of certain contaminants were, however reported (BaP) which, although not significant in terms of end use, may influence waste classification.

Soil Type: NATURAL

Contaminants	Units	No of Samples Tested	Range	Sample Mean	Tier 1 Screening Value
Arsenic (As)	mg/kg	3	<1-3.6	1.9	640
Cadmium (Cd)	mg/kg	3	<0.2	0.2	190
Total Chromium (Cr)	mg/kg	3	10-22	18	--
Hexavalent Chromium (CrVI)	mg/kg	3	<4.0	4.0	33
Lead (Pb)	mg/kg	3	21-24	23	2330
Mercury (Hg)	mg/kg	3	<0.3	0.3	29-330
Selenium (Se)	mg/kg	3	<1.0	1.0	12,000
Nickel (Ni)	mg/kg	3	27-46	34	980
Copper (Cu)	mg/kg	3	32-45	38	68,000
Zinc (Zn)	mg/kg	3	32-79	54	730,000
Benzo[a]pyrene	mg/kg	3	<0.1	0.1	36
Naphthalene	mg/kg	3	<0.05	0.05	77-430
Acidity (pH value)	Units	3	5.3-8.2	7.1	--
Soil Organic Matter	%	3	0.6-6.3	2.6	--

The underlying natural ground analysed was free from significant contamination, relative to the corresponding tier 1 screening values. The concentrations reported reflect background concentrations

9.2 Asbestos

The samples analysed for the STC Suites were also screened for asbestos as part of the general contamination testing. Although none was observed during the sampling, asbestos was reported in three of the samples screened as Chrysotile Loose fibres. Quantification tests were undertaken on all samples that screened positive, with all results reporting levels of <0.001%. As such, the overall risk to human health is likely to be low, assuming that site operatives employ good health and safety practices and some remediation is carried out in any soft landscaped areas.

It should be noted that some of the exploratory holes are discrete in nature with limited investigation below the existing building. There is always the potential for pockets of asbestos or for asbestos containing materials to be present, which have not been detected in the sampling, particularly below the existing building footprint.

The buildings and immediate surroundings should be subject to an asbestos survey, with all ACMs removed from site to a suitably licensed tip.

9.3 Organic Contaminants

Although there was no significant evidence of fuel contamination observed in the boreholes, given the site history, petroleum hydrocarbons and VOCs were considered a potential on-site contaminant (and therefore included in the conceptual model).

As a precaution, six samples from around the site were analysed for petroleum hydrocarbons (with detailed aliphatic and aromatic splits) and four samples for VOCs. All samples retuned results were either below detection limit or well below the human health screening values and no specific remediation is necessary in this regard.

9.4 Waste Disposal

The results for the general suites, carried out on selected samples of made ground and natural material recovered, together with three WAC tests, are appended for information, and should be forwarded to the tips for classification prior to removal.

10 Site Investigation – Gas

The desk study identified a potential gas source, both on and off-site, with a variable depth of made ground anticipated on site and potential backfilled quarries locally. This type of sources are characterised as being of medium generation potential, after Wilson and Haines (2005)[5].

Three gas monitoring wells were installed over the footprint of the proposed building. Four rounds of gas monitoring are scheduled, but to date just two have been completed, with two scheduled in the coming weeks.

10.1 Monitoring Programme and Results

The sensitivity of the proposed development is rated as low and, therefore, 4 gas readings will be undertaken in total (CIRIA C665, Table 5.5). The results of the monitoring programme to date (2 visits) are summarised below.

Borehole Gas Monitoring Results Summary			
Monitoring Well	WS4	WS5	WS6
Response Zone/Stratum	MADE GROUND	NATURAL	NATURAL
Evidence of contamination	General fill	None	None
No. of monitoring events (to date)	2	2	2
Methane % range	<0.1	<0.1	<0.1
Carbon Dioxide % range	1.2-1.9	1.6-1.9	1.0-1.2
Oxygen % range	18.9-19.8	18.9-19.5	19.9-20.4
Flow rate l/hr range	<0.1-0.1	<0.1-0.1	<0.1
BH Pressure range mb	-0.8 to -0.73	-0.8 to -0.73	-0.8 to -0.73
Water level mbgl	2.92-2.9	1.8-1.74	2.33-2.19
Atmospheric pressure during monitoring mb	1004-1006	1004-1006	1004-1006

The two monitoring visits to date have been undertaken to date, over a small range of atmospheric pressure (1004-1006mb). Only limited levels of gas have been measured to date, with the maximum concentration recorded being 1.9% (carbon dioxide). In addition, only very limited flow has been recorded, with a maximum of 0.1 l/hr.

[5] Wilson, S and Haines, S. 2005. Site investigation and monitoring for ground gas assessment – back to basics. Land Contamination & Reclamation 13, 3, 211-222.

Groundwater has ranged between 1.74 and 2.9m below ground level in the monitoring visits to date.

10.2 Identified Gas Regime

The maximum flow rate measured of 0.1l/hr has been assumed and used in the calculation, along with the maximum carbon dioxide reading of 1.9%. This yields a gas screening value (GSV) of 0.0019 for the site. This corresponds to Characteristic Situation 1 of the modified Wilson and Card classification, something that is supported by the low levels of gas recorded.

On the basis of these readings, no gas protection measures are required in the new build. This will be updated once the monitoring is complete.

11 Summary of Chemical Results

On the basis of the investigation to date, and relative to the proposed end-use, limited amounts of contamination has been identified – low concentrations of asbestos in places. The instigation was limited by the presence of the existing building and therefore there remains the potential for more significant contamination to be present under the existing building (particularly asbestos under the slab). However, on the basis of the results to date, no large scale remediation is required for the site. Any proposed landscaped areas will require sufficient topsoil and subsoil, mainly to provide a suitable growing medium, but also to mitigate any minor risk to the end-users.

We trust we have understood your requirements and would be pleased to discuss the above further, if required.

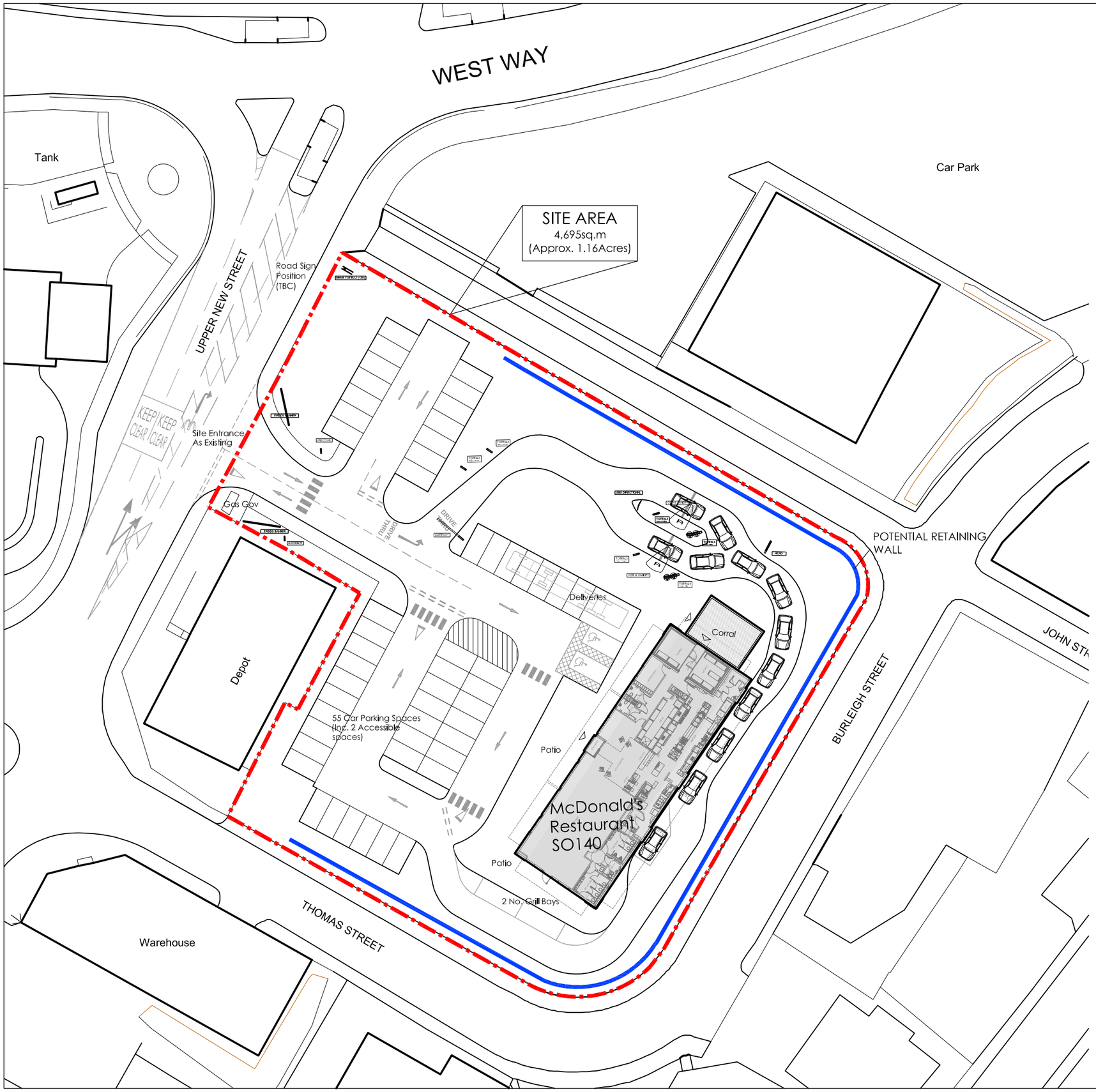
Yours faithfully,

Andrew Moffatt BSc MSc FGS
For and on behalf of
Southern Testing Laboratories Limited
DDI: 01604-500024
Email: amoffatt@stconsult.co.uk

APPENDIX A: Site Plan and Trial Hole Logs
APPENDIX B: Geotechnical Laboratory Results
APPENDIX C: Chemical laboratory Results
APPENDIX D: Gas Monitoring Results

APPENDIX A

Site Plans and Trial Hole Logs



Schedule of Areas (SO140):	sq.m
Site Area	tbc
Demise Area	4,695
Gross external area	444.1
Gross internal building area only (excludes freezer / chiller)	374.8
Corral Area	50
Approx. DT Area	653
Approx Car Park Area	1597
Approx Paved Areas	637
Site Layout Notes:	
Building Type	SO140
Distance between Booths	13825mm
DT Type	SBS
Transit or Family Saloon	Transit
COD position	Cars 10
No. Vehicles before COD	~7
Is local car parking available	NO

PROPOSED CAR PARKING SCHEDULE :

Grill Bays	=	2 Bays
Accessible	=	2 Spaces
General	=	51 Spaces
TOTAL	=	55 Spaces

TRANSIT SIDE BY SIDE SHOWN
(COD's at Cars 10)

FAST FORWARD SHOWN

NOTES

- All dimensions and levels are to be checked on site.
- Any discrepancies are to be reported to the architect before any work commences.
- This drawing shall not be scaled to ascertain any dimensions. Work to figured dims only.
- This drawing shall not be reproduced without express written permission from AEW.
- Title overlay drawings and ownership boundaries are produced using all reasonable endeavours. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
- All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
- All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

NOTES:

Drawing based on OS Map. Full digital topographical survey required for accuracy.

Site boundary location subject to confirmation.

Layout based on desktop study of the site only, site visit required.

Layout subject to confirmation of swept path analysis by Highways Engineer for large family saloon for drive thru lane and 16.5m HGV for deliveries.

Layout based on McDonald's standard SO140 building footprint.

N

0 5 10 15 20 25m

Scale 1:500

REV	Date	Drawn by: -	Checked by: -
A	20/06/16	EG	JC

Updated to ADL Tracking. Refer to drawing no. 3210-SK-04.

Status	Purpose of Issue
S2	For Information

drawing stage: **FEASIBILITY**

client: McDonald's Restaurants Ltd

project: Barnsley Upper New Street

store: TBC

drawing title: **FEASIBILITY SITE LAYOUT OPTION 3**

date: 31/05/16 drawn: EG
scale@A3: 1:500 checked: JC

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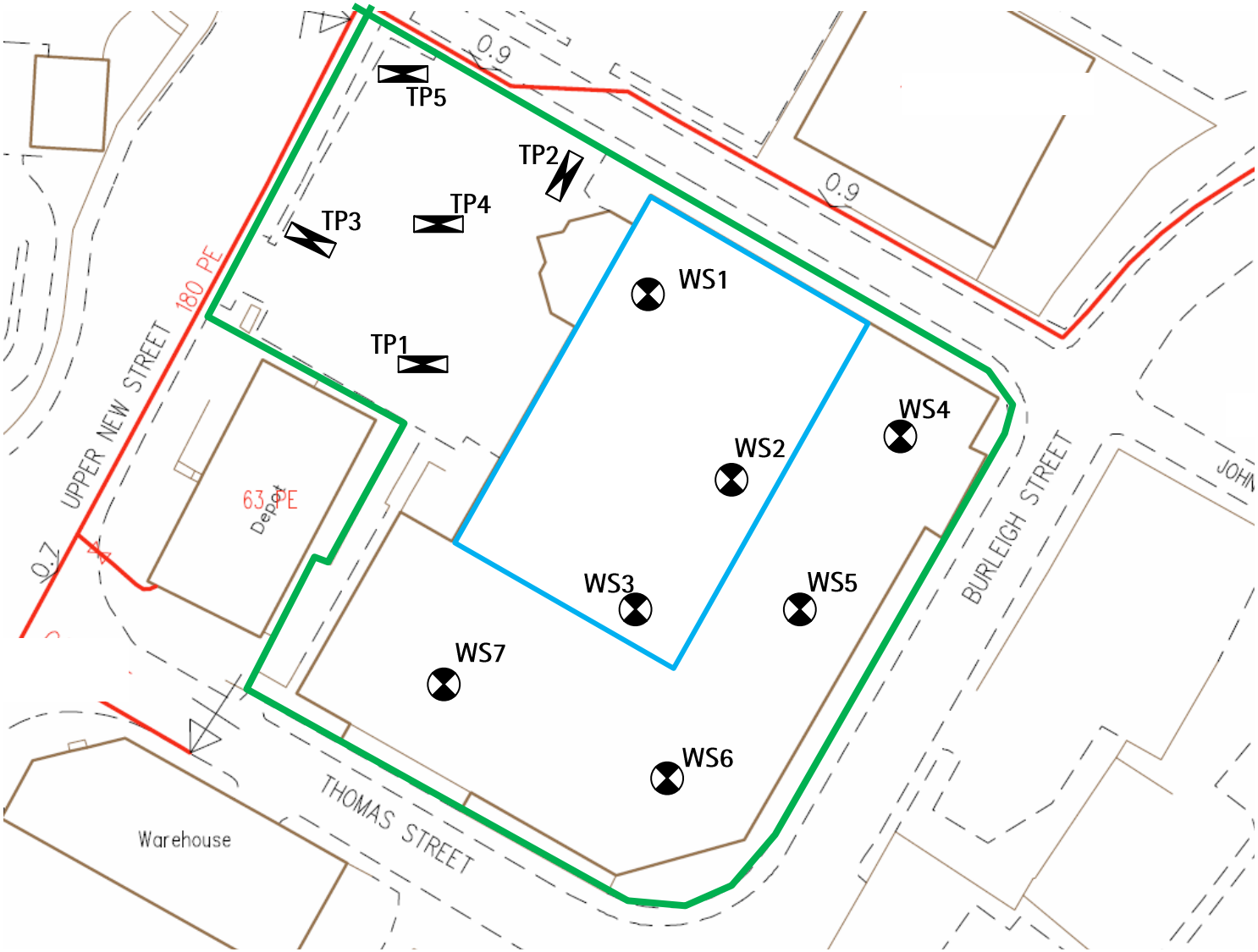

NB: Positions of Boreholes and/or Trial Pits are only indicative unless dimensioned – subject to services and access.

Site: Upper New Street, Barnsley	STL: JN0877	Fig No: 1
Date: 19 December 2016	Fieldwork location plan.	

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Southern Testing | ST Consult
Environmental & Geotechnical

Tel: 01342 333100

Project No.	Machine Type	Trialpit No
JN0877	**JCB**	**TP1** Sheet 1 of 1

Project Name: Barnsley

NGR: -
Level: -

Date: 30/11/2016

Location: Barnsley

Dimensions: -
Depth 2.90m

Client: Glanville

Logged By CN

Samples & In Situ Testing			Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
Depth (m)	Type	Results					
				0.10		0.10	ASPHALT
				0.30		0.40	MADE GROUND - Moderately compact buff silty sandy fine to coarse limestone gravel MOT.
0.50	ES			0.20		0.60	Possible MADE GROUND - stiff buff and black mottled silty sandy gravelly CLAY including mudstone and coal.
0.90 0.90	D	UCS = 190.0		0.65		1.25	Stiff buff orange brown mottled silty gravelly CLAY including mudstone.
				1.65			Extremely weak subhorizontal fissile buff light grey MUDSTONE recovered as flaggy gravels and cobbles with ferruginous surfaces. Occasional sitstone bands and small boulder sized recovery.
2.90	D					2.90	Trial Pit Complete at 2.90 m

1

2

Remarks:

Pit Stability: Spall

Groundwater: Dry

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Tel: 01342 333100

Project No.	Machine Type	Trialpit No
JN0877	**JCB**	**TP2** Sheet 1 of 1

Project Name: Barnsley

NGR: -
Level: -

Date: 30/11/2016

Location: Barnsley

Dimensions: -
Depth 2.85m

Client: Glanville

Logged By CN

Samples & In Situ Testing Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
				0.20		0.20	ASPHALT
0.30	ES			0.15		0.35	MADE GROUND - Moderately compact buff slightly silty sand and limestone gravel MOT.
				0.45		0.80	MADE GROUND - Dark grey sand and fine to coarse gravel including clinker sandstone and brick.
				0.45		1.25	MADE GROUND - Sandstone boulders.
1.60 1.60	D	UCS = 210.0		0.85		2.10	Firm to stiff buff light grey mottled silty slightly fine sandy CLAY with occasional mudstone and coal. 1.65m: No coal fragments.
				0.75		2.85	Extremely weak light grey orange brown fissured MUDSTONE with sandy clay matrix. Recovered as flaggy gravels and cobbles. Occasional siltstone bands.
2.85	D						Trial Pit Complete at 2.85 m

1
2

Remarks:

Pit Stability: Spall

Groundwater: Dry

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Tel: 01342 333100

Project No.	Machine Type	Trialpit No
JN0877	**JCB**	**TP3** Sheet 1 of 1

Project Name: Barnsley

NGR: -
Level: -

Date: 30/11/2016

Location: Barnsley

Dimensions: -
Depth 2.90m

Client: Glanville

Logged By CN

Samples & In Situ Testing			Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description	
Depth (m)	Type	Results						
				0.10		0.10	ASPHALT	
				0.20		0.30	MADE GROUND - Moderately compact buff silty sandy fine to coarse limestone gravel.	
				0.10		0.40	CONCRETE	
0.45	ES			0.15		0.55	MADE GROUND - Loose dark brown grey silty fine to coarse gravel and cobbles, including clinker, brick and sandstone.	
				0.40		0.95	MADE GROUND - Loose sandstone boulders with sandy matrix.	
1.20 1.20	D	UCS = 300.0		0.65		1.60	Firm to stiff grey orange brown mottled silty CLAY with some weak mudstone gravel.	1
				1.30			Extremely weak blue grey MUDSTONE with occasional ferruginous concretions.	2
2.90	D					2.90	Trial Pit Complete at 2.90 m	

Remarks:

Pit Stability: Spall

Groundwater: Dry

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Tel: 01342 333100

Project No.	Machine Type	Trialpit No
JN0877	**JCB**	**TP4** Sheet 1 of 1

Project Name: Barnsley

NGR: -
Level: -

Date: 30/11/2016

Location: Barnsley

Dimensions: -
Depth 2.70m

Client: Glanville

Logged By CN

Samples & In Situ Testing			Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description	
Depth (m)	Type	Results						
				0.10		0.10	ASPHALT	
				0.10		0.20	MADE GROUND - Sharp Sand	
				0.10		0.30	CONCRETE - Reinforced.	
				0.10		0.40	MADE GROUND - Moderately compact buff silty sand and limestone gravel. MOT.	
				0.15		0.55	MADE GROUND - Leanmix.	
0.60	ES			0.20		0.75	MADE GROUND - Loose to moderately compact dark grey silty sandy gravel including brick concrete and clinker fragments.	
				0.15		0.90	MADE GROUND - Loose cobbles of brick and sandstone.	
0.95	ES			0.10		1.00	MADE GROUND - Dark grey ash, metal and slate.	1
				0.15		1.15	MADE GROUND - Loose sandstone boulders.	
1.30 1.30	D	UCS = 270.0		0.55		1.70	Firm to stiff orange brown light grey mottled silty fine sandy CLAY with mudstone gravel.	
				1.00			Extremely weak subhorizontal light grey orange brown mottled MUDSTONE recovered as flaggy gravels and cobbles. Occasional siltstone / fine sandstone bands.	2
2.70	D					2.70	Trial Pit Complete at 2.70 m	

Remarks:

Pit Stability: Spall

Groundwater: Dry

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Tel: 01342 333100

Project No.	Machine Type	Trialpit No
JN0877	**JCB**	**TP5** Sheet 1 of 1

Project Name: Barnsley

NGR: -
Level: -

Date: 30/11/2016

Location: Barnsley

Dimensions: -
Depth 1.30m

Client: Glanville

Logged By CN

Samples & In Situ Testing			Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
Depth (m)	Type	Results					
				0.10		0.10	ASPHALT
				0.20		0.30	CONCRETE - leanmix.
0.50	ES			0.40		0.70	MADE GROUND - Loose to moderatley compact dark grey ashy clinker gravel. 0.50m - 1.30m: Mass concrete foundation in east.
				0.20		0.90	MADE GROUND - Loose sandstone boulders.
				0.40		1.30	Firm to stiff orange brown and light grey friable silty CLAY with occasional coal fragments.
1.30 1.30	D	UCS = 190.0					Trial Pit Complete at 1.30 m

1

2

Remarks: Mass concrete footing in east - premature termination.

Pit Stability: Spall

Groundwater: Dry

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Tel: 01342 333100

Project No.	Hole Type	Borehole No
JN0877	**WS**	**WS1** Sheet 1 of 1

Project Name: Barnsley	Dates: 30/11/2016
Location: Barnsley	NGR: -
Client: Glanville	Level: - / Logged By ADM

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.16		0.16	CONCRETE floor slab - 8mm reinforcement 125mm from top.
						0.09		0.25	Light grey/ buff, sandy gravel - possible lean mix below slab (MADE GROUND).
		0.45	ES			0.25		0.50	Dark brown, sandy, gravelly CLAY. Gravels consist of fine to coarse, angular siltstone, with brick and ash (MADE GROUND).
									End of Borehole at 0.50 m

1.0

2.0

Type	Results

Hole Diameters

Depth (m)	Hole (mm)	Casing (mm)

Water Strikes

Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)

General Remarks:

Borehole refused at 0.5m bgl.

PT = Equivilant Standard Penetration Test , UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

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Tel: 01342 333100

Project No.	Hole Type	Borehole No
JN0877	**WS**	**WS2** Sheet 1 of 1

Project Name: Barnsley	Dates: 30/11/2016
Location: Barnsley	NGR: -
Client: Glanville	Level: - / Logged By ADM

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.17			CONCRETE floor slab - 8mm reinforcement 80mm and 100mm from top of core.
								0.17	
						0.13			Light orange/ buff, sandy GRAVEL .Gravel consists of medium to coarse, micaceous limestone - subbase (MADE GROUND).
								0.30	
		0.50	D			0.50			COAL - possibly intact natural.
		0.80		UCS = 400				0.80	Stiff, grey, slightly silty CLAY - occasional leaf fossils.
		0.90		UCS = 220					
		1.00	D						
						2.20			
		2.00		UCS = 400					
		2.50	D						
								3.00	End of Borehole at 3.00 m

Type	Results

Hole Diameters			Water Strikes						General Remarks:
Depth (m)	Hole (mm)	Casing (mm)	Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)	

PT = Equivilant Standard Penetration Test , UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

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Tel: 01342 333100

Project No.	Hole Type	Borehole No
JN0877	**WS**	**WS3** Sheet 1 of 1

Project Name: Barnsley	Dates: 30/11/2016
Location: Barnsley	NGR: -
Client: Glanville	Level: - / Logged By ADM

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.17		0.17	CONCRETE floor slab - 8mm reinforcement 125mm from top of core.
						0.33		0.50	Buff/ light orange, sandy GRAVEL. Gravel consist of fine to corse, subangualr limestone - subbase (MADE GROUND).
		0.90	D			1.50			Stiff to hard, grey mottled orange-brown, silty CLAY, with weak lithorelict structure from 1.0m.
		1.80	D						
		2.00		UCS = 400				2.00	End of Borehole at 2.00 m

1.0

2.0

Type	Results

Hole Diameters

Depth (m)	Hole (mm)	Casing (mm)

Water Strikes

Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)

General Remarks:

Borehole terminated at 2.0m hard clays/ mudstones.

PT = Equivilant Standard Penetration Test , UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

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Project No.	Hole Type	Borehole No
JN0877	**WS**	**WS4**
		Sheet 1 of 1

Project Name: Barnsley	Dates: 30/11/2016
Location: Barnsley	NGR: -
Client: Glanville	Level: -
	Logged By ADM

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.18			CONCRETE floor slab - 8mm reinforcement at 80mm from top of core.
						0.13		0.18	Buff/ light orange-brown, silty sandy GRAVEL. Gravel consists of fine to coarse, subangular, limestone/ siltstone - subbase (MADE GROUND).
								0.30	MADE GROUND composed of brown, slightly sandy CLAY, with brick, ash and concrete fragments.
		0.70	ES						
		1.50	ES			2.50			
						0.20		2.80	Hard, grey silty CLAY/ weak thinly laminated MUDSTONE.
								3.00	End of Borehole at 3.00 m

1.0

2.0

Type	Results

Hole Diameters

Depth (m)	Hole (mm)	Casing (mm)

Water Strikes

Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)

General Remarks:

38mm gas monitoring well installed to 3.0m

PT = Equivilant Standard Penetration Test , UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

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Tel: 01342 333100

Project No.	Hole Type	Borehole No
JN0877	**WS**	**WS5**
		Sheet 1 of 1

Project Name: Barnsley	Dates: 30/11/2016
Location: Barnsley	NGR: -
Client: Glanville	Level: -
	Logged By ADM

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.15		0.15	CONCRETE floor slab - 8mm reinforcement 90mm from top of core.
						0.15		0.30	Buff/ light orange-brown, silty sandy GRAVEL. Gravel consists of medium to coarse, subangular limestone/ siltstone - subbase (MADE GROUND).
		0.60	D			0.50		0.80	Stiff to hard, grey, silty CLAY, with weak lithorelict structure.
		1.50	D			1.20		2.00	Grey, very weak, thinly laminated silty MUDSTONE. Ferrugenous staining on faces.

1.0

2.0

End of Borehole at 2.00 m

Type	Results

Hole Diameters

Depth (m)	Hole (mm)	Casing (mm)

Water Strikes

Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)

General Remarks:

Borehole terminated at 2.0m on weak mudstone.
38mm gas monitoring well installed to 2.0m.

PT = Equivilant Standard Penetration Test , UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

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Environmental & Geotechnical

Tel: 01342 333100

Project No.	Hole Type	Borehole No
JN0877	**WS**	**WS6**
		Sheet 1 of 1

Project Name: Barnsley	Dates: 30/11/2016
Location: Barnsley	NGR: -
Client: Glanville	Level: -
	Logged By ADM

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.19			CONCRETE floor slab - 8mm reinforcement at 100mm & 150mm from top of core.
						0.06		0.19 0.25	Buff, silty sandy GRAVEL. Gravels consists of fine to coarse, subangular limestone/ siltstone - subbase (MADE GROUND).
		0.60	ES			0.55			MADE GROUND composed of grey/ brown silty, slightly gravelly CLAY, with occasional ash and coal fragements. Gravels consist of fine to medium, subangular mudstone, limestone and siltstone.
		1.10		UCS = 350				0.80	Dark grey, very weak, thinly laminated MUDSTONE.
		1.20	D			0.90			
								1.70	Dark grey, very weak, thinly laminated MUDSTONE. Ferrugenous staining on mudstone faces.
		2.00	D			0.60			
								2.30	End of Borehole at 2.30 m

1.0

2.0

Type	Results

Hole Diameters

Depth (m)	Hole (mm)	Casing (mm)

Water Strikes

Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)

General Remarks:

Borehole terminated at 2.3m on weak mudstone.
38mm gas monitoring well installed to 2.3m.

PT = Equivilant Standard Penetration Test , UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

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Tel: 01342 333100

Project No.	Hole Type	Borehole No
JN0877	**WS**	**WS7** Sheet 1 of 1

Project Name: Barnsley

Dates: 30/11/2016

Location: Barnsley

NGR: -

Client: Glanville

Level: -

Logged By ADM

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Level (m AOD)	Thickness	Legend	Depth (m)	Stratum Description
						0.18			CONCRETE floor slab.
						0.12		0.18	Buff/ light orange, slightly silty sandy GRAVEL. Gravel consists of fine to coarse, subangular limestone/ siltstone - subbase (MADE GROUND).
								0.30	COAL possibly intact natural.
		0.60	D			0.70			
		1.10		UCS = 350		0.30		1.00	Stiff, grey silty CLAY.
		1.50	D			0.70		1.30	Stiff, light grey/ buff, silty CLAY, with weak lithorelict structure.
		2.50	D			0.80		2.00	Grey, very weak, thinly laminated silty MUDSTONE, with ferrugenous staining on mudstone faces.
								2.80	End of Borehole at 2.80 m

1.0

2.0

Type	Results

Hole Diameters

Depth (m)	Hole (mm)	Casing (mm)

Water Strikes

Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)

General Remarks:

Borehole terminated at 2.8m on weak mudstone.

PT = Equivilant Standard Penetration Test , UCS = Unconfined Compressive Strength (kN/m2) by Hand Penetrometer , HV = Hand Vane Result (kPa)

Key to Exploratory Hole Logs

General

All soil & rock descriptions in general accordance with BS5930:1999+A2:2010, BS EN ISO 14688 & BS EN ISO 14689
The Geology Code only entered where positive identification of the sampled strata has been made

Sampling

ES	Environmental Sample (taken in appropriate sampling container)
D	Disturbed Sample
B	Bulk Sample
LB	Large Bulk for Earthworks testing
C	Core Sample
U	Undisturbed Sample (number of blows indicated in results column)
SPTLS	SPT Liner Sampler
P	Piston Sample
W	Water Sample

Insitu Tests

SPT	Standard Penetration Test in accordance with BS EN ISO 22476-3:2005+A1:2011
SPT (C)	Cone Penetration Test in accordance with BS EN ISO 22476-3:2005+A1:2011
PT	Penetration Test - STL documented equivalent SPT N Value
PPT	Perth Penetration Test - STL in house documented method (N Value)
UCS (⊥)	Unconfined Compressive Strength measure by hand penetrometer (kN/m^2)
IVN	Hand Vane (kPa)
PID	Photo Ionisation Detector Results (ppm)
MEXE	Mexecone CBR Result

Drilling Records

Depth to standing water level	▼
Depth to water strike	▽
TCR	Total Core Recovery (%)
SCR	Solid Core Recovery (%)
RQD	Rock Quality Index (%)
FI	Fracture Index

Backfill Symbols

Arisings
Concrete
Blacktop
Bentonite Seal
Gravel Filter
Sand Filter

Pipe Symbols

Plain Pipe
Slotted Pipe
Filter Tip

Principal Soil Types

Topsoil
Made Ground
Clay
Silt
Sand
Gravel
Peat

Principal Rock Types

Mudstone/Claystone
Siltstone
Sandstone
Limestone
Chalk

APPENDIX B

Geotechnical Laboratory Results

Atterberg Limits Test Result Summary Sheet

Test carried out in accordance with BS 1377-2:1990(2003) cl. 3.2, 4.2, 4.3, 5.3 & 5.4

Project No : *JN0877* **Checked By :** *AM* **Date:** *19-Dec-2016*

Project Name : *Upper New Street, Barnsley*

Client : *Glanville Consultants*

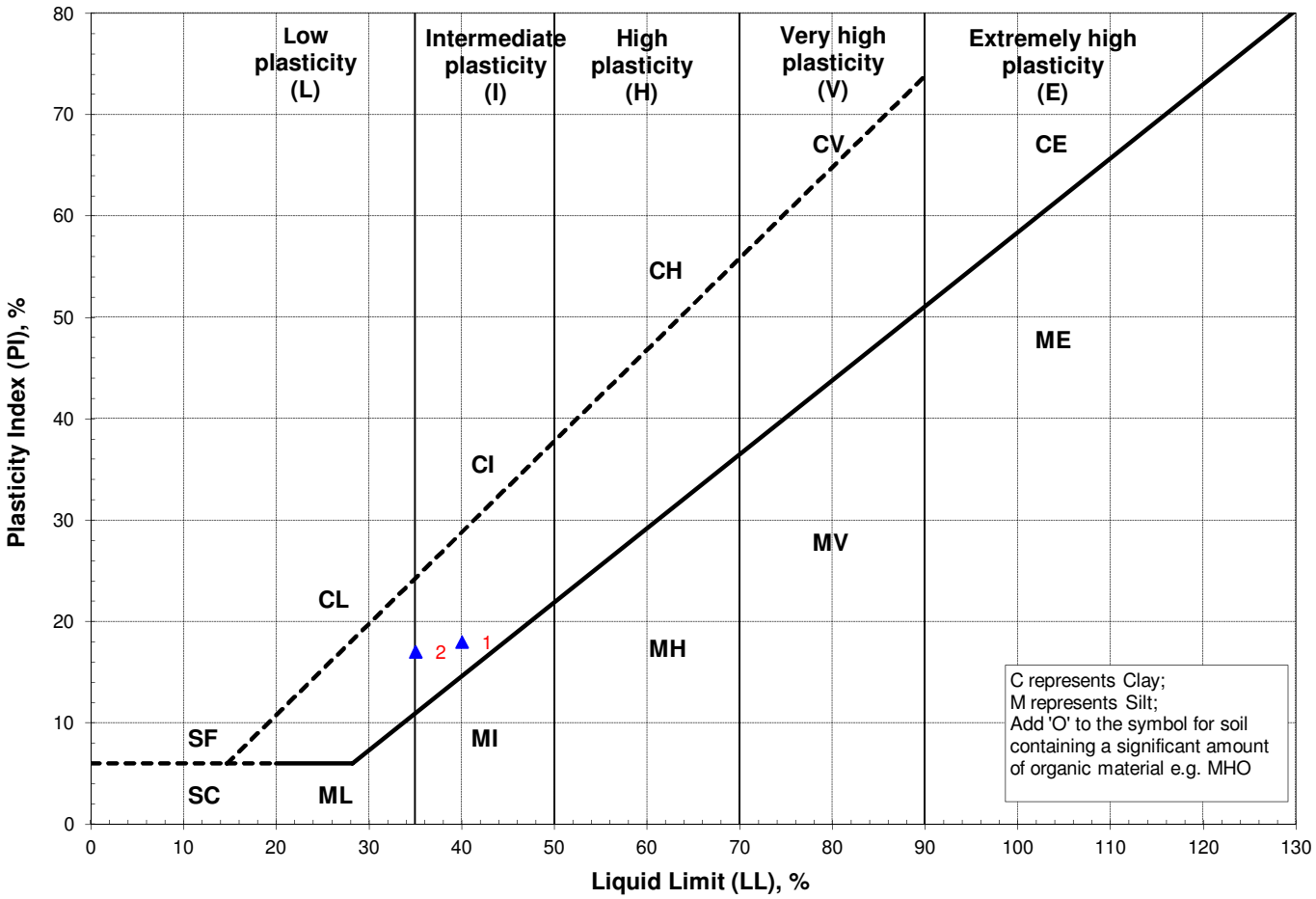
Plot No	TH No.	Depth (m)	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class-ification	% Passing 425µm (%)	Visual Description
1	*TP2*	*2.85*	*10.5*	*40*	*22*	*18*	*CI*	*17*	*Grey brown, clayey, slightly sandy, fine to coarse, subangular to subrounded mudstone GRAVEL.*
2	*TP5*	*1.30*	*17.4*	*35*	*18*	*17*	*CL/CI*	*84*	*Brown veined light grey patched orange brown, speckled black, slightly sandy, slightly gravelly CLAY. Gravel consists of fine and medium, subangular siltstone, ironstone and quartzite.*

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Plasticity Chart for Atterberg Limit Test Results



Sample List

1	TP2@2.85m
2	TP5@1.3m

Statistics

Liquid Limit	
Max	40
Min	35
Average	38
Plastic Limit	
Max	22
Min	18
Average	20
Plasticity Index	
Max	18
Min	17
Average	18

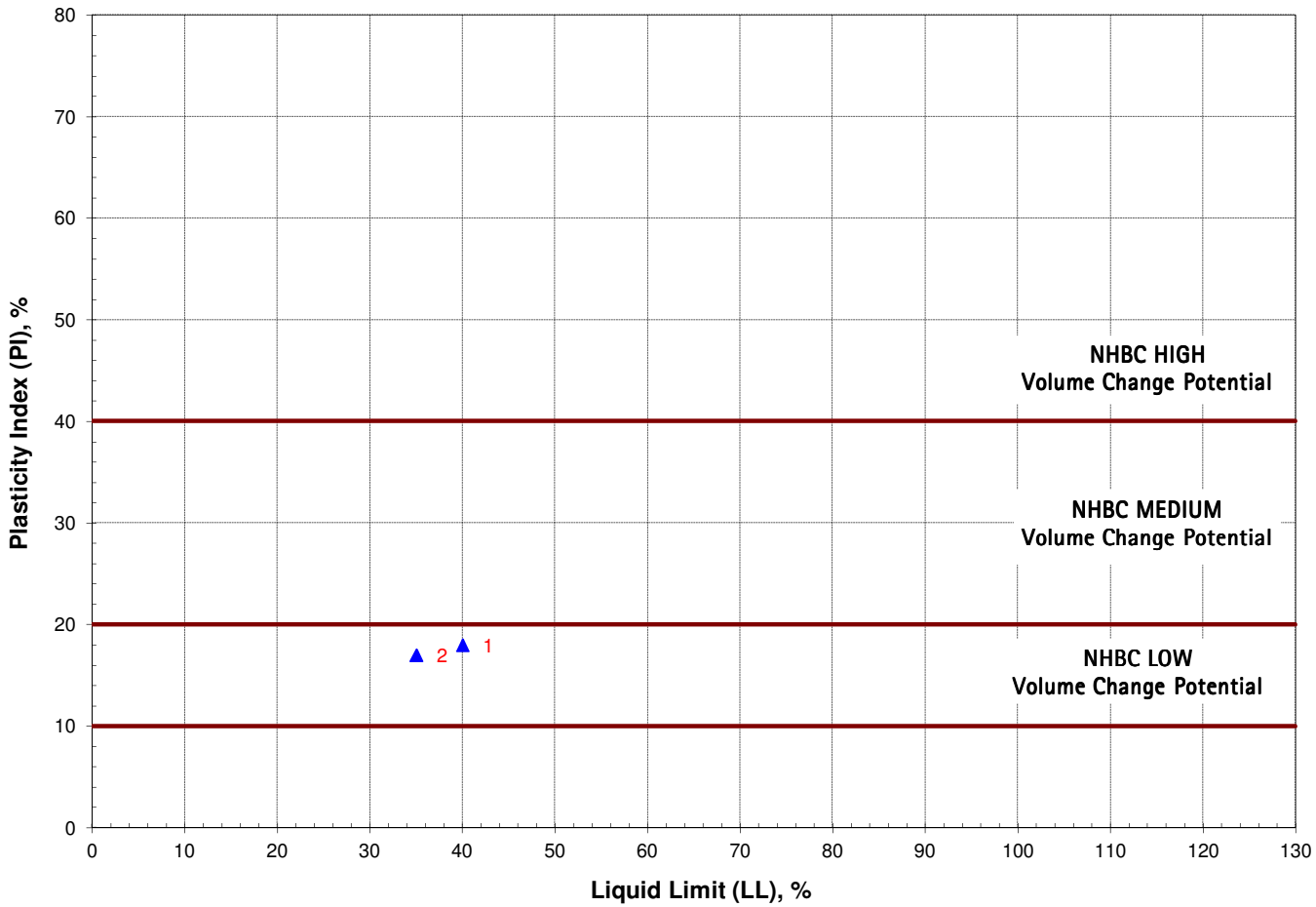
Project Name:	*Upper New Street, Barnsley*	**Project No:**	*JN0877*	**Project Engineer:**	*ADM*
Client:	*Glanville Consultants*	**Date:**	*19/12/2016*		*Figure No. 2*

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

Plot Relating Soil Plasticity to NHBC Classification for Volume Change Potential



Sample List

1	TP2@2.85m
2	TP5@1.3m

Statistics

Liquid Limit	
Max	40
Min	35
Average	38
Plastic Limit	
Max	22
Min	18
Average	20
Plasticity Index	
Max	18
Min	17
Average	18

Project Name:	*Upper New Street, Barnsley*	**Project No:**	*JN0877*	**Project Engineer:**	*ADM*
Client:	*Glanville Consultants*	**Date:**	*19/12/2016*		*Figure No. 3*

APPENDIX C

Chemical Laboratory Results

Andrew Moffatt
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Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 16-34560

Replaces Analytical Report Number : 16-34560, issue no. 1

Project / Site name:	Upper New Street, Barnsley	**Samples received on:**	02/12/2016
Your job number:	JN0877	**Samples instructed on:**	02/12/2016
Your order number:		**Analysis completed by:**	14/12/2016
Report Issue Number:	2	**Report issued on:**	14/12/2016
Samples Analysed:	15 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668000	668001	668002	668003	668004
Sample Reference				TP1	TP2	TP3	TP4	TP4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.45	0.60	0.95
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	19	14	23	11	15
Total mass of sample received	kg	0.001	NONE	0.89	1.2	1.2	1.4	1.1
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	< 0.001	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	5.9	8.2	8.5	9.3	8.6
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Organic Matter	%	0.1	MCERTS	10	3.4	3.8	1.6	2.3
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.94	< 0.05	< 0.05	0.30
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	0.70	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	0.43	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	0.76	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	6.8	0.33	0.67	2.0
Anthracene	mg/kg	0.1	MCERTS	< 0.10	1.7	0.70	0.23	0.71
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	14	0.92	1.4	5.5
Pyrene	mg/kg	0.1	MCERTS	< 0.10	13	0.77	1.3	4.7
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	9.9	0.83	0.73	3.1
Chrysene	mg/kg	0.05	MCERTS	< 0.05	8.6	0.75	0.81	2.7
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	7.8	0.97	0.69	2.6
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	7.4	1.0	0.59	1.8
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	8.0	0.73	0.60	2.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	2.8	0.65	0.32	1.1
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	0.81	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	3.4	1.2	0.48	1.1
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	87.4	8.84	7.80	27.6
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	27	19	55	14	34
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	1.9	1.9
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	15	13	16	28	35
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	14	16	28	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	40	59	66	73	92
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	88	160	130	270
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	0.5	1.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	18	18	18	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	43	59	73	170	220

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668000	668001	668002	668003	668004
Sample Reference				TP1	TP2	TP3	TP4	TP4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.45	0.60	0.95
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	11	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	47
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	53
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	7.3
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	31
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	-	-	77
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	120

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668000	668001	668002	668003	668004
Sample Reference				TP1	TP2	TP3	TP4	TP4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.45	0.60	0.95
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668005	668006	668007	668008	668009
Sample Reference				TP5	WS1	WS4	WS4	WS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.45	0.70	1.50	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	16	15	14	8.8
Total mass of sample received	kg	0.001	NONE	1.3	1.1	1.1	1.0	1.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.1	8.6	7.8	7.8	7.8
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.13	-
Organic Matter	%	0.1	MCERTS	1.4	1.5	1.9	1.9	1.1
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.70	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	0.23	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	0.41	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.25	2.0	0.88	0.34	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	0.54	0.16	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	0.34	2.1	1.9	0.68	< 0.10
Pyrene	mg/kg	0.1	MCERTS	0.34	1.7	1.7	0.61	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.24	1.0	1.1	0.40	< 0.10
Chrysene	mg/kg	0.05	MCERTS	0.25	1.2	1.2	0.44	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.79	1.1	0.28	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.89	0.95	0.26	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	0.92	0.89	0.27	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	0.33	0.44	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.49	0.67	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	13.2	10.9	3.28	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	13	10	10	3.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.5	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	12	14	13	13	18
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	14	13	14	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	43	48	29	46	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	86	61	49	46	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	14	15	24	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	73	71	49	61	68

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668005	668006	668007	668008	668009
Sample Reference				TP5	WS1	WS4	WS4	WS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.45	0.70	1.50	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.0	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.9	-	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	11	-	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	25	-	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	41	-	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	8.2	-	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	17	-	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	31	-	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	56	-	< 10	< 10

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668005	668006	668007	668008	668009
Sample Reference				TP5	WS1	WS4	WS4	WS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.45	0.70	1.50	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668010	668011	668012	668013	668014
Sample Reference				WS5	WS7	TP2	TP3	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.50	1.60	2.90	1.80
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	11	23	12	12
Total mass of sample received	kg	0.001	NONE	0.96	0.94	0.65	2.0	1.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	7.9	5.3	7.7	8.3
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.081	0.032	0.11	0.030	0.028
Organic Matter	%	0.1	MCERTS	1.0	0.6	6.3	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.6	< 1.0	< 1.0	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	-	-
Chromium (III)	mg/kg	1	NONE	22	10	21	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	10	21	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	45	36	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	24	21	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	46	27	29	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	79	32	51	-	-

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668010	668011	668012	668013	668014
Sample Reference				WS5	WS7	TP2	TP3	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.50	1.60	2.90	1.80
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-34560

Project / Site name: Upper New Street, Barnsley

Lab Sample Number				668010	668011	668012	668013	668014
Sample Reference				WS5	WS7	TP2	TP3	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.50	1.60	2.90	1.80
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-34560
Project / Site name: Upper New Street, Barnsley
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
668001	TP2	0.50	138	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
668003	TP4	0.60	130	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
668006	WS1	0.45	120	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

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Analytical Report Number : 16-34560

Project / Site name: Upper New Street, Barnsley

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
668000	TP1	None Supplied	0.50	Brown clay and sand.
668001	TP2	None Supplied	0.50	Brown loam and clay with gravel and rubble.
668002	TP3	None Supplied	0.45	Brown loam and clay with gravel and rubble.
668003	TP4	None Supplied	0.60	Light brown loam and sand with gravel and rubble.
668004	TP4	None Supplied	0.95	Brown loam and sand with gravel and rubble.
668005	TP5	None Supplied	0.50	Brown loam and sand with gravel and rubble.
668006	WS1	None Supplied	0.45	Brown loam and clay with gravel and rubble.
668007	WS4	None Supplied	0.70	Brown loam and clay with gravel and rubble.
668008	WS4	None Supplied	1.50	Brown loam and clay with gravel and rubble.
668009	WS6	None Supplied	0.60	Brown loam and clay with gravel and rubble.
668010	WS5	None Supplied	0.60	Brown clay and loam.
668011	WS7	None Supplied	1.50	Light brown clay and sand with gravel.
668012	TP2	None Supplied	1.60	Light brown clay and sand.
668013	TP3	None Supplied	2.90	Grey clay and sand.
668014	WS3	None Supplied	1.80	Grey clay and sand.

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Analytical Report Number : 16-34560

Project / Site name: Upper New Street, Barnsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP1		S	16-34560	668000	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP1		S	16-34560	668000	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TP1		S	16-34560	668000	ab	TPHCWG (Soil)	L076-PL	b
TP2		S	16-34560	668001	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TP2		S	16-34560	668001	ab	Volatile organic compounds in soil	L073B-PL	b
TP2		S	16-34560	668012	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TP3		S	16-34560	668002	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TP3		S	16-34560	668013	a			
TP4		S	16-34560	668003	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TP4		S	16-34560	668003	ab	Volatile organic compounds in soil	L073B-PL	b
TP4		S	16-34560	668004	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP4		S	16-34560	668004	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TP4		S	16-34560	668004	ab	TPHCWG (Soil)	L076-PL	b
TP5		S	16-34560	668005	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP5		S	16-34560	668005	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TP5		S	16-34560	668005	ab	TPHCWG (Soil)	L076-PL	b
WS1		S	16-34560	668006	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
WS1		S	16-34560	668006	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
WS1		S	16-34560	668006	ab	TPHCWG (Soil)	L076-PL	b
WS1		S	16-34560	668006	ab	Volatile organic compounds in soil	L073B-PL	b
WS3		S	16-34560	668014	a			
WS4		S	16-34560	668007	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
WS4		S	16-34560	668008	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
WS4		S	16-34560	668008	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
WS4		S	16-34560	668008	ab	TPHCWG (Soil)	L076-PL	b
WS5		S	16-34560	668010	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
WS6		S	16-34560	668009	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
WS6		S	16-34560	668009	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
WS6		S	16-34560	668009	ab	TPHCWG (Soil)	L076-PL	b
WS6		S	16-34560	668009	ab	Volatile organic compounds in soil	L073B-PL	b
WS7		S	16-34560	668011	ab	Speciated EPA-16 PAHs in soil	L064-PL	b

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 16-34566

Project / Site name:	Upper New Street, Barnsley	**Samples received on:**	02/12/2016
Your job number:	JN0877	**Samples instructed on:**	02/12/2016
Your order number:		**Analysis completed by:**	13/12/2016
Report Issue Number:	1	**Report issued on:**	13/12/2016
Samples Analysed:	3 10:1 WAC samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Waste Acceptance Criteria Analytical Results

Report No:	**16-34566**						
					Client:	**STCONSULT**	
Location	**Upper New Street, Barnsley**						
Lab Reference (Sample Number)	668047 / 668048				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	Deviating				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP4						
Depth (m)	0.95						
Solid Waste Analysis							
TOC (%)**	1.3				3%	5%	6%
Loss on Ignition (%) **	7.7				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	65				500	--	--
Total PAH (WAC-17) (mg/kg)	17				100	--	--
pH (units)**	8.1				--	>6	--
Acid Neutralisation Capacity (mol / kg)	10				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg			
Arsenic *	0.0082			0.0768	0.5	2	25
Barium *	0.0662			0.617	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0021			0.020	0.5	10	70
Copper *	0.0097			0.091	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0020			0.0185	0.5	10	30
Nickel *	0.0012			0.011	0.4	10	40
Lead *	0.015			0.14	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.016			0.14	4	50	200
Chloride *	2.3			21	800	4000	25000
Fluoride	0.28			2.6	10	150	500
Sulphate *	24			220	1000	20000	50000
TDS	99			920	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	2.54			23.7	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.1						
Dry Matter (%)	85						
Moisture (%)	15						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislation

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** = MCERTS accrediited

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Waste Acceptance Criteria Analytical Results

Report No:	**16-34566**						
					Client:	**STCONSULT**	
Location	**Upper New Street, Barnsley**						
Lab Reference (Sample Number)	668049 / 668050				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	Deviating				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS6						
Depth (m)	0.60						
Solid Waste Analysis							
TOC (%)**	0.6				3%	5%	6%
Loss on Ignition (%) **	3.8				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	7.4				--	>6	--
Acid Neutralisation Capacity (mol / kg)	1.8				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg			
Arsenic *	0.0029			0.0254	0.5	2	25
Barium *	0.0099			0.0868	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0009			0.0082	0.5	10	70
Copper *	0.0095			0.083	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0031			0.0274	0.5	10	30
Nickel *	0.0016			0.014	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0026			0.023	4	50	200
Chloride *	4.3			38	800	4000	25000
Fluoride	0.71			6.2	10	150	500
Sulphate *	8.8			77	1000	20000	50000
TDS	53			470	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	1.41			12.3	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.0						
Dry Matter (%)	91						
Moisture (%)	8.8						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Waste Acceptance Criteria Analytical Results

Report No:	**16-34566**						
					Client:	**STCONSULT**	
Location	**Upper New Street, Barnsley**						
Lab Reference (Sample Number)	668051 / 668052				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	Deviating				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS5						
Depth (m)	0.60						
Solid Waste Analysis							
TOC (%)**	0.6				3%	5%	6%
Loss on Ignition (%) **	4.3				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	7.7				--	>6	--
Acid Neutralisation Capacity (mol / kg)	1.1				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg			
Arsenic *	0.0034			0.0309	0.5	2	25
Barium *	0.0179			0.163	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0007			0.0062	0.5	10	70
Copper *	0.0072			0.065	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0030			0.0276	0.5	10	30
Nickel *	0.0012			0.011	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0016			0.015	4	50	200
Chloride *	1.7			15	800	4000	25000
Fluoride	0.77			7.0	10	150	500
Sulphate *	6.6			60	1000	20000	50000
TDS	43			390	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	1.62			14.7	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.96						
Dry Matter (%)	86						
Moisture (%)	14						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Analytical Report Number : 16-34566

Project / Site name: Upper New Street, Barnsley

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
668047	TP4	None Supplied	0.95	Brown loam and sand with gravel and rubble.
668049	WS6	None Supplied	0.60	Brown loam and clay with gravel and rubble.
668051	WS5	None Supplied	0.60	Brown clay and loam.

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Analytical Report Number : 16-34566

Project / Site name: Upper New Street, Barnsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS

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Analytical Report Number : 16-34566

Project / Site name: Upper New Street, Barnsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP4		L	16-34566	668048	a			
TP4		S	16-34566	668047	ab	BTEX in soil (Monoaromatics)	L073B-PL	b
TP4		S	16-34566	668047	ab	Mineral Oil (Soil) C10 - C40	L076-PL	b
TP4		S	16-34566	668047	ab	PCB's By GC-MS in soil	L027-PL	b
TP4		S	16-34566	668047	ab	Speciated WAC-17 PAHs in soil	L064-PL	b
TP4		S	16-34566	668047	ab	Total BTEX in soil (Poland)	L073-PL	b
WS5		L	16-34566	668052	a			
WS5		S	16-34566	668051	ab	BTEX in soil (Monoaromatics)	L073B-PL	b
WS5		S	16-34566	668051	ab	Mineral Oil (Soil) C10 - C40	L076-PL	b
WS5		S	16-34566	668051	ab	PCB's By GC-MS in soil	L027-PL	b
WS5		S	16-34566	668051	ab	Speciated WAC-17 PAHs in soil	L064-PL	b
WS5		S	16-34566	668051	ab	Total BTEX in soil (Poland)	L073-PL	b
WS6		L	16-34566	668050	a			
WS6		S	16-34566	668049	ab	BTEX in soil (Monoaromatics)	L073B-PL	b
WS6		S	16-34566	668049	ab	Mineral Oil (Soil) C10 - C40	L076-PL	b
WS6		S	16-34566	668049	ab	PCB's By GC-MS in soil	L027-PL	b
WS6		S	16-34566	668049	ab	Speciated WAC-17 PAHs in soil	L064-PL	b
WS6		S	16-34566	668049	ab	Total BTEX in soil (Poland)	L073-PL	b

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Table 1 - Tier 1 Screening Values

Contaminant	Units	Proposed Land Use					
		Residential with homegrown produce consumption	Residential without homegrown produce consumption	Open Space* (Residential)	Open Space* (Park)	Allotments	Commercial / Industrial
Arsenic (As) [2]	mg/kg	37	40	79	170	43	640
Cadmium (Cd) [2]	mg/kg	11	85	120	555	1.9	190
Trivalent Chromium (CrIII) [2]	mg/kg	910	910	1,500	33,000	18,000	8600
Hexavalent Chromium (CrVI) [2]	mg/kg	6	6	7.7	220	1.8	33
Lead (Pb) [3]	mg/kg	200	310	630	1300	80	2330
Mercury (Hg) [1,2,7]	mg/kg	7.6-11	9.2-15	40	68-71	6.0	29-320
Selenium (Se) [2]	mg/kg	250	430	1,100	1,800	88	12,000
Nickel (Ni) [2,4]	mg/kg	180	180	230	3,400	230	980
Copper (Cu) [2,4]	mg/kg	2,400	7,100	12,000	44,000	520	68,000
Zinc (Zn) [2,4]	mg/kg	3,700	40,000	81,000	170,000	620	730,000
Phenol [1,2]	mg/kg	120-380	440-1200	440-1300	440-1300	23-83	440-1300
Benzo[a]pyrene [1,5]	mg/kg	1.7-2.4	2.6	4.9	10	0.67-2.7	36
Naphthalene [1,2]	mg/kg	2.3-13	2.3-13	77-430^{+}	77-430^{+}	4.1-24	77-430^{+}
Total Cyanide (CN) [6]	mg/kg	/	/	/	/	/	/
Free Cyanide [6]	mg/kg	/	/	/	/	/	/
Complex Cyanides [6]	mg/kg	/	/	/	/	/	/
Thiocyanate [6]	mg/kg	/	/	/	/	/	/

Notes:

***** Open Space levels calculated on the basis of the exposure modelling developed in the C4SL research.

+ Screening values constrained to saturation limit. Higher values may be acceptable on a site specific basis.

[1] Where ranges of values are given for organic contaminants the screening value is dependant on the Soil $^{+}$Organic Matter.

[2] LQM/CIEH S4UL (2014). Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL 3116. All rights reserved.

[3] C4SL (DEFRA 2014).

[4] Copper, Zinc and Nickel may have phototoxic effects at the given concentrations. Alternative criteria should be adopted for importation of Topsoil or other soils for cultivation. BS3882:2007 and BS8601:2013 suggest values of 200 to 300mg/kg for Zn, 100 to 200mg/kg for Cu, and 60 to 110mg/kg for Ni, for topsoil and subsoil, depending on pH.

[5] Based on the Surrogate Marker approach and modelled using the modified exposure parameters of C4SL but retaining 'minimal risk' HCV.

[6] Screening criteria derived on a site specific basis if test results indicate.

[7] S4UL for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present. Lower concentrations apply for elemental Mercury.

These screening values are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

APPENDIX D

Gas Monitoring Results

Southern Testing
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SOIL GAS AND GROUND WATER DAILY RECORD SHEET

Project Name:	Upper New Steety, Barnsley	Project Engineer:	ADM	Date:	15-Dec-16	Project No:
Client:	Glanville	Operative:	TC	Day of the week:	Thursday	JN05877

Well / TH No.	Atmospheric Pressure (mb) and Ambient Temperature		PID	Differential Pressure	Flow Rate		CH_4	CO_2	O_2	CO	H_2S	Depth to base of well	Water level	Height of Cover	Details of water samples (colour, clarity, odour etc)	Ground Conditions (soft, wet/dry, frozen etc) & Weather Conditions	General Remarks
			Land Gas Data									Groundwater Data			Remarks		
			ppm	pa	l/hr		%	%	%	ppm	ppm	m below top of cover	m below top of cover	m above GL			
WS4	1004.0	P		-0.7	<0.1	P	<0.1	1.2	19.8	0.0	0.0	3.00	2.90				
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					
WS5	1004.0	P		-0.7	<0.1	P	<0.1	1.6	19.5	0.0	0.0	1.90	1.74				
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					
WS6	1004.0	P		-0.7	<0.1	P	<0.1	1.0	20.4	0.0	0.0	2.30	2.19				
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					
		P				P											
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					
		P				P											
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					
		P				P											
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					

P = Peak Reading, S = Steady reading

Equipment Used: Interface Meter, Ion Science PhoCheck TIGER, GFM435 Gas Analyser

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Southern Testing
Environmental & Geotechnical

ST Consult
Environmental & Geotechnical

SOIL GAS AND GROUND WATER DAILY RECORD SHEET

Project Name:	Upper New Street, Barnsley	Project Engineer:	ADM	Date:	20-Dec-16	Project No:
Client:	Glanville Consultants	Operative:	TC	Day of the week:	Tuesday	JN0877

Land Gas Data												Groundwater Data			Remarks		
Well / TH No.	Atmospheric Pressure (mb) and Ambient Temperature		PID	Differential Pressure	Flow Rate		CH_4	CO_2	O_2	CO	H_2S	Depth to base of well	Water level	Height of Cover	Details of water samples (colour, clarity, odour etc)	Ground Conditions (soft, wet/dry, frozen etc) & Weather Conditions	General Remarks
			ppm	pa	l/hr		%	%	%	ppm	ppm	m below top of cover	m below top of cover	m above GL			
WS4	1006.0	P		-0.8	0.1	P	0.0	1.9	18.9	0.0	0.0		2.92				
		S				S											
		Time Of Readings: 11:30				Time Of Readings: 11:30						Time Of Readings: 11:30					
WS5	1006.0	P		-0.8	0.1	P	0.0	1.9	18.9	0.0	0.0		1.80				
		S				S											
		Time Of Readings: 11:40				Time Of Readings: 11:40						Time Of Readings: 11:40					
WS6	1006.0	P		-0.8	0.0	P	0.0	1.2	19.9	0.0	0.0		2.33				
		S				S											
		Time Of Readings: 11:50				Time Of Readings: 11:50						Time Of Readings: 11:50					
		P				P											
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					
		P				P											
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					
		P				P											
		S				S											
		Time Of Readings:				Time Of Readings:						Time Of Readings:					

P = Peak Reading, S = Steady reading

Equipment Used: Interface Meter, Ion Science PhoCheck TIGER, GFM435 Gas Analyser

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